Surface Water Supply of the United States 1957

Part 4. St. Lawrence River Basin

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

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1507

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, L. B. Leopold, chief, under the general direction of J. V. B. Wells, chief, Surface Water Branch, and F. J. Flynn, chief, Basic Records Section.

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

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L. R. Sawyer	St. Paul, Minn.
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CALENDAR FOR WATER YEAR 1957

OCTOBER 1956

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NOVEMBER 1956

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JULY 1957

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AUGUST 1957

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SEPTEMBER 1957

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SURFACE WATER SUPPLY OF ST. LAWRENCE RIVER BASIN, 1957

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, 1957. 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 13,750 gaging stations in the 48 States and at many others in the Territories of Alaska and Hawaii. On September 30, 1957, the Geological Survey and cooperating organizations were maintaining 7,030 gaging stations, including those in Alaska and Hawaii. Discharge measurements only were made at many other points in the 1957 water year. The name of each stream measured at points other than gaging stations is not listed in the index to this report. Only the major river basins in which measurements were made are listed under the item "Discharge measurements" in the index.

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, E. A. Rosenstone, 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 W. J. Mortimer, superintendent.

Indiana: State Department of Conservation, E. K. Marlin, director, through Division of Water Resources, C. H. Bechert, director; State Highway Commission, John Peters, chairman, and C. E. Vogelgesang, chief engineer; Indiana Flood Control and Water Resources Commission, Anton Hulman, Jr., chairman, and J. I. Perrey, chief engineer; State Board of Health, Dr. A. C. Offutt, commissioner, and B. A. Poole, director, Bureau of Sanitary Engineering; and city of Fort Wayne Filtration Plant, L. R. Matthews, superintendent.

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

Minnesota: State Department of Conservation, Division of Waters, S. A. Frellsen, director; and Minnesota State Iron Range Resources and Rehabilitation Commission, K. J. Otava, commissioner.

New York: State Department of Health, Water Pollution Control Board, H. E. Hilleboe, commissioner; State Department of Law, J. K. Javits, attorney general, succeeded by L. J. Lefkowitz; State Department of Public Works, J. W. Johnson, superintendent; Board of Black River Regulating District, L. P. Gaylord, chief engineer; Oswegatchie River-Cranberry Reservoir Commission, A. E. Boughner, commissioner; city of Auburn, G. F. Train, city manager.

Ohio: State Department of Highways, S. O. Linzell, director, succeeded by C. M. Noble, secretary to the Governor; State Department of Natural Resources, A. W. Marion, director, succeeded by H. B. Eagon.

Vermont: Water Conservation Board, R. W. Thieme, commissioner.

Wisconsin: Public Service Commission of Wisconsin, Warren Oakey, 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 76 gaging stations, of which 3 were in Indiana, 30 in Michigan, 2 in Minnesota, 18 in New York, 14 in Ohio, 3 in Vermont, and 6 in Wisconsin.

Assistance was also furnished by the Weather Bureau of the United States Department of Commerce, Fish and Wildlife Service of the United States Department of the Interior, and the United States Department of State.

On waters adjacent to the international boundary, certain gaging stations are maintained by the United States (or Canada) under agreement with Canada (or the United States), and the records are obtained and compiled in a manner equally acceptable in both countries. These stations are designated herein as "International gaging stations."

The following organizations aided in collecting records:

Indiana: Indiana & Michigan Electric Co., and Sanitary District of Chicago.

Michigan: Wayne County Road Commission; Huron-Clinton Metropolitan Authority; Southeastern Oakland Co. Sewage Disposal District; cities of Adrian, Allegan, Battle Creek, Birmingham, Crystal Falls, Dearborn, Detroit, Flint, Jackson, Grand Rapids, Lansing, Niles, and Owosso; 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; villages of Lancaster and Williamsville; Cornell University; New York State Electric & Gas Corp.; Niagara Mohawk Power Corp.; and Rochester Gas & Electric Corp.

Wisconsin: State Conservation Department; Lake Superior District Power Co.; Wisconsin-Michigan Power Co.; and Wisconsin Public Service Corp.

DIVISION OR WORK

The stream-gaging work was done by the Water Resources Division of the Geological Survey, under the direction of personnel shown in the preface. The data for stations in the several States were collected and prepared for publication in the district offices listed below.

State	District office	Address
Illinois	Champaign	605 South Neil Street.
Indiana	Indianapolis	611 North Park Avenue.
Michigan a/	Lansing	407 Capitol Saving & Loan Building.
Minnesota	St. Paul	1610 Post Office Building.
New York	Albany	343 Federal Building.
Ohio	Columbus	1509 Hess Street.
Vermont	Boston, Mass	141 Milk Street.
Wisconsin b/	Madison	666 State Office Building.

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a Except Menominee River at Twin Falls, near Iron Mountain and below Koss but including Brule and Menominee Rivers near Florence, Wis.

b Except Brule and Menominee Rivers near Florence but including Menominee River at Twin Falls, near Iron Mountain and below Koss, Mich.

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 on page 2. Provisional records of discharge prior to publication, and other unpublished data containing 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.

WSP is used as an abbreviation for "Water-Supply Paper" in references to previously published reports.

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.

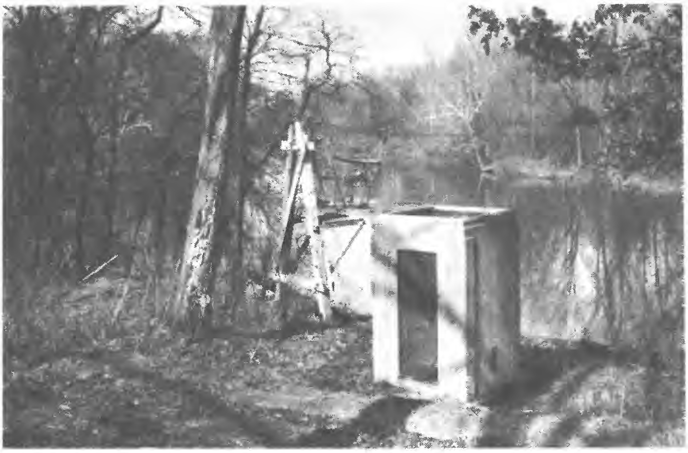
EXPLANATION OF DATA

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.

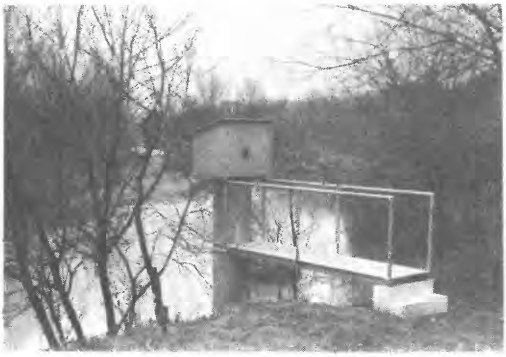
Rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, they are made on the basis of indirect determinations of peak discharge (such as slope-area or contracted-opening determinations, 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 in stage is used as a factor in the determination of discharge.

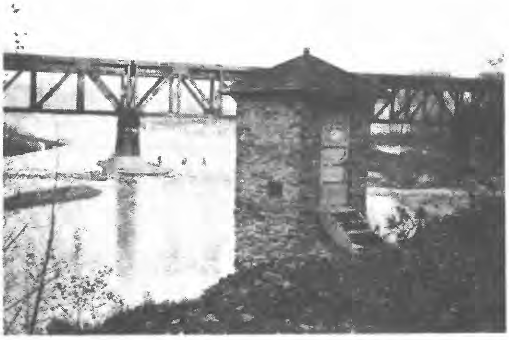
At most gaging stations in the northern part of the United States and at some in the mountainous regions of other parts the stage-discharge relation is affected by ice during the winter, and it becomes impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed 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



A, **Kalamazoo River near Battle Creek, Mich.**



B, **Huron River at Milan, Ohio**



C, **Genesee River at Portageville, N.Y.**

FIGURE 1.—GAGING STATION STRUCTURES

stage-discharge relation is affected by ice, this information is given in a note to the 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. Records are published for the water year which begins on October 1 and ends on September 30. A calendar for the water year 1957 is shown on page IV for the purpose of finding the day of the week for any date.

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 "Records available" are given the periods for which there are published records generally equivalent to those at the present site. 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, locations, and datums of previous gages used during the period of records available. 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). In the first paragraph, the data given are for the complete current water year unless otherwise specified. In the second paragraph, the data given are for the periods of record within the calendar year dates in the heading (not necessarily those for the complete years indicated by the heading dates). Reliable information concerning major floods that have occurred outside the period of record are given in the third or last paragraph under "Extremes." 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 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. Skeleton rating tables are generally not published for stations on canals.

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 figures for the maximum day and the minimum day for each month are underlined. If the figure 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 figures; 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"). Figures 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 figures of maximum are the maximum daily discharges, not the momentary discharges when the water was at crest stage. Likewise, the minimum 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.

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 published each year for all reservoirs for which records are published on a daily basis, but is not published for reservoirs for which only monthly data are given.

Discharge measurements and determinations of peak flows made at sites other than gaging stations are listed at the end of each report.

At many gaging stations water samples are collected from the streams for the purpose of making chemical analyses, computing dissolved solids, suspended sediment loads, and particle-size distribution, or measuring water temperatures. For most of these samples the results are published in an annual series of water-supply papers entitled "Quality of Surface Waters of the United States" which is issued in four volumes. In this report under "Remarks" a reference is made to quality-of-water records collected at gaging stations on a regular basis and published in the quality-of-water reports. At many other gaging stations quality-of-water data are obtained at irregular intervals and published as "miscellaneous analyses" in quality-of-water reports; such records are not referred to in "Remarks" paragraph in this report. At many gaging stations water temperature is obtained also at the time a discharge measurement is made; such temperature readings are not reported in the quality-of-water annual 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, figures 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.

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 2.

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)

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.
WSP 11.......	Gage heights..	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge..	1895-96.

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

(A = Annual Report; B = Bulletin)

Report	Character of data	Year
WSP 15.......	Descriptions, measurements, and gage heights of streams east of the Mississippi River, and Missouri River and tributaries above Kansas River.	1897.
WSP 16.......	Descriptions, measurements, and gage heights of streams 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.
WSP 27.......	Measurements, ratings, and gage heights of streams east of the Mississippi River, and Missouri River and tributaries.	1898.
WSP 28.......	Measurements, ratings, and gage heights of streams west of the Mississippi River, except Missouri River and tributaries.	1898.
20th A, pt. 4	Monthly discharge..	1898.
WSP 35 to 39.	Descriptions, measurements, gage heights, and ratings.......	1899.
21st A, pt. 4	Monthly discharge..	1899.
WSP 47 to 52.	Descriptions, measurements, gage heights, and ratings.......	1900.
22d A, pt. 4.	Monthly discharge..	1900.
WSP 65, 66...	Descriptions, measurements, gage heights, and ratings.......	1901.
WSP 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, 1899-1957

Year	WSP	Year	WSP	Year	WSP	Year	WSP	Year	WSP
1899	36	1912	324	1925	604	1937	824	1949	1144
1900	49	1913	354	1926	624	1938	854	1950	1174
1901	65,75	1914	384	1927	644	1939	874	1951	1207
1902	a82,83	1915	404	1928	664	1940	894	1952	1237
1903	97	1916	434	1929	684	1941	924	1953	1277
1904	129	1917	454	1930	699	1942	954	1954	1337
1905	170	1918	474	1931	714	1943	974	1955	1387
1906	206	1919-20	504	1932	729	1944	1004	1956	1437
1907-8	244	1921	524	1933	744	1945	1034	1957	1507
1909	264	1922	544	1934	759	1946	1054		
1910	284	1923	564	1935	784	1947	1084		
1911	304	1924	584	1936	804	1948	1114		

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. Discharge measurements at many points other than regular gaging stations have been made each year and are published 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.

A compilation of records for the area covered by this report through September 1950 has been published as Water-Supply Paper 1307. That report contains a summary of monthly and annual discharges for all previously published records as well as some records not contained in the annual series of water-supply papers. All records were reexamined and revised where warranted. Estimates of discharge were made to fill short gaps whenever practical.

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 or other agencies. 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:

Report	Issued by
WSP 147: Destructive floods in the United States in 1904.	U. S. Geological Survey.
WSP 162: Destructive floods in the United States in 1905.	Do.
WSP 636-C: The New England flood of November 1927.	Do.

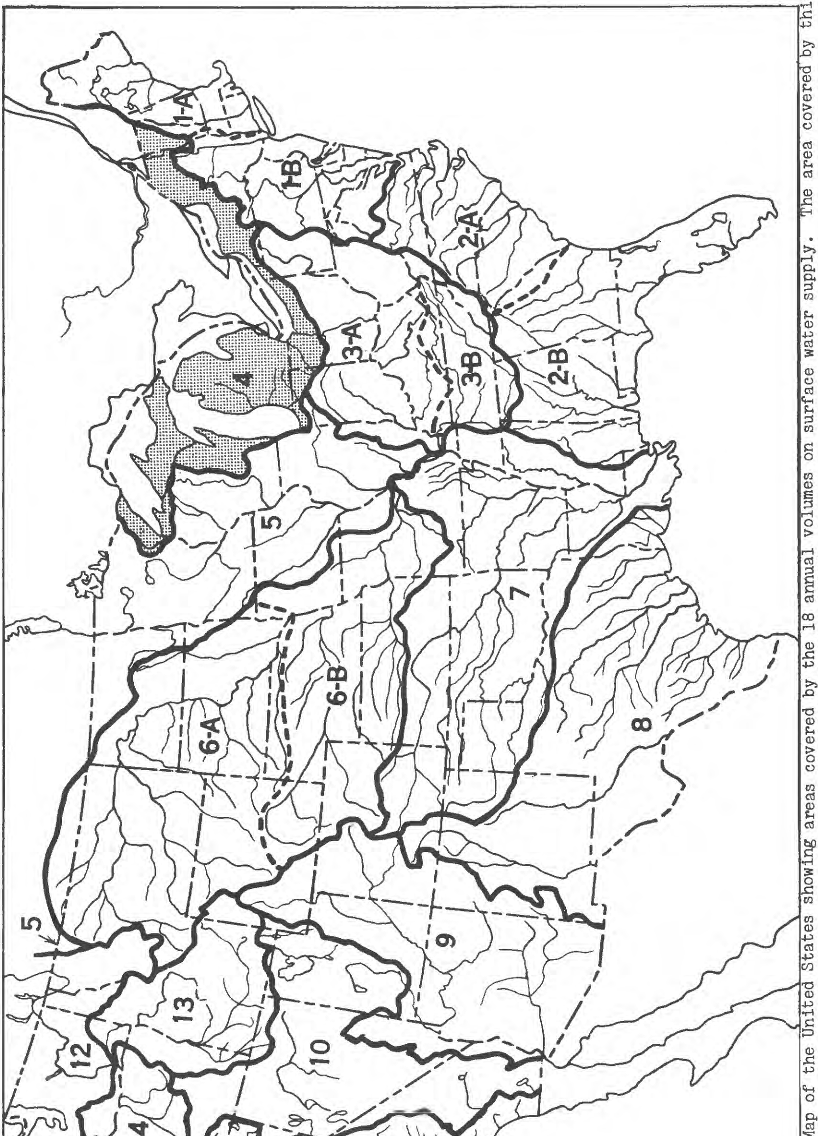

1-A
1-B
2-A
2-B
3-A
3-B
4
5
6-A
6-B
7
8
9
10
11
12
13
14
5

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.

Special reports of floods published by the Geological Survey and other agencies--Continued

Report	Issued by
WSP 771: Floods in the United States, magnitude and frequency.	U. S. Geological Survey.
WSP 773-E: The New York State flood of July 1935.	Do.
WSP 798: The floods of March 1936, part 1, New England Rivers.	Do.
WSP 799: The floods of March 1936, part 2, Hudson River to Susquehanna River region.	Do.
WSP 847: Maximum discharges at stream-measurement stations through September 1938.	Do.
WSP 867: Hurricane floods of September 1938.	Do.
WSP 1137-G: Floods of 1950 in the Upper Mississippi River and Lake Superior basins in Minnesota.	Do.
WSP 1137-I: Summary of floods in the United States during 1950.	Do.
Bull. 1: Magnitude and frequency of floods in Minnesota.	Minnesota Division of Waters.
Bull. 7: Floods in Ohio, magnitude and frequency.	Ohio Water Resources Board.
Bull. 14: Local floods in Ohio during 1947.	Do.
WSP 1227-D: Summary of floods in the United States during 1951.	U. S. Geological Survey.
WSP 1370-B: Floods of October 1954 in the Chicago area, Illinois, and Indiana.	Do.

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 1956 to September 1957 by agencies other than the Geological Survey. The records of these stations are not contained in publications of the Geological Survey.

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........	1926-57	State Department of Public Works, Syracuse, N. Y.
Clyde River..........	Clyde, N. Y....................	1924-57	Do.
Indian River.........	Theresa, N. Y..................	1934-57	Niagara Mohawk Power Corporation, Syracuse, N. Y.
Oswegatchie River, East Branch.	Brown Falls, N. Y..............	1934-57	Do.
Oswego River.........	Dam O-5, Minetto, N. Y.........	1928-57	State Department of Public Works, Syracuse, N. Y.
Do................	Lower Dam, Fulton, N. Y........	1926-57	Oswego River Watershed Corporation, Fulton, N. Y.
Do................	High Dam, Oswego, N. Y.........	1940-57	Niagara Mohawk Power Corporation, Syracuse, N. Y.
Raquette River.......	Colton, N. Y...................	1934-57	Do.
St. Regis River, West Branch.	Parishville, N. Y..............	1934-57	Do.
Salmon River.........	Bennetts Bridge, Altmar, N. Y..	1934-57	Do.
Saranac River........	Kents Falls, N. Y..............	1934-57	System Properties, Inc., Cadyville, N. Y.
Seneca River.........	Seneca Falls, N. Y.............	1931-57	New York State Electric & Gas Corp., Geneva, N. Y.
Do................	Waterloo, N. Y.................	1931-57	Do.
Skaneateles Lake Outlet.	Skaneateles, N. Y..............	1922-57	City of Syracuse, 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 Agricultural Research Service of the U. S. Department of Agriculture (beginning in 1941) has collected records of runoff from 3 areas of less than 2 acres each near East Lansing, Mich.

Streamflow was generally deficient in northern New York, Vermont, northeastern Wisconsin, and the Upper Peninsula of Michigan. Elsewhere in the area covered by this report, streamflow averaged near median. The only noteworthy departure from the median was in the Lower Peninsula of Michigan during July, when peak discharge and monthly mean discharge were record-high at a few scattered stations. Extensive flooding also occurred in northern Indiana and in the Chicago area during July. Local floods occurred in the Syracuse, N. Y., area in August. Streamflow was excessive in the Upper Peninsula of Michigan during September. For two key gaging stations in the area covered by this report, a comparison of the monthly and yearly mean discharges during the 1957 water year with the median discharges for the 25-year period 1921-45 is shown in figure 3 below.

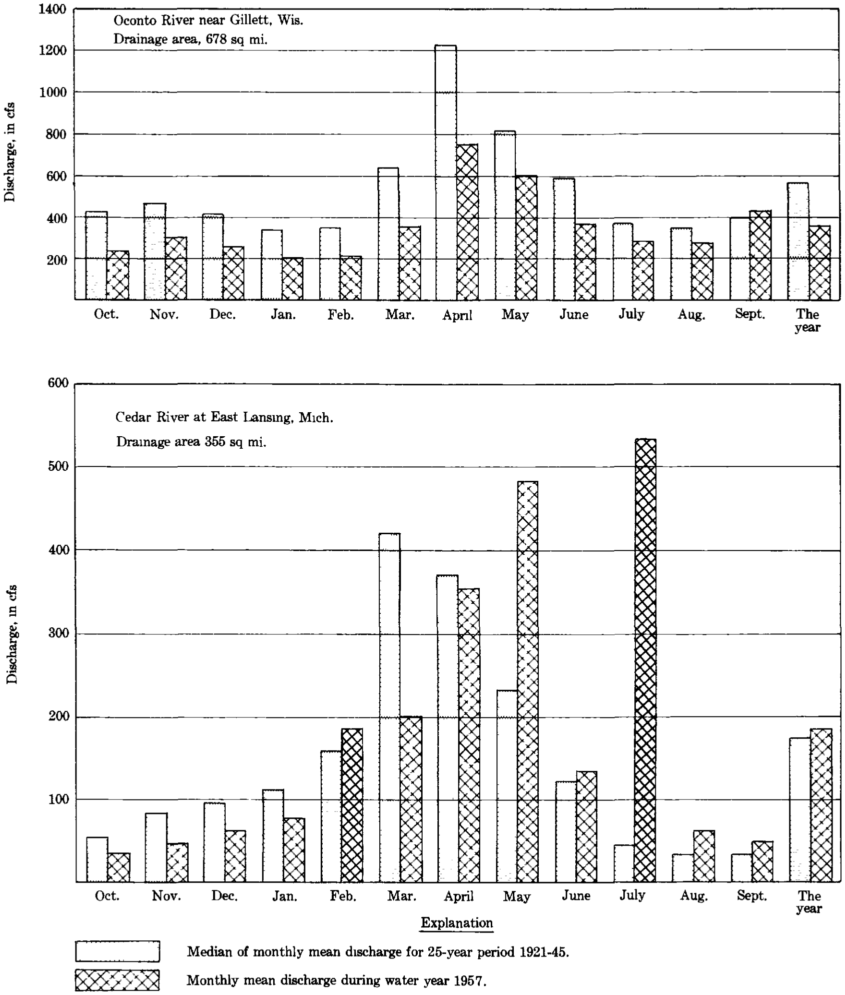


Figure 3. Comparison of discharge at two key gaging stations during 1957 water year with median discharge for 25-year period.

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 5¾ miles downstream from International Bridge.

Drainage area.--600 sq mi.

Records available.--April 1924 to September 1957 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 1957 in reports of Water Resources Branch, Department of Northern Affairs and National Resources, 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, 5¾ miles upstream at datum 100.24 ft higher.

Average discharge.--34 years (1923-57), 504 cfs.

Extremes.--Maximum discharge during year, 5,580 cfs Apr. 25 (gage height, 8.28 ft); minimum daily, 95 cfs Mar. 8; minimum gage height, 0.86 ft Sept. 30.

1923-57: Maximum discharge, 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 period of ice effect, which are fair.

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

Revisions (water years).--WSP 744: 1927, 1928. WSP 974: Drainage area. WSP 804: 1934(M). WSP 1337: 1924(M), 1925, 1926-28(M), 1931(M), 1938(M), 1941(M), 1945-46(M), 1947, 1948(M), 1950(M).

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	103	5.0	1,940
1.0	137	6.0	2,800
2.0	414	7.0	3,910
3.0	775	9.0	6,880
4.0	1,260		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	183	146	152	143	100	108	226	2,530	968	578	155	160
2	*176	148	155	142	100	105	*265	2,160	982	534	155	163
3	170	153	158	142	100	103	315	1,840	968	534	155	170
4	165	153	*158	*141	100	102	360	*1,570	932	534	155	165
5	158	153	160	140	100	100	390	1,380	878	568	153	158
6	153	220	158	140	101	97	399	1,250	842	558	146	151
7	151	317	148	142	102	96	389	1,170	829	494	153	148
8	148	317	142	144	103	95	380	1,090	793	442	170	146
9	142	314	139	140	104	98	386	996	744	399	170	139
10	137	250	143	136	107	102	380	932	710	371	160	*139
11	129	231	146	130	108	105	374	878	*685	350	153	139
12	126	226	153	125	*109	110	362	820	503	335	146	139
13	124	220	154	118	110	112	356	727	433	258	*148	139
14	124	207	153	116	111	113	350	816	414	196	158	135
15	135	172	152	113	112	115	359	856	448	186	165	137
16	160	155	152	112	111	115	408	718	461	*189	163	133
17	163	180	155	110	111	116	458	802	426	209	155	129
18	158	210	158	110	111	116	494	635	423	199	151	131
19	155	205	160	110	110	118	714	744	423	176	148	144
20	151	195	165	110	110	*124	1,450	558	411	176	146	146
21	146	180	168	110	110	152	2,010	802	514	178	148	146
22	144	165	168	109	110	170	2,600	1,560	1,640	176	146	139
23	142	160	165	107	110	175	*3,410	1,580	1,740	170	144	137
24	137	158	162	106	110	178	4,560	1,120	1,510	163	142	133
25	133	155	160	105	110	180	5,280	874	1,120	160	153	126
26	144	155	158	103	109	180	5,080	1,010	932	160	173	120
27	155	152	157	102	108	182	4,380	1,200	838	165	173	118
28	155	152	155	100	108	184	*3,670	1,100	731	163	173	115
29	144	150	150	100	-	190	3,140	1,000	689	160	163	114
30	*139	150	148	100	--------	200	2,830	1,080	639	158	160	114
31	144	--------	146	100	--------	208	--------	1,010	--------	155	160	--------
Total	4,591	5,749	4,798	3,706	2,995	4,149	45,775	34,808	23,626	9,094	4,840	4,173
Mean	148	192	155	120	107	134	1,526	1,123	788	293	156	139
Cfsm	0.247	0.320	0.258	0.200	0.178	0.223	2.54	1.87	1.31	0.488	0.260	0.232
In.	0.28	0.36	0.30	0.23	0.19	0.26	2.84	2.16	1.46	0.56	0.30	0.26

Calendar year 1956: Max 4,050 Min 124 Mean 484 Cfsm 0.807 In. 10.98
Water year 1956-57: Max 5,280 Min 95 Mean 406 Cfsm 0.677 In. 9.20

Peak discharge (base, 3,000 cfs).--Apr. 25 (8 p.m.) 5,580 cfs (8.28 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 15 to Apr. 5.

Poplar River at Lutsen, Minn.

Location.--Lat 47°38', long 90°42', in sec. 33, T. 60 N., R. 3 W., on right bank 350 ft upstream from concrete bridge on U. S. Highway 61 at Lutsen and 1,650 ft upstream from mouth.

Drainage area.--114 sq mi.

Records available.--May 1911 to December 1912 (gage heights only), January 1913 to September 1917, July 1928 to February 1929, March 1930 to September 1947, August 1952 to September 1957.

Gage.--Water-stage recorder and concrete control. Datum of gage is 697.89 ft above mean sea level. May 6 to Nov. 4, 1911, staff gage at site 1,250 ft downstream and Aug. 22, 1912, to Sept. 30, 1917, at site 900 ft downstream at different datum. July 17, 1928, to Mar. 30, 1937, chain gage at old steel highway bridge, 150 ft downstream at datum 6.90 ft lower.

Average discharge.--25 years (1913-17, 1930-32, 1933-47, 1952-57), 111 cfs.

Extremes.--Maximum discharge during year, 1,170 cfs Apr. 25 (gage height, 5.48 ft); minimum, 19 cfs Oct. 11 (gage height, 2.38 ft).

1913-17, 1928-47, 1952-57: Maximum discharge, 1,880 cfs May 1, 1954 (gage height, 6.23 ft); minimum, 2.3 cfs Dec. 3, 1939 (gage height, 1.73 ft).

Remarks.--Records good.

Revisions (water years).--WSP 894: 1938-39. WSP 974: Drainage area. WSP 1337: 1914(M), 1928, 1930-35, 1936(M).

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 18, 19, Apr. 26 to May 6, May 21-23, 26, 27, June 21-25)

2.3	15	3.7	202
2.5	26	4.0	290
2.8	48	4.5	525
3.1	84	5.0	870
3.4	134	5.5	1,250

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	74	b52	45	32	32	b56	720	233	283	86	33
2	*26	68	b52	b44	31	32	*b60	624	202	302	81	37
3	26	64	b53	b44	30	31	*b65	*549	224	326	74	39
4	24	60	*b54	*b43	29	30	67	470	202	298	71	34
5	22	58	b54	b43	29	30	62	420	183	344	67	32
6	23	71	b55	b43	28	29	61	375	169	283	62	30
7	23	71	b53	43	28	28	63	334	180	255	62	30
8	24	64	b50	43	27	27	65	306	166	235	81	27
9	22	58	b51	44	28	27	63	276	155	195	74	26
10	20	52	b52	41	30	27	63	249	153	173	68	*30
11	19	50	b53	40	31	27	61	233	*224	188	62	31
12	20	50	b53	40	*31	27	61	210	207	235	56	30
13	21	48	b54	39	32	27	60	195	173	214	*58	32
14	34	48	b56	38	32	27	58	202	200	171	64	28
15	38	43	58	38	32	30	63	262	266	151	83	28
16	34	b38	60	38	32	33	81	220	210	*138	89	30
17	31	b48	60	36	33	34	103	204	220	129	74	28
18	28	b57	58	35	34	34	116	195	238	127	64	30
19	27	b58	58	35	33	33	*200	178	214	162	61	55
20	26	58	56	37	32	*33	470	157	220	188	54	69
21	25	56	54	38	32	32	604	236	528	180	50	58
22	24	56	54	40	33	34	664	481	810	155	47	52
23	22	b54	52	39	34	37	*765	411	818	132	45	48
24	21	b52	52	37	34	40	915	302	624	120	42	46
25	24	b51	b51	34	34	41	1,120	269	460	111	40	48
26	66	b51	50	32	33	41	1,060	465	398	121	38	44
27	62	b50	50	32	32	44	922	460	362	111	33	40
28	50	b50	b48	31	32	45	*832	362	362	105	32	38
29	44	b50	b46	32	-	48	802	310	380	100	31	38
30	*63	b51	46	33	--------	b52	788	272	326	94	31	36
31	89	--------	45	32	--------	b55	--------	247	--------	89	31	--------
Total	1,004	1,659	1,640	1,189	878	1,067	10,370	10,194	9,107	5,715	1,811	1,127
Mean	32.4	55.3	52.9	38.4	31.4	34.4	346	329	304	184	58.4	37.6
Cfsm	0.284	0.485	0.464	0.337	0.275	0.302	3.04	2.89	2.67	1.61	0.512	0.330
In.	0.33	0.54	0.54	0.39	0.29	0.35	3.38	3.33	2.97	1.86	0.59	0.37

Calendar year 1956:	Max 1,030	Min 19	Mean 129	Cfsm 1.13	In. 15.39
Water year 1956-57:	Max 1,120	Min 19	Mean 125	Cfsm 1.10	In. 14.94

Peak discharge (base, 500 cfs).--Apr. 25 (2:30 a.m.) 1,170 cfs (5.48 ft); May 22 (2 p.m.) 503 cfs (4.58 ft); May 26 (6 to 8 p.m.) 508 cfs (4.59 ft); June 22 (10 p.m.) 885 cfs (5.12 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Baptism River near Beaver Bay, Minn.

Location (revised).--Lat 47°20'15", long 91°12'00", in SE¼NE¼ sec. 15, T. 56 N., R. 7 W., on right bank 260 ft upstream from bridge on U. S. Highway 61, 0.2 mile upstream from mouth, 4 miles northeast of Silver Bay, and 7 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 1957.

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.--25 years (1930-47, 1949-57), 168 cfs.

Extremes.--Maximum discharge during year, 2,940 cfs Apr. 24 (gage height, 5.24 ft); minimum, 11 cfs Aug. 27-31; minimum gage height, 1.89 ft Aug. 30.

1928-29, 1930-47, 1949-57: Maximum discharge recorded, 9,350 cfs Aug. 9, 1939 (gage height, 8.11 ft), from rating curve extended above 4,000 cfs; minimum daily, 0.4 cfs Jan. 5, 6, 1940.

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

Revisions (water years).--WSP 894: 1939. WSP 1337: 1933-34(M), 1935.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 15		Nov. 15 to Apr. 16		Apr. 17 to Sept. 30			
2.3	30	2.2	27	1.9	11	3.3	231
2.6	55	2.5	50	2.1	18	3.6	470
2.9	98	2.7	71	2.4	36	4.0	875
3.2	195	2.9	111	2.7	63	4.5	1,490
3.6	425			3.0	113	5.2	2,860

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*55	333	91	61	31	35	158	710	231	237	36	12
2	63	269	88	60	31	34	164	590	182	202	32	13
3	61	228	*86	58	31	33	*162	470	174	187	28	26
4	56	200	85	58	30	33	148	*362	159	162	25	20
5	53	209	84	58	29	32	134	280	131	155	22	17
6	52	280	83	58	30	31	132	243	111	131	20	16
7	50	269	82	*57	30	30	129	211	111	113	20	14
8	49	242	84	55	29	30	127	192	98	102	20	13
9	45	204	83	55	30	30	122	170	85	83	18	13
10	43	179	82	52	32	29	116	155	88	85	17	*13
11	43	167	80	50	*33	29	108	137	*245	158	16	13
12	43	167	79	49	35	29	101	116	274	237	16	13
13	46	155	78	46	35	29	97	104	187	206	*22	14
14	142	152	77	44	35	29	96	128	192	143	25	13
15	132	167	77	43	35	30	115	211	262	104	24	13
16	110	193	76	42	36	30	210	187	206	*81	24	13
17	95	189	76	41	36	30	370	159	216	68	21	14
18	84	172	75	41	35	29	390	143	419	61	18	16
19	75	165	74	41	34	*28	*730	116	286	88	18	33
20	68	144	73	42	33	28	2,340	98	300	393	16	45
21	63	138	72	43	33	30	2,400	217	864	440	15	42
22	61	112	71	44	34	34	2,440	640	1,490	308	14	41
23	56	98	71	42	33	42	*2,620	560	2,220	206	13	40
24	55	100	71	41	33	51	2,780	400	1,680	143	12	61
25	55	101	69	39	34	64	2,620	392	980	102	12	78
26	159	100	69	37	36	73	2,100	720	640	88	12	69
27	155	99	69	35	35	85	*1,490	690	490	74	11	58
28	132	97	67	33	34	97	1,160	550	470	63	11	50
29	*112	96	64	34	-	114	980	520	460	56	11	42
30	302	93	63	33	--------	130	844	400	323	48	11	38
31	405	--------	62	33	--------	149	--------	286	--------	41	11	--------
Total	2,920	5,118	2,361	1,425	922	1,477	25,383	10,157	13,574	4,565	571	863
Mean	94.2	171	76.2	46.0	32.9	47.6	846	328	452	147	18.4	28.8
Cfsm	0.673	1.22	0.544	0.329	0.235	0.340	6.04	2.34	3.23	1.05	0.131	0.206
In.	0.78	1.36	0.63	0.38	0.24	0.39	6.74	2.70	3.61	1.21	0.15	0.23

Calendar year 1956:	Max 2,430	Min 22	Mean 203	Cfsm 1.45	In. 19.74
Water year 1956-57:	Max 2,780	Min 11	Mean 190	Cfsm 1.36	In. 18.42

Peak discharge (base, 1,300 cfs).--Apr. 24 (9 p.m.) 2,940 cfs (5.24 ft); June 23 (10:30 a.m.) 2,700 cfs (5.12 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16-22, Nov. 24 to Dec. 22, Dec. 31, Jan. 1, Mar. 11 to Apr. 16.

Second Creek near Aurora, Minn.

Location.--Lat 47°31'25", long 92°11'35", in SW¼ sec. 12, T. 58 N., R. 15 W., on left bank 0.1 mile downstream from First Creek, 0.4 mile upstream from mouth, and 2.1 miles east of Aurora.

Drainage area.--26.3 sq mi.

Records available.--March 1955 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 1,410.36 ft above mean sea level, datum of 1929 (levels by Erie Mining Co.).

Extremes.--Maximum discharge during year, 208 cfs Apr. 21 (gage height, 5.60 ft); maximum gage height, 5.75 ft Mar. 28 (backwater from ice); minimum discharge, 5.4 cfs Sept. 14 (gage height, 3.34 ft).

1955-57: Maximum discharge, that of Apr. 21, 1957; maximum gage height, that of Mar. 28, 1957; minimum discharge, 1.9 cfs Aug. 3, 1956 (gage height, 3.18 ft).

Remarks.--Records good except those for periods of ice effect and no gage-height record, which are fair. Records of chemical analyses and water temperatures for the water year 1957 are given in WSP 1520.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.3	4.5	4.2	54
3.5	9.4	4.5	81
3.7	17	5.0	136
3.9	28	5.6	208

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.2	27	10	6.6	6.1	6.5	63	*41	18	21	15	7.0
2	6.7	*28	10	6.5	6.1	6.5	69	34	15	20	16	7.8
3	6.7	26	10	6.5	6.1	6.5	66	28	16	20	15	8.9
4	8.6	25	10	6.5	6.1	6.4	61	25	16	19	14	7.5
5	9.4	23	10	6.5	6.1	6.4	*59	20	15	18	13	7.2
6	*9.4	21	10	6.5	6.1	6.4	52	17	14	17	12	8.0
7	9.4	22	*10	6.5	6.1	6.2	46	15	13	23	12	7.0
8	10	21	9.6	6.5	6.1	6.2	40	14	11	22	12	7.2
9	8.9	18	9.4	*6.5	6.1	6.2	35	14	8.9	19	11	7.2
10	9.1	16	9.1	6.5	6.3	6.2	31	14	8.6	21	9.1	7.0
11	8.3	16	8.8	6.5	6.3	6.2	28	12	11	23	8.0	6.3
12	8.6	17	8.8	6.5	6.3	6.4	24	12	11	45	7.8	6.7
13	9.1	16	8.8	6.4	6.3	6.6	22	11	12	56	9.1	6.3
14	11	15	8.8	6.4	6.3	6.8	20	18	13	54	10	*6.7
15	10	15	8.8	6.4	*6.3	6.9	22	30	15	42	11	6.3
16	11	14	8.6	6.2	6.3	6.8	*35	28	11	33	13	7.5
17	10	16	8.4	6.2	6.3	6.7	47	26	22	25	*12	7.5
18	8.9	18	8.2	6.2	6.3	7.0	48	22	a29	22	9.4	9.3
19	10	15	8.0	6.2	6.3	7.6	90	18	a39	24	8.9	21
20	12	14	8.0	6.2	6.3	8.2	174	15	a49	*39	8.6	19
21	11	14	8.0	6.2	6.3	9.1	198	16	a60	50	7.5	20
22	11	13	7.6	6.1	6.3	10	176	24	a72	48	7.5	20
23	11	12	7.6	6.1	6.3	*12	155	23	a86	41	8.6	18
24	11	12	7.4	6.1	6.4	13	142	23	a94	34	8.0	23
25	11	11	7.2	6.1	6.5	16	*120	21	a85	28	7.8	25
26	15	11	7.2	6.1	6.5	21	97	28	a71	27	7.8	25
27	14	11	7.2	6.1	6.5	23	79	37	a55	22	7.5	21
28	13	10	7.2	6.1	6.5	27	66	34	a37	20	8.3	17
29	12	10	7.2	6.1	-	35	59	32	*29	17	8.3	15
30	26	10	7.2	6.1	--------	45	51	27	25	17	7.5	14
31	27	--------	6.8	6.1	--------	53	--------	22	--------	17	7.2	--------
Total	346.3	497	263.9	195.5	175.5	396.8	2,175	701	961.5	884	312.9	369.4
Mean	11.2	16.6	8.51	6.31	6.27	12.8	72.5	22.6	32.0	28.5	10.1	12.3
Cfsm	0.426	0.631	0.324	0.240	0.238	0.487	2.76	0.859	1.22	1.08	0.384	0.468
In.	0.49	0.70	0.37	0.28	0.25	0.56	3.08	0.99	1.36	1.25	0.44	0.52

Calendar year 1956: Max 99 Min 2.8 Mean 16.4 Cfsm 0.624 In. 8.48
Water year 1956-57: Max 198 Min 6.1 Mean 19.9 Cfsm 0.757 In. 10.29

Peak discharge (base, 60 cfs).--Apr. 21 (1 to 2 a.m.) 208 cfs (5.60 ft); June 24 (time unknown) 97 cfs (4.66 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 Partridge River near Aurora.

Note.--Stage-discharge relation affected by ice Nov. 22 to Apr. 12.

Partridge River near Aurora, Minn.

Location.--Lat 47°31'02", long 92°11'24", in SE¼SW¼ sec. 12, T. 58 N., R. 15 W., on right bank at upstream side of highway bridge, 1,000 ft downstream from Second Creek, 2½ miles east of Aurora, and 2¾ miles upstream from mouth.

Drainage area.--156 sq mi.

Records available.--August 1942 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 1,402.30 ft above mean sea level, datum of 1929. Aug. 5, 1942, to Aug. 25, 1944, staff gage and Aug. 26, 1944, to July 1, 1956, water-stage recorder, at site 45 ft downstream at same datum.

Average discharge.--15 years, 136 cfs (adjusted for storage and diversion).

Extremes.--Maximum discharge during year, 1,630 cfs Apr. 24 (gage height, 5.97 ft); minimum daily, 10 cfs Mar. 2-4, 8-12, 16, 17.

1942-57: 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 except those for period of ice effect, which are fair. Flow regulated at times by storage in off-channel Partridge Reservoir, formerly known as Whitewater Lake. Reservoir formed from lake by levees around marsh areas and natural outlet. Available capacity, 20,000 acre-ft between elevation 1,410 ft (natural lake level) and 1,440 ft. Storage began Apr. 9, 1955. Storage in reservoir obtained from Colby Lake during periods of high flow; release from storage returned to Colby Lake to maintain lake elevation during diversion for iron ore processing. Diversion began Feb. 7, 1956. Some seepage losses from reservoir bypasses station. Records of chemical analyses and water temperatures for the water year 1957 are given in WSP 1520.

Revisions (water years).--WSP 974: 1942. WSP 1307: 1943(M).

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 4-30)

1.3	10	3.0	132
1.5	14	3.5	230
1.7	20	4.0	415
1.9	25	4.5	625
2.1	32	5.0	925
2.3	42	6.0	1,660
2.6	73		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	37	59	36	21	12	11	58	*558	156	284	45	16
2	34	*68	37	21	12	10	66	423	140	230	46	17
3	33	61	36	20	12	10	71	363	122	192	44	19
4	32	58	35	20	11	10	82	292	105	168	42	16
5	32	59	34	19	11	11	*94	220	87	150	39	16
6	*29	58	34	19	11	11	77	183	81	137	38	16
7	28	55	*34	19	11	11	71	156	76	140	35	14
8	28	54	33	18	11	10	69	132	68	129	34	13
9	26	53	33	*18	11	10	72	114	59	119	31	14
10	26	50	32	18	11	10	68	100	53	116	28	13
11	25	52	31	18	11	10	71	92	52	114	27	11
12	25	51	31	18	11	10	71	82	50	166	25	12
13	25	46	30	18	12	11	69	72	47	245	28	13
14	28	47	30	17	12	11	66	78	47	347	28	*12
15	26	47	29	17	*12	11	63	96	47	387	28	12
16	26	48	28	16	12	10	*82	106	43	367	28	15
17	26	55	27	16	12	10	96	118	66	284	*27	15
18	25	61	27	16	12	11	103	105	83	220	25	17
19	25	57	26	16	12	12	151	96	99	185	24	32
20	26	46	26	16	12	14	278	86	138	*192	23	30
21	25	45	25	16	11	16	311	87	196	220	23	32
22	25	45	25	15	11	18	278	99	281	242	22	33
23	24	44	24	15	11	*18	655	103	443	242	22	33
24	25	45	24	15	11	22	1,480	106	527	220	20	42
25	25	44	23	14	11	24	*1,400	119	511	192	20	50
26	30	44	23	14	11	25	1,420	150	566	164	19	63
27	28	43	23	13	11	28	1,320	172	584	145	17	59
28	28	39	22	13	11	38	1,120	183	519	129	18	42
29	28	39	22	13	-	44	904	201	*435	113	18	46
30	46	37	22	12	-------	52	708	196	355	89	16	42
31	49	-------	21	12	-------	61	-------	179	-------	47	16	-------
Total	895	1,510	883	513	319	561	11,374	5,067	6,036	5,975	856	765
Mean	28.9	50.3	28.5	16.5	11.4	18.1	379	163	201	193	27.6	25.5
(†)	0	+7.77	0	0	0	+0.51	+124	+30.3	+13.8	+4.54	+0.21	+4.73
Adjusted for change in contents in Partridge Reservoir												
Mean	28.9	58.1	28.5	16.5	11.4	18.6	503	193	215	198	27.8	30.2
Cfsm	1.85	0.372	0.183	0.106	0.073	0.119	3.22	1.24	1.38	1.27	0.178	0.194
In.	0.21	0.42	0.21	0.12	0.08	0.14	3.60	1.43	1.54	1.46	0.21	0.22

	Observed			Adjusted		
Calendar year 1956:	Max 778	Min 11	Mean 85.7	Mean 93.9	Cfsm 0.602	In. 8.20
Water year 1956-57:	Max 1,480	Min 10	Mean 95.2	Mean 110	Cfsm 0.705	In. 9.64

Peak discharge (base, 500 cfs).--Apr. 24 (8:30 p.m.) 1,630 cfs (5.97 ft); June 27 (3 a.m.) 598 cfs (4.44 ft).

* Discharge measurement made on this day.

† Change in contents, equivalent in cubic feet per second, in Partridge Reservoir; records furnished by Erie Mining Co.

Note.--Stage-discharge relation affected by ice Dec. 10 to Mar. 28.

St. Louis 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 1957.

Gage.--Water-stage recorder. Datum of gage is 1,371.24 ft above mean sea level, datum of 1929. Prior to Aug. 26, 1944, chain gage at same site and datum.

Average discharge.--15 years, 256 cfs (adjusted for storage and diversion).

Extremes.--Maximum discharge during year, 2,090 cfs Apr. 24 (gage height, 5.11 ft); minimum, 25 cfs Sept. 11, 12, 14; minimum gage height, 0.97 ft Sept. 8.

1942-57: Maximum discharge, 5,380 cfs May 14, 1950 (gage height, 8.37 ft); minimum, 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. Flow regulated at times by storage in off-channel Partridge Reservoir, formerly known as Whitewater Lake. Reservoir formed from lake by levees around marsh areas and natural outlet. Available capacity, 20,000 acre-ft between elevation 1,410 ft (natural lake level) and 1,440 ft. Storage began Apr. 9, 1955. Storage in reservoir obtained from Colby Lake during periods of high flow; release from storage returned to Colby Lake to maintain lake elevation during diversion for iron ore processing. Diversion began Feb. 7, 1956. Some seepage losses from reservoir enters above station. Records of chemical analyses and water temperatures for the water year 1957 are given in WSP 1520.

Revisions (water years).--WSP 1337: 1950.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 27 to Sept. 30)

Oct. 1 to Apr. 9, June 16 to Sept. 30				Apr. 10 to June 15	
0.7	24	2.0	227	1.5	108
1.0	46	2.5	402	2.0	247
1.3	77	3.0	627	3.0	661
1.6	127	4.0	1,210	4.0	1,240
				5.0	2,000

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	*108	84	54	34	36	130	*1,230	325	569	154	37
2	83	121	85	54	34	35	144	1,050	296	508	142	37
3	78	119	86	53	33	34	155	950	272	531	134	38
4	75	116	82	53	33	34	165	854	240	486	123	34
5	75	114	79	53	33	33	*180	748	214	422	112	33
6	*72	114	75	52	33	33	190	666	204	402	103	32
7	67	114	72	52	33	32	198	589	192	402	94	30
8	67	112	*71	*52	33	31	202	518	176	367	88	28
9	63	112	70	52	34	30	196	465	158	316	80	28
10	63	105	70	51	34	30	192	412	147	294	76	29
11	61	105	69	50	35	31	182	378	147	288	71	27
12	60	110	69	49	35	32	176	336	142	363	66	28
13	62	105	67	47	34	32	155	300	138	490	73	29
14	69	105	66	46	34	34	142	300	140	569	71	*27
15	64	106	64	45	33	34	142	344	138	583	77	28
16	63	104	62	44	*33	34	188	348	131	545	75	30
17	63	119	61	44	32	33	*261	340	163	473	*72	31
18	61	127	60	43	32	33	300	304	183	398	67	34
19	61	118	59	43	32	34	478	282	219	379	62	56
20	63	110	58	43	32	36	892	258	278	*418	59	51
21	60	105	57	42	32	38	1,110	254	386	495	56	51
22	59	82	57	41	32	40	1,060	282	559	504	54	54
23	58	85	57	40	32	*42	1,190	293	876	490	52	56
24	57	95	56	39	33	49	1,860	282	948	*447	50	69
25	58	96	56	38	33	59	*1,940	286	846	398	46	66
26	67	92	56	37	34	73	1,980	325	834	356	42	72
27	63	89	55	36	35	85	1,940	378	852	319	40	78
28	62	86	55	36	36	94	1,790	393	824	291	39	69
29	64	85	55	35	-	103	1,600	405	742	258	38	70
30	100	84	54	35	-------	108	1,420	397	*658	227	37	71
31	103	-------	54	34	-------	117	-------	366	-------	173	36	-------
Total	2,106	3,143	2,021	1,393	933	1,469	20,558	14,333	11,428	12,761	2,289	1,323
Mean	67.9	105	65.2	44.9	33.3	47.4	685	462	381	412	73.8	44.1
(†)	0	+7.8	0	0	0	+0.51	+124	+30.3	+13.8	+4.5	+0.21	+4.7

Adjusted for diversion and change in contents in Partridge Reservoir

Mean	67.9	113	65.2	44.9	33.3	47.9	809	492	395	416	74.0	48.8
Cfsm	0.218	0.362	0.209	0.144	0.107	0.154	2.59	1.58	1.27	1.33	0.237	0.156
In.	0.25	0.40	0.24	0.17	0.11	0.18	2.89	1.82	1.42	1.53	0.27	0.17

	Observed			Adjusted		
Calendar year 1956 :	Max 1,290	Min 29	Mean 180	Mean 188	Cfsm 0.603	In. 8.20
Water year 1956-57 :	Max 1,980	Min 27	Mean 202	Mean 217	Cfsm 0.696	In. 9.45

Peak discharge (base, 600 cfs).--Apr. 24 (10 p.m.) 2,090 cfs (5.11 ft); June 24 (10 a.m. to 3 p.m.) 960 cfs (3.60 ft).

* Discharge measurement made on this day.

† Diversion from, and change in contents in Partridge Reservoir, equivalent in cubic feet per second; records furnished by Erie Mining Co.

Note.--Stage-discharge relation affected by ice Nov. 16-19, Nov. 22 to Apr. 9, Apr. 11.

Embarrass River at Embarrass, Minn.

Location.--Lat 47°39'24", long 92°11'51", 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 railroad bridge.

Drainage area.--93.8 sq mi.

Records available.--August 1942 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 1,410.36 ft above mean sea level, datum of 1929. Prior to Aug. 28, 1944, chain gage at same site and datum.

Average discharge.--15 years, 73.8 cfs.

Extremes.--Maximum discharge during year, 930 cfs Apr. 22 (gage height, 9.40 ft); minimum, 3.9 cfs Feb. 3-9; minimum gage height, 0.85 ft Sept. 14.

1942-57: Maximum discharge, 1,740 cfs May 8, 9, 1950; maximum gage height, 10.92 ft May 9, 1950; minimum daily discharge, 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, which are fair. Records of chemical analyses and water temperatures for the water year 1957 are given in WSP 1520.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	3.0	4.0	226
.9	4.7	5.0	296
1.0	8.7	6.0	370
1.2	20	7.0	466
1.5	41	8.0	606
2.0	83	9.0	815
2.5	124	10.0	1,160
3.0	159		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	69	17	10	4.0	4.4	73	288	66	142	36	8.2
2	9.7	60	17	9.6	4.0	4.4	78	246	54	104	32	14
3	*9.2	54	17	9.6	4.0	4.4	81	*207	49	79	30	12
4	8.7	50	17	9.5	3.9	4.2	*82	174	47	64	26	11
5	9.7	45	16	9.4	3.9	4.2	78	145	43	58	22	9.2
6	13	47	*15	*9.3	3.9	4.0	66	118	37	52	18	7.7
7	9.2	49	15	9.2	3.9	4.0	70	97	32	52	16	6.3
8	7.7	50	14	9.2	3.9	4.0	90	83	28	56	14	5.6
9	7.2	45	13	8.7	3.9	4.0	130	74	24	47	14	5.9
10	6.7	39	13	8.1	4.0	4.0	*145	66	22	50	13	5.6
11	6.7	35	13	7.5	4.2	4.0	120	59	23	76	11	4.7
12	6.7	39	12	7.0	4.2	4.2	95	54	24	130	9.7	4.2
13	6.7	39	12	6.5	4.2	4.2	76	51	*22	154	9.7	4.2
14	11	38	11	6.1	*4.0	4.4	63	49	20	140	12	*4.0
15	15	35	11	5.8	4.2	5.0	81	68	21	117	17	4.4
16	15	29	11	5.7	4.2	5.0	116	74	22	87	*16	5.9
17	14	34	11	5.6	4.4	4.7	*159	69	33	67	13	5.9
18	13	32	10	5.6	4.4	4.7	175	63	68	56	11	6.7
19	12	32	10	5.5	4.2	4.7	255	56	64	*64	9.7	22
20	12	29	11	5.5	4.2	4.7	400	51	76	120	8.7	36
21	11	27	11	5.3	4.0	5.0	792	47	211	152	7.2	33
22	12	24	11	5.2	4.2	5.6	921	68	258	146	6.7	32
23	12	22	11	5.0	4.2	*6.7	870	81	301	131	5.9	34
24	10	20	11	4.8	4.2	7.7	*815	76	344	110	5.6	43
25	9.7	20	11	4.6	4.4	8.2	751	68	365	83	6.3	61
26	19	20	11	4.5	4.2	10	661	75	344	74	6.3	59
27	26	18	11	4.4	4.2	15	559	110	302	66	5.2	52
28	23	18	11	4.3	4.2	22	458	118	250	58	4.7	47
29	21	17	11	4.2	-	36	386	115	213	53	5.0	43
30	52	17	11	4.1		56	334	102	180	47	5.0	37
31	*80		11	4.1		69		81		41	5.0	
Total	479.9	1,053	387	203.9	115.2	328.4	8,980	3,033	3,543	2,676	401.7	624.5
Mean	15.5	35.1	12.5	6.58	4.11	10.6	299	97.8	118	86.3	13.0	20.8
Cfsm	0.165	0.374	0.133	0.070	0.044	0.113	3.19	1.04	1.26	0.920	0.139	0.222
In.	0.19	0.42	0.15	0.08	0.05	0.13	3.56	1.20	1.40	1.06	0.16	0.25

Calendar year 1956:	Max	434	Min	3.4	Mean	51.9	Cfsm	0.553	In.	7.54
Water year 1956-57:	Max	921	Min	3.9	Mean	59.8	Cfsm	0.638	In.	8.65

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 8 to Feb. 2, Mar. 31 to Apr. 11.

Embarrass River near McKinley, Minn.

Location.--Lat 47°27'10", long 92°23'00", in NW¼ sec. 4, T. 57 N., R. 16 W., on left bank 40 ft upstream from highway bridge, 0.9 mile downstream from outlet of Esquagama Lake, and 4¼ miles southeast of McKinley.

Records available.--October 1953 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 1,338.65 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 1,240 cfs Apr. 26 (gage height, 10.82 ft); minimum, 19 cfs Sept. 11 (gage height, 3.00 ft).

1953-57: Maximum discharge, 1,690 cfs Apr. 20, 1954 (gage height, 11.72 ft); minimum, 11 cfs Sept. 7, 1955 (gage height, 2.92 ft).

Remarks.--Records good except those for periods of ice effect, which are fair. Records of chemical analyses for the water year 1957 are given in WSP 1520.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 5-23)

2.9	20	5.0	192
3.2	35	7.0	412
3.6	59	9.0	672
4.0	87	11.0	1,320

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	*64	52	34	23	25	106	821	179	394	110	26
2	44	75	52	34	23	26	130	735	173	376	98	27
3	42	87	51	34	23	26	132	658	163	344	85	29
4	42	100	50	34	23	26	*139	594	149	289	78	27
5	*39	111	49	34	23	25	118	527	133	240	72	26
6	37	114	50	*35	23	25	118	464	120	210	67	25
7	36	116	*50	33	23	25	132	397	107	202	63	24
8	33	112	49	33	24	26	141	339	96	173	61	23
9	32	108	47	32	24	26	150	284	86	149	58	22
10	31	102	46	30	25	27	150	238	85	152	54	20
11	30	100	45	30	25	27	157	211	85	174	51	20
12	30	100	43	29	26	27	167	189	77	214	48	22
13	30	93	42	28	26	26	172	168	70	200	49	24
14	34	93	41	27	*25	26	170	167	70	195	49	*23
15	33	85	40	27	25	25	173	166	66	200	48	23
16	32	88	39	26	25	25	198	145	64	205	46	22
17	33	82	37	26	25	25	*205	137	77	204	*43	21
18	31	79	36	26	25	26	212	134	73	198	42	25
19	30	76	36	26	24	26	306	130	73	204	39	36
20	30	73	36	26	24	27	464	125	85	*246	37	32
21	30	71	36	26	24	28	541	129	118	237	36	32
22	28	67	36	25	24	*28	632	147	157	232	34	31
23	30	65	35	25	24	28	797	141	257	218	34	31
24	28	63	35	25	24	29	*1,030	135	304	210	33	45
25	30	63	34	24	24	31	1,190	144	336	207	31	45
26	34	60	34	24	25	33	1,230	166	368	202	30	47
27	35	58	35	24	25	35	1,200	180	400	190	28	49
28	32	56	35	24	25	38	1,120	179	422	172	27	53
29	33	54	34	23	-	43	1,020	181	430	157	26	57
30	58	53	34	23		53	*914	183	*421	137	26	63
31	61		34	23		72		183		123	26	
Total	1,091	2,468	1,273	870	679	935	13,214	8,397	5,244	6,654	1,529	950
Mean	35.2	82.3	41.1	28.1	24.2	30.2	440	271	175	215	49.3	31.7
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956 :	Max 702	Min 25	Mean 109	Cfsm -	In. -
Water year 1956-57 :	Max 1,230	Min 20	Mean 119	Cfsm -	In. -

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 15-17, Dec. 8-26, Dec. 31 to Jan. 5, Jan. 8 to Mar. 28.

West Two River near Iron Junction, Minn.

Location.--Lat 47°24'05", long 92°42'10", in SW¼SW¼ sec. 24, T. 57 N., R. 19 W., on right bank 40 ft upstream from bridge on State Highway 216, 5 miles southwest of Iron Junction and 9¼ miles upstream from St. Louis River.

Records available.--October 1953 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 1,322.05 ft above mean sea level, datum of 1929 (Minnesota Highway Department benchmark).

Extremes.--Maximum discharge during year, 796 cfs Apr. 22 (gage height, 9.37 ft); minimum daily, 3.0 cfs Jan. 22 to Feb. 6; minimum gage height, 2.43 ft Oct. 24, 25.
1953-57: Maximum discharge, 916 cfs Apr. 17, 1954 (gage height, 9.85 ft); minimum daily, that of Jan. 22 to Feb. 6, 1957; minimum gage height, that of Oct. 24, 25, 1956.

Remarks.--Records good except those for period of ice effect, which are fair. Records of chemical analyses and water temperatures for the water year 1957 are given in WSP 1520.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-24, June 7-14, Aug. 19 to Sept. 28)

2.0	2.0	4.0	110
2.2	6.0	6.0	271
2.5	16	8.0	503
3.0	44	9.5	828

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	19	11	4.4	3.0	3.7	120	90	33	55	49	11
2	11	*18	11	4.2	3.0	3.6	145	72	28	74	*40	11
3	10	18	11	3.8	3.0	3.5	155	*62	27	106	33	11
4	10	24	10	3.6	3.0	3.5	*162	54	24	138	29	11
5	10	22	10	3.5	3.0	3.5	170	48	22	120	27	10
6	10	22	9.5	3.5	3.0	3.4	168	43	20	94	27	10
7	10	23	9.2	3.5	3.1	3.4	162	39	18	74	26	10
8	10	22	*8.8	3.4	3.1	3.4	152	36	16	72	25	9.6
9	9.9	19	8.5	3.4	3.2	3.4	146	34	15	*67	22	9.6
10	9.6	17	8.1	3.3	3.2	3.4	148	31	*15	64	21	9.6
11	10	17	7.7	3.3	3.3	3.5	150	28	17	60	20	9.0
12	10	18	7.1	3.2	*3.3	3.8	145	26	17	184	18	9.0
13	10	16	6.8	3.2	3.4	4.3	130	24	15	196	22	9.3
14	12	16	6.5	3.1	3.4	4.7	112	27	18	185	22	9.0
15	12	14	6.4	*3.1	3.4	4.8	105	36	24	133	24	9.3
16	12	11	6.2	3.1	3.3	4.8	108	40	26	81	22	9.3
17	12	11	6.0	3.1	3.3	4.9	140	36	26	62	20	9.0
18	12	13	5.8	3.1	3.2	5.0	*185	33	27	48	19	10
19	11	14	5.7	3.1	3.2	5.1	290	29	27	63	17	14
20	11	13	5.6	3.1	3.2	*5.2	562	26	31	281	16	18
21	11	13	5.6	3.1	3.1	5.4	753	25	49	408	15	17
22	11	13	5.5	3.0	3.1	5.7	769	36	98	578	14	15
23	11	13	5.3	3.0	3.1	6.3	643	46	200	516	13	14
24	10	13	5.2	3.0	3.2	7.5	467	43	236	*264	12	20
25	11	13	5.1	3.0	3.4	9.0	*361	37	243	128	11	28
26	14	12	5.0	3.0	3.5	11	304	44	165	97	10	28
27	16	12	5.0	3.0	3.5	16	239	64	107	72	9.9	24
28	15	12	4.8	3.0	3.6	28	186	80	101	62	9.6	21
29	14	12	4.7	3.0	-	36	144	65	88	54	*9.6	*19
30	16	11	4.6	3.0		51	114	50	68	47	9.9	18
31	20		4.6	3.0		85		40		48	10	
Total	362.5	471	216.3	101.1	90.1	341.8	7,435	1,344	1,801	4,431	623.0	412.7
Mean	11.7	15.7	6.98	3.26	3.22	11.0	248	43.4	60.0	143	20.1	13.8
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 622 Min 4.6 Mean 39.9 Cfsm - In. -
Water year 1956-57: Max 769 Min 3.0 Mean 48.3 Cfsm - In. -

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 15 to Apr. 18 (no gage-height record Dec. 15, 16, Dec. 19 to Jan. 14, Jan. 26 to Feb. 11, Apr. 11-13; discharge estimated on basis of weather records and records for stations on nearby streams).

East Swan River near Toivola, Minn.

Location.--Lat 47°16'55", long 92°50'05", in NE¼NE¼ sec. 2, T. 55 N., R. 20 W., on left bank 350 ft downstream from bridge on St. Louis County Road 442, 4.8 miles upstream from confluence with West Swan River, 8 miles northwest of Toivola, and 8¾ miles upstream from St. Louis River.

Drainage area.--112 sq mi.

Records available.--September 1953 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 1,260.46 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 1,370 cfs Apr. 21 (gage height, 16.52 ft); minimum daily, 14 cfs Jan. 16-19, Jan. 24 to Feb. 3; minimum gage height, 3.48 ft Oct. 10.

1953-57: Maximum discharge, 1,690 cfs Apr. 15, 1956 (gage height, 17.94 ft); maximum gage height, 18.45 ft Apr. 12, 1954 (backwater from ice); minimum daily discharge, 13 cfs Jan. 28 to Feb. 3, 1955; minimum gage height, 3.24 ft Nov. 10, 1954.

Flood in May 1950 reached a stage of about 20.0 ft, from information by local residents.

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

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-13, July 18-29, Sept. 25-30)

3.5	24	8.0	302
3.7	30	11.0	580
4.0	39	15.0	1,080
5.0	81	17.0	1,470
6.0	141		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	47	25	16	14	16	55	201	56	94	66	37
2	27	48	25	16	14	16	70	172	48	78	61	41
3	23	46	24	16	14	16	120	*147	52	94	*60	40
4	23	44	23	15	15	16	300	123	49	109	54	34
5	23	38	22	15	15	16	360	106	44	96	50	30
6	25	45	21	15	15	16	370	94	38	77	44	28
7	28	46	*20	15	15	16	350	84	35	72	38	27
8	32	46	20	15	15	16	320	78	32	73	37	27
9	28	41	19	15	15	16	310	74	30	*60	35	29
10	22	36	19	15	15	16	315	65	34	61	34	28
11	22	37	19	15	15	16	320	62	*33	94	35	28
12	28	39	19	15	*15	16	320	53	33	189	38	28
13	29	41	19	15	15	16	305	49	29	501	57	31
14	36	43	18	*15	15	17	270	53	30	458	67	32
15	39	43	18	15	15	17	240	114	66	278	54	34
16	35	32	18	14	15	17	250	103	59	180	46	36
17	30	34	18	14	15	18	300	78	51	115	41	34
18	31	36	18	14	15	18	*352	67	61	86	40	33
19	32	37	18	14	15	*19	585	64	51	141	39	57
20	32	36	18	15	15	19	1,240	59	65	592	35	72
21	30	33	18	15	15	19	1,340	54	168	984	38	56
22	33	31	17	15	15	20	1,240	94	227	1,010	40	46
23	30	29	17	15	15	20	843	118	449	*609	36	46
24	30	29	17	14	16	22	618	92	502	325	32	50
25	29	30	17	14	16	23	*516	74	364	222	34	67
26	35	29	17	14	16	25	448	98	234	158	35	65
27	41	28	17	14	16	27	396	164	218	133	33	57
28	41	26	17	14	16	30	337	153	203	116	31	51
29	39	25	17	14	-	33	284	115	172	106	*33	*45
30	42	25	17	14		38	237	84	119	90	33	42
31	53		16	14		46		69		74	34	
Total	977	1,100	588	456	422	636	13,011	2,961	3,552	7,275	1,310	1,231
Mean	31.5	36.7	19.0	14.7	15.1	20.5	434	95.5	118	235	42.3	41.0
Cfsm	0.281	0.328	0.170	0.131	0.135	0.183	3.88	0.853	1.05	2.10	0.378	0.366
In.	0.32	0.37	0.20	0.15	0.14	0.21	4.32	0.98	1.18	2.42	0.43	0.41

Calendar year 1956:	Max 1,570	Min 16	Mean 75.8	Cfsm 0.677	In. 9.20
Water year 1956-57:	Max 1,340	Min 14	Mean 91.8	Cfsm 0.820	In. 11.13

Peak discharge (base, 400 cfs).--Apr. 21 (7 p.m.) 1,370 cfs (16.52 ft); June 24 (2 a.m. to 12 m.) 511 cfs (10.31 ft); July 13 (11:30 p.m.) 523 cfs (10.43 ft); July 22 (1 a.m.) 1,070 cfs (15.32 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 15 to Apr. 19 (no gage-height record Mar. 29 to Apr. 3, Apr. 10-15).

Swan River near Toivola, Minn.

Location.--Lat 47°15'02", long 92°48'36", in NE¼NE¼ sec. 13, T. 55 N., R. 20 W., on left bank at upstream side of bridge on St. Louis County Highway 5, 0.4 mile downstream from confluence of East Swan and West Swan Rivers, 3½ miles upstream from mouth, and 5¾ miles north of Toivola.

Drainage area.--254 sq mi.

Records available.--October 1952 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 1,251.78 ft above mean sea level, datum of 1929.

Average discharge.--5 years, 190 cfs.

Extremes.--Maximum discharge during year, 2,540 cfs Apr. 22 (gage height, 15.39 ft); minimum daily, 20 cfs Jan. 5 to Feb. 5; minimum gage height, 2.46 ft Oct. 11.

1952-57: Maximum discharge, 2,980 cfs Apr. 13, 1954 (gage height, 17.17 ft, backwater from ice); minimum, 20 cfs Nov. 13, 1952, Jan. 5 to Feb. 5, 1957; minimum gage height, 2.33 ft July 26, 1954.

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

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-9)

2.3	22	6.0	440
2.6	40	9.0	985
3.0	71	13.0	1,900
4.0	180	16.0	2,710

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	60	31	21	20	24	150	425	123	226	138	50
2	31	*59	31	21	20	24	190	362	100	178	123	56
3	31	58	30	21	20	24	250	*315	96	163	*114	51
4	26	57	29	21	20	24	315	271	92	170	102	45
5	27	54	28	20	20	24	375	232	84	152	91	39
6	27	57	27	20	21	25	425	205	73	123	80	36
7	31	62	27	20	21	25	455	181	64	112	69	36
8	34	63	*27	20	21	25	440	161	66	124	62	40
9	34	58	27	20	21	26	420	146	50	*103	57	39
10	29	53	27	20	21	26	425	129	52	105	53	36
11	26	50	28	20	21	26	430	116	*50	194	51	33
12	29	52	26	20	*22	27	390	102	49	256	54	34
13	33	55	26	20	22	28	355	90	45	604	64	34
14	39	56	25	20	22	29	320	95	44	613	103	37
15	44	57	25	20	22	30	310	205	81	460	82	38
16	41	37	25	*20	22	31	350	224	93	353	69	41
17	36	38	25	20	22	32	415	179	80	260	60	41
18	34	45	24	20	22	32	*554	151	99	184	56	40
19	36	47	24	20	23	*32	700	132	90	296	53	55
20	36	46	24	20	23	33	1,050	116	101	979	48	107
21	36	43	24	20	23	33	2,270	105	308	1,440	46	90
22	36	40	24	20	23	35	2,480	174	458	1,560	53	76
23	37	37	24	20	23	37	2,020	244	807	*1,250	47	69
24	34	35	23	20	24	39	1,480	223	864	786	42	72
25	34	36	23	20	24	42	*1,200	188	697	536	41	91
26	37	35	23	20	24	45	1,010	218	525	381	43	94
27	48	33	23	20	24	50	883	312	509	308	40	85
28	48	32	22	20	24	57	746	313	449	262	38	75
29	48	31	22	20	-	70	624	266	387	229	*39	*69
30	48	31	22	20		92	509	204	302	193	39	61
31	61		22	20		119		158		161	43	
Total	1,122	1,417	788	624	615	1,166	21,541	6,242	6,838	12,761	2,000	1,670
Mean	36.2	47.2	25.4	20.1	22.0	37.6	718	201	228	412	64.5	55.7
Cfsm	0.143	0.186	0.100	0.079	0.087	0.148	2.83	0.791	0.898	1.62	0.254	0.219
In.	0.16	0.21	0.12	0.09	0.09	0.17	3.15	0.91	1.00	1.87	0.29	0.24

Calendar year 1956:	Max	2,650	Min	22	Mean	134	Cfsm	0.528	In.	7.20
Water year 1956-57:	Max	2,480	Min	20	Mean	156	Cfsm	0.614	In.	8.30

Peak discharge (base, 900 cfs).--Apr. 22 (7 a.m.) 2,540 cfs (15.39 ft); July 22 (10:30 a.m.) 1,580 cfs (11.70 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16 to Apr. 20.

St. Louis River at Scanlon, Minn.

Location.--Lat 46°42'12", long 92°25'07", in NW¼ sec. 30, T. 49 N., R. 16 W., on right bank 25 ft downstream from lower bridge on U. S. Highway 61 at Scanlon, 0.6 mile downstream from Minnesota Power & Light Co. powerplant, 3 miles upstream from Thomson Reservoir, and 3.2 miles upstream from Midway River.

Drainage area.--3,430 sq mi, approximately.

Records available.--October 1909 to September 1915, October 1950 to September 1957. Published as "near Thomson" 1909-15.

Gage.--Water-stage recorder. Datum of gage is 1,101.23 ft above mean sea level, datum of 1929. Oct. 5, 1909, to Sept. 30, 1915, chain gage 3 miles downstream and 50 ft below powerplant at datum about 420 ft lower. Oct. 1, 1950, to Aug. 4, 1953, power-plant record at Thomson hydroelectric plant.

Average discharge.--10 years (1910-13, 1950-57), 2,511 cfs (unadjusted).

Extremes.--Maximum discharge during year, 18,100 cfs Apr. 22 (gage height, 9.85 ft); minimum, 362 cfs Dec. 13 (gage height, 2.24 ft).

1909-15, 1950-57: Maximum discharge, 25,100 cfs Apr. 16, 1954 (gage height, 11.78 ft); minimum daily, 171 cfs Feb. 19, 1912.

Maximum discharge known, 40,700 cfs May 9, 1950 (gage height, 15.8 ft, from Minnesota Highway Department).

Remarks.--Records good except those for periods of no gage-height record, which are fair. Diurnal fluctuation caused by powerplant upstream. Flow regulated by Whiteface Reservoir and Boulder, Island, Rice, and Fish Lakes (combined capacity, 332,160 acre-ft).

Revisions (water years).--WSP 1337: 1911-12.

Rating tables, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 24				June 25 to Sept. 30			
2.4	450	5.0	4,100	2.7	730	6.0	6,250
2.7	650	6.0	6,200	3.0	985	8.0	11,800
3.0	900	8.0	11,800	3.5	1,510	9.0	15,100
3.5	1,450	10.0	18,600	4.0	2,350	10.0	18,600
4.0	2,200			5.0	4,170		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*754	980	1,060	930	786	720	2,310	6,960	2,120	6,210	2,440	949
2	778	1,160	960	802	802	740	2,780	6,260	1,900	4,970	2,080	895
3	778	1,160	*1,030	*778	810	730	3,200	5,590	1,650	4,130	1,730	1,210
4	770	1,160	1,000	882	837	710	3,510	4,860	1,480	3,850	1,570	1,070
5	746	1,290	930	873	819	760	3,410	4,290	1,570	3,300	1,730	1,080
6	730	1,290	920	864	810	720	3,100	3,590	1,780	2,930	1,740	1,040
7	754	1,280	754	837	794	720	3,060	3,200	1,870	3,050	1,690	967
8	690	1,250	650	864	794	720	3,030	*3,080	1,660	*3,290	1,510	913
9	706	1,240	450	900	819	710	3,390	2,430	1,610	2,930	1,580	*878
10	706	1,220	944	846	819	690	3,510	2,270	1,710	2,370	1,500	886
11	710	1,220	1,330	762	*802	740	2,960	1,980	1,800	2,620	1,520	886
12	710	1,250	794	846	810	720	*2,760	1,750	1,550	3,120	*1,560	895
13	720	1,180	486	746	786	720	2,450	1,550	1,690	4,250	1,570	931
14	740	1,150	910	770	794	800	2,290	1,680	1,620	5,110	1,640	852
15	760	1,330	990	770	810	780	2,130	1,690	1,500	*4,450	1,660	861
16	745	1,180	990	770	819	720	2,670	2,120	1,530	3,810	1,690	1,010
17	730	1,010	920	746	786	660	4,200	2,270	2,130	3,290	1,520	886
18	740	1,120	682	754	738	675	5,320	1,950	2,650	3,120	1,570	940
19	760	1,070	601	770	762	*730	6,200	1,760	2,330	5,600	1,460	1,000
20	730	1,290	1,090	778	810	738	13,200	1,500	2,050	13,100	1,430	931
21	760	1,260	1,110	819	786	778	17,800	1,500	2,870	15,800	1,280	913
22	730	1,040	1,030	810	778	746	*17,700	2,150	6,960	14,100	922	1,010
23	760	770	990	802	778	855	16,900	2,990	10,200	11,600	940	958
24	740	517	1,040	786	794	910	15,600	3,010	12,500	9,180	852	886
25	770	1,280	900	762	786	1,060	13,900	2,600	12,000	7,460	770	976
26	900	1,090	900	762	786	1,140	12,400	2,720	10,600	5,850	770	895
27	900	1,150	940	746	760	1,280	*11,100	3,270	9,120	4,950	762	958
28	780	1,010	940	746	740	1,610	10,000	3,870	8,590	4,510	886	1,050
29	*1,020	778	930	770	-	1,870	8,900	3,590	8,240	3,920	844	922
30	1,020	819	960	770	--------	2,220	8,020	3,100	7,640	3,120	802	895
31	1,110	--------	930	786	--------	2,270	--------	2,560	--------	2,940	794	--------
Total	24,247	33,544	28,161	24,847	22,215	29,242	207,800	92,140	124,920	168,930	42,812	28,543
Mean	782	1,118	908	802	793	943	6,927	2,972	4,164	5,449	1,381	951
(†)	-286	-180	-314	-493	-547	-391	+1,392	+571	+800	+18	-784	-177

Adjusted for change in reservoir contents

Mean	496	938	594	309	246	552	8,319	3,543	4,964	5,467	597	774
Cfsm	0.145	0.273	0.173	0.090	0.072	0.161	2.43	1.03	1.45	1.59	0.174	0.226
In.	0.17	0.30	0.20	0.10	0.07	0.19	2.71	1.19	1.62	1.83	0.20	0.25

	Observed			Adjusted		
Calendar year 1956:	Max 19,700	Min 450	Mean 2,012	Mean 2,015	Cfsm 0.587	In. 7.98
Water year 1956-57:	Max 17,800	Min 450	Mean 2,267	Mean 2,234	Cfsm 0.651	In. 8.83

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* Discharge measurement made on this day.

† Change in contents, equivalent in cubic feet per second, in Whiteface Reservoir and Boulder, Island, Rice, and Fish Lakes; records furnished by Minnesota Power and Light Co.

Note.--No gage-height record Oct. 11-28, Feb. 27 to Mar. 18; discharge estimated on basis of Thomson powerplant record.

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 1957 (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 elevations above mean sea level.

Extremes.--Maximum elevation observed during year, 1,197.64 ft July 24; minimum observed, 1,196.33 ft Oct. 10, 13, 24.
1936-57: Maximum elevation observed, 1,199.32 ft May 9, 1950; minimum observed, 1,195.82 ft Oct. 28, 1948.

Remarks.--Lake has natural outlet.

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

Elevation, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-					-	-	6.94	-	-	-
2	-	-					-	-	-	-	-	-
3	6.43	6.63					6.84	-	-	7.14	7.22	-
4	-	-					-	6.94	-	-	-	-
5	-	-					-	-	6.68	-	-	-
6	6.37	-					-	-	-	7.08	-	6.90
7	-	6.63					-	-	-	-	7.04	-
8	-	-					-	6.90	6.64	-	-	-
9	-	-					-	-	-	-	-	-
10	6.33	6.63					6.94	-	-	7.14	6.98	-
11	-	-					-	6.84	-	-	-	6.90
12	-	-	6.65				-	-	6.88	7.13	-	-
13	6.33	-					6.94	-	-	7.13	-	-
14	-	6.63					-	-	-	-	6.94	6.88
15	-	-					-	6.74	6.84	-	6.92	-
16	-	-					-	-	-	-	-	-
17	6.45	6.71					6.98	-	-	6.98	6.88	-
18	-	-					-	6.74	-	-	-	6.94
19	-	-					-	-	6.94	-	-	-
20	6.43	-					7.04	-	-	7.54	-	-
21	-	6.83					-	-	-	-	6.78	7.02
22	-	-					-	6.84	7.28	-	-	-
23	-	-					-	-	-	-	-	-
24	6.33	6.83		6.61			7.04	-	-	7.64	6.74	-
25	6.43	-					-	6.79	-	-	-	7.00
26	-	-					-	-	7.34	-	-	-
27	6.43	-					7.04	-	-	7.60	-	-
28	-	-					-	-	-	-	6.70	6.94
29	-	-					-	6.98	7.28	-	-	-
30	-	-			-------		-	-	-	-	-	-
31	6.63	-------			-------	6.84	-------	-	-------			-------

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.--October 1942 to September 1957. Prior to January 1943, monthly discharge only published in WSP 1307.

Gage.--Chain gage read once daily. Datum of gage is 948.49 ft above mean sea level, datum of 1929.

Average discharge.--15 years, 176 cfs.

Extremes.--Maximum discharge during year, 513 cfs Apr. 20 (gage height, 3.02 ft, from graph based on gage readings); minimum daily, 111 cfs Aug. 30.

1942-57: Maximum discharge, 1,520 cfs June 5, 1944 (gage height, 5.2 ft, from graph based on gage readings), from rating curve extended above 745 cfs; minimum observed, 67 cfs Mar. 13, 1943.

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

Revisions (water years).--WSP 1207: Drainage area. WSP 1337: 1943(M), 1944, 1945-50(M).

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.4	111	2.3	295
1.6	140	2.6	379
1.8	175	3.0	506
2.0	219		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	131	192	154	150	130	134	201	205	198	160	153	125
2	140	179	154	140	130	140	219	196	186	153	146	140
3	137	167	154	140	130	135	224	188	181	153	146	160
4	134	156	148	145	135	135	219	183	169	160	143	153
5	134	156	154	150	140	132	219	173	166	150	143	146
6	134	153	148	150	150	130	224	169	162	156	131	140
7	131	156	154	155	155	130	208	166	158	160	131	137
8	131	153	145	150	160	130	194	162	151	156	128	125
9	131	150	140	145	170	130	*208	158	151	153	128	114
10	131	150	150	140	165	130	198	154	158	153	128	119
11	131	146	155	135	170	125	194	151	162	150	125	117
12	131	150	*157	135	185	125	190	148	158	*192	125	128
13	131	150	145	130	180	125	180	143	154	188	137	137
14	146	146	150	130	170	128	175	143	151	179	134	134
15	146	146	155	130	153	137	179	150	158	167	*131	131
16	143	155	160	125	150	131	214	143	162	153	128	131
17	140	160	155	120	145	128	264	143	166	153	122	131
18	137	167	150	125	145	128	274	153	169	146	122	137
19	137	166	150	130	140	128	314	153	162	221	122	164
20	137	162	150	135	140	124	479	145	151	362	122	167
21	134	162	160	135	135	130	418	151	151	333	122	160
22	134	160	155	140	135	136	364	*173	251	295	122	153
23	134	160	155	145	135	140	330	166	a280	269	122	150
24	134	160	150	*147	140	140	308	158	272	243	125	146
25	*134	162	150	145	150	138	298	154	246	214	122	143
26	143	158	148	145	140	136	272	a300	221	192	119	146
27	146	156	148	140	140	151	256	330	208	183	117	143
28	140	154	148	140	*136	156	238	292	186	175	119	140
29	140	154	148	135	-	164	224	261	181	171	119	137
30	175	154	151	130	--------	175	210	236	169	164	111	137
31	188	--------	154	130	--------	188	--------	208	--------	156	128	--------
Total	4,315	4,740	4,695	4,292	4,154	4,259	7,495	5,655	5,438	5,860	3,971	4,191
Mean	139	158	151	138	148	137	250	182	181	189	128	140
Cfsm	1.23	1.40	1.34	1.22	1.31	1.21	2.21	1.61	1.60	1.67	1.13	1.24
In.	1.42	1.56	1.55	1.41	1.37	1.40	2.47	1.86	1.79	1.93	1.31	1.38

Calendar year 1956: Max 479 Min 115 Mean 162 Cfsm 1.43 In. 19.56
Water year 1956-57: Max 479 Min 111 Mean 162 Cfsm 1.43 In. 19.45

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for White River near Ashland and Bad River near Odanah.

Note.--Stage-discharge relation affected by ice Nov. 16, 17, 22-24, 27, 29, Dec. 8-23, Jan. 1 to Feb. 14, Feb. 16-25, 27, Mar. 3, 4, 7, 8 (no gage-height record Dec. 8, 9, 15, 16, 22, 23, Jan. 1, 5, 6, 19, 20, Feb. 2, 3, Mar. 3).

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 23 miles upstream from mouth.

Drainage area.--611 sq mi.

Records available.--July 1914 to November 1922, May 1948 to September 1957.

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.--17 years (1914-22, 1948-57), 630 cfs.

Extremes.--Maximum discharge during year, 5,930 cfs Apr. 20 (gage height, 9.55 ft); minimum, 76 cfs Nov. 16 (gage height, 2.15 ft), result of freezeup and regulation.

1914-22, 1948-57: 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 period of ice effect, which are fair.

Revisions (water years).--WSP 1207: Drainage area. WSP 1337: 1922.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	85	4.0	820
2.4	127	5.0	1,430
2.6	186	7.0	3,050
3.0	345	9.3	5,630

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	183	230	200	120	*180	2,300	572	553	404	173	122
2	132	183	240	190	120	190	2,180	502	452	337	151	160
3	143	170	240	190	120	190	1,780	443	379	291	135	282
4	146	167	240	190	120	180	1,690	396	332	291	122	408
5	138	164	240	200	120	170	1,360	353	295	534	120	387
6	132	160	240	200	120	170	1,220	324	262	452	113	316
7	130	183	240	200	120	160	1,090	295	231	383	109	246
8	130	204	230	200	120	160	*1,000	274	204	311	109	190
9	130	204	230	200	120	160	1,040	353	186	266	120	157
10	127	190	230	190	120	160	902	417	170	227	135	146
11	125	183	220	180	120	160	770	366	197	235	125	130
12	127	201	220	160	120	160	670	311	291	660	118	120
13	127	235	*216	150	130	170	625	274	274	*1,350	116	116
14	143	239	210	140	130	170	544	250	231	966	122	113
15	164	231	210	130	130	180	610	564	219	650	127	118
16	173	94	210	120	140	200	1,070	695	208	461	*127	111
17	164	160	210	120	140	220	2,430	520	223	349	111	102
18	157	260	210	120	150	220	3,070	492	430	278	109	100
19	151	280	220	120	150	220	3,710	511	470	239	102	109
20	149	250	220	130	150	240	5,560	443	362	1,090	100	132
21	146	240	220	130	140	270	5,260	408	400	1,060	98	143
22	146	220	220	140	140	360	3,710	685	1,800	1,010	94	176
23	143	210	220	150	140	460	2,470	*690	2,500	914	102	216
24	135	200	220	140	140	520	1,890	562	2,100	705	127	246
25	135	210	220	140	150	560	1,570	483	1,640	515	140	258
26	*149	210	230	136	160	680	1,320	984	1,160	400	127	254
27	154	220	230	130	170	900	1,090	1,790	892	320	109	231
28	149	220	230	130	180	1,100	897	1,570	705	278	111	208
29	146	230	230	130	-	1,300	765	1,140	577	353	109	183
30	160	230	220	120	--------	1,600	660	826	483	270	109	173
31	183	--------	210	120	--------	1,900	--------	645	--------	204	116	--------
Total	4,450	6,131	6,956	4,796	3,780	13,310	53,253	18,138	18,226	15,803	3,686	5,653
Mean	144	204	224	155	135	429	1,775	585	608	510	119	188
Cfsm	0.236	0.334	0.367	0.254	0.221	0.702	2.91	0.957	0.995	0.835	0.195	0.308
In.	0.27	0.37	0.42	0.29	0.23	0.81	3.25	1.10	1.11	0.96	0.22	0.34

Calendar year 1956:	Max 4,730	Min 94	Mean 504	Cfsm 0.825	In. 11.22
Water year 1956-57:	Max 5,560	Min 94	Mean 422	Cfsm 0.691	In. 9.37

Peak discharge (base, 3,000 cfs).--Apr. 20 (6 p.m.) 5,930 cfs (9.55 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 17 to Apr. 1 (no gage-height record Dec. 14, 16-22, 24-29, Dec. 31 to Jan. 4, Jan. 6-12, 14-18, 20-24, Jan. 28 to Feb. 2, Feb. 4-9, 11-16, 18-22, 24-28, Mar. 11-13; discharge estimated on basis of 3 discharge measurements, weather records, daily generation at Mellen powerplant, and records for nearby stations).

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 1957.

Gage.--Chain gage read twice daily or more often when plant load is changed. Datum of gage is 660.15 ft above mean sea level, datum of 1929 (Lake Superior District Power Co. benchmark).

Average discharge.--9 years, 327 cfs.

Extremes.--Maximum discharge during year, 1,010 cfs Mar. 30 (gage height, 2.66 ft, from graph based on gage readings); minimum, 78 cfs Jan. 2 (gage height, 0.71 ft).

1948-57: Maximum discharge, 6,270 cfs July 1, 1953 (gage height, 7.90 ft); minimum, 3.1 cfs Apr. 28-30, 1949 (gage height, 0.09 ft).

Remarks.--Records good except those for periods of ice effect, which are fair. Diurnal fluctuation caused by powerplant at gage.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	195	247	242	173	200	*220	676	222	270	245	179	186
2	195	247	242	109	200	200	513	211	252	218	170	198
3	174	222	242	170	205	200	517	202	254	203	176	223
4	182	210	211	215	210	185	477	202	212	192	164	215
5	176	234	249	200	195	200	367	210	226	286	173	209
6	208	210	224	215	220	195	343	182	233	262	168	198
7	170	234	198	225	210	205	*361	182	219	232	162	183
8	208	240	140	215	200	195	416	182	223	207	151	186
9	176	198	88	195	220	185	472	229	208	215	162	183
10	176	222	157	170	200	215	429	207	229	193	179	203
11	201	216	247	165	230	220	361	202	187	213	168	198
12	195	191	222	170	200	210	325	181	253	307	164	180
13	174	240	*152	170	235	225	259	207	217	*425	169	169
14	214	204	188	175	215	220	266	177	205	406	174	162
15	226	210	242	170	205	220	292	220	223	330	186	162
16	174	146	261	175	205	250	506	295	217	235	*174	162
17	220	164	215	148	215	250	507	237	229	236	176	162
18	208	290	221	170	160	265	522	226	241	190	157	162
19	195	295	175	185	210	260	532	226	295	206	157	173
20	201	308	260	185	205	260	653	220	217	543	162	179
21	195	268	235	190	200	260	630	189	241	477	174	190
22	226	201	249	185	205	321	619	*234	348	458	162	190
23	182	148	253	200	205	370	522	247	434	444	157	194
24	174	148	236	*144	190	453	482	234	487	388	180	202
25	174	254	228	180	195	507	402	272	463	330	189	196
26	*232	261	191	195	200	553	361	492	397	236	169	179
27	245	255	228	165	190	585	343	537	321	219	157	190
28	201	236	247	190	235	688	334	502	270	195	157	179
29	232	230	198	190	-	665	242	425	253	237	174	179
30	245	198	216	210	--------	810	249	366	253	209	169	173
31	264	--------	216	195	--------	830	--------	279	--------	220	174	--------
Total	6,238	6,727	6,673	5,644	5,760	10,422	12,978	7,997	8,077	8,757	5,233	5,565
Mean	201	224	215	182	206	336	433	258	269	282	169	186
Cfsm	0.747	0.833	0.799	0.677	0.766	1.25	1.61	0.959	1.00	1.05	0.628	0.691
In.	0.86	0.93	0.92	0.78	0.80	1.44	1.79	1.11	1.12	1.21	0.72	0.77

Calendar year 1956: Max 1,560 Min 88 Mean 273 Cfsm 1.01 In. 13.80
Water year 1956-57: Max 830 Min 88 Mean 247 Cfsm 0.918 In. 12.45

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 4-16, Jan. 18 to Mar. 20.

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 1957.

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

Average discharge.--19 years, 342 cfs.

Extremes.--Maximum discharge during year, 2,920 cfs Apr. 20 (gage height, 5.03 ft); minimum, 44 cfs Aug. 5 (gage height, 1.63 ft).

1938-57: 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 or no gage-height record, 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, 29,610 acre-ft) since April 1941.

Revisions (water years).--WSP 894: 1938-39. WSP 924: 1939-40. WSP 1307: 1948(M).

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.6	40	3.0	593
1.8	73	3.5	990
2.1	152	4.0	1,520
2.3	226	5.0	2,870
2.6	357		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	170	170	210	190	115	74	a1,100	206	195	206	170	108
2	176	156	210	190	115	*75	a900	187	203	199	170	180
3	187	140	210	190	115	76	a750	187	195	191	170	176
4	180	136	210	190	115	76	a600	203	206	226	176	234
5	176	156	210	190	105	75	a500	199	203	195	170	214
6	176	162	206	190	95	72	a420	191	206	184	173	187
7	176	214	210	190	85	66	*382	210	214	214	173	140
8	176	222	210	190	72	60	367	191	195	214	173	95
9	176	191	210	190	62	56	362	195	195	184	173	80
10	173	176	210	180	55	54	326	247	203	203	173	66
11	173	149	210	180	50	58	290	218	218	199	173	62
12	173	156	210	180	47	62	251	195	214	290	173	75
13	173	199	*209	170	55	66	239	195	199	357	176	113
14	176	191	200	170	62	68	218	195	191	312	173	100
15	180	195	210	170	60	74	255	195	195	222	*180	88
16	180	159	210	170	58	76	699	239	199	191	180	91
17	180	133	200	160	56	77	1,600	195	206	210	180	88
18	176	260	190	150	54	79	1,830	199	184	180	180	92
19	176	230	190	150	54	81	2,200	206	170	187	173	104
20	176	184	190	160	54	84	2,810	210	203	226	146	105
21	176	187	190	160	54	87	2,550	184	206	173	152	95
22	180	190	190	160	54	93	1,800	268	281	166	176	115
23	162	190	190	150	54	250	1,110	*286	348	170	180	146
24	166	190	190	140	54	310	850	218	272	176	159	159
25	166	200	190	*138	56	350	663	180	214	191	84	173
26	159	210	190	130	60	370	540	199	176	187	124	176
27	*166	210	190	130	67	430	431	367	199	184	118	176
28	159	210	190	140	73	500	348	362	214	170	122	176
29	170	210	190	130	-	700	290	281	199	159	126	176
30	162	210	190	120	--------	900	239	214	199	173	124	176
31	170	--------	190	120	--------	a1,300	--------	187	--------	170	115	--------
Total	5,365	5,586	6,205	5,068	1,956	6,699	24,920	6,809	6,302	6,309	4,935	3,966
Mean	173	186	200	163	69.9	216	831	220	210	204	159	132
Cfsm	0.616	0.662	0.712	0.580	0.249	0.769	2.96	0.783	0.747	0.726	0.566	0.470
In.	0.71	0.74	0.82	0.67	0.26	0.89	3.30	0.90	0.83	0.83	0.65	0.52

Calendar year 1956:	Max 1,980	Min 105	Mean 289	Cfsm 1.03	In. 14.02
Water year 1956-57:	Max 2,810	Min 47	Mean 230	Cfsm 0.819	In. 11.12

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage, generation at Saxon Falls powerplant 1½ miles upstream and records for nearby stations.

Note.--Stage-discharge relation affected by ice Nov. 22 to Dec. 5, Dec. 7 to Mar. 30.

Black River near Bessemer, Mich.

Location.--Lat 46°30'55", long 90°04'10", in SE¼ sec. 32, T. 48 N R. 46 W., on right bank 450 ft downstream from bridge on county highway, 500 ft downstream from Powder Mill Creek, and 2½ miles north of Bessemer.

Drainage area.--202 sq mi.

Records available.--October 1954 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 1,150 ft (from topographic map).

Extremes.--Maximum discharge during year, 5,420 cfs Apr. 21 (gage height, 9.76 ft); minimum, 15 cfs Aug. 21, 22, 23 (gage height, 0.91 ft).

1954-57: Maximum discharge, that of Apr. 21, 1957; minimum, that of Aug. 21, 22, 23, 1957.

Remarks.--Records good except those for period of ice effect, which are fair. Some ground water pumped from mines at Bessemer. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 10 to Nov. 14)

0.9	17	6.0	2,020
1.2	65	8.0	3,240
2.0	250	9.5	4,930
3.0	594		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47	34	145	80	39	51	562	275	107	81	47	63
2	*54	34	145	80	39	51	703	221	92	69	44	401
3	51	33	145	78	39	50	682	191	83	58	37	347
4	49	31	140	76	39	50	650	165	71	56	36	430
5	47	30	*140	75	39	49	535	144	*65	49	*33	*401
6	47	83	140	74	39	49	455	131	61	41	30	314
7	44	120	135	*73	40	49	384	*111	60	39	30	242
8	42	111	130	72	40	49	347	103	52	39	34	188
9	41	109	125	70	40	48	*343	107	51	34	27	151
10	37	103	120	68	40	48	299	105	51	*31	27	118
11	36	96	115	66	40	50	275	96	51	42	24	94
12	39	142	115	62	40	52	258	89	49	81	24	79
13	37	142	110	60	41	55	232	85	45	165	24	81
14	47	144	110	58	41	58	214	71	44	140	24	69
15	45	150	110	56	41	60	234	85	42	136	28	65
16	45	155	110	53	42	60	645	100	44	96	27	63
17	44	155	110	51	42	60	1,360	105	51	77	24	58
18	44	160	105	50	43	65	1,760	118	58	63	24	54
19	41	160	105	48	44	72	2,750	114	65	54	23	51
20	41	160	105	48	44	78	4,830	100	56	49	21	45
21	39	160	105	47	45	86	*4,480	105	81	118	20	54
22	37	155	105	47	46	100	*2,820	151	293	60	20	71
23	37	155	100	47	47	120	2,090	140	299	47	28	105
24	33	150	100	47	48	150	1,620	118	250	42	31	149
25	34	150	98	46	49	190	1,240	103	219	41	27	203
26	37	145	96	45	50	230	953	129	181	39	27	203
27	36	145	92	44	51	*270	724	216	153	37	25	181
28	33	145	90	42	*51	330	554	198	127	37	25	156
29	34	145	86	41	-	390	437	172	114	39	25	138
30	*34	145	84	41	--------	462	340	147	96	42	25	114
31	36	--------	82	*40	--------	546	--------	125	--------	47	37	--------
Total	1,268	3,647	3,498	1,785	1,199	3,978	32,776	4,120	3,011	1,949	878	4,688
Mean	40.9	122	113	57.6	42.8	128	1,093	133	100	62.9	28.3	156
Cfsm	0.202	0.604	0.559	0.285	0.212	0.634	5.41	0.658	0.495	0.311	0.140	0.772
In.	0.23	0.67	0.64	0.33	0.22	0.73	6.04	0.76	0.55	0.36	0.16	0.86

Calendar year 1956: Max 2,080 Min 30 Mean 207 Cfsm 1.02 In. 13.96
Water year 1956-57: Max 4,830 Min 20 Mean 172 Cfsm 0.851 In. 11.55

Peak discharge (base, 1,500 cfs).--Apr. 21 (12:30 a.m.) 5,420 cfs (9.76 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 15 to Mar. 29.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 1,489.30 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to May 27, 1949, wire-weight gage at site a quarter of a mile downstream at different datum.

Average discharge.--12 years, 182 cfs.

Extremes.--Maximum discharge during year, 1,540 cfs Apr. 21 (gage height, 8.17 ft); minimum, 33 cfs Aug. 6 (gage height, 3.01 ft).

1945-57: Maximum discharge, 2,670 cfs Apr. 21, 1952 (gage height, 9.90 ft); minimum observed, 13 cfs Sept. 30, 1948 (gage height, 2.25 ft, site and datum then in use).

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

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-11, Aug. 4 to Sept. 19)

2.9	32	6.0	610
3.3	74	7.0	940
4.0	188	8.1	1,500

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	53	120	90	65	*71	325	270	121	85	59	78
2	*56	50	120	90	64	71	292	240	113	87	50	183
3	55	50	120	90	64	70	304	221	105	74	46	221
4	49	49	115	88	64	69	300	197	94	66	40	256
5	47	49	*115	88	64	68	284	181	*94	60	*38	*238
6	51	117	110	88	65	68	266	170	91	55	35	190
7	50	172	110	*86	66	68	252	*163	84	54	37	148
8	49	158	110	86	66	68	236	151	80	53	66	124
9	46	136	105	84	66	69	*234	179	70	*48	78	96
10	42	117	105	82	67	70	216	184	68	45	69	78
11	40	105	105	82	67	71	210	165	68	48	56	73
12	41	117	105	80	67	72	188	148	74	105	48	67
13	42	124	105	80	67	74	192	136	73	193	45	78
14	46	128	100	78	67	82	183	139	81	175	47	87
15	49	133	100	76	68	94	195	223	165	141	50	84
16	50	135	100	76	68	100	250	254	134	105	58	82
17	43	140	100	76	68	100	410	221	133	82	54	77
18	43	140	98	74	68	100	577	204	168	69	49	70
19	45	140	98	74	68	100	741	193	172	68	46	68
20	45	135	98	74	69	110	1,180	174	150	73	43	67
21	45	130	96	74	70	130	*1,500	165	144	102	39	74
22	66	125	96	74	71	160	1,260	202	179	96	37	91
23	63	120	96	74	71	200	958	193	197	82	49	102
24	54	120	96	74	71	250	768	174	184	67	94	131
25	49	115	94	72	71	300	660	151	160	62	92	165
26	50	115	94	72	71	321	*601	174	139	61	75	160
27	49	115	92	70	71	325	522	208	121	54	64	143
28	47	115	92	70	71	346	438	202	106	53	56	122
29	49	115	92	68	-	346	368	179	100	69	53	106
30	55	115	92	66	--------	327	312	168	92	70	51	92
31	*53	--------	90	*66	--------	361	--------	146	--------	68	51	--------
Total	1,521	3,433	3,169	2,422	1,895	4,661	14,222	5,775	3,560	2,470	1,675	3,551
Mean	49.1	114	102	78.1	67.7	150	474	186	119	79.7	54.0	118
Cfsm	0.281	0.651	0.583	0.446	0.387	0.857	2.71	1.06	0.680	0.455	0.309	0.674
In.	0.32	0.73	0.67	0.51	0.40	0.99	3.02	1.22	0.76	0.52	0.36	0.75

Calendar year 1956: Max 622 Min 40 Mean 143 Cfsm 0.817 In. 11.13
Water year 1956-57: Max 1,500 Min 35 Mean 132 Cfsm 0.754 In. 10.25

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 16 to Mar. 25.

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 Tula, 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 1957.

Gage.--Wire-weight gage and crest-stage indicator; gage read once daily. Datum of gage is 1,299.66 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--12 years, 281 cfs.

Extremes.--Maximum discharge during year, 3,430 cfs Apr. 21 (gage height, 12.77 ft); minimum, 42 cfs Aug. 7 (gage height, 4.43 ft).

1945-57: 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, which are fair.

Revisions (water years).--WSP 1387: 1945.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr.21				Apr. 22 to Sept. 30			
4.6	53	8.0	900	4.4	38	8.0	900
5.0	120	10.0	1,700	5.0	133	10.0	1,700
6.0	340	13.0	3,600	6.0	340	12.0	2,850

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	69	77	190	120	88	98	520	382	161	123	77	300
2	*74	75	190	120	86	98	520	316	145	111	69	400
3	79	72	185	115	85	98	520	275	131	111	61	474
4	72	70	180	115	84	98	500	241	119	98	55	452
5	66	67	*175	115	*84	97	490	215	*111	88	49	*372
6	66	132	170	115	85	96	480	199	130	78	46	302
7	68	264	165	*110	86	96	460	*190	123	76	*42	241
8	71	253	165	110	86	96	440	182	111	75	54	190
9	64	217	160	110	87	97	*410	186	100	67	83	150
10	61	187	160	110	88	98	370	203	94	*60	89	126
11	58	180	155	110	88	100	328	190	97	61	80	113
12	55	184	155	105	88	105	300	175	94	73	66	104
13	53	198	155	105	88	105	280	159	96	172	62	109
14	59	198	150	105	88	115	270	150	94	180	58	116
15	66	209	150	105	88	130	268	168	130	166	62	115
16	66	215	150	105	88	140	333	235	180	135	62	114
17	67	215	150	105	88	140	546	230	154	108	69	109
18	63	215	145	105	88	145	891	218	224	91	64	101
19	63	210	145	105	88	150	1,480	205	252	80	60	96
20	66	200	140	105	88	160	*2,690	192	203	80	55	94
21	64	190	140	105	89	180	3,320	173	205	88	51	99
22	63	182	140	105	90	210	2,810	203	311	126	49	110
23	83	180	140	105	90	250	2,260	220	360	106	56	148
24	75	180	135	100	91	290	1,750	199	347	91	67	199
25	71	180	135	100	93	320	*1,350	175	268	80	110	277
26	69	180	135	98	95	360	1,090	205	218	75	104	263
27	69	180	130	97	97	400	885	241	177	75	88	226
28	67	185	130	95	*98	440	700	252	155	70	81	194
29	66	187	125	93	-	470	518	222	163	67	75	170
30	*72	195	125	91	--------	500	471	194	140	80	73	143
31	79	--------	120	90	--------	500	--------	182	--------	80	77	--------
Total	2,084	5,277	4,690	3,274	2,482	6,182	27,250	6,577	5,093	2,971	2,094	5,907
Mean	67.2	176	151	106	88.6	199	908	212	170	95.8	67.5	197
Cfsm	0.258	0.677	0.581	0.408	0.341	0.765	3.49	0.815	0.654	0.368	0.260	0.758
In.	0.30	0.76	0.67	0.47	0.36	0.88	3.89	0.94	0.73	0.42	0.30	0.85

Calendar year 1956:	Max 1,550	Min 53	Mean 221	Cfsm 0.850	In. 11.59
Water year 1956-57:	Max 3,320	Min 42	Mean 202	Cfsm 0.777	In. 10.57

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16-21, 24-28, Dec. 1 to Apr. 10, Apr. 12-14. No gage-height record Sundays and holidays; discharge interpolated.

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 downstream from logging bridge, 1¼ 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 1952 to September 1957 (discontinued).

Gage.--Water-stage recorder. Datum of gage is 730.52 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--5 years, 144 cfs.

Extremes.--Maximum discharge during year, 4,810 cfs Apr. 21 (gage height, 5.83 ft); minimum, 3.0 cfs Aug. 23 (gage height, 1.79 ft).

1952-57: Maximum discharge, 7,900 cfs Apr. 19, 1952 (gage height, 7.27 ft), from rating curve extended above 3,900 cfs by logarithmic plotting; minimum, 2.7 cfs Nov. 7, 1953, Aug. 19-22, 1954 (gage height, 1.91 ft); minimum gage height, that of Aug. 23, 1957.

Remarks.--Records fair.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 31	
2.0	8.0
2.1	17
2.5	85
3.0	220

Apr. 1 to Sept. 30			
1.8	3.1	2.9	190
1.9	4.2	3.3	360
2.0	8.0	3.8	720
2.1	17	4.5	1,700
2.5	85	5.2	3,200

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.2	12	85	49	25	26	426	80	22	14	8.6	3.9
2	11	13	83	48	25	26	598	72	18	12	6.4	24
3	*11	12	82	47	24	25	590	60	17	11	5.0	49
4	11	12	80	46	24	25	487	54	14	11	4.7	*89
5	10	12	78	45	23	24	340	45	*12	11	3.9	39
6	11	69	*77	45	23	24	241	37	12	11	*3.6	22
7	11	132	76	44	24	24	194	*29	12	11	3.8	14
8	11	107	75	*43	24	24	157	29	12	9.2	9.2	11
9	11	92	74	42	24	24	166	34	11	8.6	11	9.2
10	11	76	72	41	24	24	*146	37	11	*7.4	8.6	8.0
11	11	64	72	40	25	25	135	32	11	7.4	6.0	6.9
12	10	112	70	38	25	26	114	28	11	9.9	5.0	6.4
13	11	140	70	37	25	28	114	24	11	26	4.7	8.6
14	12	122	68	36	25	30	105	24	11	22	5.0	9.2
15	11	117	68	35	25	31	130	24	11	14	5.6	9.9
16	12	115	66	33	25	31	589	28	11	11	5.6	9.9
17	12	110	64	32	24	32	1,700	26	11	8.6	4.7	13
18	12	110	64	31	24	33	1,960	24	14	7.4	4.0	12
19	12	105	64	30	24	34	2,240	23	22	6.0	3.7	11
20	11	105	62	29	24	36	*2,680	23	14	6.4	3.5	11
21	12	100	61	28	24	39	3,130	20	13	56	3.4	9.9
22	12	98	60	28	24	44	1,750	23	34	54	3.2	11
23	11	96	59	28	24	56	1,420	30	64	26	3.6	17
24	11	96	58	28	25	80	1,190	24	52	16	4.7	56
25	11	94	58	27	25	105	*753	20	42	11	6.4	110
26	11	92	57	27	25	135	402	23	32	9.2	6.0	68
27	11	90	56	27	26	170	257	54	26	8.0	4.5	47
28	11	88	54	27	*26	210	175	70	24	7.4	3.9	34
29	10	88	52	26	-	260	132	44	20	23	3.8	26
30	*11	86	51	*26		320	103	35	17	17	3.8	22
31	12		50	26		370		26		11	3.8	
Total	344.2	2,565	2,066	1,089	685	2,341	22,424	1,102	592	463.5	159.7	767.9
Mean	11.1	85.5	66.6	35.1	24.5	75.5	747	35.5	19.7	15.0	5.15	25.6
Cfsm	0.111	0.855	0.666	0.351	0.245	0.755	7.47	0.355	0.197	0.150	0.052	0.256
In.	0.13	0.95	0.77	0.40	0.26	0.87	8.33	0.41	0.22	0.17	0.06	0.29

Calendar year 1956: Max 1,780 Min 6.0 Mean 98.5 Cfsm 0.985 In. 13.40
Water year 1956-57: Max 3,130 Min 3.2 Mean 94.8 Cfsm 0.948 In. 12.86

Peak discharge (base, 1,500 cfs).--Apr. 21 (1 a.m.) 4,810 cfs (5.83 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16 to Feb. 3, Feb. 6, 7, Feb. 10 to Mar. 31; (no gage-height record Jan. 9-29; discharge estimated on basis of weather records and records for nearby stations).

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 5¼ miles southeast of Paulding.

Drainage area.--About 175 sq mi.

Records available.--June 1942 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 1,485.66 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to Sept. 28, 1942, reference point on downstream side of bridge at same datum.

Average discharge.--15 years, 178 cfs.

Extremes.--Maximum discharge during year, 1,080 cfs Apr. 21 (gage height, 8.02 ft); minimum, 68 cfs Aug. 23 (gage height, 3.46 ft).

1942-57: Maximum discharge, 2,050 cfs Apr. 30, 1951 (gage height, 10.0 ft, from high-water mark); minimum, 27 cfs Nov. 22, 1946 (result of freezeup); minimum gage height, 2.96 ft Nov. 26, 1942 (result of freezeup).

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

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.5	72
4.0	132
5.0	307
8.0	1,070

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95	101	135	110	90	105	156	235	110	95	81	101
2	*99	105	130	110	90	105	174	213	106	90	79	195
3	98	105	130	*110	90	105	173	197	105	89	78	186
4	93	100	*130	110	90	105	172	187	*100	89	77	*161
5	92	100	125	105	*88	*105	172	178	99	88	*76	132
6	94	181	125	105	88	105	172	172	114	89	74	114
7	108	280	120	105	88	105	164	*161	117	90	74	104
8	104	250	115	105	88	105	160	149	106	*86	97	97
9	98	200	115	105	88	100	158	143	100	81	100	92
10	93	170	115	100	88	100	152	142	97	78	110	94
11	92	155	115	98	90	100	149	139	99	81	92	94
12	92	175	115	96	90	100	143	133	106	99	84	94
13	95	180	115	94	90	105	143	129	101	133	83	100
14	92	175	115	94	92	105	140	126	100	115	83	97
15	93	160	115	94	92	110	143	146	118	97	83	110
16	95	140	115	92	94	115	170	158	117	89	89	117
17	95	115	115	92	94	120	255	142	119	86	84	109
18	98	130	115	94	94	125	356	156	174	83	81	101
19	100	135	115	94	94	125	478	160	156	84	81	98
20	98	140	115	94	94	125	803	145	135	121	76	95
21	99	135	115	94	94	130	*1,050	132	131	156	74	114
22	98	130	115	94	94	135	996	133	133	166	72	129
23	97	130	115	94	94	135	838	129	131	128	89	133
24	97	130	115	94	96	135	698	122	124	104	132	155
25	98	135	115	94	100	140	597	118	119	95	114	181
26	104	135	115	92	100	145	507	124	114	90	94	161
27	105	130	110	92	105	*149	418	136	106	89	85	145
28	103	130	110	92	105	154	347	131	103	84	83	128
29	100	135	110	92	-	155	299	126	101	84	89	121
30	98	135	110	92	--------	149	265	117	100	90	91	114
31	*99	--------	110	92	--------	156	--------	114	--------	86	90	--------
Total	3,022	4,422	3,630	3,029	2,600	3,753	10,448	4,593	3,441	3,035	2,695	3,672
Mean	97.5	147	117	97.7	92.9	121	348	148	115	97.9	86.9	122
Cfsm	0.557	0.840	0.669	0.558	0.531	0.691	1.99	0.846	0.657	0.559	0.497	0.697
In.	0.64	0.94	0.77	0.64	0.55	0.80	2.22	0.98	0.73	0.64	0.57	0.78

Calendar year 1956:	Max	559	Min	87	Mean	154	Cfsm	0.880	In.	11.93
Water year 1956-57:	Max	1,050	Min	72	Mean	132	Cfsm	0.754	In.	10.26

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice from about Nov. 15 to about Mar. 25. No gage-height record Nov. 7 to Jan. 2, Jan. 13 to Feb. 4, Feb. 17 to Mar. 4, Mar. 8-26; discharge estimated on basis of weather records, recorded range in stage, 1 discharge measurement, and records for nearby stations.

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 left bank 40 ft upstream from intake to pipeline No. 2, 1.4 mile southeast of Paulding, and 1.5 miles downstream from Bond Falls Reservoir on Middle Branch Ontonagon River.

Records available.--July 1942 to September 1957.

Gage.--Staff gage and concrete control; gage read once daily. Datum of gage is 1,444.59 ft above mean sea level, datum of 1929.

Average discharge.--15 years, 131 cfs.

Extremes.--Maximum daily discharge during year, 319 cfs Feb. 28 (gage height, 2.88 ft); minimum, 7.8 cfs Mar. 24 to Apr. 5 (gage height, 0.30 ft).

1942-57: 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 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 near Rockland.

Rating table, water year 1956-57, 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	174
1.0	56	3.0	341

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	220	64	25	28	223	314	7.8	9.7	188	166	82	102
2	*220	64	25	29	223	296	7.8	9.7	215	140	207	102
3	220	64	25	29	223	284	7.8	11	215	121	207	88
4	218	64	26	29	223	269	7.8	11	215	121	207	*78
5	218	64	26	29	*224	*248	7.8	11	214	121	207	64
6	217	53	26	29	224	220	8.3	11	214	150	206	51
7	195	34	27	40	224	220	8.3	11	214	186	204	51
8	174	24	27	99	230	220	8.3	11	244	*207	201	51
9	174	24	27	160	250	220	8.3	11	270	207	201	51
10	174	24	27	160	250	220	8.3	11	270	207	201	51
11	174	24	27	160	250	220	8.3	11	270	206	201	51
12	158	24	27	160	250	220	8.3	11	268	204	201	51
13	126	24	27	160	248	220	8.3	11	253	204	201	52
14	85	24	27	160	245	220	8.3	12	201	204	200	52
15	85	24	27	157	245	220	8.3	12	201	189	198	52
16	85	24	27	157	245	220	8.3	12	162	168	198	52
17	85	24	27	157	245	220	8.3	12	123	168	198	52
18	85	24	27	157	245	220	8.7	12	169	168	198	52
19	85	24	27	176	245	220	8.7	12	192	168	198	52
20	85	25	27	214	245	209	8.7	12	146	168	198	52
21	85	25	27	214	245	183	9.2	12	123	131	181	52
22	85	25	28	214	245	154	9.2	12	151	131	126	52
23	85	25	28	214	245	140	9.2	12	171	163	122	52
24	85	25	28	214	240	63	9.7	40	159	180	102	55
25	85	25	28	214	240	7.8	9.7	127	141	196	102	58
26	85	25	28	214	240	7.8	9.7	166	141	196	102	60
27	74	25	28	214	284	7.8	9.7	166	128	195	102	58
28	65	25	28	214	319	7.8	9.7	166	121	194	102	66
29	64	25	28	219	-	7.8	9.7	166	150	194	102	75
30	64	25	28	223		7.8	9.7	166	166	123	102	75
31	64		28	223		7.8		166		86	102	
Total	3,924	970	838	4,667	6,815	5,294.6	260.2	1,423.4	5,695	5,262	5,159	1,810
Mean	127	32.3	27.0	151	243	171	8.67	45.9	190	170	166	60.3
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 314	Min 3.4	Mean 136	Cfsm -	In. -
Water year 1956-57: Max 319	Min 7.8	Mean 115	Cfsm -	In. -

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 14-16, 18-23, 25-31, Feb. 2-8, 10-27, Mar. 4-15, 16-21.

Bond Falls Reservoir near Paulding, Mich.

Location.--Lat 46°24'29", long 89°07'42", in SW¼ sec. 1, T. 46 N., R. 39 W., at Bond Falls Dam on Middle Branch Ontonagon River, 2½ miles east of Paulding.

Drainage area.--About 210 sq mi.

Records available.--June 1942 to September 1957. Prior to October 1950, published in WSP 1307.

Gage.--Staff gage read once daily. Datum of gage is 1,335.59 ft above mean sea level, datum of 1929.

Remarks.--Reservoir is formed by earth-fill and concrete dam with one taintor gate; dam completed in 1937. Usable capacity, 1,730,000,000 cu ft between gage heights of 121 ft (maximum drawdown) and 141 ft (full pond). Dead storage unknown. Water diverted to South Branch Ontonagon River through Bond Falls Canal; water used for power production at Victoria Dam near Rockland.

Cooperation.--Gage-height record furnished by Upper Peninsula Power Co.

Month-end gage height and contents, water year October 1956 to September 1957

Date	Gage height (feet)†	Contents (millions of cubic feet)	Change in contents (millions of cubic feet)
Sept. 30	129.50	725	-
Oct. 31	127.99	601	-124
Nov. 30	131.36	884	+283
Dec. 31	133.72	1,080	+196
Calendar year 1956	-	-	+91
Jan. 31	131.66	910	-170
Feb. 28	126.91	510	-400
Mar. 31	124.91	349	-161
Apr. 30	136.07	1,310	+961
May 31	138.02	1,490	+180
June 30	135.05	1,200	-290
July 31	131.78	919	-281
Aug. 31	128.17	618	-301
Sept. 30	130.02	767	+149
Water year 1956-57	-	-	+42

† Gage height at about 8:30 a.m.

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 0.1 mile upstream from State Highway 28, 3¾ miles west of village of Trout Creek, and 6½ miles downstream from Bond Falls Reservoir.

Drainage area.--About 225 sq mi.

Records available.--June 1942 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 1,132.03 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to Nov. 4, 1942, staff gage at same site and datum.

Average discharge.--15 years, 85.5 cfs.

Extremes.--Maximum discharge during year, 136 cfs Apr. 19 (gage height, 2.10 ft); maximum gage height, 2.23 ft Jan. 26 (ice jam); minimum discharge, 38 cfs Mar. 18, 20 (gage height, 1.57 ft).

1942-57: Maximum discharge, 1,750 cfs Nov. 7, 1951 (gage height, 5.05 ft); 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. Flow regulated by Bond Falls Reservoir (see p. 37). Diversion to South Branch Ontonagon River by Bond Falls Canal (see p. 36).

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 14		Jan. 14 to Sept. 30	
1.6	41	1.6	42
1.8	72	1.8	73
		2.0	114

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	49	49	b48	49	49	60	49	54	58	57	60
2	*49	49	49	b52	b48	49	60	49	55	58	57	71
3	48	49	49	*52	48	b50	58	48	55	57	57	57
4	48	49	*49	50	b48	b50	58	48	*57	58	58	*49
5	48	49	52	49	*48	*51	57	48	57	57	*57	47
6	49	63	50	49	48	49	55	48	60	57	57	45
7	50	55	50	48	48	b49	52	47	58	58	58	45
8	49	52	49	48	49	b49	52	51	57	57	58	45
9	49	52	b50	48	49	48	*52	52	57	*57	58	45
10	49	50	52	b48	48	b48	52	49	57	57	58	45
11	49	50	b50	b48	b49	49	52	49	57	58	57	45
12	49	52	b50	b48	49	48	51	49	58	63	57	45
13	49	50	b50	b48	49	48	52	49	57	58	57	48
14	50	50	52	b48	49	49	52	49	58	57	57	45
15	50	50	50	b48	52	49	54	52	57	57	58	48
16	50	52	49	b48	49	48	65	51	58	57	57	48
17	50	50	49	b48	49	48	82	49	60	57	57	47
18	50	49	b50	b48	b49	48	88	52	60	57	57	45
19	50	49	50	b48	b49	49	103	51	58	60	57	45
20	50	49	50	48	b49	48	110	49	58	60	57	45
21	50	50	49	48	49	49	77	49	63	60	57	52
22	50	48	49	48	49	51	63	49	63	58	57	49
23	50	48	49	48	49	52	60	48	62	57	62	51
24	50	49	50	b48	49	52	57	48	60	57	58	58
25	50	50	48	b49	49	52	*55	48	60	57	57	54
26	52	50	52	b49	48	54	54	49	58	57	57	51
27	50	49	50	b49	b48	55	52	49	58	57	57	49
28	50	50	49	b50	49	55	52	49	58	57	57	48
29	50	49	49	51	-	57	51	49	60	57	57	48
30	*50	49	46	b50	---	57	49	51	58	57	57	48
31	49	---	49	49	---	57	---	54	---	57	57	---
Total	1,535	1,510	1,539	1,511	1,366	1,567	1,835	1,532	1,748	1,789	1,779	1,478
Mean	49.5	50.3	49.6	48.7	48.8	50.5	61.2	49.4	58.3	57.7	57.4	49.3
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 107 Min 46 Mean 53.2 Cfsm - In. -
Water year 1956-57: Max 110 Min 45 Mean 52.6 Cfsm - In. -

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* 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 secs. 32 and 33, T. 50 N., R. 38 W., on right bank 700 ft downstream from highway bridge, 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 1957.

Gage.--Water-stage recorder. Datum of gage is 873.55 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to Oct. 1, 1949, wire-weight gage at bridge 700 ft upstream at same datum.

Average discharge.--15 years, 266 cfs.

Extremes.--Maximum discharge during year, 3,380 cfs Apr. 20 (gage height, 9.58 ft); minimum, 81 cfs Aug. 4, 23 (gage height, 3.33 ft).

1942-57: Maximum discharge, 4,590 cfs July 1, 1953 (gage height, 10.57 ft); 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 period of doubtful gage-height record, which are good, and those for periods of ice effect, which are fair.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.3	76	6.0	920
4.0	212	8.0	2,110
5.0	500	10.0	3,760

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	125	131	215	160	130	145	525	234	140	d127	87	95
2	135	131	215	155	125	145	642	212	133	d118	86	268
3	*131	131	220	155	125	150	582	195	131	d115	82	410
4	127	133	225	150	125	150	493	179	*129	d110	86	*435
5	125	131	225	150	125	150	370	173	123	d105	89	300
6	125	332	*220	150	120	150	313	166	140	d100	*87	214
7	138	419	215	150	120	150	278	162	152	d96	87	160
8	150	335	210	145	120	145	254	*160	142	d99	114	136
9	142	268	210	*145	125	145	256	226	131	d97	133	122
10	136	224	205	140	125	145	*234	268	125	d94	118	114
11	133	198	200	140	125	150	222	219	125	*d90	106	111
12	133	241	195	135	125	155	210	188	127	d122	99	107
13	133	246	195	135	130	160	202	173	125	150	94	136
14	133	231	190	135	130	170	200	164	122	142	95	136
15	131	222	185	135	130	180	246	184	146	122	97	138
16	129	195	180	130	130	200	568	256	152	107	97	184
17	127	207	180	130	130	210	1,220	217	150	100	94	190
18	127	215	180	130	130	220	1,500	205	190	97	90	166
19	125	220	180	130	130	225	1,930	231	222	95	89	148
20	125	210	185	130	130	230	2,970	207	179	109	86	138
21	125	200	185	130	130	240	*2,240	181	156	193	84	152
22	125	179	180	130	130	250	1,440	173	214	166	84	219
23	123	184	180	130	130	280	1,050	170	219	142	107	222
24	123	190	175	130	135	300	834	160	181	116	142	271
25	123	200	170	130	140	340	666	152	158	104	136	403
26	135	210	170	130	140	*360	518	166	148	100	116	324
27	136	210	165	130	*145	390	416	198	146	99	106	246
28	136	215	165	130	145	420	343	198	135	97	104	198
29	*131	215	160	130	-	450	294	175	136	99	99	173
30	131	215	160	*130	--------	470	258	160	d142	94	97	152
31	131	--------	160	130	--------	500	--------	152	--------	89	95	--------
Total	4,049	6,438	5,900	4,260	3,625	7,375	21,274	5,904	4,519	3,494	3,086	6,068
Mean	131	215	190	137	129	238	709	190	151	113	99.5	202
Cfsm	0.494	0.811	0.717	0.517	0.487	0.898	2.68	0.717	0.570	0.426	0.375	0.762
In.	0.57	0.90	0.83	0.60	0.51	1.04	2.99	0.83	0.64	0.49	0.43	0.85

Calendar year 1956:	Max 1,700	Min 107	Mean 223	Cfsm 0.842	In. 11.48
Water year 1956-57:	Max 2,970	Min 82	Mean 208	Cfsm 0.785	In. 10.68

Peak discharge (base, 1,400 cfs).--Apr. 20 (9 p.m.) 3,380 cfs (9.58 ft).

* Discharge measurement made on this day.

d Doubtful gage-height record; discharge computed on basis of appearance of recorded graph, weather records, and records for nearby stations.

Note.--Stage-discharge relation affected by ice Nov. 18-21, Nov. 24 to Mar. 31.

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 1957.

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

Average discharge.--15 years, 552 cfs.

Extremes.--Maximum discharge during year, 8,270 cfs Apr. 20 (gage height, 11.60 ft); minimum, 193 cfs Aug. 2 (gage height, 4.96 ft).

1942-57: Maximum discharge, 27,000 cfs Aug. 22, 1942 (gage height, 21.2 ft, from floodmarks), from rating curve extended above 7,500 cfs on basis of slope-area 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 those above 900 cfs, which are fair. Flow regulated by Bond Falls Reservoir (see p. 37). Diversion to South Branch Ontonagon River by Bond Falls Canal (see p. 36).

Rating tables, water year 1956-57, 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			
5.3	212	6.5	880	4.9	178	6.5	920
5.5	268	8.0	2,590	5.5	360	7.5	1,950
6.0	510	11.0	7,250	6.0	590	11.0	7,250

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	217	222	420	300	235	280	1,500	384	257	245	206	208
2	235	225	420	300	235	280	1,700	350	230	225	193	560
3	*230	225	430	290	230	280	1,580	325	236	230	208	1,160
4	222	225	430	285	230	280	1,480	304	*245	227	203	630
5	220	238	*430	280	*230	280	*816	290	242	225	198	422
6	228	760	420	280	230	280	640	284	254	211	*203	332
7	244	898	420	275	230	280	492	287	275	219	198	266
8	238	570	410	*275	230	275	385	*287	260	222	239	214
9	241	434	400	270	230	275	504	372	248	216	257	230
10	233	350	390	270	230	280	395	404	245	*214	233	227
11	230	380	380	260	235	290	400	342	245	214	225	219
12	230	428	370	260	240	300	360	297	245	219	214	214
13	225	450	360	255	240	310	341	287	248	275	214	266
14	233	400	350	250	245	330	324	281	239	266	211	254
15	228	360	340	245	250	350	534	297	339	233	214	242
16	222	311	335	245	250	380	1,770	396	290	222	211	318
17	222	316	330	245	250	400	3,500	336	281	219	206	318
18	228	340	330	240	250	410	3,900	322	339	216	200	287
19	215	360	335	240	250	430	3,820	356	356	211	200	257
20	215	417	340	240	250	439	*6,570	325	297	242	195	251
21	215	412	340	240	255	434	4,540	294	278	432	195	266
22	217	341	340	240	260	500	2,720	284	314	311	195	396
23	217	292	335	240	260	550	2,030	294	346	263	230	368
24	220	350	325	240	265	600	1,580	272	300	230	260	490
25	220	375	320	240	270	700	1,280	263	275	222	280	1,040
26	235	400	315	240	280	800	880	284	269	222	250	590
27	235	410	315	240	*280	900	694	325	260	214	230	388
28	230	410	310	240	280	1,030	550	314	251	214	216	314
29	220	410	305	240	-	1,130	468	287	251	216	210	284
30	*228	410	305	240	--------	1,280	418	269	260	214	210	257
31	228	--------	305	240	--------	1,400	--------	272	--------	203	210	--------
Total	7,021	11,719	11,155	7,945	6,920	15,753	46,171	9,684	8,175	7,292	6,714	11,268
Mean	226	391	360	256	247	508	1,539	312	272	235	217	376
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956:	Max 5,720	Min 196	Mean 439	Cfsm -	In. -
Water year 1956-57:	Max 6,570	Min 193	Mean 410	Cfsm -	In. -

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 24 to Mar. 19, Mar. 22 to Apr. 2.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 1,290.81 ft above mean sea level, datum of 1929. Prior to Nov. 5, 1942, staff gage a quarter of a mile upstream at different datum.

Average discharge.--15 years, 180 cfs.

Extremes.--Maximum discharge during year, 968 cfs Apr. 24 (gage height, 5.02 ft); minimum daily discharge, 10 cfs Sept. 15-19, 21-23.

1942-57: Maximum discharge, 1,300 cfs May 3, 1954; 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 except those below 20 cfs, which are fair. Flow regulated by Gogebic Lake (usable capacity, about 50,000 acre-ft).

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

0.6	9	2.5	152
1.0	23	3.0	255
1.5	47	4.0	565
2.0	85	5.0	960

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	49	57	60	110	163	55	376	100	94	142	40
2	*64	49	57	60	108	147	55	370	101	95	156	38
3	61	50	57	60	107	135	56	363	100	93	138	37
4	57	54	*57	60	105	130	58	326	99	94	100	*37
5	58	54	58	60	103	129	59	307	*99	90	131	38
6	58	58	58	60	*101	128	61	337	100	147	156	37
7	56	55	58	60	100	124	62	*379	100	140	*113	37
8	55	49	58	*61	99	122	64	373	100	112	83	38
9	53	49	58	61	100	120	*65	373	99	*114	82	37
10	52	50	58	61	99	116	65	306	99	97	81	31
11	53	49	64	61	99	114	66	234	97	87	79	22
12	52	48	61	61	96	114	68	291	95	89	78	19
13	54	49	59	61	95	108	121	320	92	90	81	18
14	53	47	59	61	94	79	165	304	94	90	77	12
15	53	44	60	61	94	59	129	296	93	90	75	10
16	53	49	60	61	96	59	75	301	91	90	75	10
17	52	51	60	61	95	61	70	206	93	91	74	10
18	52	52	60	61	94	61	74	149	116	92	73	10
19	52	52	60	61	93	61	84	245	126	91	72	10
20	52	52	60	60	92	61	102	309	91	92	69	12
21	52	52	60	60	92	105	401	315	92	93	64	10
22	52	52	60	60	92	135	736	318	94	93	57	10
23	49	54	60	61	92	135	852	288	92	93	57	10
24	51	54	60	61	90	83	884	192	94	93	56	23
25	51	55	60	78	91	53	*864	135	95	130	57	24
26	50	55	60	93	90	54	856	137	96	131	56	*25
27	49	55	60	91	129	54	808	132	94	93	51	26
28	50	56	60	106	*163	54	780	135	94	92	41	28
29	49	57	60	119	-	54	732	134	94	92	38	31
30	*49	57	60	116		55	485	134	94	92	38	27
31	48		60	111		54		117		92	38	
Total	1,655	1,557	1,839	2,168	2,819	2,927	8,952	8,202	2,924	3,072	2,488	717
Mean	53.4	51.9	59.3	69.9	101	94.4	298	265	97.5	99.1	80.3	23.9
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 640 Min 44 Mean 151 Cfsm 0.944 In. 12.85
Water year 1956-57: Max 884 Min 10 Mean 108 Cfsm 0.675 In. 9.16

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 15 to Jan. 7, Sept. 14-19, 21-23; discharge estimated on basis of recorded range in stage and observer's daily readings of power company's staff gage ½ mile upstream.

Cisco Branch Ontonagon River at Cisco Lake Outlet, Mich.

Location.--Lat 46°15', long 89°27', in sec. 32, T. 45 N., R. 41 W., on right bank 80 ft downstream from Cisco Lake Dam, 2½ miles upstream from Langford Lake Outlet, 4¾ 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 1957.

Gage.--Staff gage read once daily. Datum of gage is 1,676.69 ft above mean sea level, datum of 1929.

Average discharge.--13 years, 47.4 cfs.

Extremes.--Maximum discharge during year, 118 cfs Apr. 24 (gage height, 1.34 ft); minimum daily, 1.3 cfs July 1-12.
1944-57: 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. Flow regulated by Cisco Lake (usable capacity, 15,600 acre-ft).

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

0.1	0.5	0.6	22
.2	2.1	.8	40
.3	5.0	1.2	93
.4	9.0	1.4	129

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	45	35	39	33	*30	44	7.2	62	1.3	44	30
2	*19	45	33	39	33	30	44	5.0	57	1.3	44	32
3	19	54	33	37	31	30	34	5.0	39	1.3	16	34
4	18	60	33	37	31	28	29	5.7	15	1.3	2.7	32
5	19	57	*33	37	31	28	37	5.0	6.4	1.3	*2.7	*32
6	16	90	33	37	31	28	49	5.0	*3.2	1.3	2.7	32
7	18	107	33	*37	29	28	56	*5.0	3.2	1.3	2.7	15
8	16	110	52	37	29	28	56	5.7	3.2	*1.3	9.4	5.7
9	16	107	61	37	29	28	*56	5.0	3.2	1.3	13	5.7
10	16	103	61	37	29	28	56	5.0	3.2	1.3	13	6.4
11	16	58	58	37	30	28	53	5.0	3.2	1.3	13	6.4
12	37	52	58	37	30	27	53	5.0	3.2	1.3	13	6.4
13	47	63	58	37	30	25	53	5.0	3.2	25	13	6.4
14	56	54	58	37	30	25	53	5.0	3.2	42	13	6.4
15	62	38	39	37	30	27	56	4.3	3.2	44	14	6.4
16	57	34	20	37	30	30	68	3.7	3.2	44	13	7.2
17	57	58	20	35	30	30	73	3.1	3.2	32	13	6.4
18	57	73	20	33	30	30	73	3.1	20	29	13	6.4
19	57	70	20	29	30	30	75	3.1	41	20	6.2	6.4
20	65	68	20	26	30	30	107	9.1	*48	16	2.8	21
21	70	65	20	17	30	32	*110	11	53	13	2.8	41
22	68	65	20	12	30	34	114	11	55	14	2.8	47
23	65	65	20	12	30	54	114	10	60	13	32	47
24	65	62	20	12	30	66	85	10	65	12	53	50
25	68	62	21	12	30	66	68	17	62	12	57	50
26	56	65	31	26	30	57	41	35	56	12	42	50
27	52	65	37	33	30	51	30	56	24	12	30	47
28	52	62	39	33	30	44	24	65	3.2	8.9	28	47
29	47	53	39	33	-	44	14	65	1.7	32	27	47
30	47	41	39	33	--------	44	10	62	1.5	46	28	22
31	*45	--------	39	*33	--------	44	--------	62	--------	46	28	--------
Total	1,318	1,951	1,103	975	846	1,104	1,735	504.0	708.2	488.5	594.8	752.2
Mean	42.5	65.0	35.6	31.5	30.2	35.6	57.8	16.3	23.6	15.8	19.2	25.1
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956:	Max 173	Min 1.3	Mean 38.8	Cfsm 0.776	In. 10.56
Water year 1956-57:	Max 114	Min 1.3	Mean 33.1	Cfsm 0.662	In. 8.99

* Discharge measurement made on this day.

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 M28 bridge in Ewen.

Drainage area.--About 320 sq mi.

Records available.--April 1942 to September 1957.

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

Average discharge.--15 years, 499 cfs.

Extremes.--Maximum discharge during year, 4,480 cfs Apr. 21 (gage height, 15.72 ft); minimum, 121 cfs Sept. 12 (gage height, 1.24 ft).

1942-57: Maximum discharge, 6,710 cfs Apr. 19, 1952; maximum gage height, 18.86 ft June 25, 1946; minimum discharge observed, 76 cfs Sept. 23, 1948, June 7, Aug. 9, 22, 1949 (gage height, 0.88 ft).

Remarks.--Records good except those for period of ice effect, which are fair. Some diversion from Middle Branch Ontonagon River by Bond Falls Canal (see p. 36). Some regulation at medium and low flows by Cisco Lake (usable capacity, 15,600 acre-ft).

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Rate of change in stage used as a factor Apr. 19-22)

Oct. 1 to Mar. 23		Mar. 24 to Sept. 30			
1.8	181	1.2	117	10.0	1,980
3.0	350	3.0	355	14.0	3,600
5.0	700	6.0	934	16.0	4,630

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	312	193	305	205	350	480	1,100	352	334	244	237	191
2	*314	191	300	205	350	480	1,180	318	355	234	251	340
3	318	186	295	*205	350	460	1,170	275	352	197	282	340
4	322	191	*290	205	350	440	1,010	241	*348	183	289	*301
5	320	197	280	205	350	*410	806	219	332	180	*275	265
6	318	277	265	205	*350	400	618	200	340	176	252	233
7	323	518	255	205	350	390	485	*188	331	197	242	176
8	294	466	240	225	350	380	450	185	330	242	266	161
9	281	415	240	270	360	370	*477	213	337	*254	268	150
10	278	370	250	300	370	370	435	193	337	248	266	135
11	270	342	255	310	375	370	424	180	340	244	261	127
12	273	353	255	305	380	380	403	170	331	255	259	125
13	257	364	250	300	380	390	385	170	324	286	249	140
14	238	348	245	300	380	410	360	165	305	277	249	145
15	210	328	235	295	380	430	400	201	430	283	249	149
16	229	297	225	290	380	450	824	230	464	272	241	151
17	232	300	215	290	380	470	1,540	214	360	269	237	155
18	225	320	205	290	380	490	2,140	219	319	262	240	151
19	215	330	200	290	375	500	2,660	230	346	248	247	143
20	222	340	200	290	370	520	3,760	214	349	248	231	136
21	229	350	200	305	370	560	*4,380	211	338	259	209	156
22	236	350	200	315	370	600	3,270	205	349	205	179	180
23	239	350	195	315	370	640	2,120	197	432	224	187	228
24	234	340	195	315	380	646	1,330	188	411	233	183	308
25	232	340	195	315	400	640	*1,080	230	346	244	193	422
26	242	330	195	320	410	718	899	294	330	249	208	379
27	231	325	200	340	420	789	723	324	314	252	211	331
28	210	320	205	340	450	894	559	337	272	244	205	300
29	201	315	205	340	-	982	478	340	255	266	185	280
30	*199	310	205	345		936	416	343	262	277	184	265
31	200		205	350		1,080		343		284	188	
Total	7,904	9,656	7,205	8,790	10,480	17,075	35,882	7,389	10,273	7,536	7,223	6,563
Mean	255	322	232	284	374	551	1,196	238	342	243	233	219
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 2,900 Min 141 Mean 427 Cfsm - In. -
Water year 1956-57: Max 4,380 Min 125 Mean 373 Cfsm - In. -

Peak discharge (base, 2,000 cfs).--Apr. 21 (9:30 a.m.) 4,480 cfs (15.72 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 17 to Mar. 23.

Ontonagon River near Rockland, Mich.

Location.--Lat 46°43'15", long 89°12'25", in sec. 20, T. 50 N., R. 39 W., in downstream side of left pier of bridge on highway between Rockland and Victoria, 1¾ miles southwest of Rockland and 2.4 miles downstream from confluence of Middle and West Branches.

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

Records available.--June 1942 to September 1957.

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.--15 years, 1,447 cfs.

Extremes.--Maximum discharge during year, 14,300 cfs Apr. 20 (gage height, 16.48 ft); minimum daily, 365 cfs Sept. 14.

1942-57: Maximum discharge, 42,000 cfs Aug. 22, 1942 (gage height, 28.6 ft, from floodmark), from rating curve extended above 14,000 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 powerplant on West Branch 5 miles above station, by Bond Falls Reservoir (see p. 37), and by Gogebic and Cisco Lakes (combined usable capacity, about 65,600 acre-ft).

Revisions (water years).--WSP 1387: 1943, 1946-47.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

5.5	350	8.0	1,960
6.0	540	11.0	5,630
7.0	1,130	16.0	13,400

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	599	518	930	640	740	800	4,500	1,340	726	624	690	410
2	620	502	960	620	710	910	4,800	1,200	686	634	584	688
3	*600	531	1,020	640	740	950	4,300	1,060	810	570	539	1,220
4	590	514	950	640	730	910	3,600	984	*771	556	639	*1,100
5	606	542	970	640	730	890	2,600	817	686	625	712	962
6	573	1,190	950	640	740	890	1,600	902	714	551	*668	794
7	582	1,580	940	610	720	850	1,350	909	764	545	636	388
8	664	1,370	880	*650	680	820	1,200	*894	709	615	688	403
9	646	1,130	800	690	660	800	1,350	943	648	582	672	704
10	592	948	880	740	720	770	*1,250	985	686	*616	607	463
11	524	908	860	740	750	850	1,210	854	764	566	486	414
12	504	1,010	860	700	760	820	1,130	682	706	660	588	390
13	588	1,020	760	700	760	850	967	796	702	710	638	454
14	626	1,030	780	700	750	890	1,010	825	862	690	698	365
15	436	1,040	780	700	730	940	1,270	758	1,080	680	674	636
16	491	833	760	680	700	900	2,970	898	1,020	620	594	496
17	558	800	760	680	740	870	7,520	878	929	640	474	426
18	576	896	700	670	780	1,000	8,360	719	864	650	410	456
19	520	932	700	590	750	1,040	*9,560	748	854	640	571	482
20	603	992	750	600	730	1,050	13,200	932	808	650	532	517
21	566	1,020	760	660	760	1,040	10,400	888	721	960	516	390
22	561	800	720	680	780	1,100	7,980	805	838	850	610	670
23	552	690	720	690	760	1,300	6,080	824	845	726	602	557
24	510	800	740	710	720	1,800	4,610	752	834	659	566	876
25	573	900	660	700	800	1,950	3,780	633	824	638	482	1,280
26	564	940	730	640	800	2,150	3,030	652	775	694	662	1,220
27	582	910	710	660	870	2,450	2,560	922	728	723	520	1,030
28	590	940	670	720	820	2,900	2,100	844	696	584	476	473
29	550	910	680	730	-	3,300	1,830	840	698	690	498	615
30	*520	950	660	*740	--------	3,600	1,620	747	522	756	522	757
31	535	--------	680	740	--------	4,200	--------	798	--------	594	552	--------
Total	17,601	27,146	24,720	20,940	20,930	43,590	117,737	26,829	23,270	20,298	18,106	19,636
Mean	568	905	797	675	748	1,406	3,925	865	776	655	584	655
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 12,000	Min 436	Mean 1,203	Cfsm 0.933	In. 12.70
Water year 1956-57: Max 13,200	Min 365	Mean 1,043	Cfsm 0.809	In. 10.98

Peak discharge (base, 9,000 cfs).--Apr. 20 (2:30 a.m.) 14,300 cfs (16.48 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice from about Nov. 25 to about Apr. 1. No gage-height record Nov. 16, Nov. 22 to Apr. 10, July 12-22; discharge estimated on basis of 2 discharge measurements, weather records, records for nearby stations, and records of discharge at Victoria Dam.

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.--171 sq mi (revised).

Records available.--October 1912 to September 1915, April 1943 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 1,214.40 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 Oct. 1, 1946, chain and staff gages at old timber bridge 20 ft upstream at present datum.

Average discharge.--17 years, 204 cfs.

Extremes.--Maximum discharge during year, 3,670 cfs Apr. 21 (gage height, 10.40 ft); minimum, 8.0 cfs Aug. 22, 23 (gage height, 3.52 ft).

1912-15, 1943-57: Maximum discharge, 3,670 cfs Apr. 30, 1951, Apr. 21, 1957; maximum gage height, that of Apr. 21, 1957; minimum discharge, 4.6 cfs Oct. 8, 1948 (gage height, 3.47 ft).

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

Rating tables, water year 1956-57, 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. 3				Sept. 4-30	
3.9	28	3.5	7.0	5.5	347	4.3	67
4.1	46	3.7	18	7.0	1,020	4.7	133
4.5	104	4.0	43	9.0	2,340	5.0	197
5.0	193	4.5	108	10.4	3,670	5.5	346
		5.0	204			6.0	540
						7.0	1,020

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	34	115	80	47	49	270	444	111	46	16	46
2	50	34	115	78	46	48	347	357	94	43	15	549
3	47	34	115	76	45	47	357	296	87	42	14	1,030
4	*49	34	110	74	44	46	*312	251	83	38	13	948
5	45	34	110	73	43	45	287	219	78	37	12	670
6	45	50	110	72	42	44	253	192	87	31	10	440
7	52	77	105	70	42	43	284	173	106	28	9.5	293
8	62	82	105	69	41	43	264	158	108	26	11	193
9	59	82	105	*67	40	43	212	164	93	23	12	137
10	56	74	105	65	39	43	202	175	79	20	14	104
11	51	71	105	64	*39	*42	190	164	72	19	33	84
12	51	86	*105	63	39	42	175	145	74	36	25	71
13	47	98	100	62	40	45	166	132	67	53	18	80
14	46	102	100	61	41	48	162	130	62	41	16	86
15	41	104	100	60	41	60	170	160	143	37	14	117
16	41	101	98	59	41	80	273	150	190	32	14	186
17	40	98	96	58	39	110	502	145	175	28	12	180
18	39	97	95	57	38	140	*720	135	164	24	11	160
19	37	100	94	57	38	140	1,090	125	149	22	11	130
20	36	105	96	57	38	135	2,060	120	132	22	10	110
21	35	110	98	58	40	135	3,400	115	119	47	9.5	130
22	34	110	98	59	41	140	3,250	115	108	80	8.5	190
23	34	110	96	58	42	155	2,520	115	98	65	14	190
24	31	116	95	56	44	170	2,080	115	87	50	44	250
25	31	119	92	54	47	*185	*1,840	110	80	38	47	360
26	36	118	89	53	*49	190	1,600	170	76	31	37	330
27	38	119	*87	52	50	200	1,210	200	*75	28	26	*290
28	36	118	85	50	50	210	900	*188	66	24	19	228
29	*36	118	84	*49	-	215	716	173	62	23	17	188
30	36	*115	83	48	--------	220	*567	145	54	*20	*15	157
31	34	--------	82	48	--------	240	--------	127	--------	18	15	--------
Total	1,325	2,650	3,073	1,907	1,186	3,353	26,379	5,408	2,979	1,072	542.5	7,927
Mean	42.7	88.3	99.1	61.5	42.4	108	879	174	99.3	34.6	17.5	264
Cfsm	0.250	0.516	0.580	0.360	0.248	0.632	5.14	1.02	0.581	0.202	0.102	1.54
In.	0.29	0.58	0.67	0.42	0.26	0.73	5.74	1.18	0.65	0.23	0.12	1.72

Calendar year 1956:	Max 1,140	Min	28	Mean	182	Cfsm	1.06	In.	14.52
Water year 1956-57:	Max 3,400	Min	8.5	Mean	158	Cfsm	0.924	In.	12.59

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 17-20, 22, 23, Nov. 30 to Mar. 31. No gage-height record May 14-27, Sept. 17-26; discharge estimated on basis of weather records, recorded range in stage, and records for nearby stations.

Sturgeon River near Alston, Mich.

Location.--Lat 46°44', long 88°40', in SE¼ sec. 15, T. 50 N., R. 35 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 1957.

Gage.--Water-stage recorder. Datum of gage is 670.3 ft above mean tide at New York City (levels by Corps of Engineers).

Average discharge.--10 years, 410 cfs.

Extremes.--Maximum discharge during year, 4,750 cfs Apr. 22 (gage height, 50.57 ft); minimum daily, 13 cfs July 4.

1947-57: Maximum discharge, 5,000 cfs Apr. 29, 1951 (gage height, 51.12 ft); minimum, 7.9 cfs Oct. 24, 1948.

Remarks.--Records good. Flow regulated by powerplant at station.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	256	164	203	140	161	178	553	740	246	257	111	96
2	282	157	228	263	159	97	557	638	242	258	110	251
3	281	166	348	232	116	84	557	545	363	217	109	990
4	230	124	297	217	155	298	557	530	213	13	111	1,430
5	220	160	305	230	152	205	561	520	255	297	113	828
6	146	248	299	188	155	178	561	520	251	180	108	678
7	146	309	306	198	134	176	561	510	251	210	109	560
8	204	316	292	192	141	194	557	424	167	252	111	545
9	180	323	205	193	83	117	561	369	167	172	111	530
10	198	203	298	292	76	85	561	346	296	136	110	253
11	178	122	374	186	156	271	561	282	262	137	110	250
12	178	233	304	191	181	295	418	247	257	146	111	104
13	137	227	257	180	173	293	336	413	261	106	111	94
14	107	311	201	190	149	312	281	366	218	142	109	249
15	160	237	237	192	135	313	295	178	209	117	112	223
16	161	313	182	184	82	189	306	212	139	115	112	418
17	166	311	263	191	82	110	693	339	262	109	113	417
18	163	208	267	187	178	310	*1,200	345	*275	102	107	298
19	168	292	236	189	174	314	1,700	191	252	104	111	297
20	164	291	239	141	181	315	3,320	350	252	107	113	292
21	108	320	242	177	146	310	4,010	423	261	108	113	312
22	164	264	214	186	148	281	4,590	427	157	112	110	168
23	174	269	180	189	106	304	3,720	429	172	113	113	252
24	165	222	246	190	102	102	*2,880	338	265	112	71	324
25	164	164	190	188	236	360	2,380	242	253	111	47	*408
26	163	300	239	187	238	*402	2,200	167	246	112	104	530
27	157	305	252	136	*185	550	1,680	*335	252	107	104	530
28	106	300	*247	183	177	553	1,260	339	257	103	102	530
29	*153	*310	214	191	-	550	*1,100	352	171	109	*99	525
30	157	249	184	*196		553	873	166	171	108	102	520
31	154		269	162		553		295		*111	100	
Total	5,390	7,418	7,818	5,961	4,161	8,852	39,389	11,578	7,043	4,383	3,277	12,902
Mean	174	247	252	192	149	286	1,313	373	235	141	106	430
Cfsm	0.503	0.714	0.728	0.555	0.431	0.827	3.79	1.08	0.679	0.408	0.306	1.24
In.	0.58	0.80	0.84	0.64	0.45	0.95	4.23	1.24	0.76	0.47	0.35	1.38

Calendar year 1956: Max	1,850	Min	106	Mean	367	Cfsm	1.06	In.	14.45
Water year 1956-57: Max	4,590	Min	13	Mean	324	Cfsm	0.936	In.	12.69

* 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.--165 sq mi (revised).

Records available.--October 1942 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Wire-weight gage and crest-stage indicator; gage read twice daily. Datum of gage is 617.88 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--15 years, 222 cfs.

Extremes.--Maximum discharge during year, 4,030 cfs Apr. 21 (gage height, 13.01 ft); minimum, 70 cfs Aug. 3 (gage height, 2.88 ft).

1942-57: Maximum discharge, 4,540 cfs Apr. 19, 1952 (gage height, 13.52 ft); minimum observed, 68 cfs Nov. 18, 1947 (discharge measurement); minimum gage height, 2.88 ft Aug. 3, 1957.

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

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 19		Apr. 20 to Aug. 23				Aug. 24 to Sept. 30	
3.3	91	2.9	72	7.0	910	2.9	77
4.0	196	3.4	139	10.0	2,090	3.5	158
5.5	475	5.0	400	12.5	3,670		
8.5	1,290						

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95	101	180	130	110	130	452	304	118	96	74	142
2	104	98	180	130	110	130	592	263	106	91	76	148
3	102	98	175	130	110	130	492	234	109	91	72	144
4	99	97	170	130	110	130	*438	215	105	94	78	124
5	95	98	170	130	110	130	354	197	104	99	77	101
6	99	183	*165	125	110	130	308	188	118	91	74	93
7	112	254	160	125	110	130	254	178	124	91	86	88
8	115	204	160	120	110	130	214	170	112	89	86	86
9	105	182	160	120	110	130	233	164	105	84	84	86
10	101	156	160	120	110	130	215	154	104	84	82	84
11	102	145	160	120	110	130	207	145	104	85	79	85
12	101	182	160	120	110	130	193	145	102	86	74	84
13	101	182	160	120	110	135	188	133	99	92	77	94
14	101	169	155	115	110	140	183	134	100	88	80	94
15	98	162	155	115	110	145	230	160	114	84	85	93
16	101	150	155	115	110	150	450	150	106	83	79	101
17	99	150	150	115	110	155	912	139	*112	84	78	103
18	98	145	150	115	115	155	*1,130	138	151	83	78	96
19	97	145	145	115	120	160	1,260	132	132	84	74	96
20	98	145	140	115	120	165	2,880	124	108	84	74	96
21	98	145	140	115	120	170	3,500	121	109	92	77	103
22	97	150	140	115	120	175	*2,460	124	148	91	76	111
23	97	155	140	110	120	185	2,040	124	176	83	88	124
24	95	165	135	110	120	190	1,760	116	183	79	103	127
25	98	170	135	110	120	200	1,680	112	157	80	88	128
26	99	175	135	110	*125	*210	1,130	165	145	82	82	*110
27	104	180	135	110	125	230	745	*189	132	82	82	100
28	101	180	*135	110	130	250	545	180	124	82	82	96
29	*101	180	135	*110	-	275	*410	154	112	77	*84	95
30	99	180	130	110	-------	330	350	138	101	*77	82	92
31	101	-------	130	110	-------	423	-------	126	-------	77	84	-------
Total	3,113	4,726	4,700	3,645	3,205	5,403	25,805	5,016	3,620	2,665	2,495	3,124
Mean	100	158	152	118	114	174	860	162	121	86.0	80.5	104
Cfsm	0.606	0.958	0.921	0.715	0.691	1.05	5.21	0.982	0.733	0.521	0.488	0.630
In.	0.70	1.07	1.06	0.82	0.72	1.21	5.81	1.13	0.82	0.60	0.56	0.70

Calendar year 1956:	Max 1,200	Min 83	Mean	191	Cfsm	1.16	In.	15.77
Water year 1956-57:	Max 3,500	Min 72	Mean	185	Cfsm	1.12	In.	15.20

Peak discharge (base, 1,300 cfs).--Apr. 21 (9 a.m.) 4,030 cfs (13.01 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 17-21, Nov. 23 to Mar. 29.

Sturgeon River near Arnheim, Mich.

Location.--Lat 46°56', long 88°33', in SE¼ sec. 1, T. 52 N., R. 34 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.--703 sq mi (revised).

Records available.--October 1942 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Staff gage read once daily. Datum of gage is 605.98 ft above mean tide at New York City (Corps of Engineers benchmark).

Average discharge.--15 years, 820 cfs.

Extremes.--Maximum discharge during year, 8,900 cfs Apr. 22 (gage height, 14.00 ft); minimum, 224 cfs Aug. 30 (gage height, 0.98 ft).

1942-57: Maximum discharge, 15,500 cfs Apr. 20, 1952 (gage height, 14.57 ft, from graph based on gage readings); minimum, 200 cfs Sept. 14, 1948; minimum gage height, that of Aug. 30, 1957.

Remarks.--Records good.

Revisions (water years).--WSP 1387: 1943-45(M), 1950-52.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-3; rate of change in stage used as a factor Apr. 18 to May 1)

Oct. 1 to Jan. 6, Apr. 1 to Sept. 30				Jan. 7 to Mar. 31	
0.9	207	13.0	5,330	1.5	298
5.0	1,330	13.5	6,200	5.0	1,330
9.0	3,060	14.0	8,900		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	344	311	542	b460	b350	392	1,350	1,690	488	388	237	268
2	356	321	515	b460	353	387	1,520	1,560	455	403	235	311
3	388	311	531	b460	347	359	1,580	1,330	445	398	232	304
4	385	311	574	b460	347	364	1,550	1,170	488	403	228	601
5	380	316	553	b460	331	331	1,450	1,060	466	351	230	969
6	377	326	590	b450	325	364	1,350	972	461	331	230	972
7	372	434	590	437	331	364	1,230	916	466	351	232	899
8	359	534	558	420	342	359	1,140	905	461	336	237	798
9	359	553	499	403	342	359	1,080	838	419	331	232	737
10	349	563	461	392	325	353	1,050	782	393	331	237	682
11	354	515	450	b380	298	309	1,010	704	408	311	237	580
12	346	466	547	b370	298	347	978	639	429	307	232	515
13	336	477	547	b370	b315	387	910	607	424	297	235	434
14	321	482	547	b370	b320	420	843	623	429	297	232	356
15	314	520	520	381	b320	443	810	666	424	287	241	356
16	295	542	515	387	b320	487	894	607	414	278	241	372
17	304	515	488	387	b310	465	1,300	547	*382	268	237	455
18	316	b500	488	387	298	431	2,330	536	429	264	237	515
19	321	b480	482	381	309	415	3,130	563	461	255	232	482
20	316	b470	493	381	b310	471	4,800	531	461	250	228	472
21	324	b480	493	375	b310	504	6,270	520	461	252	228	466
22	314	b490	488	364	b310	527	8,480	580	477	259	232	499
23	302	477	488	370	b310	541	6,790	623	482	259	246	461
24	311	461	477	b365	b310	b580	*5,610	612	482	255	252	445
25	326	482	488	364	309	*610	5,080	580	499	252	255	482
26	331	477	455	364	*325	646	4,540	563	493	250	228	*526
27	326	488	*466	364	*359	748	4,000	531	482	246	226	601
28	331	542	488	364	381	883	3,350	*553	472	250	228	634
29	*316	*542	482	*353	-	1,030	2,680	585	466	241	230	650
30	307	547	455	b355	--------	1,100	*2,130	569	424	*237	*232	661
31	307	--------	461	b350	--------	1,240	--------	520	--------	237	228	--------
Total	10,387	13,933	15,731	12,184	9,105	16,216	79,235	23,482	13,541	9,175	7,267	16,503
Mean	335	464	507	393	325	523	2,641	757	451	296	234	550
Cfsm	0.477	0.660	0.721	0.559	0.462	0.744	3.76	1.08	0.642	0.421	0.333	0.782
In.	0.55	0.74	0.83	0.64	0.48	0.86	4.20	1.24	0.72	0.49	0.38	0.87

Calendar year 1956:	Max	3,540	Min	295	Mean	712	Cfsm	1.01	In.	13.79
Water year 1956-57:	Max	8,480	Min	226	Mean	621	Cfsm	0.883	In.	12.00

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

Tahquamenon River near Tahquamenon Paradise, Mich.

Location.--Lat 46°34'30", long 85°16'10", in NE¼ sec. 11, T. 48 N., R. 8 W., on left bank 0.7 mile upstream from Tahquamenon (Big) Falls, 11.5 miles west of Tahquamenon Paradise, and 19 miles northeast of Newberry.

Drainage area.--790 sq mi.

Records available.--August 1953 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 697 ft (from river-profile map).

Extremes.--Maximum discharge during year, 5,740 cfs Apr. 26 (gage height, 9.43 ft); minimum, 201 cfs Aug. 14 (gage height, 3.07 ft).

1953-57: Maximum discharge, that of Apr. 26, 1957; minimum, 157 cfs July 26, 1955 (gage height, 2.88 ft).

Remarks.--Records excellent except those for periods of no gage-height record, which are good.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.1	210	6.0	1,700
4.0	522	8.0	3,760
5.0	1,030	9.5	5,850

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	442	318	780	445	360	434	1,500	4,820	1,420	682	431	328
2	423	318	750	440	355	442	1,650	*4,520	1,380	710	474	334
3	438	318	730	435	355	446	1,780	4,220	1,300	988	446	372
4	415	318	710	430	355	450	1,860	3,930	1,170	1,250	415	478
5	423	321	690	430	350	450	1,870	3,650	1,070	1,590	375	544
6	400	*328	670	430	350	450	1,780	3,340	958	1,840	331	544
7	386	341	650	425	350	442	1,790	3,040	877	2,040	308	510
8	386	358	640	420	345	438	1,780	2,730	816	2,110	270	486
9	379	379	620	420	345	431	1,730	2,450	710	2,050	255	450
10	375	393	600	415	340	415	1,660	2,220	642	1,950	243	415
11	368	397	583	410	335	408	*1,610	1,990	583	1,780	231	390
12	361	423	560	410	335	415	1,530	1,750	619	1,600	225	386
13	358	502	540	405	335	415	1,430	1,540	646	1,400	228	379
14	348	539	530	400	*335	*423	1,330	1,350	650	1,200	*213	379
15	341	619	514	*393	335	482	1,250	1,520	660	1,030	249	423
16	*341	855	510	393	335	522	1,210	1,920	642	838	292	526
17	331	1,000	500	393	335	548	1,210	2,100	619	*678	328	*614
18	318	1,110	*498	390	330	574	1,310	2,180	*570	535	328	628
19	321	1,200	490	382	330	606	1,580	2,150	502	434	312	601
20	315	1,260	478	375	330	624	2,520	2,080	466	375	289	574
21	308	1,280	474	372	330	650	4,000	1,990	434	337	280	565
22	308	1,240	470	375	330	682	*4,880	1,880	390	318	273	570
23	289	1,200	470	380	335	740	5,240	*1,710	351	308	273	570
24	302	1,150	466	385	345	811	*5,550	1,590	321	302	334	574
25	305	1,050	462	390	360	882	5,720	1,440	321	296	427	574
26	299	1,000	458	385	390	946	5,730	1,390	351	286	454	574
27	302	940	454	375	412	1,020	5,640	1,440	386	276	454	565
28	318	900	450	370	427	1,100	5,540	1,530	415	264	431	548
29	321	860	450	370	-	1,180	5,320	1,550	526	264	393	526
30	328	820	450	365	--------	1,280	5,120	1,540	637	302	368	490
31	315	--------	450	360	--------	1,400	--------	1,510	--------	365	344	--------
Total	10,864	21,737	17,097	12,368	9,769	20,106	85,120	71,070	20,432	28,398	10,274	14,917
Mean	350	725	552	399	349	649	2,837	2,293	681	916	331	497
Cfsm	0.443	0.918	0.699	0.505	0.442	0.822	3.59	2.90	0.862	1.16	0.419	0.629
In.	0.51	1.02	0.81	0.58	0.46	0.95	4.00	3.34	0.96	1.34	0.48	0.70

Calendar year 1956:	Max 3,340	Min 234	Mean 753	Cfsm 0.953	In. 12.96
Water year 1956-57:	Max 5,730	Min 213	Mean 883	Cfsm 1.12	In. 15.15

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice from about Jan. 25 to Feb. 25. No gage-height record Nov. 23 to Dec. 10, Dec. 12-14, 16, 17, Dec. 28 to Jan. 14, Jan. 23 to Feb. 13; discharge estimated on basis of weather records and records for nearby stations.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 629.7 ft above mean sea level, datum of 1929.

Average discharge.--6 years, 25.6 cfs.

Extremes.--Maximum discharge during year, 690 cfs Apr. 20 (gage height, 7.95 ft), from rating curve extended above 400 cfs by logarithmic plotting; minimum, 7.0 cfs Mar. 10; minimum gage height, 2.22 ft Feb. 15, Mar. 10.

1951-57: Maximum discharge, that of Apr. 20, 1957; minimum, 4.9 cfs Mar. 11, 1956 (gage height, 2.10 ft).

Remarks.--Records good. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57, 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			
2.2	6.5	4.0	93	2.2	7.3	5.0	200
2.4	12.4	5.0	171	2.4	13.6	6.0	324
3.0	37			3.0	41	7.0	500
				4.0	107		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	8.9	21	15	11	12	66	57	40	22	13	12
2	12	8.9	21	15	11	11	101	*48	34	20	14	16
3	11	9.2	21	14	11	11	93	42	31	40	13	17
4	11	8.9	20	14	11	10	64	38	28	61	12	16
5	10	8.9	20	14	11	10	50	34	26	135	12	14
6	10	*9.5	22	14	10	10	45	32	26	88	11	13
7	11	10	21	14	10	9.8	42	30	27	60	11	12
8	10	10	20	14	10	9.8	38	30	24	46	11	12
9	10	9.8	19	13	10	9.5	35	48	22	39	11	11
10	10	9.8	18	13	10	9.2	31	39	21	34	10	10
11	9.8	14	b17	b12	10	9.8	*30	34	26	30	10	12
12	9.8	16	b17	b12	10	12	29	30	28	27	9.8	13
13	9.5	17	b17	b12	10	12	27	28	25	26	10	12
14	9.5	17	17	b12	*9.8	*13	26	38	26	25	*11	11
15	9.5	38	17	*b12	9.8	20	28	71	36	22	14	20
16	*9.5	58	17	b12	9.8	20	33	57	28	*21	13	25
17	9.2	48	18	b12	9.8	19	43	46	26	19	12	*22
18	9.2	42	*18	b12	9.8	20	79	40	*22	17	11	20
19	8.9	39	17	12	9.8	19	117	36	21	16	11	19
20	9.2	36	17	12	9.8	19	497	32	19	15	11	23
21	9.2	38	17	12	9.5	19	*374	30	20	16	11	22
22	9.2	36	16	13	9.8	21	*263	31	18	16	10	25
23	8.9	31	16	13	9.8	25	197	*28	17	14	14	25
24	8.9	28	16	13	10	27	*172	28	16	13	24	23
25	8.9	27	16	12	12	28	163	26	19	13	20	24
26	9.2	26	16	12	13	30	151	72	22	13	17	21
27	9.2	24	16	b12	13	33	124	72	24	12	15	19
28	9.2	23	16	12	12	36	97	56	21	12	14	18
29	8.9	22	15	12	-	40	79	52	36	12	13	16
30	8.9	22	15	11		44	67	50	27	12	13	16
31	8.9		15	11		48		42		12	12	
Total	299.5	695.9	549	393	292.7	617.1	3,161	1,297	756	908	393.8	519
Mean	9.66	23.2	17.7	12.7	10.5	19.9	105	41.8	25.2	29.3	12.7	17.3
Cfsm	0.345	0.829	0.632	0.454	0.375	0.711	3.75	1.49	0.900	1.05	0.454	0.618
In.	0.40	0.92	0.73	0.52	0.39	0.82	4.18	1.72	1.00	1.21	0.52	0.69

Calendar year 1956: Max 210 Min 7.0 Mean 20.5 Cfsm 0.732 In. 9.97
Water year 1956-57: Max 497 Min 8.9 Mean 27.1 Cfsm 0.968 In. 13.10

Peak discharge (base, 120 cfs).--Apr. 2 (7:30 p.m.) 154 cfs (4.81 ft); Apr. 20 (1 p.m.) 690 cfs (7.95 ft); July 5 (5 a.m.) 158 cfs (4.58 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

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 600 ft upstream from bridge on State Highway 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 1957.

Gage.--Water-stage recorder. Datum of gage is 662.40 ft above mean sea level (levels by Michigan Department of Conservation). Prior to Dec. 29, 1938, staff gage at site 600 ft downstream at different datum.

Average discharge.--19 years, 436 cfs.

Extremes.--Maximum discharge during year, 1,740 cfs Apr. 22 (gage height, 6.94 ft); minimum, 165 cfs Aug. 8, 13, 14 (gage height, 0.90 ft).

1938-57: Maximum discharge, 2,130 cfs Apr. 1, 1938 (gage height, 8.50 ft, from graph based on gage readings, site and datum then in use); minimum, 135 cfs July 25, 26, 1955 (gage height, 0.77 ft).

Remarks.--Records excellent except those for periods of ice effect, which are fair. Since July 1948, slight regulation during summer low flow by dam on outlet of Manistique Lake.

Rating tables, water year 1956-57, 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	
1.6	276	0.9	165
4.0	888	2.0	363
7.0	1,760	7.0	1,760

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	362	304	400	340	285	305	748	907	718	257	180	196
2	381	300	390	335	285	305	772	848	669	240	177	212
3	406	300	380	330	280	305	750	788	615	259	176	255
4	401	298	375	325	280	305	729	726	579	326	172	303
5	386	296	370	320	280	305	664	677	558	374	171	320
6	372	*298	360	320	280	305	621	642	545	374	170	320
7	357	300	360	315	285	305	589	618	566	368	166	307
8	357	296	355	310	285	305	623	605	566	348	166	280
9	350	296	350	310	285	305	632	626	540	295	168	245
10	350	296	350	305	290	310	582	632	514	262	170	226
11	346	296	350	300	290	320	556	618	504	250	171	217
12	341	311	350	300	285	330	*527	592	532	242	168	217
13	337	335	350	295	285	340	493	574	535	240	165	220
14	335	339	350	290	285	350	467	574	517	236	168	215
15	332	364	345	290	*285	*360	470	899	509	231	*202	236
16	330	436	340	*290	285	365	506	1,010	501	*218	236	*293
17	*326	470	335	290	280	369	566	918	504	212	242	322
18	324	472	330	285	280	365	629	883	411	204	223	322
19	321	475	*330	285	280	357	750	856	*284	199	207	303
20	317	480	335	285	280	357	1,110	802	269	198	196	290
21	315	472	345	290	280	364	*1,440	745	259	204	190	293
22	313	416	350	290	280	381	*1,720	*699	259	214	185	320
23	306	357	350	295	280	394	1,620	664	248	220	190	324
24	306	465	355	295	285	418	1,360	634	231	212	245	328
25	311	475	350	295	290	431	1,210	608	238	202	280	337
26	309	470	350	290	300	452	1,150	658	248	201	278	326
27	304	455	345	290	305	488	1,110	772	252	199	255	328
28	309	435	346	290	305	537	1,060	791	248	199	230	365
29	309	420	345	290	-	613	1,010	791	257	194	217	356
30	306	410	345	290	-------	680	958	812	264	190	209	341
31	304	-----	345	285	-------	723	-------	766	-------	185	202	-------
Total	10,423	11,337	10,931	9,320	7,995	12,049	25,422	22,735	12,940	7,553	6,175	8,617
Mean	336	378	353	301	286	389	847	733	431	244	199	287
Cfsm	0.985	1.11	1.04	0.883	0.839	1.14	2.48	2.15	1.26	0.716	0.584	0.842
In.	1.14	1.24	1.20	1.02	0.87	1.31	2.77	2.48	1.41	0.83	0.67	0.94

Calendar year 1956: Max 1,020 Min 175 Mean 354 Cfsm 1.04 In. 14.16
Water year 1956-57: Max 1,720 Min 165 Mean 399 Cfsm 1.17 In. 15.88

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 25, Nov. 27 to Dec. 23, Dec. 25-27, Dec. 29 to Mar. 16, Mar. 18.

Manistique River near Blaney, Mich.

Location.--Lat 46°05'05", long 86°03'35", in SE¼ sec. 28, 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 1957.

Gage.--Water-stage recorder. Datum of gage is 612.55 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to July 24, 1939, chain gage on downstream side of bridge 40 ft upstream at same datum.

Average discharge.--19 years, 811 cfs.

Extremes.--Maximum discharge during year, 3,690 cfs Apr. 24 (gage height, 17.01 ft); minimum daily, 205 cfs Aug. 13.

1938-57: Maximum discharge, 9,300 cfs Apr. 1, 1938 (gage height, 19.42 ft, from graph based on gage readings), from rating curve extended above 6,100 cfs by logarithmic plotting; minimum, 182 cfs July 26, 1955.

Remarks.--Records good except those for period of ice effect, which are fair. Since July 1948, slight regulation during summer low flow by dam on outlet of Manistique Lake.

Revisions (water years).--WSP 874: 1938. WSP 1387: 1943-44(M), 1945, 1952(M).

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 24		Apr. 25 to Sept. 30	
6.9	400	5.8	204
13.0	1,880	7.0	405
16.0	3,000	12.0	1,580
17.0	3,680	15.0	2,540
		17.0	3,680

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	579	417	630	520	440	465	2,230	1,890	1,300	428	240	248
2	601	413	620	520	440	460	2,240	1,720	1,190	407	234	257
3	638	408	600	510	440	455	2,270	1,560	1,110	397	230	292
4	649	406	590	510	440	455	2,400	1,420	1,030	438	225	384
5	626	*402	580	500	435	455	2,320	1,300	962	558	220	432
6	610	404	570	500	435	455	2,170	1,200	929	568	220	438
7	599	408	570	490	430	455	2,080	1,120	948	543	215	422
8	585	413	560	485	430	455	2,080	1,060	938	522	215	399
9	574	408	550	480	430	455	2,020	1,080	902	486	215	363
10	561	406	550	470	430	460	*1,900	1,090	865	428	215	326
11	546	415	540	465	430	465	1,790	1,050	880	399	215	308
12	530	425	540	460	430	465	1,680	998	890	384	210	300
13	521	448	530	455	430	*470	1,540	953	838	382	*205	308
14	513	471	530	450	425	480	1,420	936	801	373	207	304
15	502	513	530	445	*425	500	1,350	1,330	789	*360	220	320
16	495	663	520	*440	425	520	1,300	1,900	766	342	264	*397
17	*471	762	520	440	420	530	1,320	1,990	743	320	288	432
18	461	773	520	440	420	530	1,400	1,860	716	305	285	440
19	450	766	520	440	415	540	1,550	1,730	*612	288	260	428
20	444	760	520	445	415	550	2,110	1,600	539	281	244	411
21	438	766	530	450	415	570	2,960	1,450	520	317	242	405
22	434	737	530	450	415	600	3,380	1,370	494	331	231	440
23	432	739	540	455	420	680	*3,560	*1,290	472	320	234	460
24	419	760	540	455	425	790	3,660	1,190	446	305	300	460
25	423	770	550	455	435	910	3,450	1,100	440	295	349	480
26	427	750	550	450	450	1,050	*3,110	1,160	452	290	360	498
27	427	710	540	445	460	1,250	2,760	1,330	448	285	340	500
28	421	680	540	445	465	1,500	2,500	1,380	430	280	308	508
29	425	660	540	440	-	1,700	2,260	1,340	436	275	281	522
30	423	640	540	440	--------	1,900	2,070	1,380	438	265	267	508
31	419	--------	530	440	--------	2,100	--------	1,380	--------	250	257	--------
Total	15,643	17,293	17,020	14,390	12,070	22,670	66,880	42,157	22,324	11,422	7,796	11,990
Mean	505	576	549	464	431	731	2,229	1,360	744	368	251	400
Cfsm	0.717	0.818	0.780	0.659	0.612	1.04	3.17	1.93	1.06	0.523	0.357	0.568
In.	0.83	0.91	0.90	0.76	0.64	1.20	3.54	2.22	1.18	0.60	0.41	0.63

Calendar year 1956: Max 3,240 Min 278 Mean 652 Cfsm 0.926 In. 12.61
Water year 1956-57: Max 3,660 Min 205 Mean 717 Cfsm 1.02 In. 13.82

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 24 to Mar. 31. No gage-height record July 23 to Aug. 1, Aug. 3-12; discharge estimated on basis of weather records, recorded range in stage, 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 1957.

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.--19 years, 1,328 cfs.

Extremes.--Maximum discharge during year, 7,350 cfs Apr. 24 (gage height, 10.63 ft); minimum, 331 cfs Aug. 13 (gage height, 1.44 ft).

1938-57: Maximum discharge, 13,600 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 period of ice effect, which are fair. Since July 1948, slight regulation during summer low flow by dam on outlet of Manistique Lake.

Revisions (water years).--WSP 1387: 1938-39, 1940-42(M), 1943, 1945.

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 24				Apr. 25 to Sept. 30			
2.2	586	9.0	4,520	1.4	319	8.0	3,600
4.0	1,260	10.0	5,890	3.0	833	10.0	5,890
7.0	2,900	11.0	8,430	5.0	1,710	11.0	8,430

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	820	628	1,030	860	660	720	4,000	3,980	2,120	716	421	409
2	828	621	1,000	840	650	710	a4,100	3,560	1,940	684	403	a410
3	860	618	980	820	650	700	a4,150	3,170	1,780	665	394	a460
4	884	615	960	800	650	700	a4,100	2,790	1,660	678	388	a560
5	860	*608	940	790	640	680	a3,900	2,480	1,540	796	a375	a660
6	831	608	920	780	640	680	a3,600	2,240	1,460	859	a370	a710
7	824	612	910	770	630	680	3,310	2,030	1,460	829	a365	a700
8	810	625	900	760	630	680	3,220	1,870	1,460	796	a360	a650
9	802	628	900	740	620	680	3,150	1,840	1,420	764	358	616
10	799	621	890	730	610	670	*3,060	1,840	1,350	694	358	a560
11	792	632	890	720	610	670	a2,850	1,800	1,300	652	352	a510
12	778	649	880	700	610	680	a2,650	1,740	1,290	639	343	a500
13	761	666	880	690	*600	*680	a2,500	1,630	1,280	636	*331	a500
14	747	703	870	*680	600	710	2,340	1,590	1,250	626	a340	a500
15	734	764	870	670	600	740	a2,200	1,970	1,220	*600	a365	528
16	720	908	870	670	600	770	a2,100	2,820	1,180	578	388	*588
17	710	1,090	*860	660	600	790	a2,200	3,300	*1,140	556	436	658
18	*700	1,150	860	660	600	800	a2,300	3,330	1,100	531	451	688
19	683	1,170	860	660	600	820	a2,600	3,200	1,030	503	430	688
20	676	1,170	870	670	600	830	a3,400	2,940	882	484	403	668
21	666	1,200	880	690	600	860	4,350	2,640	844	497	a385	655
22	659	1,180	890	700	600	940	a6,000	2,410	818	578	a370	681
23	652	1,120	900	700	610	1,100	a7,000	2,230	789	575	a370	726
24	638	1,220	910	700	630	1,200	7,270	*2,050	764	546	a460	744
25	628	1,250	910	700	660	1,400	*7,110	1,880	740	519	528	768
26	638	1,230	910	690	680	1,700	6,570	1,870	754	494	a560	a780
27	645	1,160	910	680	700	2,000	5,930	2,100	758	481	a540	a780
28	642	1,120	910	680	720	2,300	5,500	2,220	740	469	a500	a790
29	635	1,080	910	670	-	2,700	a5,000	2,230	733	466	a460	796
30	632	1,050	900	670	-------	3,200	a4,500	2,210	733	466	a435	786
31	632	-----	880	670	-------	3,700	-------	2,210	-------	442	a420	-------
Total	22,686	26,696	28,050	22,220	17,600	35,490	120,960	74,170	35,535	18,819	12,659	19,069
Mean	732	890	905	717	629	1,145	4,032	2,393	1,184	607	408	636
Cfsm	0.665	0.809	0.823	0.652	0.572	1.04	3.67	2.18	1.08	0.552	0.371	0.578
In.	0.77	0.90	0.95	0.75	0.60	1.20	4.10	2.51	1.20	0.64	0.43	0.64

Calendar year 1956: Max 6,080 Min 490 Mean 1,088 Cfsm 0.989 In. 13.47
Water year 1956-57: Max 7,270 Min 331 Mean 1,189 Cfsm 1.08 In. 14.69

* 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 nearby stations.

Note.--Stage-discharge relation affected by ice Nov. 23 to Apr. 1.

Low-flow investigation in Indian River basin near Steuben, Mich.

An investigation of the Indian River basin was made on Aug. 20, 1957, for the purpose of determining the base yields of various parts of the basin. The Michigan Department of Conservation who sponsored the investigation, intend to use the data collected in planning watershed and channel improvement work in the basin, one of the main objectives being the improvement of fish habitat for trout. 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 appraise the results of such work later on. This investigation was used in planning future work. Precipitation at Steuben prior to the investigation amounted to 0.22 in. on Aug. 13 and 0.50 in. on Aug. 15; therefore measurements should very closely represent base flow.

The measurements are listed in order proceeding downstream. Drainage areas shown were determined from county and U. S. Forest Service maps showing physical and cultural features but no contours.

Discharge measurements of Indian River and tributaries, near Steuben, Mich., Aug. 20, 1957

Stream	Location	Drainage area in square miles	Discharge (cfs)	Cfs per square mile
Indian River..........	NW¼ sec. 28, T. 45 N., R. 19 W., 1½ miles below unnamed tributary and 13 miles northwest of Steuben.	10.5	13.0	1.24
Do.................	NW¼ sec. 34, T. 45 N., R. 19 W., at Doe Lake Outlet, 11½ miles northwest of Steuben.	17.5	26.0	1.49
Do.................	E½ sec. 13, T. 44 N., R. 19 W., at Federal Highway 13, 1¼ miles below Fish Lake and 7½ miles west of Steuben.	26.8	42.2	1.57
Do.................	NW¼ sec. 29, T. 44 N., R. 18 W., ¾ mile below Straits Lake and 6 miles west of Steuben.	46.0	62.4	1.36
Deer Creek............	SW¼ sec. 22, T. 44 N., R. 18 W., above Indian River, 4½ miles west of Steuben.	8.5	2.80	.329
Indian River..........	SW¼ sec. 22, T. 44 N., R. 18 W., ½ mile below Deer Creek and 4 miles west of Steuben.	60.4	69.8	1.16
Little Indian River...	NE¼ sec. 25, T. 45 N., R. 19 W., 1½ miles below McNeil Lake Outlet and 9½ miles northwest of Steuben.	11.7	3.79	.324
Do.................	NW¼ sec. 4, T. 44 N., R. 18 W., 2½ miles above Grassy Creek and 6 miles northwest of Steuben.	15.8	5.95	.377
Do.................	SE¼ sec. 10, T. 44 N., R. 18 W., ½ mile above Grassy Creek and 4½ miles northwest of Steuben.	16.8	8.59	.511
Do.................	NW¼ sec. 23, T. 44 N., R. 18 W., ½ mile above Indian River and 3 miles west of Steuben.	22.8	9.36	.411
Indian River..........	On line between sec. 25, T. 44 N., R. 18 W., and sec. 30, T. 44 N., R. 17 W., 1 mile below Triangle Lake Outlet and 1½ miles west of Steuben.	90.8	80.4	.885
Camp 83 creek.........	NW¼ sec. 30, T. 44 N., R. 17 W., ¼ mile above Indian River and 1½ miles west of Steuben.	1.3	.39	.300
Indian River..........	NE¼ sec. 13, T. 44 N., R. 17 W., 1½ miles below Camp 83 creek, at Steuben.	93.5	84.3	.902
Delias Run Creek......	SE¼ sec. 20, T. 44 N., R. 17 W., 1 mile above Indian River, at Steuben.	11.6	2.70	.233
Indian River..........	NW¼ sec. 2, T. 43 N., R. 17 W., at U. S. Forest Service campgrounds, 3½ miles southeast of Steuben.	111	104	.937
Do.................	NW¼ sec. 14, T. 43 N., R. 17 W., 2½ miles above Little Murphy Creek and 5 miles southeast of Steuben.	115	110	.957
Little Murphy Creek...	NE¼ sec. 17, T. 43 N., R. 17 W., ¼ mile below Big Murphy Lake and 4½ miles south of Steuben.	6.5	5.31	.817
Do.................	SW¼ sec. 22, T. 43 N., R. 17 W., 1 mile above Indian River and 6 miles southeast of Steuben.	10.3	9.52	.924
Indian River..........	SE¼ sec. 27, T. 43 N., R. 17 W., ½ mile below Little Murphy Creek and 7½ miles southeast of Steuben.	129	121	.938
Big Murphy Creek......	SE¼ sec. 30, T. 43 N., R. 17 W., at Thunder Lake Outlet and 7 miles south of Steuben.	23.8	27.0	1.13
Bear Creek............	N½ sec. 31, T. 43 N., R. 17 W., above Big Murphy Creek, 1 mile below Bear Lake and 7½ miles south of Steuben.	7.7	6.64	.862
Big Murphy Creek......	SW¼ sec. 32, T. 43 N., R. 17 W., 1¼ miles below Bear Creek and 8 miles south of Steuben.	32.6	35.2	1.08
Do.................	NE¼ sec. 4, T. 42 N., R. 17 W., ½ mile below unnamed tributary and 8½ miles south of Steuben.	35.6	38.8	1.09

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 just upstream from highway bridge over outlet of Indian Lake, 2 miles northwest of Manistique.

Drainage area.--302 sq mi.

Records available.--March 1938 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 608.66 ft above mean sea level (levels by Michigan Department of Conservation). Prior to July 9, 1942, chain gage at highway bridge 30 ft downstream at same datum. Since Jan. 18, 1944, auxiliary staff gage on right bank 1½ miles downstream at same datum, read twice daily.

Average discharge.--19 years, 372 cfs.

Extremes.--Maximum daily discharge during year, 691 cfs Apr. 27; maximum gage height, 5.20 ft Apr. 27; minimum daily discharge, 31 cfs Aug. 25; minimum gage height, 3.27 ft Nov. 22 (ice jam at outlet of Indian Lake).

1938-57: 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, 2.22 ft Nov. 17, 1955 (ice jam at outlet of Indian Lake); almost no flow occasionally when ice jams form at lake outlet.

Remarks.--Records good except those below 150 cfs, which are fair. Indian Lake regulated by needles in gate section of concrete dam 1½ miles below gage.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	297	241	385	319	259	229	382	660	534	267	237	145
2	299	241	380	315	261	231	394	636	525	261	236	220
3	297	241	379	315	265	231	401	622	520	264	230	221
4	287	244	372	305	262	235	413	596	540	291	222	361
5	279	*239	369	307	258	234	424	587	550	259	217	354
6	303	244	364	350	252	235	437	577	540	247	218	357
7	289	248	370	393	248	234	439	568	535	241	222	364
8	275	240	370	307	249	230	439	552	530	237	213	392
9	268	239	363	301	252	231	443	552	525	225	221	406
10	270	255	368	295	252	223	*443	541	520	241	221	402
11	275	239	366	300	249	225	453	524	520	223	223	402
12	272	218	355	299	253	222	453	513	510	224	214	396
13	275	233	345	296	*249	291	453	502	505	234	213	392
14	270	225	347	*296	244	288	443	495	500	234	199	381
15	*268	237	341	292	261	*295	445	528	450	237	*192	391
16	263	226	332	290	247	296	438	536	390	241	187	393
17	263	226	*328	284	243	292	441	554	*292	241	85	390
18	262	243	324	287	244	290	445	560	307	*227	86	*386
19	259	230	324	282	240	291	457	560	295	227	87	391
20	256	237	319	276	233	291	503	563	299	230	70	373
21	252	260	314	282	234	289	554	561	304	237	63	382
22	253	357	314	273	233	289	607	*566	296	224	55	372
23	252	318	317	274	233	292	*639	555	287	236	125	388
24	253	343	312	280	229	303	669	554	290	227	71	380
25	251	352	312	275	236	318	674	536	290	236	31	386
26	244	369	319	277	236	321	689	552	292	236	53	377
27	247	371	324	274	242	330	691	555	284	230	95	377
28	243	375	319	268	240	338	679	550	290	241	123	373
29	244	378	320	264	-	348	686	547	283	236	87	373
30	246	383	314	264		361	665	547	282	240	89	369
31	246		324	262		374		536		241	110	
Total	8,258	8,252	10,590	9,102	6,904	8,657	15,299	17,285	12,285	7,435	4,695	10,894
Mean	266	275	342	294	247	279	510	558	410	240	151	363
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956:	Max 633	Min 109	Mean 323	Cfsm 1.07	In. 14.56
Water year 1956-57:	Max 691	Min 31	Mean 328	Cfsm 1.09	In. 14.80

* Discharge measurement made on this day.

Note.--No gage-height record June 2-16; discharge estimated on basis of weather records and records of stage at auxiliary gage.

Middle Branch Escanaba River near Ishpeming, Mich.

Location.--Lat 46°23'40", long 87°45'30", in NW¼SW¼ sec. 12, T. 46 N., R. 28 W., on left bank half a mile downstream from County Highway 581, 6 miles southwest of Ishpeming, and 10 miles east of Republic.

Drainage area.--128 sq mi.

Records available.--June 1954 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 1,389.02 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Extremes.--Maximum discharge during year, 1,440 cfs Apr. 22 (gage height, 9.36 ft); minimum, 12 cfs Aug. 21-23; minimum gage height, 1.17 ft Aug. 22, 23.

1954-57: Maximum discharge, 1,510 cfs Apr. 15, 1955 (gage height, 9.56 ft); minimum, that of Aug. 21-23, 1957; minimum gage height, that of Aug. 22, 23, 1957.

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

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	8.0	2.0	96
1.3	19	6.0	707
1.6	44	9.2	1,390

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	31	64	52	30	32	179	237	76	45	14	43
2	35	31	63	51	29	31	205	200	68	42	14	232
3	36	31	64	50	29	30	226	169	64	45	14	448
4	33	31	64	49	28	31	212	148	60	44	14	605
5	32	32	64	48	27	31	181	134	55	42	15	624
6	32	36	64	47	27	31	165	120	64	37	14	476
7	34	42	63	46	26	31	159	113	100	32	14	235
8	35	47	59	45	26	30	151	106	89	30	15	152
9	35	*46	56	*45	25	30	135	163	74	28	15	117
10	35	46	55	44	25	30	125	186	62	25	15	93
11	34	43	55	43	25	*30	114	144	64	*24	15	79
12	34	47	54	42	*24	30	103	117	*62	27	15	69
13	33	55	54	41	24	30	99	104	53	35	15	65
14	32	54	53	40	24	33	95	106	51	37	15	64
15	34	56	53	40	24	40	103	152	97	32	*17	88
16	*31	60	53	39	24	50	134	188	107	28	17	121
17	30	67	53	38	24	65	208	156	82	24	17	*121
18	30	65	53	37	24	78	320	142	68	21	15	99
19	30	60	54	37	24	80	442	149	62	19	14	82
20	30	58	55	36	24	77	625	*131	53	24	13	71
21	30	58	55	37	25	78	948	114	53	32	12	76
22	30	60	55	37	26	84	1,370	123	54	32	12	110
23	30	60	55	37	27	94	*1,180	124	76	25	18	111
24	29	60	55	36	29	105	944	109	81	21	25	116
25	28	60	56	35	31	110	836	99	69	19	28	176
26	31	59	56	34	33	120	804	110	68	19	22	173
27	32	58	56	33	33	125	*717	110	71	20	19	134
28	33	58	55	32	33	130	551	104	69	17	18	111
29	32	58	55	32	-	135	415	97	58	17	17	95
30	32	63	54	31	--------	141	306	93	51	15	16	81
31	32	--------	53	30	--------	162	--------	88	--------	15	16	--------
Total	996	1,532	1,758	1,244	750	2,104	12,052	4,136	2,061	873	500	5,067
Mean	32.1	51.1	56.7	40.1	26.8	67.9	402	133	68.7	28.2	16.1	169
Cfsm	0.251	0.399	0.443	0.313	0.209	0.530	3.14	1.04	0.537	0.220	0.126	1.32
In.	0.29	0.45	0.51	0.36	0.22	0.61	3.50	1.20	0.60	0.25	0.15	1.47

Calendar year 1956:	Max 656	Min 28	Mean 123	Cfsm 0.961	In. 13.05
Water year 1956-57:	Max 1,370	Min 12	Mean 90.6	Cfsm 0.708	In. 9.61

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23-25, Dec. 12-19, Jan. 1 to Mar. 26.

East Branch Escanaba River at Gwinn, Mich.

Location.--Lat 46°17'10", long 87°26'00", in NE¼ sec. 21, T. 45 N., R. 25 W., on right bank in county park at Gwinn, 1 mile upstream from mouth.

Drainage area.--125 sq mi.

Records available.--October 1954 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 1,079.2 ft above mean sea level, datum of 1929.

Extremes.--Maximum daily discharge during year, 648 cfs Apr. 21; minimum, 23 cfs Aug. 22, 23 (gage height, 6.54 ft).

1954-57: Maximum discharge, 1,030 cfs Apr. 15, 1955 (gage height, 12.01 ft); minimum, that of Aug. 22, 23, 1957.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

6.5	22	8.0	158
6.8	34	9.0	330
7.2	64	11.0	768

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36	32	52	47	31	36	210	166	125	42	25	35
2	36	32	52	46	31	35	214	145	100	40	25	88
3	35	32	52	45	31	35	225	131	90	40	24	130
4	34	32	51	44	31	34	*206	121	76	46	25	178
5	32	32	51	43	31	34	180	108	70	65	25	144
6	32	34	51	42	32	34	165	101	80	49	24	92
7	32	40	*51	42	32	32	154	94	105	41	24	64
8	32	44	51	41	32	32	145	87	95	38	24	52
9	32	*42	50	*41	33	31	127	100	86	36	25	45
10	32	40	50	41	34	30	127	150	72	34	25	40
11	32	38	50	40	34	30	124	130	72	34	25	38
12	32	43	49	39	*35	*30	113	110	*75	36	25	37
13	32	49	49	38	34	32	107	95	71	50	25	39
14	32	48	49	37	34	34	101	100	64	42	25	38
15	31	53	49	36	34	40	112	140	103	37	*28	69
16	*31	57	48	35	35	45	157	180	93	35	30	93
17	31	60	48	35	34	46	227	160	75	32	28	*75
18	31	55	47	35	34	49	312	140	66	31	26	62
19	31	51	48	35	34	53	442	145	61	30	25	54
20	31	50	50	34	33	53	611	*127	54	30	25	48
21	31	51	50	35	32	61	648	118	54	32	24	49
22	32	52	50	35	32	72	600	125	52	35	24	70
23	31	52	51	35	32	85	*520	121	53	33	25	69
24	30	52	52	35	33	100	*440	108	50	30	35	64
25	30	52	50	34	36	110	450	96	51	*29	34	92
26	30	51	50	33	37	120	512	109	53	29	28	87
27	32	51	50	32	36	130	*388	118	63	28	26	72
28	34	51	50	32	36	140	297	108	57	27	25	60
29	34	51	49	32	-	151	234	107	52	27	25	55
30	33	52	49	32	--------	168	194	150	47	27	25	48
31	33	--------	48	31	--------	180	------	140	--------	26	25	--------
Total	997	1,379	1,547	1,162	933	2,062	8,342	3,830	2,165	1,111	804	2,087
Mean	32.2	46.0	49.9	37.5	33.3	66.5	278	124	72.2	35.8	25.9	69.6
Cfsm	0.258	0.368	0.399	0.300	0.266	0.532	2.22	0.992	0.578	0.286	0.207	0.557
In.	0.30	0.41	0.46	0.35	0.28	0.61	2.48	1.14	0.64	0.33	0.24	0.62

Calendar year 1956: Max 549 Min 30 Mean 91.2 Cfsm 0.730 In. 9.95
Water year 1956-57: Max 648 Min 24 Mean 72.4 Cfsm 0.579 In. 7.86

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 17, 18, Nov. 22 to Dec. 19, Jan. 9-11, Mar. 9-12, 15, 23-28. No gage-height record Dec. 1-6, 14, 21, 22, Dec. 26 to Jan. 8, Jan. 12 to Feb. 11, Apr. 22, 23, May 9-19, May 30 to June 11; discharge estimated on basis of weather records 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, half a mile downstream from Bobs' Creek, three-quarters of a mile northeast of Cornell, and 15 miles upstream from mouth.

Drainage area.--870 sq mi.

Records available.--August 1903 to November 1912, January 1913 to November 1915 (gage heights only), October 1950 to September 1957. Monthly discharge only for some periods, published in WSP 1307. Published as "near Escanaba" 1903-15.

Gage.--Water-stage recorder. Datum of gage is 749.26 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). August 1903 to November 1915, chain gage at site 11 miles downstream at different datum.

Average discharge.--16 years (1903-12, 1950-57), 958 cfs.

Extremes.--Maximum discharge during year, 5,780 cfs Apr. 22 (gage height, 3.89 ft); maximum gage height, 5.39 ft Dec. 11 (ice jam); minimum discharge, 108 cfs Aug. 7 (gage height, 1.17 ft).

1903-12, 1950-57: Maximum discharge, 10,000 cfs Apr. 19, 1952; maximum gage height, 5.72 ft Apr. 7, 1956 (ice jam); minimum discharge observed, 90 cfs July 5, 1910 (gage height, 1.5 ft), but may have been less during extended periods of no gage-height record during winter seasons of 1903-12.

Remarks.--Records good except those for period of ice effect, which are fair. Diurnal fluctuation caused by Boney Falls powerplant 8 miles above station, since 1950.

Revisions (water years).--WSP 1387: 1904.

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 17		Apr. 18 to Sept. 30			
1.3	155	1.2	120	2.5	1,720
1.6	374	1.4	230	3.0	2,920
1.9	710	1.7	495	4.0	6,220
2.5	1,700	2.0	850		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	224	290	500	370	210	240	1,150	1,540	994	318	200	224
2	302	287	400	315	200	250	1,350	1,300	512	248	213	365
3	308	292	280	315	190	200	1,500	1,110	434	464	187	547
4	267	232	250	305	185	220	1,400	1,100	622	336	178	1,130
5	260	204	450	280	155	250	1,250	783	570	314	318	1,240
6	284	269	430	310	200	255	1,100	620	434	644	230	1,110
7	178	360	460	230	245	270	1,200	724	560	364	205	970
8	189	*376	520	220	250	250	980	724	578	267	158	628
9	288	328	250	330	240	260	740	708	437	234	158	780
10	260	414	300	340	180	200	900	766	352	322	199	406
11	299	234	370	330	210	180	940	865	540	284	194	476
12	258	298	340	350	225	*210	960	634	410	216	187	360
13	312	305	370	220	260	230	800	581	*428	363	211	367
14	159	316	285	210	265	235	600	734	421	318	261	293
15	197	414	400	210	250	275	*900	1,100	590	250	242	328
16	298	398	270	270	250	260	1,100	1,560	495	359	205	*509
17	*282	530	290	260	250	235	1,300	1,460	437	242	211	833
18	234	278	310	245	200	220	1,930	1,510	482	270	180	602
19	234	350	380	250	205	300	2,300	1,220	455	*278	144	586
20	194	466	*360	210	205	295	3,590	*1,040	438	236	154	610
21	192	500	300	*190	*260	350	5,020	1,040	542	246	187	574
22	*216	350	320	215	265	440	5,160	912	599	268	*205	410
23	*212	280	310	240	270	500	4,800	1,040	586	295	218	480
24	264	430	250	235	220	450	*4,230	844	472	290	163	722
25	260	300	320	250	205	450	3,780	978	508	298	168	884
26	267	250	300	250	190	720	3,570	684	524	254	180	912
27	269	375	350	185	250	700	*3,230	786	478	186	188	936
28	208	375	380	180	290	720	2,800	885	612	237	190	864
29	205	380	370	205	-	900	2,230	932	396	224	230	582
30	276	450	290	230	--------	1,100	1,780	829	458	198	228	472
31	307	--------	235	220	--------	1,250	--------	739	--------	228	418	--------
Total	7,703	10,331	10,640	7,970	6,325	12,415	62,590	29,748	15,364	9,051	6,410	19,200
Mean	248	344	343	257	226	400	2,086	960	512	292	207	640
Cfsm	0.285	0.395	0.394	0.295	0.260	0.460	2.40	1.10	0.589	0.336	0.238	0.736
In.	0.33	0.44	0.45	0.34	0.27	0.53	2.68	1.27	0.66	0.39	0.27	0.82

Calendar year 1956: Max 3,750 Min 159 Mean 664 Cfsm 0.763 In. 10.39
Water year 1956-57: Max 5,160 Min 144 Mean 542 Cfsm 0.623 In. 8.45

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 21 to Apr. 17.

Ford River near Hyde, Mich.

Location.--Lat 45°45'20", long 87°12'05", in SW¼ sec. 19, T. 39 N., R. 23 W., on right bank 40 ft downstream from county highway bridge, 1.4 miles downstream from Tenmile Creek, and 1½ miles north of Hyde.

Drainage area.--450 sq mi.

Records available.--October 1954 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 677.9 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 2,860 cfs Apr. 21 (gage height, 5.58 ft); minimum, 23 cfs Aug. 22, 23 (gage height, 1.39 ft).
1954-57: Maximum discharge, 3,120 cfs Apr. 14-16, 1955; maximum gage height, 5.89 ft Apr. 15, 1955; minimum discharge, that of Aug. 22, 23, 1957.

Remarks.--Records good except those for period of ice effect, which are fair. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 19				Apr. 20 to Sept. 30			
1.5	36	2.8	426	1.4	24	2.5	305
1.8	89	3.5	820	1.6	51	3.0	530
2.2	186	4.0	1,180	2.0	136	4.0	1,220

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	75	145	62	44	52	780	985	421	98	40	53
2	111	75	140	61	44	52	820	824	403	89	42	55
3	103	75	135	60	44	51	810	704	364	85	35	60
4	99	79	130	60	44	50	750	597	324	100	31	73
5	93	77	125	60	44	50	640	514	278	107	28	104
6	93	81	120	60	44	50	560	454	262	126	*28	121
7	91	81	115	60	44	50	570	408	248	118	26	116
8	85	*91	110	59	44	50	600	373	237	107	35	98
9	81	97	110	58	44	50	*580	373	220	91	38	81
10	79	101	105	57	44	50	520	356	196	77	35	69
11	77	107	105	55	44	50	470	332	203	79	34	62
12	75	107	100	53	44	*50	431	317	223	67	34	55
13	75	99	*98	51	44	52	407	301	*203	69	34	48
14	75	99	96	50	44	75	392	340	180	69	32	46
15	*73	127	94	48	44	110	*447	831	186	71	34	75
16	73	155	91	46	44	130	563	1,090	199	65	32	*83
17	73	142	89	45	44	150	658	1,080	237	60	29	139
18	69	140	87	44	44	170	*802	1,030	301	55	29	167
19	69	*180	84	43	44	180	1,040	943	301	*48	28	164
20	67	158	82	42	44	200	*2,440	817	230	44	28	144
21	65	153	80	*43	*43	220	2,750	*704	193	46	28	134
22	65	109	78	44	43	245	2,550	671	199	71	24	134
23	67	83	76	45	43	280	*2,420	621	196	121	45	144
24	65	125	74	46	43	330	2,200	558	177	116	67	164
25	64	150	72	46	45	370	2,000	499	161	98	65	206
26	67	155	70	46	47	400	*1,760	563	150	81	83	266
27	67	155	68	45	49	450	1,590	591	139	67	85	289
28	71	155	66	45	51	500	1,460	546	126	60	77	286
29	75	150	65	45	-	560	1,320	520	118	58	69	259
30	75	150	64	44	--------	640	1,150	483	107	51	58	220
31	75	--------	63	44	--------	710	--------	440	--------	45	55	--------
Total	2,433	3,531	2,937	1,567	1,244	6,377	33,480	18,865	6,782	2,439	1,308	3,915
Mean	78.5	118	94.7	50.5	44.4	206	1,116	609	226	78.7	42.2	130
Cfsm	0.174	0.262	0.210	0.112	0.099	0.458	2.48	1.35	0.502	0.175	0.094	0.289
In.	0.20	0.29	0.24	0.13	0.10	0.53	2.77	1.56	0.56	0.20	0.11	0.32

Calendar year 1956:	Max 2,000	Min 63	Mean 260	Cfsm 0.578	In. 7.84
Water year 1956-57:	Max 2,750	Min 24	Mean 233	Cfsm 0.518	In. 7.01

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 24 to Apr. 11 (no gage-height record Jan. 25 to Feb. 20, Feb. 27 to Mar. 11; discharge estimated on basis of weather records and records for nearby stations).

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 1957.

Gage.--Wire-weight gage and crest-stage indicator; gage read twice daily. Datum of gage is 1,438.78 ft above mean sea level, datum of 1929.

Average discharge.--9 years, 86.0 cfs.

Extremes.--Maximum discharge during year, 212 cfs June 18 (gage height, 5.63 ft); minimum observed, 42 cfs Aug. 7 (gage height, 3.71 ft).

1948-57: Maximum discharge, 1,430 cfs July 2, 1953 (gage height, 10.20 ft); minimum observed, 29 cfs Mar. 13, 1954 (gage height, 3.41 ft).

Remarks.--Records good. Flow regulated by ground water pumped from mines into river above station.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.7	41
4.0	61
5.0	147
6.0	258

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*60	55	64	61	57	54	81	66	60	*58	51	58
2	59	67	66	67	55	53	83	66	62	54	43	57
3	56	60	63	66	55	52	82	64	*60	46	51	*83
4	55	59	*63	*64	*52	b54	85	64	59	53	53	68
5	57	57	64	63	53	55	82	63	58	61	47	61
6	57	96	63	61	50	*53	83	*63	65	60	49	63
7	57	87	63	55	52	53	74	57	63	63	46	56
8	55	75	54	60	53	50	*82	58	62	60	55	56
9	55	67	54	58	54	53	73	58	60	53	57	53
10	54	61	60	63	54	54	70	58	58	57	55	56
11	48	68	62	63	54	55	71	59	61	57	54	53
12	54	69	56	60	51	53	71	62	61	83	50	52
13	58	65	63	b59	50	61	70	58	55	75	47	46
14	55	64	61	b59	50	60	71	62	83	64	51	49
15	55	67	66	60	b51	62	71	79	69	60	46	72
16	56	64	62	b59	51	60	87	71	63	59	53	64
17	55	65	63	b58	b51	60	129	64	65	55	57	57
18	53	67	57	b58	51	59	127	63	188	58	53	46
19	58	67	58	b56	b52	57	*164	61	162	57	53	50
20	58	66	58	51	53	58	195	61	104	66	56	52
21	56	67	59	58	b54	61	188	59	88	63	56	63
22	54	64	65	57	b53	66	151	64	80	58	57	55
23	53	b64	60	57	53	78	132	64	72	55	88	59
24	54	67	61	59	52	70	111	61	67	59	76	82
25	56	65	61	56	59	82	116	64	71	53	62	71
26	58	66	63	b56	56	85	107	71	71	53	57	62
27	58	62	61	b55	51	83	95	63	61	53	53	57
28	58	66	61	55	54	90	79	69	60	58	54	58
29	55	63	63	55	-	91	82	59	62	*51	58	52
30	57	62	63	b54		86	73	58	61	55	55	55
31	*57		63	58		83		58		61	55	
Total	1,731	1,992	1,900	1,821	1,481	1,991	2,985	1,947	2,211	1,818	1,698	1,766
Mean	55.8	66.4	61.3	58.7	52.9	64.2	99.5	62.8	73.7	58.6	54.8	58.9
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 232 Min 48 Mean 74.2 Cfsm - In. -
Water year 1956-57: Max 195 Min 43 Mean 63.9 Cfsm - In. -

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

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 1957.

Gage.--Water-stage recorder. Altitude of gage is 1,210 ft (from topographic map). Prior to Aug. 29, 1944, wire-weight or chain gages at bridge 40 ft downstream at same datum.

Average discharge.--14 years (1914-15, 1944-57), 355 cfs.

Extremes.--Maximum discharge during year, 881 cfs Apr. 21 (gage height, 3.23 ft); maximum gage height, 7.66 ft Dec. 14 (ice jam); minimum discharge, 183 cfs Aug. 7 (gage height, 1.90 ft).

1914-16, 1944-57: Maximum discharge, 4,700 cfs July 2, 1953 (gage height, 6.57 ft); maximum gage height, 7.70 ft Apr. 5, 1954 (ice jam); minimum discharge, 155 cfs Aug. 16, 22, 1949; minimum gage height, 1.86 ft Aug. 27, Sept. 13, 1948.

Remarks.--Records good except those for periods of ice effect, which are fair. Flow not adjusted for ground water pumped from mines into Iron River above station at Caspian, Mich.

Revisions (water years).--WSP 1387: 1914-16.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 7		Apr. 8 to June 18		June 19 to Sept. 30	
1.9	185	2.0	227	1.9	183
2.3	337	2.5	440	2.3	323
3.0	745	3.3	930	3.0	725

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*262	*262	315	230	225	230	410	377	276	230	197	284
2	283	266	310	*230	225	225	400	359	263	*224	194	250
3	274	270	*305	230	225	220	390	341	*263	214	194	*258
4	266	266	300	230	*225	*220	390	318	256	230	191	262
5	257	262	295	230	225	220	380	305	249	269	191	240
6	257	332	290	225	225	220	375	*297	263	243	189	224
7	262	451	285	225	225	220	370	292	271	230	189	217
8	257	403	280	225	225	220	*368	284	256	230	240	208
9	253	347	275	225	225	220	359	288	249	221	243	208
10	253	314	275	220	220	220	346	288	238	211	217	205
11	253	300	275	220	220	225	336	280	259	211	208	203
12	253	309	270	220	220	230	328	276	263	230	203	205
13	257	305	270	220	220	240	318	271	252	302	*197	217
14	257	300	270	220	220	250	314	288	297	269	200	214
15	257	300	265	215	215	260	336	475	495	240	211	314
16	257	305	265	215	215	270	386	460	395	227	221	310
17	257	305	260	215	215	270	490	377	332	217	205	262
18	253	305	260	215	215	265	562	359	450	208	203	237
19	253	305	260	215	215	265	*640	350	660	208	203	227
20	249	305	255	220	215	270	770	328	487	323	200	221
21	253	296	255	230	215	280	874	314	380	254	205	240
22	253	300	250	240	210	300	790	332	328	237	200	269
23	253	310	250	240	210	330	673	314	302	233	254	262
24	253	310	250	240	215	380	654	297	280	214	380	293
25	253	310	245	230	220	420	608	288	269	205	293	351
26	266	320	245	225	230	440	551	314	262	205	247	310
27	270	320	240	225	230	430	505	314	258	205	224	273
28	270	325	240	225	230	*430	460	305	243	205	221	254
29	266	320	235	225	-	420	422	301	240	208	233	247
30	257	320	235	225	-------	420	395	292	233	200	233	*240
31	262	-------	230	225	-------	410	-------	284	-------	*200	233	-------
Total	8,026	9,343	8,255	6,975	6,175	9,020	14,200	9,968	9,269	7,103	6,819	7,505
Mean	259	311	266	225	221	291	473	322	309	229	220	250
Cfsm	0.682	0.818	0.700	0.592	0.582	0.766	1.24	0.847	0.813	0.603	0.579	0.658
In.	0.79	0.91	0.81	0.68	0.61	0.88	1.38	0.98	0.91	0.70	0.67	0.73

Calendar year 1956: Max	1,140	Min	205	Mean	343	Cfsm	0.903	In.	12.30
Water year 1956-57: Max	874	Min	189	Mean	281	Cfsm	0.739	In.	10.05

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 17-19, Nov. 22 to Mar. 28. No gage-height record Mar. 29 to Apr. 7; discharge estimated on basis of weather records, recorded range in stage, and records for nearby stations.

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 1957.

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

Average discharge.--13 years, 577 cfs.

Extremes.--Maximum discharge during year, 4,060 cfs Apr. 22 (gage height, 6.05 ft); minimum, 108 cfs Aug. 1 (gage height, 1.71 ft); minimum daily, 164 cfs Aug. 4.

1944-57: Maximum discharge, 10,700 cfs July 2, 1953 (gage height, 9.70 ft); minimum, 7.7 cfs Sept. 17, 1950 (gage height, 0.89 ft); minimum daily, 81 cfs Nov. 1, 1947.

Remarks.--Records excellent except those for period of no gage-height record, which are fair. Diurnal fluctuation caused by powerplant immediately above station.

Revisions (water years).--WSP 1174: 1947-48(m).

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.9	156	4.0	1,540
2.4	329	6.0	3,980
3.0	662		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*332	303	388	292	272	283	660	854	370	*294	182	212
2	329	279	387	*302	274	285	718	734	342	276	178	331
3	323	279	*400	305	258	284	754	686	*338	266	174	*544
4	310	279	379	b305	*276	265	728	580	316	288	164	523
5	293	279	375	b310	276	270	697	526	303	274	179	448
6	292	346	408	b310	270	*267	720	*478	310	250	171	396
7	300	596	393	b305	264	271	660	458	325	240	188	360
8	298	577	373	b300	267	266	*638	434	336	245	198	324
9	298	480	324	b295	263	254	634	456	310	227	236	288
10	290	436	334	b290	258	272	585	473	304	216	231	262
11	281	418	360	b285	268	256	562	461	297	212	217	240
12	284	418	344	b280	267	262	536	436	296	252	*209	230
13	268	448	322	275	250	284	508	432	290	262	192	230
14	273	437	334	294	265	282	482	436	319	270	197	240
15	274	442	352	275	260	328	498	520	382	253	198	290
16	278	432	342	270	256	360	574	616	433	233	198	320
17	274	395	352	264	247	342	800	542	436	220	204	300
18	274	462	339	267	258	348	1,200	556	648	214	166	250
19	268	460	326	276	257	332	1,680	576	798	214	194	240
20	270	452	335	275	256	324	*2,480	574	635	220	184	240
21	264	410	336	317	254	335	3,480	483	498	240	183	240
22	267	321	340	300	246	376	3,980	498	471	257	173	260
23	268	308	337	321	252	430	3,510	472	425	243	222	270
24	264	416	335	304	246	522	2,880	452	398	220	307	290
25	258	448	323	209	272	562	2,360	426	387	206	278	340
26	276	422	330	290	276	561	1,890	423	366	210	248	320
27	276	404	332	272	300	576	1,550	455	345	198	216	300
28	275	404	334	277	288	611	1,320	466	326	191	210	270
29	279	388	331	271	-	673	1,140	440	318	195	217	260
30	268	376	314	276		620	991	420	292	*192	216	250
31	*276		338	269		662		398		190	211	
Total	8,780	12,115	10,817	8,970	7,396	11,763	39,215	15,761	11,614	7,268	6,341	9,068
Mean	283	404	349	289	264	379	1,307	508	387	234	205	302
Cfsm	0.459	0.656	0.567	0.469	0.429	0.615	2.12	0.825	0.628	0.380	0.333	0.490
In.	0.53	0.73	0.65	0.54	0.45	0.71	2.36	0.95	0.70	0.44	0.38	0.55

Calendar year 1956:	Max 2,210	Min 245	Mean 512	Cfsm 0.831	In. 11.31
Water year 1956-57:	Max 3,980	Min 164	Mean 409	Cfsm 0.664	In. 8.99

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Sept. 11-30; discharge estimated on basis of weather records and records for nearby stations.

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 Michigamme Reservoir, 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 1957.

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

Average discharge.--13 years, 691 cfs.

Extremes.--Maximum discharge during year, 1,180 cfs June 10; maximum gage height, 4.95 ft Feb. 22; minimum daily discharge, 73 cfs Aug. 11.
1944-57: Maximum discharge, 6,340 cfs May 3, 1954 (gage height, 10.11 ft); minimum daily, 71 cfs Nov. 26, 1950.

Remarks.--Records excellent. Flow regulated by powerplants and by Michigamme Reservoir (capacity, 119,950 acre-ft) 4.5 miles above station.

Rating tables, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 18				Apr. 19 to Sept. 30			
1.7	94	3.8	570	1.4	68	3.0	304
2.3	164	4.6	965	2.0	121	3.6	517
3.0	308			2.5	192	4.1	755

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*554	430	103	582	682	624	662	109	137	*685	557	116
2	554	390	104	664	678	619	715	106	120	685	402	97
3	554	432	*496	725	678	619	785	101	*529	685	111	*92
4	550	430	700	*730	678	*614	790	98	745	695	112	86
5	550	433	696	730	673	610	910	98	740	690	420	82
6	550	269	696	730	*673	606	806	*487	697	607	552	81
7	546	101	691	725	668	602	795	725	740	548	557	81
8	546	105	691	725	668	602	*582	740	740	552	570	80
9	546	105	691	725	668	594	735	735	740	503	401	417
10	546	105	686	725	664	590	700	735	725	505	95	579
11	492	105	691	725	660	590	730	735	740	420	73	584
12	542	105	686	720	664	586	682	735	730	322	387	589
13	542	105	682	720	660	582	655	735	740	118	552	589
14	542	105	682	715	655	578	637	740	700	112	552	589
15	453	108	682	715	660	582	526	586	404	345	552	282
16	461	105	682	715	655	578	598	156	175	430	548	84
17	460	105	682	696	650	574	888	147	561	427	548	81
18	461	105	682	705	650	570	932	138	755	424	548	420
19	431	105	678	696	625	550	174	138	745	431	548	589
20	425	105	682	705	642	546	218	536	725	519	543	584
21	428	105	678	700	642	532	245	745	489	516	543	593
22	433	105	624	700	562	534	245	745	152	493	543	589
23	439	105	590	696	637	586	196	740	149	97	406	593
24	429	105	586	696	642	660	441	571	520	104	95	607
25	435	106	586	696	637	668	610	174	690	304	101	276
26	436	105	586	691	632	668	149	169	661	425	100	88
27	432	106	586	691	628	664	136	160	685	510	97	87
28	429	105	586	691	628	655	126	152	685	512	100	86
29	434	104	586	686	-	828	119	150	695	466	92	85
30	432	105	586	686	--------	855	116	149	685	*557	77	*423
31	*427	--------	582	686	--------	806	--------	147	--------	557	76	--------
Total	15,059	4,904	18,959	21,792	18,259	19,272	15,903	12,482	17,599	14,244	10,858	9,529
Mean	486	163	612	703	652	622	530	403	587	459	350	318
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956 :	Max	1,640	Min	101	Mean	624	Cfsm	0.931	In.	12.66
Water year 1956-57 :	Max	932	Min	73	Mean	490	Cfsm	0.731	In.	9.91

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 17, Nov. 1, 2, 8-14, 16-24; discharge estimated on basis of recorded range in stage and records of discharge at Way Dam powerplant.

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 1957.

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

Average discharge.--7 years, 1,929 cfs.

Extremes.--Maximum discharge during year, 4,240 cfs Apr. 22 (gage height, 6.33 ft); minimum, 69 cfs Oct. 20, 27 (gage height, 1.33 ft); minimum daily, 506 cfs Sept. 15.

1950-57: Maximum discharge, 20,500 cfs July 2 or 3, 1953 (gage height, 13.81 ft, from floodmarks), from rating curve extended above 12,000 cfs by logarithmic plotting; minimum, 57 cfs Sept. 18, 1950 (gage height, 1.28 ft); minimum daily, 220 cfs Feb. 4, 1951.

Remarks.--Records excellent. Flow regulated by powerplants, and by Michigamme Reservoir (capacity, 119,950 acre-ft) and Peavy Pond (capacity, 33,860 acre-ft, corrected) on on Michigamme River, and by many other smaller reservoirs on tributaries above station.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

2.5	485	6.0	3,780
3.0	760	7.0	5,230
4.0	1,530		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*1,360	*1,050	905	1,210	1,390	a1,400	2,180	1,830	1,090	1,380	912	769
2	1,380	1,130	718	*1,400	1,190	a1,350	2,090	1,840	867	*1,400	936	620
3	1,360	1,140	*1,190	1,260	1,120	a1,400	2,010	1,710	*1,540	1,290	812	*770
4	1,360	847	1,120	1,370	*1,230	*a1,600	2,060	1,460	1,210	794	670	808
5	1,250	1,190	1,170	1,350	1,470	1,440	2,050	1,250	1,230	1,170	1,000	764
6	1,420	1,090	1,270	1,460	1,410	1,520	1,940	*1,490	1,290	1,090	870	870
7	852	1,240	1,430	1,440	1,370	1,390	2,030	1,540	1,320	1,050	907	840
8	1,440	1,080	1,220	1,400	1,360	1,780	*2,050	1,440	1,110	1,340	950	843
9	1,440	1,030	1,120	1,320	1,280	1,790	2,010	1,380	824	1,190	938	1,010
10	1,300	1,030	1,380	1,420	962	1,580	2,010	1,270	1,410	1,180	724	1,180
11	1,150	922	1,210	1,470	1,470	1,630	2,210	1,170	1,360	1,060	600	1,220
12	1,220	1,130	1,290	1,430	1,340	1,570	1,600	1,010	1,310	989	886	1,150
13	1,230	1,100	1,240	1,290	1,330	1,700	1,090	1,340	1,300	1,020	*900	1,060
14	922	1,040	1,330	1,500	1,380	1,770	1,420	1,360	1,490	700	966	1,030
15	1,230	1,050	1,340	1,560	1,370	2,150	1,460	1,250	1,650	1,150	869	506
16	760	982	988	1,440	1,300	1,680	1,420	1,270	818	1,090	875	909
17	786	1,040	1,490	1,400	1,200	1,770	1,370	1,160	1,620	898	830	822
18	960	824	1,440	1,390	1,300	1,950	1,340	1,090	1,540	908	737	798
19	946	932	1,400	1,310	1,390	1,770	1,120	630	1,920	864	904	864
20	744	942	1,400	1,290	1,320	1,660	1,590	1,280	1,720	782	934	983
21	942	900	1,520	1,380	1,350	1,790	2,010	1,430	1,700	765	880	943
22	1,370	765	1,260	1,460	1,280	1,860	3,630	1,300	1,510	978	932	740
23	1,150	1,150	1,260	1,460	1,250	1,790	3,950	1,320	1,190	860	798	994
24	1,030	1,060	1,040	1,450	1,160	1,890	3,720	1,320	1,430	786	735	1,030
25	974	897	1,270	1,590	1,340	2,070	3,360	1,140	1,490	1,030	668	1,080
26	1,180	1,160	1,390	1,410	1,350	1,900	2,340	790	1,520	891	898	850
27	736	1,100	1,450	1,280	1,350	2,130	2,130	1,430	1,490	810	806	1,420
28	836	1,060	1,380	1,470	a1,350	2,160	1,450	1,270	1,430	557	938	1,310
29	1,130	1,040	1,250	1,460	-	1,980	1,680	1,380	1,350	1,100	792	1,090
30	1,110	1,120	1,170	1,400	--------	2,060	1,730	593	1,020	904	966	*1,400
31	1,010	--------	1,150	1,410	--------	2,080	--------	1,270	--------	*902	844	--------
Total	34,578	31,041	38,791	43,480	36,612	54,610	61,050	40,013	40,749	30,928	26,477	28,673
Mean	1,115	1,035	1,251	1,403	1,308	1,762	2,035	1,291	1,358	998	854	956
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 4,300 Min 718 Mean 1,619 Cfsm - In. -
Water year 1956-57: Max 3,950 Min 506 Mean 1,279 Cfsm - In. -

* Discharge measurement made on this day.

a No gage-height reoord; discharge estimated on basis of discharge records for Brule and Peavy Falls powerplants.

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 1957.

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

Average discharge.--43 years, 1,810 cfs.

Extremes.--Maximum daily discharge during year, 4,120 cfs Apr. 23; minimum daily, 736 cfs Sept. 2.

1914-57: 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 and rating for tailwater gage during periods of spill. Ratings developed by Geological Survey. Flow regulated by powerplants, and by Michigamme Reservoir (capacity, 119,950 acre-ft) and Peavy Pond (capacity, 33,860 acre-ft, corrected) on Michigamme River, and by many smaller reservoirs above station.

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

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,380	1,020	960	1,260	1,490	1,590	2,500	1,890	1,220	1,360	1,020	805
2	1,450	1,180	938	1,360	1,390	1,570	2,280	1,890	1,210	1,400	988	736
3	1,360	1,140	1,140	1,380	1,170	1,420	2,220	1,930	1,300	1,390	860	802
4	1,430	1,010	1,180	1,530	1,460	1,590	2,250	1,620	1,390	1,010	896	776
5	1,360	1,130	1,140	1,500	1,390	1,580	2,380	1,300	1,330	930	938	865
6	1,350	1,260	1,210	1,490	1,470	1,660	2,330	1,660	1,430	1,200	938	948
7	1,140	1,200	1,270	1,670	1,370	1,600	2,380	1,690	1,410	1,140	875	930
8	1,250	1,070	1,250	1,560	1,480	1,670	2,330	1,500	1,370	1,260	1,030	1,020
9	1,340	1,070	1,250	1,610	1,300	1,610	2,320	1,450	1,150	1,160	967	1,030
10	1,370	1,030	1,250	1,540	1,150	1,620	2,350	1,460	1,460	1,210	791	1,170
11	1,360	965	1,320	1,600	1,460	1,720	2,330	1,420	1,360	1,210	774	1,140
12	1,280	1,220	1,340	1,570	1,420	1,720	1,550	1,390	1,430	1,080	804	910
13	1,140	1,290	1,330	1,480	1,450	1,770	1,430	1,400	1,430	857	937	1,060
14	1,020	1,180	1 300	1,600	1,490	1,920	1,560	1,430	1,420	783	996	1,040
15	1,110	1,190	1,380	1,630	1,390	2,130	1,620	1,500	1,850	1,060	934	897
16	1,030	1,050	1,290	1,560	1,360	2,060	1,610	1,360	1,460	1,100	890	916
17	1,050	863	1,500	1,420	1,280	1,840	1,580	1,280	1,390	1,040	879	824
18	874	898	1,560	1,540	1,410	2,240	1,440	1,280	1,790	872	864	782
19	783	950	1,470	1,540	1,370	2,100	1,330	1,090	1,870	925	859	949
20	864	879	1,430	1,480	1,370	1,860	1,750	1,160	1,830	1,010	972	935
21	847	922	1,500	1,560	1,410	1,830	2,460	1,510	1,840	886	969	1,020
22	1,070	790	1,420	1,520	1,380	1,800	3,630	1,400	1,520	964	969	804
23	1,060	1,100	1,410	1,580	1,390	1,890	4,120	1,330	1,420	851	859	1,040
24	1,020	1,090	1,300	1,620	1,210	2,230	3,700	1,370	1,550	856	839	1,070
25	1,040	1,040	1,220	1,620	1,480	2,250	3,610	1,300	1,520	994	773	1,040
26	1,040	1,160	1,500	1,600	1,380	2,070	2,570	1,290	1,540	934	806	926
27	802	1,130	1,410	1,330	1,400	2,460	2,360	1,340	1,530	807	834	1,360
28	870	1,150	1,500	1,590	1,410	2,340	1,850	1,370	1,500	927	912	1,420
29	922	1,150	1,440	1,610	-	2,310	1,910	1,330	1,270	983	851	1,260
30	1,070	1,170	1,280	1,620	--------	2,260	1,830	994	1,350	869	853	1,330
31	1,150	--------	1,370	1,560	--------	2,300	--------	1,180	--------	953	917	--------
Total	34,832	32,297	40,858	47,530	38,740	58,960	67,580	44,114	44,140	32,021	27,794	29,805
Mean	1,124	1,077	1,318	1,533	1,384	1,902	2,253	1,423	1,471	1,033	897	994
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 4,560 Min 783 Mean 1,711 Cfsm - In. -
Water year 1956-57: Max 4,120 Min 736 Mean 1,366 Cfsm - In. -

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.

Records available.--October 1923 to September 1957.

Average discharge.--34 years, 420 cfs.

Extremes.--Maximum daily discharge during year, 1,440 cfs Apr. 21, 25; minimum daily, 52 cfs Aug. 1, 3, 7.

1923-57: Maximum daily discharge, 4,380 cfs Apr. 9, 1929; no flow at times in 1924, 1926-27, 1930-31, 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.

Revisions.--WSP 1237: Drainage area.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	208	156	260	182	104	169	468	704	364	182	52	286
2	208	208	208	195	130	169	468	624	312	156	130	312
3	208	208	273	182	104	169	468	572	312	156	52	390
4	208	208	260	182	156	156	468	442	312	208	91	364
5	208	182	208	182	143	156	338	364	338	130	78	338
6	208	260	286	182	143	156	312	334	208	182	91	338
7	156	390	260	195	156	156	416	334	312	182	52	312
8	208	*585	260	195	156	156	468	312	156	156	182	208
9	182	520	208	182	143	156	416	312	208	156	156	182
10	182	364	208	195	143	156	364	312	208	104	130	156
11	208	364	208	156	156	156	364	312	208	156	130	156
12	208	364	208	195	156	156	338	208	286	156	91	169
13	156	325	182	156	156	150	312	312	208	208	78	182
14	156	325	182	169	169	156	312	208	114	156	65	117
15	156	364	182	156	156	208	364	520	612	208	104	416
16	156	338	208	156	156	260	364	921	704	156	104	368
17	169	208	208	156	156	208	520	804	684	156	78	442
18	169	286	208	130	156	295	784	724	468	130	78	403
19	208	338	208	143	156	208	964	744	416	156	78	*312
20	156	312	208	130	130	226	1,200	664	416	156	78	312
21	195	286	208	156	156	208	1,440	516	364	234	130	312
22	182	260	208	130	156	208	1,390	494	312	156	78	312
23	182	156	208	142	143	312	1,340	507	286	182	260	286
24	182	208	182	156	169	312	1,380	429	208	91	312	364
25	156	312	182	169	156	468	1,440	442	286	104	364	364
26	156	260	208	156	156	494	1,380	442	312	143	312	312
27	195	260	266	130	195	468	1,150	416	182	117	156	312
28	182	260	182	117	169	416	979	442	182	91	130	312
29	201	234	195	104	-	494	904	364	208	143	208	312
30	182	234	195	156	--------	416	774	416	156	65	182	156
31	221	--------	208	130	--------	442	--------	442	--------	130	208	--------
Total	5,752	8,775	6,675	4,965	4,225	7,860	21,885	14,637	9,342	4,706	4,238	8,805
Mean	186	292	215	160	151	254	730	472	311	152	137	294
Cfsm	0.352	0.553	0.407	0.303	0.286	0.481	1.38	0.894	0.589	0.288	0.259	0.557
In.	0.41	0.62	0.47	0.35	0.30	0.55	1.54	1.03	0.66	0.33	0.30	0.62

Calendar year 1956: Max 1,340 Min 123 Mean 364 Cfsm 0.689 In. 9.39
Water year 1956-57: Max 1,440 Min 52 Mean 279 Cfsm 0.528 In. 7.18

* Discharge measurement made on this day.

Sturgeon River near Foster City, Mich.

Location.--Lat 45°54'30", long 87°45'15", in NW¼ sec. 36, T. 41 N., R. 28 W., on left bank 30 ft downstream from bridge on County Highway 569, 1¾ miles downstream from confluence of East and West Branches, and 4 miles south of Foster City.

Drainage area.--244 sq mi.

Records available.--October 1954 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 966.6 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 1,020 cfs Apr. 22 (gage height, 7.06 ft); minimum, 20 cfs Aug. 23 (gage height, 2.17 ft).
1954-57: Maximum daily discharge, 1,400 cfs Apr. 14, 15, 1955; minimum discharge, that of Aug. 23, 1957.

Remarks.--Records good except those for period of ice effect, which are fair. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 23-27, July 21-28, Sept. 2-5, 15-30)

Oct. 1 to Apr. 3		Apr. 4 to Sept. 30	
2.3	37	2.1	20
3.0	118	2.5	58
4.0	278	3.0	121
5.0	470	4.0	288
		7.0	1,010

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74	67	80	60	42	45	280	352	244	55	39	47
2	76	67	78	58	42	44	300	288	204	51	*45	48
3	79	67	78	56	42	44	305	238	179	47	46	68
4	80	67	80	56	42	44	*300	209	156	47	41	86
5	77	70	82	56	42	43	249	185	140	65	38	91
6	75	74	84	56	41	43	219	168	132	69	*36	84
7	71	85	84	56	41	43	214	155	138	65	32	68
8	70	*98	82	56	41	43	242	144	136	57	41	58
9	70	99	82	56	41	43	218	140	128	47	58	50
10	69	93	80	54	41	43	192	135	113	43	57	46
11	66	88	78	54	*41	*43	182	127	103	42	50	40
12	66	87	76	52	41	43	179	120	*110	45	42	37
13	65	91	*74	48	41	44	166	115	108	52	37	36
14	66	95	72	46	41	48	158	120	104	56	33	38
15	*64	104	70	45	41	54	172	226	118	52	35	81
16	64	119	70	44	41	58	213	388	152	47	42	*169
17	65	114	70	44	41	62	*298	421	174	43	42	180
18	64	118	70	43	40	66	390	405	152	39	36	*148
19	61	115	68	43	40	68	485	386	122	36	31	121
20	60	105	68	43	40	72	*663	344	103	32	25	*100
21	58	104	68	44	40	78	933	*290	91	98	23	94
22	*61	101	68	*45	40	90	1,010	282	84	246	22	107
23	61	95	68	45	40	110	*975	278	85	226	37	111
24	60	91	68	46	41	130	866	246	81	189	106	115
25	59	88	68	46	42	145	767	214	82	*146	121	158
26	61	85	66	45	45	155	*738	224	80	102	98	189
27	66	84	64	44	46	170	681	251	79	76	71	184
28	70	84	62	43	46	180	598	244	70	65	57	156
29	71	84	62	43	-	200	507	223	64	58	52	132
30	70	82	60	42	--------	215	427	247	59	57	50	113
31	69	--------	60	42	--------	250	--------	264	--------	43	49	--------
Total	2,088	2,721	2,240	1,511	1,162	2,716	12,927	7,429	3,591	2,296	1,492	2,955
Mean	67.4	90.7	72.3	48.7	41.5	87.6	431	240	120	74.1	48.1	98.5
Cfsm	0.276	0.372	0.296	0.200	0.170	0.359	1.77	0.984	0.492	0.304	0.197	0.404
In.	0.32	0.42	0.34	0.23	0.18	0.41	1.98	1.13	0.55	0.35	0.23	0.45

Calendar year 1956:	Max	690	Min	50	Mean	139	Cfsm	0.570	In.	7.75
Water year 1956-57:	Max	1,010	Min	22	Mean	118	Cfsm	0.484	In.	6.59

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 23 to Apr. 3.

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.--October 1949 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

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

Average discharge.--8 years, 3,110 cfs.

Extremes.--Maximum discharge during year, 9,110 cfs Apr. 23 (gage height, 7.23 ft); minimum, 805 cfs Aug. 12, 13 (gage height, 1.85 ft).

1949-57: Maximum discharge, 25,500 cfs July 3, 1953 (gage height, 13.06 ft); minimum, that of Aug. 12, 13, 1957.

Remarks.--Records good except those for period of ice effect, which are fair. Flow regulated by powerplants and by Michigamme Reservoir (capacity, 119,950 acre-ft) and Peavy Pond (capacity, 33,860 acre-ft, corrected), on the Michigamme River, and by many smaller reservoirs above station.

Revisions (water years).--WSP 1277: 1952.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,640	1,640	1,600	1,500	1,700	1,750	3,770	3,820	2,810	1,710	1,210	1,430
2	1,760	1,780	1,500	1,450	1,650	1,800	3,630	3,660	2,370	1,740	1,230	1,550
3	2,030	1,840	1,500	1,600	1,500	1,600	3,620	3,510	2,270	1,660	1,210	1,540
4	2,130	1,690	1,600	1,700	1,300	1,600	3,520	3,000	2,230	1,780	1,150	1,640
5	1,890	1,530	1,700	1,750	1,400	1,750	3,490	2,790	2,280	1,500	1,090	1,460
6	1,730	*1,720	1,750	1,900	1,500	1,800	3,450	2,690	2,480	1,640	1,170	1,550
7	1,970	1,740	1,800	1,800	1,550	1,800	3,350	2,590	2,220	1,700	1,240	1,660
8	1,680	1,900	1,650	1,800	1,600	1,800	3,350	2,240	1,990	1,460	1,250	1,450
9	1,790	2,010	1,600	1,800	1,600	1,800	3,330	2,540	2,180	1,430	1,230	1,450
10	1,800	2,030	1,650	1,850	1,550	1,800	*3,300	2,370	1,790	*1,410	1,190	1,440
11	1,780	1,710	1,750	1,800	1,550	1,800	3,280	2,350	2,230	1,440	1,090	1,460
12	1,960	1,480	1,600	1,700	1,500	1,850	2,880	2,350	2,250	1,510	1,040	1,840
13	1,790	1,820	1,600	1,900	1,700	1,950	2,640	1,780	2,150	1,530	1,120	1,310
14	1,590	1,900	1,700	1,700	*1,800	2,050	2,470	2,470	2,010	1,440	1,170	1,530
15	1,480	1,960	1,700	1,650	1,700	2,200	2,390	3,070	2,360	1,260	*1,110	1,660
16	1,660	1,900	1,650	1,650	1,600	2,300	2,870	4,020	3,000	1,140	1,100	1,990
17	1,600	1,780	1,800	1,700	1,500	2,400	3,040	3,900	2,690	1,310	1,120	1,910
18	1,430	1,540	1,800	1,650	1,500	2,450	3,420	4,000	2,920	1,340	1,020	1,910
19	1,490	1,480	1,750	1,700	1,550	2,450	3,980	3,770	2,900	1,330	1,020	*1,750
20	1,400	1,770	1,850	1,750	1,550	2,400	5,410	3,260	2,600	1,210	1,210	1,710
21	1,550	1,720	1,900	1,750	1,600	2,400	6,680	3,080	2,650	1,310	1,190	1,700
22	1,410	1,650	1,900	1,750	1,600	*2,450	7,190	3,080	2,520	1,640	1,150	1,850
23	1,450	1,400	1,900	1,750	1,600	2,600	8,380	3,030	2,160	1,580	1,290	1,570
24	1,500	1,400	1,800	1,750	1,600	2,750	7,380	*2,930	2,090	1,550	1,360	1,640
25	1,560	1,550	1,700	1,750	1,600	2,950	7,450	2,490	2,090	1,400	1,490	1,970
26	1,440	1,650	1,700	1,700	1,600	3,100	6,270	2,880	2,000	1,390	1,340	1,890
27	1,620	1,750	1,800	1,700	1,600	3,200	5,940	2,960	2,290	1,250	1,450	2,100
28	1,580	1,700	1,900	1,700	1,650	3,300	4,980	2,780	2,130	1,350	1,320	1,980
29	1,360	1,600	1,850	1,700	-	3,400	4,210	2,530	1,890	1,300	1,340	2,190
30	1,440	1,500	1,800	1,700	--------	3,560	4,000	2,810	1,880	1,270	1,350	2,210
31	1,490	--------	1,650	1,700	--------	3,620	--------	2,250	--------	1,260	1,380	--------
Total	51,000	51,140	53,450	53,300	44,150	72,680	129,670	91,000	69,430	44,840	37,630	51,340
Mean	1,645	1,705	1,724	1,719	1,577	2,345	4,322	2,935	2,314	1,446	1,214	1,711
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 7,450 Min 1,360 Mean 2,505 Cfsm - In. -
Water year 1956-57: Max 8,380 Min 1,020 Mean 2,054 Cfsm - In. -

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23 to Mar. 29.

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 and 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 1957.

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. 4, 1934, chain gage at highway bridge three-quarters of a mile downstream at different datum. Aug. 5, 1934, to Oct. 6, 1946, staff gage at present site and datum.

Average discharge.--43 years, 219 cfs.

Extremes.--Maximum discharge during year, 1,080 cfs Apr. 21 (gage height, 4.75 ft); minimum, 77 cfs Aug. 7 (gage height, 1.60 ft).

1914-57: Maximum discharge, 2,800 cfs Apr. 10, 1922 (gage height, 7.8 ft, from graph based on gage readings, 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 excellent except those for periods of ice effect or no gage-height record, which are fair.

Revisions (water years).--WSP 699: 1927. WSP 1207: Drainage area. WSP 1337: 1914(M), 1916-19(M), 1921-24(M), 1926(M), 1928(M), 1929, 1930(M), 1931, 1932-33(M), 1935, 1936-37(M), 1938, 1939-46(M).

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.6	77	2.5	279
1.8	105	3.0	432
2.0	144	4.6	1,010

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	114	116	140	110	78	96	a280	a260	232	109	93	156
2	121	121	140	110	78	94	a260	237	206	105	89	201
3	123	123	140	110	78	92	243	a220	193	107	87	255
4	118	123	135	110	78	90	204	a210	183	105	86	258
5	116	121	135	110	79	89	188	a200	176	109	84	217
6	114	*127	135	110	80	88	201	a200	173	105	81	170
7	114	154	135	110	81	88	223	a190	166	104	80	144
8	112	151	*130	105	82	88	206	190	161	104	90	134
9	107	140	120	*104	83	89	206	188	154	102	104	121
10	105	131	120	105	84	90	201	178	142	*98	105	116
11	109	127	125	105	85	92	198	173	142	96	104	114
12	112	129	120	100	86	100	190	180	140	102	94	116
13	114	134	120	98	87	115	188	226	138	107	90	114
14	118	131	120	95	*88	125	186	519	144	110	*90	110
15	114	151	120	92	87	135	212	727	183	107	90	196
16	114	160	115	89	86	140	294	646	190	102	90	312
17	116	160	115	86	85	140	407	516	188	98	87	267
18	114	160	110	84	84	140	478	441	190	94	86	204
19	112	161	110	83	84	140	510	392	176	93	87	173
20	114	151	115	82	83	145	709	336	158	92	90	*163
21	116	151	120	83	84	160	970	306	149	107	87	173
22	116	145	120	84	86	*178	927	312	142	125	84	215
23	116	140	120	86	88	200	a800	291	149	119	104	212
24	112	130	120	86	90	220	a700	*261	136	107	140	183
25	110	130	120	86	93	250	a740	240	131	102	131	170
26	112	135	120	85	96	270	a700	312	129	102	116	161
27	118	135	115	83	98	280	a600	351	121	99	104	151
28	118	140	115	81	97	300	a500	303	118	96	102	140
29	118	140	110	79	-	a310	a400	273	116	100	112	131
30	116	140	110	78		a310	a320	267	114	104	114	131
31	116		110	78		a300		258		98	131	
Total	3,549	4,157	3,780	2,907	2,388	4,954	12,241	9,403	4,740	3,208	3,032	5,208
Mean	114	139	122	93.8	85.3	160	408	303	158	103	97.8	174
Cfsm	0.451	0.549	0.482	0.371	0.337	0.632	1.61	1.20	0.625	0.407	0.387	0.688
In.	0.52	0.61	0.56	0.43	0.35	0.73	1.80	1.38	0.70	0.47	0.45	0.77

Calendar year 1956: Max 776 Min 86 Mean 163 Cfsm 0.644 In. 8.75
Water year 1956-57: Max 970 Min 78 Mean 163 Cfsm 0.644 In. 8.77

* 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 nearby stations.

Note.--Stage-discharge relation affected by ice Nov. 16-18, Nov. 22 to Mar. 28.

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 of Koss, and at mile 24.7.

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

Records available.--July 1907 to March 1909 (published as "at Koss"), July 1913 to September 1957.

Gage.--Headwater and tailwater gages and generation data entered hourly in daily log sheet by company employees. Prior to June 1913, chain gage on railroad bridge 4 miles upstream.

Average discharge.--45 years (1907-8, 1913-57) 3,143 cfs.

Extremes.--Maximum daily discharge, 8,370 cfs Apr. 24; minimum daily, 864 cfs Aug. 20. 1908, 1913-57: 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 powerplants, and by Michigammee Reservoir (capacity, 119,950 acre-ft) and Peavy Pond (capacity, 33,860 acre-ft, corrected), on Michigamme River, and by many smaller reservoirs above station.

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

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,150	1,620	1,870	1,660	1,730	1,660	4,260	3,490	3,070	1,880	1,150	1,380
2	1,710	1,610	1,940	1,680	1,660	1,960	4,000	3,750	2,470	1,680	1,180	1,640
3	1,750	1,860	1,900	1,440	1,660	1,870	3,860	3,800	2,480	1,590	1,220	1,920
4	2,210	2,020	1,560	1,880	1,510	1,660	4,030	3,440	2,360	1,600	1,320	2,220
5	2,310	1,890	2,000	1,730	1,250	1,870	3,890	2,920	2,360	1,800	1,100	1,920
6	1,540	1,610	1,900	1,780	1,520	1,860	3,900	2,880	2,350	1,350	1,120	1,430
7	2,020	2,020	1,980	1,950	1,540	1,940	3,510	2,590	2,440	1,510	1,060	1,620
8	2,050	1,850	2,200	1,750	1,600	1,720	3,270	2,590	2,280	1,730	1,200	1,780
9	1,950	1,960	1,680	1,820	1,650	1,930	3,190	2,500	2,280	1,380	1,440	1,590
10	2,100	2,120	1,540	1,780	1,700	1,840	3,610	2,640	1,830	1,440	1,450	1,480
11	1,540	2,040	1,770	1,860	1,720	1,770	3,190	2,400	1,870	1,380	1,200	1,580
12	1,840	1,610	1,890	1,960	1,520	1,850	3,100	2,450	2,250	1,440	1,150	1,520
13	2,060	1,620	1,700	1,540	1,520	1,900	2,730	2,400	2,320	1,620	1,200	1,950
14	1,730	2,040	1,760	2,000	1,810	2,090	2,720	2,400	2,160	1,530	1,250	1,300
15	1,500	2,240	1,880	1,660	1,820	2,160	2,610	3,040	2,030	1,500	1,150	1,820
16	1,580	2,200	2,060	1,640	1,620	2,540	2,400	4,520	2,620	1,320	1,150	1,980
17	1,510	2,060	1,690	1,670	1,680	2,640	3,310	5,210	2,870	1,200	1,150	2,280
18	1,600	2,090	2,190	1,790	1,490	2,550	3,870	5,200	2,620	1,150	1,150	2,120
19	1,400	1,840	1,770	1,540	1,630	2,450	4,540	4,130	2,810	1,250	1,100	2,150
20	1,380	1,590	1,800	1,950	1,530	2,420	5,300	4,500	2,620	1,300	864	1,980
21	1,570	2,040	1,930	1,890	1,540	2,470	6,920	3,640	2,520	1,390	1,200	1,940
22	1,630	2,140	2,140	1,660	1,620	2,210	7,870	3,480	2,370	1,480	1,300	1,890
23	1,440	1,340	1,990	1,780	1,800	2,500	8,160	3,360	2,300	1,730	1,300	1,970
24	1,640	1,340	2,060	1,780	1,730	2,690	8,370	3,260	1,950	1,590	1,560	1,800
25	1,590	1,870	1,970	1,770	1,680	3,080	7,440	2,710	1,950	1,460	1,620	1,910
26	1,620	1,900	1,790	1,680	1,730	3,400	7,410	3,120	1,800	1,320	1,600	2,000
27	1,560	1,860	1,730	1,640	1,590	3,640	6,430	3,180	1,920	1,420	1,350	2,000
28	1,740	2,120	2,050	1,690	1,680	3,740	5,560	3,360	2,160	1,200	1,480	2,000
29	1,740	2,050	2,020	1,800	-	3,780	4,160	3,000	2,060	1,400	1,460	2,010
30	1,450	1,740	2,000	1,590	--------	4,220	3,800	2,910	1,770	1,200	1,440	2,160
31	1,510	--------	1,850	1,660	--------	3,810	--------	2,850	--------	1,500	1,810	--------
Total	53,420	56,290	58,610	54,020	45,530	76,220	137,410	101,720	68,890	45,340	39,724	55,340
Mean	1,723	1,876	1,891	1,743	1,626	2,459	4,580	3,281	2,296	1,463	1,281	1,845
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 7,360 Min 1,340 Mean 2,662 Cfsm - In. -
Water year 1956-57: Max 8,370 Min 864 Mean 2,171 Cfsm - In. -

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 1957.

Gage.--Water-stage recorder. Altitude of gage is 630 ft (from river-profile map). Prior to May 15, 1945, wire-weight gage.

Average discharge.--12 years, 3,309 cfs.

Extremes.--Maximum discharge during year, 11,000 cfs Apr. 24 (gage height, 13.39 ft); minimum, 865 cfs Aug. 20 (gage height, 7.65 ft); minimum daily, 1,020 cfs Aug. 20.

1945-57: 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 except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by powerplants, by Michigamme Reservoir (capacity, 119,950 acre-ft) and Peavy Pond (capacity, 33,860 acre-ft, corrected) on the Michigamme River, and by many smaller reservoirs above station.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

7.8	1,000	11.0	5,680
8.3	1,480	12.0	7,750
9.0	2,270	13.2	10,400
10.0	3,820		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,330	1,610	1,900	1,750	1,800	1,800	4,360	4,820	3,370	2,090	1,320	1,520
2	1,810	1,560	1,950	1,800	1,750	2,050	4,430	4,490	2,620	1,910	1,290	1,800
3	1,820	1,690	1,950	1,600	1,700	2,000	4,270	4,340	2,620	1,820	1,300	1,990
4	2,060	1,930	1,800	1,950	1,500	1,800	4,250	4,050	2,490	1,790	1,360	2,370
5	2,340	*1,860	2,000	1,850	1,450	1,900	4,340	3,340	2,520	2,000	1,240	2,140
6	1,820	1,580	2,050	1,900	1,550	2,000	4,450	3,340	2,520	1,510	1,250	1,540
7	1,930	1,800	*2,110	2,050	1,600	2,050	4,250	2,880	2,740	1,690	1,190	1,620
8	1,900	2,040	2,200	1,850	1,700	1,850	4,200	2,820	2,610	1,940	1,320	1,830
9	1,880	2,000	1,800	1,900	1,750	2,000	*3,950	2,820	2,670	*1,520	1,490	1,680
10	1,950	2,270	1,700	1,900	1,800	2,000	4,200	3,050	2,040	1,560	1,530	1,520
11	1,590	2,130	1,850	2,000	1,800	1,900	3,500	2,620	2,040	1,570	1,300	1,610
12	1,760	a1,750	2,000	2,050	1,600	1,950	3,430	2,740	2,480	1,560	1,250	1,670
13	2,080	a1,800	1,800	1,800	1,600	2,050	3,400	2,640	2,640	1,780	1,340	2,040
14	1,740	a2,200	1,900	2,050	1,900	2,200	3,340	2,280	2,380	1,650	1,380	1,360
15	1,560	a2,300	2,000	1,800	1,850	2,350	3,130	3,650	2,240	1,680	*1,300	1,880
16	1,670	a2,200	2,100	1,800	1,700	2,600	2,940	5,370	2,790	1,460	1,280	2,140
17	1,580	a2,100	1,800	1,800	1,750	2,800	3,860	6,160	3,450	1,340	1,270	2,580
18	1,680	2,000	2,250	1,850	1,600	2,700	4,500	5,700	3,000	1,340	1,240	*2,240
19	1,710	1,900	1,900	1,750	1,700	2,600	4,910	5,520	3,160	1,400	1,250	2,180
20	1,430	1,780	1,900	2,050	1,600	2,600	6,020	4,990	3,110	1,440	1,020	1,920
21	1,600	2,050	2,050	2,000	1,600	2,500	8,740	4,230	2,920	1,540	1,310	1,980
22	1,760	2,250	2,200	1,800	1,700	2,400	10,000	4,180	2,800	1,600	1,350	1,910
23	1,510	1,580	2,100	1,850	1,900	2,700	10,100	3,890	2,820	2,000	1,350	2,030
24	1,690	1,620	2,150	1,900	1,800	3,000	10,300	3,870	2,230	1,780	1,500	1,870
25	1,660	1,900	2,050	1,900	1,800	3,300	9,270	*3,510	2,270	1,660	1,680	1,990
26	1,600	2,100	1,900	1,800	1,800	3,600	9,310	3,790	2,010	1,410	1,690	2,130
27	1,590	2,050	1,800	1,750	1,700	3,800	7,860	3,770	2,150	1,540	1,500	2,090
28	1,690	2,300	2,100	1,800	1,750	4,000	7,310	4,140	2,350	1,300	1,540	2,180
29	1,770	2,200	2,150	1,900	-	4,100	5,960	3,620	2,260	1,520	1,550	2,060
30	1,530	1,950	2,100	1,700	--------	4,200	5,200	3,400	1,950	1,330	1,480	2,300
31	1,670	--------	1,950	1,750	--------	4,360	--------	3,270	--------	1,550	1,820	--------
Total	54,770	58,500	61,510	57,650	47,750	81,160	165,780	119,290	77,250	50,280	42,690	58,170
Mean	1,767	1,950	1,984	1,860	1,705	2,618	5,526	3,848	2,575	1,622	1,377	1,939
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 9,880 Min 1,430 Mean 2,887 Cfsm - In. -
Water year 1956-57: Max 10,300 Min 1,020 Mean 2,397 Cfsm - In. -

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

Note.--Discharge computed from once-daily wire-weight-gage readings Nov. 18 to Apr. 12. Stage-discharge relation affected by ice Nov. 18, 19, 21, 22, Nov. 25 to Mar. 30.

Peshtigo River at Peshtigo, Wis.

Location.--Lat 45°02'50", long 87°44'40", in NE¼ sec. 30, T. 30 N., R. 22 E., on left bank 75 ft downstream from Chicago and North Western Railway bridge, half a mile downstream from Wisconsin Public Service Corp. powerplant in Peshtigo, and 11½ miles upstream from mouth.

Drainage area.--1,124 sq mi.

Records available.--June 1953 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 584.64 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 3,680 cfs Apr. 20 (gage height, 7.07 ft); minimum daily, 84 cfs Aug. 5.

1953-57: Maximum discharge, 4,380 cfs May 3, 1954 (gage height, 7.78 ft); minimum, 32 cfs Aug. 28, 1953 (gage height, 1.46 ft); minimum daily, that of Aug. 5, 1957.

Remarks.--Records good except those for periods of ice effect, which are fair. Diurnal fluctuation caused by powerplant half a mile above station.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	362	562	468	365	170	330	448	1,270	1,050	136	211	979
2	566	480	564	380	280	350	776	1,220	752	242	240	486
3	442	592	414	410	310	335	655	1,040	444	440	359	340
4	495	415	366	450	240	350	908	1,020	685	452	92	604
5	323	*259	530	490	230	454	890	805	648	239	84	732
6	498	569	636	460	310	526	1,010	572	996	446	85	823
7	486	370	*503	344	240	536	646	903	1,080	376	290	878
8	165	438	414	*378	310	336	514	708	936	295	149	576
9	317	664	511	400	290	548	*884	670	568	*532	161	354
10	326	656	325	420	250	658	960	660	388	815	346	400
11	340	622	448	430	290	444	945	734	770	694	164	452
12	465	452	495	310	320	415	1,040	664	580	500	150	499
13	349	748	466	330	215	693	1,010	398	726	474	140	290
14	271	541	664	300	310	912	726	797	571	258	254	459
15	132	500	465	350	*360	1,210	747	1,400	714	233	372	558
16	339	906	324	310	330	1,280	1,360	1,250	587	385	*242	370
17	530	836	360	260	300	1,080	1,260	1,370	936	266	330	*600
18	414	385	390	300	230	904	1,100	1,620	838	299	100	852
19	353	366	412	260	320	762	1,300	1,970	795	279	280	799
20	474	714	465	210	350	770	2,190	902	774	412	230	758
21	394	736	400	300	265	*884	2,560	962	552	292	329	854
22	222	878	522	480	320	1,100	2,940	1,220	536	201	246	474
23	440	200	634	260	265	1,300	2,590	1,060	462	493	472	360
24	337	342	473	240	368	1,500	2,570	968	328	287	482	770
25	424	380	518	320	261	847	2,540	*1,090	713	239	470	202
26	414	372	506	230	374	882	2,490	984	500	203	179	449
27	420	458	338	170	414	768	2,640	1,260	486	192	352	348
28	288	534	472	200	421	1,030	2,350	1,600	438	222	242	495
29	304	503	448	310	-	928	2,090	938	418	180	496	278
30	521	338	355	300	--------	1,060	1,720	1,240	326	430	462	238
31	444	--------	380	250	--------	760	--------	635	--------	292	826	--------
Total	11,855	15,816	14,266	10,217	8,343	23,952	43,859	31,930	19,597	10,804	8,835	16,277
Mean	382	527	460	330	298	773	1,462	1,030	653	349	285	543
Cfsm	0.340	0.469	0.409	0.294	0.265	0.688	1.30	0.916	0.581	0.310	0.254	0.483
In.	0.39	0.52	0.47	0.34	0.28	0.79	1.45	1.06	0.65	0.36	0.29	0.54

Calendar year 1956: Max 3,280 Min 132 Mean 692 Cfsm 0.616 In. 8.37
Water year 1956-57: Max 2,940 Min 84 Mean 591 Cfsm 0.526 In. 7.14

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 30 to Jan. 3, Jan. 5, 6, Jan. 9 to Feb. 23, Mar. 1-4.

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 George Tyrrell's cottage, 3½ miles east of Lakewood.

Drainage area.--2 sq mi, approximately.

Records available.--August 1936 to September 1957 (fragmentary).

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

Extremes.--Maximum elevation observed during year, 95.08 ft Apr. 11; minimum observed, 94.38 ft Aug. 23.
1936-57: 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 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								-	-	-	-	
2								-	-	4.68	-	
3								-	-	-	4.56	
4								-	4.84	4.68	-	
5								-	-	4.67	4.48	
6								-	-	-	-	
7								-	4.84	4.63	4.44	
8		4.81						-	-	-	-	
9								-	-	-	4.48	
10								-	-	4.62	-	
11							5.08	-	4.80	-	-	
12								-	-	-	-	
13								-	-	4.64	4.44	
14								4.96	4.80	4.62	4.44	
15								-	-	-	4.46	
16								-	4.90	-	-	
17								4.95	-	4.60	4.44	
18								-	-	-	-	
19								-	4.86	-	4.40	
20								-	-	4.56	-	4.58
21								4.88	4.84	-	-	
22								-	-	4.54	-	
23								-	4.80	-	4.38	
24								4.86	-	-	-	
25								-	-	4.58	4.46	
26								-	4.76	-	-	
27								-	-	4.56	-	
28								4.88	-	-	4.40	
29								-	4.70	4.54	-	
30					-------			-	-	-	-	
31		-------			-------		-------	4.88	-------	4.60	-	-------

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°16'20", long 88°37'55", 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 1957 (fragmentary).

Gage.--Staff gage.

Extremes.--Maximum elevation observed during year, 95.12 ft Apr. 23; minimum observed, 94.54 ft Aug. 14.

1936-57: 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. Lake free of ice Apr. 21.

Elevation, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-						-	-	-	-	-	-
2	-						-	-	4.82	-	-	-
3	-						-	4.90	-	-	-	-
4	-						-	-	-	-	-	-
5	4.93						-	4.85	4.84	-	4.62	-
6	-						-	-	-	-	-	-
7	-						-	-	-	4.68	-	4.66
8	-	4.80					-	-	4.82	4.68	4.78	-
9	-						-	-	4.82	-	-	-
10	-						-	-	-	-	-	4.68
11	-						4.93	-	-	4.63	-	-
12	-						-	-	-	-	-	-
13	4.83						-	4.86	-	4.82	-	-
14	-						4.92	-	-	-	4.54	-
15	-						-	-	-	-	-	-
16	-						-	-	-	-	4.74	-
17	4.80						-	-	4.78	-	-	-
18	-						-	4.82	-	-	-	-
19	-						-	-	-	-	-	4.70
20	4.78						-	4.76	4.78	-	-	4.70
21	-						-	-	-	-	-	-
22	-						-	-	-	-	4.68	-
23	-						5.12	4.80	-	-	-	-
24	-						-	-	-	4.70	4.66	-
25	-						-	-	-	-	4.66	-
26	-						-	-	-	-	4.64	-
27	-						-	-	-	4.68	-	-
28	-						-	-	-	4.68	-	-
29	-						-	-	-	-	-	-
30	-				-------		-	4.83	-	-	-	-
31	-	-------			-------		-------	-	-------	-	-	-------

Note.--Add 90.00 ft to obtain elevation above 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, October 1913 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

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.--46 years (1906-8, 1913-57), 574 cfs.

Extremes.--Maximum discharge during year, 1,480 cfs Apr. 23 (gage height, 3.05 ft); maximum gage height, 3.08 ft Nov. 22 (backwater from ice); minimum daily discharge, 170 cfs Jan. 26-31 (ice affected).

1906-9, 1913-57: Maximum discharge observed, 8,400 cfs Apr. 10, 1922 (gage height, 11.2 ft, from floodmarks), 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 period of ice effect, which are fair.

Revisions (water years).--WSP 384: Drainage area. WSP 1207: 1922. WSP 1307: 1907-8(M), 1914-16(M), 1918-21(M), 1923-33(M), 1937-38(M), 1943(M).

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 27		Mar. 28 to Sept. 30			
0.7	224	0.5	185	1.5	572
1.1	371	.8	275	2.3	992
		1.1	390	3.1	1,510

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	234	254	280	240	180	260	432	871	557	g254	278	481
2	244	254	290	240	180	250	428	759	513	g254	258	602
3	244	260	290	230	190	250	415	682	472	g240	237	572
4	240	*260	290	220	190	250	407	627	454	g244	216	557
5	237	264	300	230	190	240	415	582	424	g250	202	587
6	237	292	*312	240	190	250	419	532	403	g247	200	537
7	234	311	300	250	190	250	441	494	398	g247	195	454
8	231	334	310	*253	190	250	*472	476	390	*264	200	390
9	231	334	250	250	190	250	494	481	378	306	225	366
10	227	334	230	240	200	260	508	463	362	326	258	362
11	224	350	240	240	200	270	504	458	354	300	303	338
12	234	319	250	230	200	280	485	441	350	338	292	303
13	268	282	240	230	*209	300	472	436	342	441	*264	296
14	234	311	240	220	210	350	467	508	334	485	254	292
15	234	338	240	210	220	390	485	692	342	403	244	334
16	231	359	250	200	220	390	547	796	g424	334	268	458
17	237	371	250	190	230	380	622	791	g432	306	370	*572
18	250	355	240	190	230	370	692	713	g494	289	318	547
19	247	346	230	180	230	360	765	672	g428	268	278	499
20	244	346	230	180	220	350	992	632	g398	244	258	445
21	240	330	230	180	220	*350	1,080	587	g370	237	244	424
22	237	300	240	180	230	370	1,300	*532	g338	250	231	411
23	237	240	240	180	240	410	1,470	527	g322	289	240	428
24	234	220	240	180	250	450	1,440	499	g292	278	275	450
25	234	300	250	180	270	470	1,360	476	g289	261	378	419
26	247	310	250	170	280	500	1,220	622	g272	250	358	378
27	268	280	250	170	280	520	1,160	723	g278	247	310	358
28	271	260	260	170	270	547	1,120	728	g275	244	286	346
29	240	250	260	170	-	537	1,040	692	g261	237	286	318
30	234	260	260	170		454	964	627	g258	234	303	314
31	247		250	170		441		582		278	354	
Total	7,451	9,024	7,992	6,383	6,099	10,999	22,616	18,701	11,204	8,845	8,383	12,838
Mean	240	301	258	206	218	355	754	603	373	285	270	428
Cfsm	0.354	0.444	0.381	0.304	0.322	0.524	1.11	0.889	0.550	0.420	0.398	0.631
In.	0.41	0.49	0.44	0.35	0.33	0.60	1.24	1.03	0.61	0.49	0.46	0.70

Calendar year 1956: Max 1,800 Min 210 Mean 388 Cfsm 0.572 In. 7.79
Water year 1956-57: Max 1,470 Min 170 Mean 358 Cfsm 0.528 In. 7.15

Peak discharge (base, 1,500 cfs).--No peak above base.
* Discharge measurement made on this day.
g Computed from once-daily staff-gage readings.
Note.--Stage-discharge relation affected by ice Nov. 22 to Mar. 27.

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 outlet culvert on Silver Lake Street in Portage.

Drainage area.--1 sq mi, approximately.

Records available.--August 1936 to September 1957 (fragmentary).

Gage.--Staff gage.

Extremes.--Maximum elevation observed during year, 92.42 ft June 16; minimum observed, 91.62 ft Sept. 29.
1936-57: Maximum elevation observed, 93.68 ft Apr. 13, 1952, Apr. 24, 1955; 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. Lake covered by ice Dec. 8, 1956, to Mar. 24, 1957.

Elevation, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.31	-	7.32			-	-	-	-	-	-	6.76
2	-	-	-			-	-	-	7.28	-	-	-
3	-	7.04	-			-	-	-	-	-	-	-
4	-	-	-			-	-	-	-	-	6.92	6.72
5	-	-	-				-	7.08	-	-	-	-
6	7.26	-	-			-	-	-	-	-	-	-
7	-	-	-	7.27		-	7.26	-	-	7.14	-	-
8	-	-	7.32			-	-	-	-	-	-	6.68
9	-	7.16	-			-	-	-	7.28	-	-	-
10	-	7.16	-			-	-	-	-	-	-	-
11	-	-	-			-	-	-	-	-	6.90	-
12	-	-	-			-	-	7.04	7.40	-	-	-
13	7.16	-	-			-	-	-	-	-	-	-
14	-	-	-			-	7.20	-	-	7.10	-	-
15	-	-	-			-	-	7.00	-	-	-	6.68
16	-	-	-			-	-	-	7.42	-	-	-
17	-	7.34	-			7.28	-	-	-	-	-	-
18	-	-	-			-	-	7.06	-	-	6.80	-
19	-	-	-			-	-	7.16	-	-	-	-
20	7.14	-	-			-	-	-	-	-	-	-
21	-	-	-			-	7.22	-	-	7.06	-	-
22	-	-	-			-	-	-	-	7.08	-	6.72
23	-	-	-			-	-	-	7.28	-	-	-
24	-	7.36	-			7.30	-	-	-	-	-	-
25	-	-	-			-	-	-	-	-	6.76	-
26	-	-	-			-	-	7.20	-	-	-	-
27	7.08	7.35	-		7.28	7.16	-	-	-	-	-	-
28	-	-	-			-	7.26	-	-	7.02	-	-
29	-	-	-		-	-	7.20	-	-	-	-	6.62
30	-	-	-		-------	-	-	-	7.20	-	-	-
31	-	-------	-		-------	7.16	-------	-	-------	-	-	-------

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

Little Green Lake near Markesan, Wis.

Location.--Lat 43°44'10", long 88°58'25", in sec. 32, T. 15 N., R. 13 E., 200 ft north of lake outlet and 2 miles north of Markesan.

Drainage area.--3.35 sq mi.

Records available.--August 1936 to September 1957 (fragmentary prior to October 1956).

Gage.--Staff gage. From Apr. 28, 1949, to Sept. 26, 1956, at site 0.5 mile north at same datum.

Extremes.--Maximum elevation observed during year, 95.82 ft June 16, 17; minimum observed, 94.88 ft Nov. 14, 15.

1936-57: 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.

Revisions.--WSP 1437: Drainage area.

Elevation, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.12	4.92	4.94	4.92	4.96	5.08	5.18	5.24	5.52	5.66	5.50	5.16
2	5.12	4.92	4.94	4.92	4.96	5.08	5.18	5.22	5.52	5.64	5.50	5.16
3	5.12	4.92	4.94	4.94	4.98	5.08	5.18	5.20	5.50	5.62	5.50	5.16
4	5.12	4.92	4.94	4.94	4.98	5.08	5.18	5.20	5.50	5.62	5.48	5.14
5	5.10	4.92	4.92	4.94	4.98	5.08	5.18	5.18	5.52	5.60	5.46	5.12
6	5.10	4.92	4.92	4.94	5.00	5.08	5.18	5.16	5.52	5.60	5.44	5.12
7	5.10	4.92	4.92	4.94	5.00	5.08	5.26	5.14	5.52	5.58	5.40	5.10
8	5.10	4.91	4.92	4.94	5.00	5.08	5.26	5.12	5.52	5.56	5.38	5.08
9	5.06	4.91	4.92	4.94	5.00	5.08	5.26	5.10	5.50	5.66	5.38	5.06
10	5.04	4.91	4.92	4.94	5.00	5.08	5.26	5.10	5.48	5.64	5.38	5.10
11	5.02	4.90	4.92	4.92	5.02	5.08	5.22	5.10	5.74	5.62	5.36	5.12
12	5.02	4.90	4.92	4.92	5.02	5.08	5.22	5.12	5.74	5.60	5.34	5.12
13	5.02	4.90	4.92	4.92	5.04	5.08	5.22	5.16	5.72	5.60	5.32	5.12
14	5.02	4.88	4.92	4.92	5.04	5.08	5.22	5.38	5.72	5.65	5.32	5.10
15	5.02	4.88	4.92	4.92	5.04	5.08	5.22	5.38	5.72	5.62	5.30	5.08
16	5.02	4.98	4.92	4.92	5.06	5.08	5.22	5.36	5.82	5.60	5.30	5.06
17	5.02	4.98	4.92	4.92	5.06	5.10	5.22	5.36	5.82	5.60	5.29	5.04
18	5.00	4.96	4.92	4.92	5.06	5.12	5.22	5.36	5.80	5.58	5.26	5.02
19	5.00	4.96	4.90	4.92	5.06	5.10	5.22	5.36	5.78	5.58	5.24	5.02
20	5.00	4.94	4.90	4.94	5.06	5.10	5.22	5.36	5.78	5.56	5.22	5.04
21	4.98	4.94	4.90	4.94	5.06	5.10	5.24	5.42	5.76	5.54	5.20	5.04
22	4.98	4.94	4.90	4.96	5.06	5.10	5.24	5.44	5.76	5.60	5.20	5.02
23	4.98	4.94	4.90	4.96	5.06	5.10	5.24	5.44	5.70	5.58	5.18	5.00
24	4.96	4.94	4.90	4.96	5.06	5.12	5.27	5.44	5.68	5.56	5.16	4.98
25	4.96	4.94	4.90	4.96	5.06	5.12	5.28	5.44	5.68	5.56	5.16	4.96
26	4.94	4.94	4.90	4.96	5.06	5.12	5.28	5.48	5.68	5.54	5.14	4.96
27	4.94	4.94	4.90	4.96	5.06	5.12	5.30	5.48	5.66	5.54	5.14	4.96
28	4.94	4.94	4.90	4.96	5.06	5.12	5.28	5.48	5.66	5.54	5.14	4.95
29	4.94	4.94	4.90	4.96	-	5.12	5.26	5.50	5.66	5.53	5.14	4.94
30	4.94	4.94	4.90	4.96	-------	5.12	5.26	5.50	5.66	5.52	5.16	4.93
31	4.94	-------	4.90	4.96	-------	5.18	-------	5.50	-------	5.52	5.16	-------

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°57'15", long 88°57'10", in NE¼ sec. 16, T. 17 N., R. 13 E., on left bank 0.3 mile downstream from government lock, 1 mile south of Huron Street Bridge in Berlin, 2.5 miles upstream from Barnes Creek and at mile 89.0.

Drainage area.--1,430 sq mi.

Records available.--January 1898 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 744.52 ft above mean tide at New York City (by Corps of Engineers). Prior to Oct. 27, 1954, staff gage at site 0.3 mile upstream at same datum.

Average discharge.--59 years, 1,104 cfs.

Extremes.--Maximum discharge during year, 1,690 cfs June 18, 19 (gage height, 10.24 ft); minimum, 389 cfs Aug. 22 (gage height, 6.80 ft).

1898-1957: 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 period of ice effect, which are fair. About 20 cfs diverted into basin from the Wisconsin River throughout most of the year.

Revisions (water years).--WSP 1337: 1910.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-8)

6.9	409
7.4	524
8.0	704
9.0	1,080
10.3	1,730

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	642	608	900	580	510	810	907	1,070	1,440	828	572	522
2	661	*599	900	560	520	830	846	996	1,400	791	529	522
3	624	596	900	550	530	840	846	938	1,340	816	540	499
4	652	596	900	550	540	860	787	892	1,300	773	492	482
5	624	602	900	540	550	880	888	884	1,280	748	497	482
6	630	645	840	530	540	900	1,110	911	1,240	731	497	482
7	584	721	760	530	540	900	1,310	895	1,180	681	464	454
8	572	770	680	530	550	920	1,450	884	1,140	738	487	457
9	534	762	700	540	560	950	1,500	903	1,100	731	480	448
10	540	773	720	540	570	980	1,540	850	1,060	694	522	430
11	556	770	760	530	*581	1,050	1,560	861	1,170	704	*509	470
12	587	752	740	520	590	1,050	1,560	892	1,340	678	452	473
13	593	756	700	510	600	1,050	1,540	934	1,440	681	468	499
14	596	895	680	500	610	1,050	1,500	996	1,500	*694	499	492
15	567	1,080	700	*482	610	1,000	1,440	1,240	1,540	674	480	477
16	556	1,220	700	470	610	953	*1,390	1,360	1,610	671	426	504
17	550	1,320	700	460	610	861	1,340	1,440	1,650	684	428	480
18	537	1,340	680	450	590	*876	1,280	1,480	1,690	674	454	509
19	509	1,380	660	450	580	773	1,260	1,500	1,690	633	443	509
20	532	1,400	650	460	570	780	1,390	1,500	1,650	620	420	487
21	542	1,300	650	470	580	884	1,460	*1,480	1,590	627	448	509
22	516	1,250	650	490	590	926	1,480	1,500	1,520	633	409	522
23	473	1,200	650	510	610	961	1,480	1,480	1,430	602	415	499
24	441	1,150	650	530	630	957	1,420	1,460	1,340	602	459	494
25	506	1,100	650	540	670	865	1,360	1,420	1,210	611	445	532
26	611	1,050	650	530	720	791	1,280	1,440	1,120	611	426	487
27	611	1,050	660	520	760	869	1,230	1,450	1,060	608	424	426
28	617	1,000	660	520	800	918	1,180	1,460	1,010	624	441	452
29	624	970	650	520	-	907	1,160	1,450	969	572	468	487
30	624	910	620	510	-------	918	1,110	1,450	903	608	459	473
31	633	-------	600	510	-------	930	-------	1,450	-------	590	499	-------
Total	17,844	28,565	22,260	15,932	16,721	28,239	38,604	37,466	39,912	20,932	14,552	14,559
Mean	576	952	718	514	597	911	1,287	1,209	1,330	675	469	485
Cfsm	0.403	0.666	0.502	0.359	0.417	0.637	0.900	0.845	0.930	0.472	0.328	0.339
In.	0.46	0.74	0.58	0.41	0.43	0.73	1.00	0.97	1.04	0.54	0.38	0.38

Calendar year 1956: Max 3,970 Min 360 Mean 1,032 Cfsm 0.722 In. 9.82
Water year 1956-57: Max 1,690 Min 409 Mean 810 Cfsm 0.566 In. 7.66

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 21 to Mar. 14.

Wolf River above West Branch Wolf River, Wis.

Location.--Lat 44°56'10", long 88°39'15", 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.--October 1927 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Wire-weight gage read once daily. Datum of gage is 856.57 ft above mean sea level (levels by Wisconsin Power & Light Co.). Prior to Sept. 21. 1956, chain gage at same site and datum.

Average discharge.--30 years, 561 cfs.

Extremes.--Maximum discharge during year, 1,520 cfs Apr. 21 (gage height, 4.35 ft, from graph based on gage readings); minimum daily discharge, 230 cfs Aug. 6.
1927-57: Maximum discharge, 2,640 cfs Apr. 8, 1929 (gage height, 6.20 ft, from graph based on gage readings); minimum observed, 199 cfs Feb. 20, 1936.

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

Revisions (water years).--WSP 1337: 1929-30(M), 1931, 1934-35(M), 1939(M), 1941(M), 1944-50(M).

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	210	2.5	564
1.6	281	3.0	788
1.9	362	3.5	1,040
2.2	453	4.3	1,490

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	342	299	390	340	250	350	540	857	552	304	258	644
2	340	299	400	330	250	350	540	817	572	278	254	652
3	351	297	400	320	260	340	537	778	537	274	251	662
4	318	*304	400	320	260	330	521	698	514	278	249	564
5	304	304	400	320	260	320	492	537	484	278	234	541
6	289	376	*411	330	260	320	609	518	440	274	230	521
7	291	246	400	340	260	310	609	552	424	276	244	478
8	297	271	400	340	260	310	564	529	412	400	246	431
9	286	264	360	340	260	310	537	510	400	315	312	415
10	289	537	380	*333	270	320	537	492	394	278	342	388
11	a290	548	380	320	270	320	*510	488	394	*281	326	371
12	286	484	370	310	270	330	492	481	374	437	310	368
13	362	443	370	290	*273	340	481	464	368	525	340	354
14	365	424	360	270	270	360	474	499	450	503	*345	345
15	371	467	360	260	270	400	481	657	460	467	345	a480
16	356	464	360	260	270	400	529	754	537	474	406	a600
17	342	456	360	260	270	380	635	750	556	453	388	a630
18	334	251	360	260	270	370	740	745	609	406	345	a570
19	331	503	370	260	270	360	842	698	568	a281	a340	a520
20	329	488	370	270	270	*351	1,300	680	503	232	310	*481
21	329	a400	380	270	270	360	1,490	652	456	286	320	a500
22	329	304	380	280	290	370	1,270	a600	394	342	318	a520
23	320	340	390	270	310	390	1,150	*533	365	342	329	a540
24	291	370	370	270	320	420	1,100	464	359	320	382	a510
25	284	390	360	260	310	440	1,140	499	348	348	379	a450
26	307	400	370	260	340	460	1,100	635	348	334	365	434
27	310	380	370	250	350	480	1,030	618	340	329	340	a420
28	310	370	360	250	350	500	993	580	334	312	351	a410
29	297	370	360	240	-	520	922	548	329	291	359	409
30	299	380	350	240	--------	530	877	560	330	278	447	397
31	297	--------	350	250	--------	540	--------	537	--------	268	537	--------
Total	9,846	11,429	11,641	8,913	7,833	11,881	23,042	18,730	13,151	10,464	10,202	14,605
Mean	318	381	376	288	280	383	768	604	438	338	329	487
Cfsm	0.502	0.602	0.594	0.455	0.442	0.605	1.21	0.954	0.692	0.534	0.520	0.769
In.	0.58	0.67	0.68	0.52	0.46	0.70	1.35	1.10	0.77	0.61	0.60	0.86

Calendar year 1956: Max 1,600 Min 246 Mean 463 Cfsm 0.731 In. 9.96
Water year 1956-57: Max 1,490 Min 230 Mean 416 Cfsm 0.657 In. 8.90

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for station at Keshena Falls.
Note.--Stage-discharge relation affected by ice Nov. 23 to Apr. 2.

Wolf River at Keshena Falls, Wis.

Location.--Lat 44°53'30", long 88°39'20", 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 136.4.

Drainage area.--812 sq mi.

Records available.--May 1907 to March 1909, October 1910 to September 1957. Monthly discharge only for some periods, published in WSP 1307. Published as "at Keshena" prior to March 1928.

Gage.--Water-stage recorder. Datum of gage is 820.0 ft above mean sea level (levels by Wisconsin Power and Light Co.). Prior 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.--48 years (1907-8, 1910-57), 758 cfs.

Extremes.--Maximum discharge during year, 2,070 cfs Apr. 21 (gage height, 7.44 ft); minimum, 252 cfs Aug. 8 (gage height, 5.05 ft).

1907-9, 1910-57: 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, which are fair. Diurnal fluctuation caused by powerplant upstream.

Revisions (water years).--WSP 664: Drainage area (site at Keshena). WSP 1337: 1914-15(M), 1918-19(M), 1921, 1923(M), 1926(M), 1928(M), 1933.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

5.0	229	6.5	1,230
5.2	321	7.0	1,650
5.6	546	7.4	2,030
6.0	840		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	459	386	500	400	350	480	720	1,030	712	424	341	916
2	453	402	500	390	360	470	770	986	742	346	326	924
3	381	408	510	390	360	450	720	947	683	326	312	908
4	381	*355	520	390	350	410	668	901	653	375	274	870
5	441	360	530	390	350	390	646	870	595	360	260	810
6	360	476	*530	400	350	380	668	779	574	321	265	734
7	331	638	520	400	350	380	697	690	595	365	302	638
8	360	764	520	400	360	380	705	690	527	436	260	560
9	392	742	520	400	370	380	712	675	470	476	298	482
10	355	697	520	*397	380	390	683	660	508	408	370	430
11	360	675	520	390	390	390	*660	623	533	*350	436	488
12	392	638	520	390	400	400	638	602	533	540	355	476
13	447	553	520	380	*398	410	616	574	a540	675	413	465
14	459	514	530	360	390	430	609	690	a550	683	*447	392
15	419	595	550	340	390	460	560	901	a620	616	413	595
16	459	560	540	320	390	480	660	971	a720	623	465	787
17	465	540	530	330	390	490	734	963	a770	595	441	817
18	453	514	540	340	380	500	908	939	779	546	381	734
19	402	567	560	350	380	500	1,020	908	772	476	402	668
20	419	553	570	360	380	*492	1,610	863	675	402	402	*623
21	436	533	580	370	390	500	2,020	810	602	397	381	616
22	392	514	560	370	400	520	1,700	779	527	441	386	668
23	413	510	540	360	410	550	1,500	*660	501	436	386	705
24	402	500	510	340	410	580	1,370	638	476	508	546	675
25	355	500	490	340	430	610	1,390	668	470	459	501	609
26	350	510	480	330	460	650	1,360	893	447	424	470	546
27	402	520	470	330	470	690	1,280	901	408	408	441	520
28	419	510	470	340	480	720	1,200	825	413	397	386	508
29	397	510	460	340	-	730	1,130	772	413	375	413	488
30	370	500	450	340	--------	720	1,070	817	430	370	459	470
31	326	--------	430	340	--------	680	--------	749	--------	360	595	--------
Total	12,450	16,044	15,990	11,317	10,918	15,612	29,024	24,774	17,238	13,918	12,127	19,122
Mean	402	535	516	365	390	504	967	799	575	449	391	637
Cfsm	0.495	0.659	0.635	0.449	0.480	0.621	1.19	0.984	0.708	0.553	0.482	0.784
In.	0.57	0.73	0.73	0.52	0.50	0.72	1.33	1.13	0.79	0.64	0.56	0.88

Calendar year 1956:	Max	1,670	Min	310	Mean	589	Cfsm	0.725	In.	9.87
Water year 1956-57:	Max	2,020	Min	260	Mean	544	Cfsm	0.670	In.	9.10

Peak discharge (base, 1,500 cfs).--Apr. 21 (1 p.m.) 2,070 cfs (7.44 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage, daily generation at Shawano powerplant, and records for station above West Branch Wolf River.

Note.--Stage-discharge relation affected by ice Nov. 23 to Apr. 3 (no gage-height record Mar. 2-9).

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 highway 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 1957.

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.--38 years, 286 cfs.

Extremes.--Maximum discharge during year, 1,310 cfs Apr. 21 (gage height, 5.35 ft); minimum, 27 cfs Nov. 22 (gage height, 2.42 ft), result of freezeup.

1919-57: Maximum discharge, 6,920 cfs Apr. 10, 1922 (gage height, 11.6 ft, from graph based on gage readings), 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.

Revisions (water years).--WSP 1337: 1920-26(M), 1928, 1929-30(M), 1933-34, 1936-37, 1938(M), 1940.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 11 to Sept. 30)

2.5	42	4.0	585
3.0	158	5.3	1,280
3.5	345		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	84	112	145	100	72	110	235	278	390	93	82	177
2	102	120	191	130	60	120	225	266	314	97	78	168
3	100	*110	125	100	54	120	198	249	236	95	85	153
4	110	136	113	84	46	110	207	200	210	88	83	94
5	101	82	*136	94	58	100	192	224	197	97	63	105
6	87	133	185	120	64	110	219	164	175	94	67	101
7	74	264	152	76	72	94	221	148	163	75	64	106
8	97	325	200	96	68	90	299	183	158	99	68	94
9	113	256	180	88	80	88	285	183	146	100	59	76
10	106	207	190	*98	68	82	334	185	114	93	84	88
11	72	161	150	110	62	80	339	223	169	89	68	85
12	86	146	110	110	*82	120	*288	201	128	*103	61	93
13	98	118	160	100	76	90	253	182	188	104	*93	86
14	79	179	150	86	70	170	220	231	142	136	76	80
15	104	129	100	90	64	280	249	470	272	96	88	82
16	113	226	140	92	80	300	227	542	239	146	78	185
17	112	180	96	80	70	350	302	509	385	90	68	208
18	110	170	100	60	70	300	391	431	348	91	83	153
19	69	142	110	66	80	*233	435	322	284	85	61	94
20	98	207	130	58	70	200	850	300	226	88	64	145
21	90	169	100	50	76	190	1,240	272	210	80	68	93
22	107	70	100	56	78	177	1,190	*263	162	74	69	123
23	115	130	110	60	68	205	920	183	144	123	85	103
24	107	170	110	66	82	295	739	163	122	114	90	94
25	85	205	120	72	66	350	582	198	119	73	56	102
26	138	208	100	56	100	339	562	394	157	61	78	94
27	86	149	120	46	110	279	546	708	111	74	106	84
28	127	118	110	44	100	272	501	606	99	78	105	84
29	110	150	110	50	-	259	429	445	146	76	84	84
30	128	160	120	54	--------	238	295	401	86	85	85	*79
31	101	--------	86	76	--------	230	--------	447	--------	82	127	--------
Total	3,109	4,932	4,049	2,468	2,046	5,981	12,973	9,571	5,840	2,879	2,426	3,313
Mean	100	164	131	79.6	73.1	193	432	309	195	92.9	78.3	110
Cfsm	0.253	0.415	0.332	0.202	0.185	0.489	1.09	0.782	0.494	0.235	0.198	0.278
In.	0.29	0.46	0.38	0.23	0.19	0.56	1.22	0.90	0.55	0.27	0.23	0.31

Calendar year 1956: Max 2,300 Min 68 Mean 215 Cfsm 0.544 In. 7.39
Water year 1956-57: Max 1,240 Min 44 Mean 163 Cfsm 0.413 In. 5.59

Peak discharge (base, 1,100 cfs).--Apr. 21 (8:30 p.m.) 1,310 cfs (5.35 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 23, 24, 29, 30, Dec. 8 to Mar. 21.

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 100 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.--March 1896 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

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.--61 years, 1,708 cfs.

Extremes.--Maximum discharge during year, 3,320 cfs Apr. 28 (gage height, 6.11 ft); minimum, 396 cfs Aug. 6, 10, 11, 12 (gage height, 0.00 ft).
1896-1957: Maximum discharge observed, 15,500 cfs Apr. 13, 1922 (gage height, 11.4 ft); minimum daily, 150 cfs Mar. 1, 1900.
Maximum stage known, 11.6 ft Apr. 16, 1888, from information by Corps of Engineers.

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

Revisions (water years).--WSP 1114: 1943(M). WSP 1337: 1931.

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 5 to Aug. 2, Sept. 21-30)

Oct. 1 to May 14				May 15 to Sept. 30			
0.3	540	4.0	1,980	-0.1	380	2.0	1,230
1.0	775	6.1	3,310	.5	620	4.0	2,140
2.0	1,160			1.0	820	5.0	2,690

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	688	656	740	720	600	820	1,250	2,890	2,380	724	616	728
2	688	635	740	700	610	800	1,240	2,660	2,190	684	544	864
3	713	*610	740	680	610	760	1,220	2,460	1,960	680	480	1,060
4	779	600	740	690	610	720	1,220	2,260	1,710	676	456	1,130
5	731	659	750	720	600	680	1,260	2,110	1,550	592	448	1,240
6	764	745	770	730	600	640	1,350	1,900	1,430	496	428	1,180
7	745	738	800	740	600	620	1,440	1,740	1,320	568	428	1,090
8	713	768	800	740	600	620	1,590	1,500	1,260	604	440	1,020
9	597	973	800	730	600	630	1,760	1,360	1,170	552	456	964
10	552	1,050	790	720	600	650	1,800	1,270	1,090	600	416	896
11	632	1,080	770	*702	580	670	1,840	1,310	1,090	636	420	844
12	666	1,040	750	690	*571	700	*1,810	1,320	1,090	*660	432	784
13	695	951	740	680	580	740	1,700	1,340	1,140	628	*508	744
14	724	955	740	660	600	780	1,600	1,390	1,130	672	528	772
15	688	944	750	610	630	900	1,510	1,810	1,160	760	504	808
16	691	1,000	760	580	640	1,000	1,450	2,180	1,190	856	480	832
17	742	1,040	760	580	630	1,050	1,470	2,400	1,360	900	536	792
18	745	1,030	770	580	600	1,060	1,480	2,550	1,470	884	504	984
19	756	1,010	760	610	600	1,050	1,590	2,590	1,530	840	512	1,090
20	771	977	760	630	600	1,050	2,000	2,610	1,490	820	480	1,090
21	709	929	760	640	610	1,040	2,390	2,440	1,390	772	448	1,060
22	695	910	770	640	620	1,040	2,620	*2,340	1,350	760	448	1,050
23	684	831	790	640	610	1,050	2,770	2,180	1,180	680	476	996
24	670	782	810	620	620	1,100	2,900	1,950	1,020	648	488	960
25	706	780	820	600	680	1,200	3,010	1,720	956	684	560	984
26	698	780	820	590	740	1,300	3,130	1,940	916	668	636	940
27	656	780	810	580	780	1,450	3,290	2,330	840	672	608	936
28	659	770	800	580	820	1,510	3,310	2,570	784	664	612	888
29	622	760	780	580		1,470	3,250	2,670	736	628	640	836
30	642	750	760	580	--------	1,370	3,090	2,680	684	576	616	756
31	646	--------	740	590	--------	1,290	--------	2,570	--------	580	676	--------
Total	21,467	25,533	23,890	20,132	17,541	29,760	60,340	65,040	38,566	21,164	15,824	28,318
Mean	692	851	771	649	626	960	2,011	2,098	1,286	683	510	944
Cfsm	0.309	0.380	0.344	0.290	0.279	0.429	0.898	0.937	0.574	0.305	0.228	0.421
In.	0.36	0.42	0.40	0.33	0.29	0.49	1.00	1.08	0.64	0.35	0.26	0.47

Calendar year 1956: Max 7,440 Min 552 Mean 1,310 Cfsm 0.585 In. 7.98
Water year 1956-57: Max 3,310 Min 416 Mean 1,007 Cfsm 0.450 In. 6.09

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 25 to Mar. 27.

Little Wolf River at Royalton, Wis.

Location.--Lat 44°24'45", long 88°51'55", in NE¼ sec. 1, T. 22 N., R. 13 E., on right bank 50 ft upstream from highway bridge in Royalton and 6 miles upstream from mouth.

Drainage area.--485 sq mi.

Records available.--January 1914 to September 1957.

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 at present site and datum.

Average discharge.--43 years, 405 cfs.

Extremes.--Maximum discharge during year, 1,080 cfs Apr. 21 (gage height, 2.71 ft); maximum gage height, 2.88 ft Dec. 9 (backwater from ice); minimum discharge, 83 cfs Aug. 6 (gage height, 0.85 ft).

1914-57: 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 periods of ice effect, which are fair. Frequent fluctuation caused by powerplant 6 miles above station.

Revisions (water years).--WSP 1337: 1914-16(M), 1918-19(M), 1921-25(M), 1927(M), 1928-37, 1939(M), 1940, 1945-46(M), 1948(M), 1950(M). Revised figures of discharge, in cubic feet per second, for high-water period in water year 1943, superseding those published in WSP 974, and 1307, are given herewith:

1943		1943-Con.	
Mar. 25	800	Mar. 28	4,000
26	1,500	29	4,200
27	3,000	30	3,800

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
March 1943	29,143	4,200	280	940	1.94	2.23
Water year 1942-43	191,358	4,200	215	524	1.08	14.69
Calendar year 1943	177,547	4,200	120	486	1.00	13.63

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.9	94	1.7	407
1.1	141	2.0	591
1.4	251	2.7	1,070

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	158	151	174	154	130	220	287	339	396	144	148	174
2	164	201	215	158	125	160	323	378	373	141	148	178
3	240	*154	174	150	125	200	282	264	301	148	141	185
4	178	148	256	155	150	160	274	264	196	154	114	181
5	158	189	*171	150	180	155	287	279	274	192	112	274
6	174	211	268	145	150	150	318	266	256	144	94	130
7	164	298	243	145	145	150	367	271	178	148	130	130
8	161	377	185	150	140	150	454	211	256	158	94	133
9	164	324	310	145	135	200	496	247	158	164	112	136
10	158	221	185	140	135	160	496	243	204	167	136	144
11	154	164	240	*141	130	150	515	334	192	151	128	148
12	154	252	181	140	*118	150	436	274	254	148	196	136
13	161	174	154	140	115	160	356	296	196	*151	*136	141
14	164	284	167	140	115	380	334	367	253	151	112	154
15	154	204	244	140	130	420	*318	546	239	148	112	270
16	154	325	185	140	140	450	350	637	367	196	114	185
17	151	325	185	135	135	380	384	598	289	161	117	257
18	158	211	224	130	130	350	460	540	323	164	114	174
19	151	292	154	130	135	*330	442	503	292	196	125	218
20	151	264	161	125	140	282	826	425	239	148	119	178
21	148	192	207	125	150	264	1,030	367	219	154	130	154
22	204	240	181	130	150	312	1,040	*345	243	158	110	158
23	148	270	174	130	150	323	1,000	307	154	138	141	178
24	144	207	245	130	150	373	881	243	154	138	141	178
25	144	269	164	135	200	350	677	301	231	125	196	161
26	148	174	154	130	280	396	565	683	161	125	148	148
27	138	237	192	100	230	339	644	860	141	144	141	144
28	188	181	185	105	240	307	546	805	192	144	141	151
29	204	231	158	140	-	287	466	690	161	148	144	141
30	154	158	227	150		274	407	540	151	125	122	125
31	151		158	140		274		454		154	219	
Total	5,042	6,928	6,121	4,268	4,253	8,256	15,261	12,877	7,043	4,733	4,116	5,037
Mean	163	231	197	138	152	266	509	415	235	153	133	168
Cfsm	0.336	0.476	0.406	0.285	0.313	0.548	1.05	0.856	0.485	0.315	0.274	0.346
In.	0.39	0.53	0.47	0.33	0.33	0.63	1.17	0.99	0.54	0.36	0.32	0.39

Calendar year 1956:	Max	3,530	Min	125	Mean	298	Cfsm	0.614	In. 8.39
Water year 1956-57:	Max	1,040	Min	94	Mean	230	Cfsm	0.474	In. 6.45

Peak discharge (base, 1,600 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 22, 23, Dec. 8-11, Jan. 3 to Mar. 19.

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 1957. 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. 19, 1917, chain gage at site 1 mile downstream at different datum. Oct. 19, 1917, to Nov. 23, 1938, chain gage on bridge at present site and datum.

Average discharge.--41 years, 242 cfs.

Extremes.--Maximum discharge during year, 353 cfs Apr. 21 (gage height, 1.96 ft); maximum gage height, 3.35 ft Nov. 22 (backwater from ice); minimum discharge, 84 cfs Aug. 16 (gage height, 0.97 ft); minimum daily, 120 cfs Jan. 17, 18.

1916-57: 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 discharge, 38 cfs June 7, 1947; minimum daily, 50 cfs Jan. 22, 28, 1926.

Revisions.--The maximum discharge for the water year 1949, published in WSP 1144 and 1307, was affected by ice; the correct maximum is 652 cfs Apr. 26, 1949 (gage height, 2.73 ft).

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

Revisions (water years).--WSP 1054: 1926(m). WSP 1084: 1919, 1922-24, 1938, 1940, 1942(M), 1944(M), 1945-46. WSP 1337: 1917-28(M), 1930, 1931-35(M), 1937-38(M), 1946, 1947(m), 1950(M).

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	108
1.5	202
2.0	367

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	162	162	180	150	130	230	181	181	205	143	145	154
2	166	*166	190	145	130	200	192	181	194	138	145	150
3	166	166	190	145	130	190	184	169	176	152	140	164
4	169	166	*186	150	130	180	184	179	181	174	143	174
5	169	159	179	155	135	190	192	174	171	159	138	166
6	157	197	179	155	140	200	211	157	174	129	129	154
7	162	234	186	155	150	210	222	171	159	140	129	147
8	164	211	190	150	160	200	219	154	152	154	136	143
9	162	197	190	160	160	190	234	171	162	189	143	140
10	159	184	180	150	165	190	228	176	152	159	145	131
11	159	181	165	*151	*165	190	222	169	174	157	159	150
12	162	174	160	150	165	200	214	179	181	154	*147	154
13	150	176	160	140	160	220	199	171	174	*154	147	157
14	164	176	155	135	160	250	197	211	194	164	150	152
15	166	197	150	130	155	276	*186	237	174	154	152	166
16	159	222	155	125	150	282	199	234	176	154	121	176
17	162	214	160	120	145	202	199	216	184	186	143	176
18	171	199	160	120	140	*194	197	225	189	184	129	166
19	159	194	160	125	140	199	205	216	184	162	138	162
20	162	194	170	130	135	194	306	194	171	157	131	159
21	164	199	175	130	135	189	338	*197	162	159	131	171
22	166	190	170	135	135	197	250	181	162	174	131	162
23	164	175	165	135	140	202	265	174	152	171	138	162
24	166	160	165	135	150	202	240	176	145	154	145	159
25	164	175	170	135	190	194	225	192	159	152	154	145
26	162	185	175	135	250	199	222	293	164	152	152	152
27	164	190	165	130	260	186	211	310	154	157	140	157
28	157	190	175	130	250	184	205	250	154	154	138	147
29	157	185	170	130	-	181	197	219	154	154	152	152
30	164	180	160	130	--------	186	194	228	143	152	162	143
31	159	--------	150	130	--------	186	--------	211	--------	152	157	--------
Total	5,037	5,598	5,285	4,296	4,455	6,293	6,518	6,196	5,076	4,894	4,410	4,691
Mean	162	187	170	139	159	203	217	200	169	158	142	156
Cfsm	0.531	0.613	0.557	0.456	0.521	0.666	0.711	0.656	0.554	0.518	0.466	0.511
In.	0.61	0.68	0.64	0.52	0.54	0.77	0.79	0.76	0.62	0.60	0.54	0.57

Calendar year 1956: Max 1,570 Min 125 Mean 199 Cfsm 0.652 In. 8.87
Water year 1956-57: Max 338 Min 120 Mean 172 Cfsm 0.564 In. 7.64

Peak discharge (base, 670 cfs).--No peak above base.
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 22 to Dec. 3, Dec. 8 to Mar. 14.

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 and North Western Railway 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, approximately, at lake outlet at Menasha Dam.

Records available.--October 1938 to September 1957 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, 2d session, contains semi-monthly 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 by 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, 3.30 ft May 30, June 5; minimum observed, 0.79 ft Mar. 17.

1857-1957: 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 in. above crest of Menasha Dam down to crest during navigation season, plus additional 18 to 24 in. below crest during winter. Oshkosh staff gage gives level of lake, while Deuchman gage readings are affected by loss of head in channel between lake and dam.

Cooperation.--Records furnished by Corps of Engineers.

Gage height, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.65	2.35	2.35	2.15	1.43	0.90	1.14	2.59	3.28	3.02	2.70	2.20
2	2.65	2.30	2.35	2.15	1.41	.90	1.18	2.62	3.27	3.00	2.70	2.22
3	2.68	2.30	2.35	2.10	1.35	.90	1.15	2.67	3.25	3.00	2.68	2.10
4	2.59	2.30	2.35	2.10	1.30	.89	1.18	2.59	3.25	3.00	2.65	2.21
5	2.62	2.30	2.35	2.10	1.28	.89	1.20	2.63	3.30	2.94	2.60	2.20
6	2.60	2.30	2.38	2.05	1.26	.89	1.23	2.62	3.22	2.95	2.58	2.20
7	2.60	2.25	2.38	2.03	1.23	.90	1.40	2.68	3.20	2.89	2.50	2.20
8	2.55	2.25	2.34	2.00	1.23	.90	1.48	2.65	3.20	2.85	2.43	2.20
9	2.58	2.25	2.31	1.92	1.21	.87	1.40	2.68	3.22	2.90	2.55	2.20
10	2.58	2.27	2.32	1.90	1.20	.85	1.53	2.67	3.11	2.88	2.55	2.16
11	2.52	2.25	2.28	1.89	1.20	.80	1.40	2.75	3.25	2.84	2.50	2.15
12	2.52	2.20	2.30	1.89	1.19	.82	1.54	2.78	3.23	2.90	2.50	2.20
13	2.51	2.13	2.30	1.89	1.18	.84	1.65	2.78	3.21	2.85	2.50	2.12
14	2.49	2.20	2.25	1.89	1.13	.82	1.61	2.71	3.20	2.88	2.42	2.16
15	2.50	2.40	2.24	1.86	1.12	.80	1.70	2.88	3.18	2.85	2.38	2.12
16	2.51	2.30	2.25	1.86	1.08	.80	1.75	3.00	3.21	2.85	2.34	2.15
17	2.49	2.38	2.20	1.80	1.05	.79	1.77	3.00	3.23	2.80	2.34	2.12
18	2.50	2.36	2.20	1.75	1.03	.82	1.82	3.00	3.20	2.80	2.32	2.15
19	2.50	2.35	2.20	1.75	1.01	.85	1.80	3.00	3.20	2.80	2.32	2.10
20	2.48	2.40	2.20	1.73	1.00	.87	2.00	3.00	3.15	2.80	2.32	2.18
21	2.48	2.40	2.20	1.65	.98	.90	2.00	3.00	3.10	2.78	2.32	2.18
22	2.48	2.34	2.20	1.63	.96	.90	2.10	2.90	3.08	2.82	2.28	2.17
23	2.48	2.40	2.20	1.63	.94	.90	2.20	3.05	3.12	2.86	2.25	2.15
24	2.45	2.41	2.20	1.58	.94	.94	2.30	3.13	3.15	2.82	2.30	2.12
25	2.45	2.40	2.18	1.56	.98	.93	2.30	3.13	3.10	2.75	2.26	2.10
26	2.45	2.40	2.20	1.53	.96	.92	2.21	3.21	3.10	2.72	2.20	2.12
27	2.40	2.40	2.20	1.53	.90	1.00	2.38	3.29	3.09	2.75	2.20	2.10
28	2.38	2.40	2.20	1.50	.90	1.20	2.49	3.25	3.06	2.74	2.20	2.10
29	2.35	2.37	2.20	1.50	-	1.00	2.49	3.22	3.06	2.70	2.18	2.10
30	2.35	2.37	2.20	1.45	-------	1.10	2.57	3.30	3.04	2.70	2.18	2.10
31	2.35	-------	2.15	1.45	-------	1.10	-------	3.27	-------	2.70	2.20	-------

Lake de Neveu near Fond du Lac, Wis.

Location.--Lat 43°44'10", long 88°23'45", in SW¼ sec. 30, T. 15 N., R. 18 E., at boathouse near north end of lake on farm of Nick Giebel, 3.9 miles southeast of the intersection of Main and Division Streets in Fond du Lac.

Drainage area.--0.9 sq mi, approximately.

Records available.--August 1936 to September 1957 (fragmentary).

Gage.--Reference point in lake bed.

Extremes.--Maximum elevation observed during year, 97.71 ft May 22; minimum observed, 97.24 ft Sept. 10.

1936-57: Maximum elevation observed, 98.32 ft Mar. 27, 1950; minimum observed, 96.90 ft Aug. 15, 1936.

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

Revisions.--WSP 1437: Drainage area.

Elevation, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	-	-	7.40	7.50	7.45	-	-	-	-	-
2	7.28	7.35	-	-	-	-	-	-	-	7.41	7.40	-
3	-	-	-	-	-	-	-	7.40	-	-	-	7.27
4	-	-	7.45	-	-	7.51	-	-	7.51	-	-	-
5	7.27	-	-	-	7.38	-	7.56	-	-	7.38	-	-
6	-	7.38	-	-	-	-	-	-	-	-	7.35	7.27
7	-	-	7.47	-	-	-	-	7.37	7.51	-	-	-
8	-	-	-	-	7.40	7.48	-	-	-	-	-	-
9	7.27	7.40	-	-	-	-	7.57	-	-	7.37	7.35	-
10	-	-	-	-	-	-	-	7.40	-	-	-	7.24
11	-	-	7.43	-	-	-	-	-	7.55	-	-	-
12	7.28	-	-	-	7.45	7.44	7.53	-	-	7.38	-	-
13	-	7.46	-	-	-	-	-	-	-	-	7.31	7.28
14	-	-	7.42	-	-	-	-	7.52	7.51	-	-	-
15	-	-	-	-	7.41	7.43	-	-	-	-	-	-
16	7.28	7.60	-	-	-	-	7.50	-	-	7.37	7.30	-
17	-	-	-	-	-	-	-	7.49	-	-	-	7.26
18	-	-	7.42	-	-	-	-	-	7.53	-	-	7.26
19	7.30	-	-	-	7.38	7.49	7.53	-	-	7.35	-	-
20	-	7.56	-	-	-	-	-	-	-	-	7.28	7.26
21	-	-	7.41	-	-	-	-	-	7.45	-	-	-
22	-	-	-	-	7.39	7.47	7.53	7.71	-	-	-	-
23	7.30	7.55	-	-	-	-	-	-	-	7.42	7.25	-
24	-	-	-	-	-	-	-	7.69	-	-	-	7.29
25	-	-	7.42	7.42	-	-	7.53	-	7.41	-	-	-
26	7.31	-	-	-	7.54	7.45	7.53	-	-	7.38	-	-
27	-	7.51	-	-	-	-	-	-	-	-	7.25	7.27
28	-	-	7.42	-	-	-	-	7.61	7.41	-	-	-
29	-	-	-	7.41	-	7.46	-	-	-	-	-	-
30	7.31	7.46	-	-	-------	-	7.49	-	-	7.44	7.27	-
31	-	-------	-	-	-------	-	-------	7.59	-------	-	-	-------

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 1917 (monthly discharge only), October 1917 to September 1957.

Gage.--Recording headwater and tailwater gages and electric generation data taken each half hour are used to compute the discharge records.

Average discharge.--61 years, 4,190 cfs.

Extremes.--Maximum daily discharge during year, 5,830 cfs May 29, minimum daily, 1,350 cfs Sept. 4.

1917-57: Maximum daily discharge, 24,000 cfs Apr. 18, 1952; minimum daily, 138 cfs Aug. 2, 1936.

Remarks.--Records good. Flow regulated by storage in Lake Winnebago, usable capacity 582,000 acre-ft (see p. 85). Daily discharge determined from records of flow through turbines, head, gate openings, and lockages through navigation canal. About 20 cfs diverted into basin from Wisconsin River.

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

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,800	2,380	3,490	2,940	3,650	2,900	1,660	2,600	4,800	3,090	2,460	1,650
2	2,330	2,640	3,340	3,450	3,580	2,850	1,620	2,630	5,080	2,720	2,260	1,660
3	2,250	2,490	3,380	4,280	3,250	2,770	1,750	2,360	5,680	3,140	2,160	1,760
4	2,300	2,410	3,310	4,420	4,030	2,900	1,580	2,460	4,960	2,380	1,600	1,350
5	2,290	2,340	3,570	4,120	3,570	2,970	1,960	2,680	4,940	1,910	2,120	1,610
6	2,440	2,590	3,170	4,080	3,580	2,930	1,820	3,040	4,930	2,600	2,080	1,730
7	2,070	2,520	3,370	4,240	3,640	2,760	1,910	2,780	4,570	2,640	1,960	1,520
8	2,090	2,180	3,300	4,220	3,610	2,820	2,040	2,330	4,880	2,650	2,300	1,610
9	1,860	2,270	3,310	3,790	3,480	2,880	1,990	1,970	4,400	1,630	1,980	1,660
10	1,860	2,780	3,410	3,660	3,340	2,680	1,780	2,040	4,610	2,180	2,170	1,660
11	2,320	2,500	3,070	4,100	3,340	3,130	1,840	2,100	4,840	2,140	1,830	1,750
12	2,380	2,150	3,420	3,920	3,340	2,810	1,740	2,030	5,170	1,990	1,710	1,740
13	1,990	2,650	3,230	3,550	3,220	2,840	1,890	2,420	5,190	2,010	1,940	1,650
14	1,760	2,420	3,120	3,790	3,310	3,080	1,690	3,120	5,170	1,690	1,800	1,540
15	1,910	2,530	3,190	4,050	3,540	2,930	1,860	3,560	5,130	2,300	1,710	1,690
16	1,920	2,650	3,210	3,740	3,260	2,730	1,840	2,800	5,670	2,170	1,830	1,610
17	1,800	2,550	3,210	3,900	3,040	2,800	1,930	3,320	4,840	2,200	2,010	1,550
18	1,680	2,300	2,880	3,930	3,360	2,950	1,890	4,210	5,300	2,400	1,640	1,670
19	1,810	2,820	3,010	3,770	3,190	2,900	2,200	3,880	5,000	2,500	1,930	1,680
20	2,010	2,490	3,170	3,320	3,220	1,970	2,700	3,880	5,210	2,280	1,670	1,520
21	1,840	2,430	3,140	4,170	3,170	1,920	1,930	4,320	4,680	2,120	1,650	1,600
22	1,980	2,130	3,050	3,720	3,260	1,970	2,030	3,150	4,040	2,700	1,660	1,580
23	1,690	2,550	2,850	3,720	3,190	2,140	2,340	3,030	2,930	2,720	1,770	1,660
24	2,540	2,640	2,920	3,690	3,490	1,960	2,300	3,520	3,080	2,480	1,900	1,600
25	3,130	2,280	2,900	4,020	3,270	1,810	2,680	3,870	3,240	2,470	1,750	1,530
26	2,360	2,090	3,180	3,440	3,020	2,060	2,310	3,750	3,420	2,400	1,850	1,560
27	2,440	3,310	3,130	3,480	3,080	2,210	2,300	3,980	3,290	2,480	1,730	1,500
28	2,390	3,200	3,100	3,540	2,950	2,170	2,310	5,450	3,270	2,390	1,520	1,680
29	2,660	3,210	3,240	3,520	-	1,980	2,940	5,830	3,090	2,390	1,650	1,540
30	2,560	3,270	2,910	3,660	--------	1,550	2,560	5,660	2,810	2,580	1,740	1,600
31	2,510	--------	2,990	3,590	--------	1,440	--------	5,560	--------	2,510	1,880	--------
Total	67,970	76,770	98,570	117,820	93,980	77,810	61,390	104,330	134,220	73,860	58,260	48,460
Mean	2,193	2,559	3,180	3,801	3,356	2,510	2,046	3,365	4,474	2,383	1,879	1,615
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956:	Max 10,900	Min 1,680	Mean 3,439	Cfsm -	In. -
Water year 1956-57:	Max 5,830	Min 1,350	Mean 2,777	Cfsm -	In. -

Cedar Lake near Kiel, Wis.

Location.--Lat 43°55'35", long 87°56'25", in SW¼ sec. 24, T. 17 N., R. 21 E., at Cedar Lake Resort on narrows of lake, 5.8 miles east of Kiel.

Drainage area.--1.33 sq mi.

Records available.--August 1936 to September 1942, April 1945 to September 1957(fragmentary).

Gage.--Staff gage.

Extremes.--Maximum elevation observed during year, 96.05 ft Feb. 15; minimum observed, 94.68 ft Sept. 30.

1936-42, 1945-57: Maximum elevation observed, 98.72 ft Mar. 9, 1946; minimum observed, that of Sept. 30, 1957.

An elevation of 100.37 ft (corrected) was observed May 20, 1929 (corrected) by Public Service Commission of Wisconsin.

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

Elevation, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	5.61	-	-	-	-	-	5.64	-	-	-
2	-	-	-	-	5.97	-	-	-	-	-	-	-
3	-	5.69	-	5.91	-	5.93	-	-	-	-	5.28	-
4	-	-	-	-	-	-	-	5.68	-	-	-	-
5	-	-	-	5.91	-	-	-	-	-	-	-	-
6	6.01	-	-	-	-	-	5.71	-	-	5.58	-	-
7	-	-	-	-	-	-	-	-	-	-	-	4.90
8	-	-	5.59	-	-	-	-	-	5.70	-	-	-
9	-	5.73	-	-	5.99	5.89	-	-	-	-	-	-
10	-	5.71	-	-	-	-	-	-	-	-	5.20	-
11	-	-	-	-	-	-	-	5.60	-	-	-	-
12	-	-	-	5.91	-	5.82	-	-	-	-	-	-
13	5.85	-	-	-	-	-	5.75	-	-	5.56	-	-
14	-	-	-	-	-	-	-	-	-	-	-	4.86
15	-	-	5.61	-	6.05	-	-	-	5.80	-	-	-
16	-	-	-	-	6.01	5.83	-	-	-	-	5.09	-
17	-	5.67	-	-	-	-	-	-	-	-	5.09	-
18	-	-	-	-	-	-	-	5.66	-	-	-	4.80
19	-	-	-	5.93	-	-	-	-	-	-	-	-
20	5.77	-	-	-	-	-	5.75	-	-	5.50	-	-
21	-	-	-	-	-	-	-	-	-	-	-	4.80
22	-	-	5.69	-	-	-	-	-	5.70	-	-	-
23	-	-	-	-	5.99	5.75	-	-	-	-	-	-
24	-	5.63	-	-	-	-	-	-	-	-	5.00	-
25	-	-	-	-	-	-	5.75	5.68	-	-	-	-
26	-	-	-	5.93	-	-	-	-	-	-	-	-
27	5.63	-	-	-	-	-	5.74	-	-	5.36	-	-
28	-	-	-	-	-	-	-	-	-	-	-	4.70
29	-	-	5.89	-	-	-	-	-	5.60	-	-	-
30	-	-	-	-	-------	5.73	-	-	5.60	5.32	-	4.68
31	-	-------	5.91	-	-------	-	-------	-	-------	-	5.00	-------

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

Sheboygan River at Sheboygan, Wis.

Location.--Lat 43°44'25", long 87°45'35", 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 4.2 miles upstream from mouth.

Drainage area.--403 sq mi.

Records available.--June 1916 to September 1924 (published as "near Sheboygan"), November 1950 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

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.--14 years (1916-24, 1951-57), 238 cfs.

Extremes.--Maximum discharge during year, 694 cfs Apr. 7 (gage height, 4.27 ft), minimum, 8.6 cfs Aug. 19 (gage height, 1.33 ft).
1916-24, 1950-57: 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.

Revisions (water years).--WSP 1307: 1917(M), 1919(M), 1921(M), 1923(M).

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	7	2.2	99
1.4	11	2.5	150
1.6	24	3.0	256
1.8	42	3.6	431
2.0	68	4.2	662

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61	50	84	56	45	198	183	220	278	88	46	30
2	67	58	90	50	45	180	191	183	222	74	44	34
3	72	54	96	48	45	165	172	139	191	64	14	24
4	62	47	*109	52	46	145	150	127	*176	67	13	23
5	71	60	130	54	50	130	234	132	161	50	13	20
6	76	55	178	52	54	120	593	132	143	46	13	24
7	53	71	189	50	60	115	649	129	141	54	21	28
8	61	93	143	48	66	105	525	107	124	64	25	25
9	50	*88	115	47	72	100	444	96	105	57	17	24
10	61	55	84	49	163	120	412	107	99	55	23	23
11	53	49	94	48	150	146	397	97	198	29	20	22
12	68	64	105	46	136	*215	367	97	259	50	25	26
13	57	53	105	44	135	231	331	86	206	29	18	19
14	52	61	96	*43	135	220	289	118	152	44	20	25
15	58	96	84	42	*120	226	254	278	272	46	15	20
16	61	146	82	42	104	224	229	241	303	41	16	16
17	65	168	82	42	92	244	220	181	438	44	14	23
18	54	152	94	42	86	213	220	178	346	22	15	*23
19	50	134	82	43	78	172	236	259	246	30	10	26
20	50	130	74	50	72	178	364	314	210	47	21	39
21	40	154	74	80	70	189	358	291	193	40	14	32
22	57	152	74	90	65	202	305	379	130	39	11	32
23	42	88	91	82	64	340	291	438	150	80	11	31
24	52	105	86	76	67	394	286	376	163	64	15	29
25	53	115	80	66	302	275	*305	355	130	44	15	27
26	54	110	78	60	350	222	358	406	137	37	26	22
27	47	105	74	54	285	185	367	385	120	30	26	15
28	47	98	72	50	240	183	314	326	105	25	16	14
29	61	90	66	47	-	187	278	297	91	23	29	20
30	49	84	62	45	-------	181	248	286	96	*21	30	14
31	61	-------	60	45	-------	179	-------	280	-------	26	27	-------
Total	1,765	2,785	2,933	1,643	3,197	5,984	9,570	7,040	5,585	1,430	623	730
Mean	56.9	92.8	94.6	53.0	114	193	319	227	186	46.1	20.1	24.3
Cfsm	0.141	0.230	0.235	0.132	0.283	0.479	0.792	0.563	0.462	0.114	0.050	0.060
In.	0.16	0.26	0.27	0.15	0.30	0.55	0.88	0.65	0.52	0.13	0.06	0.07

Calendar year 1956: Max 1,780 Min 23 Mean 196 Cfsm 0.486 In. 6.61
Water year 1956-57: Max 649 Min 10 Mean 119 Cfsm 0.295 In. 4.00

Peak discharge (base, 1,500 cfs).--No peak above base.
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 24 to Dec. 3, Dec. 9-21, Dec. 24 to Feb. 8, Feb. 11, 13-15, 17-21, 23, 26-28, Mar. 2-5, 7-10.

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 1957.

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

Average discharge.--27 years, 62.2 cfs.

Extremes.--Maximum discharge during year, 273 cfs May 31 (gage height, 6.40 ft, from graph based on gage readings); maximum gage height observed, 6.68 ft Feb. 10, 25 (backwater from ice); minimum daily discharge, 5.2 cfs Sept. 9, 10, 18, 19, 29, 30.

1930-57: Maximum discharge observed, 3,500 cfs Mar. 20, 1952 (gage height, 11.40 ft); 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 (water years).--WSP 804: Drainage area. WSP 1307: 1932-34(M), 1937(M), 1939(M), 1945(M), 1948-49(M).

Rating table, water year 1956-57, except for periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

5.1	4.0	5.5	33
5.2	7.0	5.7	72
5.3	12	6.0	152
5.4	20	6.3	246

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	13	18	15	16	66	54	63	152	33	8.5	10
2	15	13	18	12	16	58	54	50	91	28	8.5	8.0
3	14	13	20	12	16	49	54	43	68	23	7.5	8.0
4	14	13	23	12	16	41	96	36	*54	18	7.5	7.0
5	12	13	30	12	16	36	246	33	54	17	6.7	6.4
6	12	13	28	12	17	32	214	33	47	17	6.7	6.4
7	12	13	26	12	18	30	182	30	47	17	6.1	5.8
8	12	13	24	12	23	29	146	28	43	23	6.1	5.8
9	11	13	21	12	35	30	135	28	36	33	6.7	5.2
10	11	13	19	*12	82	34	130	30	36	30	8.5	5.2
11	11	13	18	12	68	43	118	36	33	28	7.5	5.8
12	9.5	13	17	12	56	*51	104	36	63	28	7.5	6.4
13	9.5	13	20	11	*44	60	89	36	113	25	6.7	6.4
14	9.5	17	23	10	39	72	79	33	246	23	6.7	5.8
15	9.5	33	28	9.2	35	125	65	33	164	20	6.1	6.4
16	*11	33	30	9.0	30	84	59	36	124	20	5.5	7.0
17	12	33	30	11	26	66	59	40	86	18	5.5	6.4
18	10	30	25	17	23	50	54	43	63	16	5.5	5.2
19	10	28	22	35	21	47	54	43	54	14	5.5	*5.2
20	9.5	28	20	45	20	47	59	54	43	13	5.5	7.0
21	9.5	36	18	54	20	50	59	59	33	13	6.1	6.4
22	9.5	28	18	74	19	50	59	68	28	14	6.1	6.4
23	11	20	25	68	19	50	59	68	28	14	6.7	6.4
24	11	17	30	48	21	54	*61	63	33	13	6.7	5.8
25	11	15	30	25	120	59	82	63	36	13	6.7	5.8
26	11	15	28	21	105	63	130	68	47	12	6.7	5.8
27	12	15	25	19	90	59	152	63	59	12	6.1	5.8
28	12	*20	23	17	76	59	141	54	59	10	6.1	5.8
29	12	20	20	16	-	54	113	102	50	10	6.1	5.2
30	11	18	19	16	--------	54	82	173	33	9.5	7.5	5.2
31	11	--------	17	16	--------	54	--------	233	--------	*9.5	9.5	--------
Total	350.5	575	713	668.2	1,087	1,656	2,989	1,778	2,023	574.0	209.1	188.0
Mean	11.3	19.2	23.0	21.6	38.8	53.4	99.6	57.4	67.4	18.5	6.75	6.27
Cfsm	0.100	0.170	0.204	0.191	0.343	0.473	0.881	0.508	0.596	0.164	0.060	0.055
In.	0.12	0.19	0.23	0.22	0.36	0.55	0.98	0.59	0.67	0.19	0.07	0.06

Calendar year 1956: Max	382	Min	8.8	Mean	44.8	Cfsm	0.396	In.	5.40
Water year 1956-57: Max	246	Min	5.2	Mean	35.1	Cfsm	0.311	In.	4.23

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 7-10, 19-21, Dec. 28 to Jan. 1, Jan. 3 to Mar. 17.

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 1957. Published as "near Milwaukee" prior to 1936.

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.--43 years, 388 cfs.

Extremes.--Maximum discharge during year, 2,040 cfs May 13 (gage height, 4.34 ft), result of gate manipulation at recreation dam immediately upstream; minimum, 5.0 cfs Nov. 15 (gage height, 1.60 ft).

1914-57: Maximum discharge, 15,100 cfs Mar. 20, 1918, Aug. 6, 1924 (gage height, 9.00 ft, datum then in use, from floodmark for 1918, from graph based on gage readings for 1924); no flow Sept. 8, 1943.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Occasional regulation caused by dams above station.

Revisions (water years).--WSP 564: 1918(M). WSP 924: 1940. WSP 1207: 1936(M). WSP 1337: 1915-17(M), 1918, 1919-21(M), 1922, 1923(M), 1924, 1925-33(M).

Rating table, water year, 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.8	29	2.4	224
1.9	46	2.7	391
2.0	69	3.0	584
2.2	132	3.6	1,140

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	132	122	171	b120	b90	465	332	409	835	a210	78	86
2	132	122	175	108	b90	403	316	321	622	a175	75	92
3	129	118	175	101	b90	356	338	288	385	a150	72	86
4	125	118	154	92	b92	277	440	250	379	a135	67	81
5	112	343	204	95	b96	229	668	256	*304	a125	64	75
6	108	154	204	101	b110	229	1,000	235	272	a115	62	72
7	105	141	299	108	b120	185	1,100	185	266	a105	60	69
8	105	149	250	98	129	195	990	229	224	a135	58	64
9	101	149	145	*92	b340	166	799	209	209	115	72	62
10	98	185	141	b92	316	175	686	250	219	115	86	60
11	98	190	b165	b92	282	229	584	245	a225	105	67	62
12	98	125	b150	92	b250	*266	478	240	a440	136	62	72
13	101	118	105	89	*235	310	415	347	a540	112	55	67
14	101	115	145	b90	235	367	367	129	a470	98	64	67
15	105	130	175	b90	224	422	338	294	a440	98	55	75
16	105	250	195	b90	b190	373	350	397	a900	112	55	64
17	*105	350	190	b92	b162	415	367	446	a700	98	62	86
18	108	277	b170	b92	149	356	132	440	a450	92	53	81
19	105	344	149	b96	b136	356	299	484	a350	95	44	*64
20	101	313	125	101	122	316	332	452	a275	89	46	72
21	112	277	132	149	118	299	614	458	204	108	46	67
22	115	282	145	224	115	266	584	584	a195	141	44	62
23	115	b250	209	180	112	338	530	543	a190	112	53	64
24	112	132	195	b165	118	440	*497	523	a220	118	46	60
25	115	209	175	b140	175	465	523	577	a210	115	41	62
26	125	245	b170	b120	415	409	516	570	a320	101	43	51
27	118	200	b160	b110	b480	403	614	550	a250	95	41	53
28	115	*204	b145	b100	b470	350	622	478	266	86	58	53
29	115	154	136	b96	-	321	536	431	a360	86	55	51
30	115	162	136	b94	--------	367	428	720	a260	86	95	53
31	115	--- -	132	b92	--------	332	--------	754	--------	*78	86	--------
Total	3,446	5,928	5,222	3,401	5,461	10,080	15,795	12,294	10,980	3,541	1,865	2,033
Mean	111	198	168	110	195	325	526	397	366	114	60.2	67.8
Cfsm	0.168	0.300	0.254	0.166	0.295	0.492	0.796	0.601	0.554	0.172	0.091	0.103
In.	0.19	0.33	0.29	0.19	0.31	0.57	0.89	0.69	0.62	0.20	0.10	0.11

Calendar year 1956:	Max	3,630	Min	67	Mean	322	Cfsm	0.487	In. 6.61
Water year 1956-57:	Max	1,100	Min	41	Mean	219	Cfsm	0.331	In. 4.49

Peak discharge (base, 2,000 cfs).--May 13 (8 a.m.) 2,040 cfs (4.34 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 Cedar Creek near Cedarburg and Sheboygan River at Sheboygan.

b Stage-discharge relation affected by ice.

Hart ditch at Munster, Ind.

Location.--Lat 41°33'40", long 87°28'50", in N½ sec. 20, T. 36 N., R. 9 W., on left bank at city limits of Munster, a quarter of a mile downstream from U. S. Highway 41 and 0.4 mile upstream from mouth.

Drainage area.--69.2 sq mi.

Records available.--September 1942 to September 1957.

Gage.--Water-stage recorder and concrete control. Datum of gage is 591.21 ft above mean sea level, datum of 1929.

Average discharge.--15 years, 57.5 cfs.

Extremes.--Maximum discharge during year, 2,060 cfs July 14 (gage height, 7.60 ft), from loop rating; minimum, 2.8 cfs Oct. 8; minimum gage height, 0.50 ft on many days.
1942-57: Maximum discharge, 2,600 cfs Oct. 11, 1954; maximum gage height, 7.83 ft Oct. 11, 1954; 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 or no gage-height record, which are fair. Flow from this ditch discharges into Little Calumet River near Munster. Practically all of this flow discharges into the Calumet Sag Channel or Grand Calumet River.

Revisions.--WSP 1337: Drainage area.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Backwater from storage of water downstream July 13-17)

0.49	3.3	1.0	70
.5	3.9	1.5	192
.6	12	2.0	348
.7	22	5.0	1,430
.8	35		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.9	5.8	5.1	3.9	a5.6	18	16	98	20	62	25	7.3
2	3.9	5.8	4.5	3.9	a5.6	14	17	72	18	40	20	5.8
3	4.5	5.1	3.9	4.5	a5.6	12	18	55	17	30	21	5.1
4	3.9	4.5	4.5	4.5	a5.6	9.6	55	43	16	25	45	5.1
5	4.5	4.5	5.1	4.5	a5.6	9.6	119	37	15	21	29	5.1
6	4.5	6.4	5.1	4.5	a5.8	9.6	91	32	18	18	20	5.1
7	3.9	5.1	5.1	4.5	a9.0	9.6	78	30	21	15	16	5.8
8	3.3	5.1	5.8	4.5	a16	8.7	167	26	21	13	14	5.8
9	4.5	4.5	5.8	5.1	a25	8.0	126	25	18	12	12	5.8
10	4.5	5.1	4.5	5.1	30	8.0	80	26	16	9.6	28	6.4
11	5.1	3.9	5.1	4.5	21	19	59	30	20	8.0	18	6.4
12	*5.8	3.9	5.8	4.5	*17	55	45	26	21	83	13	9.7
13	4.5	4.5	*4.5	4.5	16	*35	37	237	190	*1,540	10	6.4
14	4.5	4.5	4.5	4.5	15	24	31	364	159	*1,400	9.6	5.8
15	4.5	5.8	4.5	b3.9	12	20	28	146	119	*580	9.6	5.1
16	5.1	*5.2	4.5	*b3.6	10.	17	*24	*83	78	260	8.0	5.1
17	5.8	4.5	3.9	b3.6	8.7	15	31	66	49	145	6.4	5.1
18	5.1	3.9	4.5	b3.6	8.7	15	38	64	*45	114	6.4	5.8
19	5.8	3.9	4.5	b3.8	8.0	32	40	175	30	80	6.4	*4.9
20	5.8	5.8	4.5	3.9	8.0	37	53	237	22	60	5.1	4.5
21	5.1	5.1	5.1	8.7	7.2	29	53	131	19	46	5.1	7.2
22	5.1	4.5	5.1	32	7.2	24	71	91	20	46	4.5	7.2
23	6.4	3.9	6.4	21	7.2	19	186	64	21	51	*5.5	5.8
24	6.4	3.9	6.4	18	7.2	17	154	55	18	38	*12	5.8
25	5.8	3.9	5.8	12	14	16	380	46	16	29	8.0	5.1
26	6.4	3.9	5.1	8.7	25	17	412	46	14	24	7.2	5.1
27	6.4	4.5	5.1	a7.2	25	21	610	38	14	21	7.2	5.1
28	5.1	4.5	5.8	a6.4	18	20	544	32	192	19	8.7	5.8
29	5.1	4.5	5.8	a5.8	-	20	268	28	316	89	8.0	5.1
30	5.1	4.5	4.5	a5.8	--------	18	143	22	119	75	7.2	5.1
31	5.8	--------	3.9	a5.6	--------	16	--------	20	--------	35	6.4	--------
Total	156.1	141.0	154.7	216.6	349.0	593.1	3,974	2,445	1,662	4,988.6	402.3	173.4
Mean	5.04	4.70	4.99	6.99	12.5	19.1	132	78.9	55.4	161	13.0	5.78
Cfsm	0.073	0.068	0.072	0.101	0.181	0.276	1.91	1.14	0.801	2.33	0.188	0.084
In.	0.08	0.08	0.08	0.12	0.19	0.32	2.13	1.31	0.89	2.69	0.22	0.09

Calendar year 1956: Max 1,230 Min 3.3 Mean 40.3 Cfsm 0.582 In. 7.92
Water year 1956-57: Max 1,540 Min 3.3 Mean 41.8 Cfsm 0.604 In. 8.20

Peak discharge (base, 800 cfs).--July 14 (1 to 3 a.m.) 2,060 cfs (7.60 ft).
* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records, engineer's notes, observer's notes, and record for stations on nearby streams.
b Stage-discharge relation affected by ice.

Thorn Creek at Glenwood, Ill.

Location.--Lat 41°31'50", long 87°36'20", in $SW\frac{1}{4}SE\frac{1}{4}$ 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 1957.

Gage.--Water-stage recorder. Datum of gage is 610.97 ft above mean sea level, datum of 1929.

Average discharge.--8 years, 30.5 cfs.

Extremes.--Maximum discharge during year, 2,460 cfs July 13 (gage height, 11.14 ft); minimum daily, 8.9 cfs Oct. 7.

1949-57: Maximum discharge, that of July 13, 1957; minimum daily, 6.0 cfs July 4, Aug. 21, Sept. 5, 11, 25, 1949.

Remarks.--Records good except those for periods of ice effect, which are fair. 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 (water years).--WSP 1207: Drainage area. WSP 1437: 1955.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 15 to Sept. 30)

2.6	6.5	6.0	278
3.0	20	9.0	775
3.5	43	9.5	950
4.0	75	10.0	1,260
5.0	159	10.3	1,510

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	16	12	11	18	23	21	38	37	34	25	13
2	9.8	16	11	13	18	18	21	33	34	27	25	14
3	12	14	14	14	16	16	29	29	34	24	70	16
4	11	11	15	14	18	18	67	25	35	21	28	16
5	11	14	15	12	19	18	60	22	34	20	21	16
6	9.9	19	14	11	19	18	40	24	39	18	18	16
7	8.9	16	15	14	19	18	53	*23	37	15	18	14
8	12	15	15	14	20	19	69	22	37	17	17	12
9	13	15	12	15	46	17	40	21	34	16	18	*15
10	13	12	15	b13	25	14	33	28	32	16	23	16
11	13	10	*16	b13	*24	56	29	25	40	15	14	16
12	14	15	16	12	24	59	26	19	51	145	18	41
13	12	14	15	11	23	31	21	288	157	*1,460	18	20
14	10	16	14	b12	22	27	18	274	66	293	18	15
15	13	20	14	b13	20	25	*22	69	48	83	18	13
16	13	18	12	b13	18	19	22	62	34	57	17	16
17	14	14	14	b12	16	16	36	61	32	50	16	16
18	14	11	16	b13	b17	26	29	59	38	44	14	16
19	14	*14	15	14	b18	40	29	181	33	40	18	16
20	12	20	15	12	b18	31	30	107	29	38	*17	18
21	9.9	19	16	*31	19	26	24	64	28	31	16	19
22	14	12	14	58	18	23	61	62	25	46	16	14
23	*14	13	14	26	17	20	63	60	23	46	17	16
24	15	12	16	21	16	17	142	54	*21	*34	27	16
25	16	11	12	21	43	20	244	50	18	30	14	17
26	19	14	14	18	47	25	139	47	18	29	17	16
27	14	15	14	15	34	24	301	44	20	27	16	17
28	11	15	16	b17	24	23	112	43	513	24	22	14
29	14	16	14	b18	-	23	65	42	126	34	18	13
30	16	15	11	b18	--------	19	47	38	42	27	16	16
31	16	--------	12	b18	--------	17	--------	38	--------	25	15	--------
Total	399.5	442	438	517	636	746	1,893	1,952	1,715	2,786	625	493
Mean	12.9	14.7	14.1	16.7	22.7	24.1	63.1	63.0	57.2	89.9	20.2	16.4
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 603 Min 8.8 Mean 26.1 Cfsm - In. -
Water year 1956-57: Max 1,460 Min 8.9 Mean 34.6 Cfsm - In. -

Peak discharge (base, 240 cfs).--Apr. 25 (10 a.m.) 400 cfs (6.78 ft); Apr. 27 (2:30 p.m.) 416 cfs (6.86 ft); May 14 (12:30 a.m.) 593 cfs (7.99 ft); May 19 (5:30 p.m.) 258 cfs (5.87 ft); June 12 (11 p.m.) 258 cfs (5.84 ft); June 28 (12 m.) 865 cfs (9.28 ft); July 13 (6:30 a.m.) 2,460 cfs (11.14 ft); Aug. 3 (2:30 p.m.) 336 cfs (6.40 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

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 1957.

Gage.--Wire-weight gage read twice daily. Datum of gage is 615.95 ft above mean sea level, datum of 1929. Jan. 11, 1949, to Oct. 9, 1956, water-stage recorder at same site and datum. Oct. 10, 1956, to Sept. 24, 1957, staff gage 250 ft downstream at same datum.

Average discharge.--9 years, 13.9 cfs.

Extremes.--Maximum discharge during year, 1,380 cfs July 13 (gage height, 11.75 ft); no flow for many days.

1948-57: Maximum discharge, that of July 13, 1957; no flow for several days in 1949, 1953, 1956.

Remarks.--Records fair except those for periods of ice effect, which are poor. Undetermined amount of flow diverted for irrigation.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 3 to Mar. 11, Sept. 14-30)

1.5	0	4.0	30
1.6	.2	5.0	55
1.7	.4	7.0	137
1.8	.8	9.0	272
1.9	1.2	10.0	387
2.0	1.9	11.0	600
2.4	5.0	11.4	870
3.0	12		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	(*)	0	b0.5	b0.8	b0.8	b3.5	3.7	25	7.0	28	4.2	0.8
2		0	b.7	b.9	b.9	b3.1	3.6	16	6.2	17	3.7	.8
3		0	.9	b1.0	b.9	b2.7	4.0	14	5.9	11	13	.8
4		0	.9	1.1	b1.0	b2.5	9.4	11	5.7	8.2	19	.8
5		0	.6	1.1	b1.0	b2.7	18	9.2	5.3	7.0	12	.8
6		0	1.1	b1.0	b.9	b2.7	23	*8.0	6.1	6.1	6.9	.7
7		0	.4	b.9	b1.0	3.1	26	7.1	6.5	5.5	5.0	.6
8		0	.2	b.8	b1.1	3.0	28	6.7	8.2	5.2	4.0	.6
9	(*)	0	b.3	b.8	4.4	3.0	23	6.2	7.1	4.7	3.6	.6
10		0	*.4	b.8	4.4	3.0	18	7.8	5.8	4.0	4.6	.6
11		0	.7	b.8	*4.3	4.7	16	14	8.5	3.9	4.4	.6
12		0	b.6	b.8	3.9	6.2	8.9	29	7.2	7.3	3.5	.8
13		0	b.5	b.8	3.9	6.0	7.9	136	54	*860	2.7	.9
14		0	b.5	b.7	b3.5	5.7	7.2	218	43	350	3.2	.7
15		0	b.5	b.7	b2.7	3.9	6.4	86	24	159	3.0	.6
16		.7	b.4	b.7	b2.3	2.7	6.2	32	16	74	2.7	.6
17		.6	b.4	b.8	b2.0	2.7	8.5	26	11	40	2.3	.5
18		.3	b.3	b.9	b1.8	2.4	9.3	22	14	21	1.8	.5
19		*0	b.4	b1.0	b1.7	4.4	9.8	58	13	15	*1.8	.5
20		*.3	b.4	1.7	b1.6	5.8	11	92	*8.5	14	2.1	.5
21		*1.3	b.4	*3.4	b1.5	5.0	10	38	6.8	12	2.1	1.5
22	(*)	.8	.4	4.5	b1.6	4.6	18	26	5.1	12	2.0	1.2
23		.5	.6	3.5	b1.7	4.3	40	20	5.4	6.1	1.9	*.8
24		b.4	.9	b2.5	b1.8	3.9	50	16	5.5	4.3	2.3	.7
25		b.4	b.8	b1.7	b2.5	3.3	150	14	4.5	4.9	2.0	.7
26		b.5	b.7	b1.2	3.5	3.4	127	14	4.0	5.3	1.8	.6
27		b.5	b.7	b1.1	4.7	3.5	226	11	3.8	4.7	2.0	.5
28		b.5	b.8	b1.0	4.2	3.5	176	8.9	135	4.4	1.9	.4
29		b.4	b.8	b1.0	-	3.5	62	7.8	186	12	1.5	.4
30		b.4	b.8	b.9	--------	3.5	32	7.0	78	7.7	1.0	.3
31		--------	b.8	b.8	--------	3.6	--------	6.7	--------	5.1	.9	--------
Total	0	7.6	18.4	39.7	65.6	116.1	1,138.9	993.4	697.1	1,719.4	122.9	20.4
Mean	0	0.25	0.59	1.28	2.34	3.75	38.0	32.0	23.2	55.5	3.96	0.68
Cfsm	0	0.010	0.024	0.052	0.096	0.154	1.56	1.31	0.951	2.27	0.162	0.028
In.	0	0.01	0.03	0.06	0.10	0.18	1.74	1.51	1.06	2.62	0.19	0.03

Calendar year 1956: Max	406	Min	0	Mean	11.5	Cfsm	0.471	In. 6.39
Water year 1956-57: Max	860	Min	0	Mean	13.5	Cfsm	0.553	In. 7.53

Peak discharge (base, 250 cfs).--Apr. 27 (6 p.m.) 263 cfs (8.87 ft); May 14 (4 a.m.) 254 cfs (8.78 ft); June 28 (9 p.m.) 281 cfs (9.07 ft); July 13 (10 a.m.) 1,380 cfs (11.75 ft).

* Discharge measurement or observation of no flow made on this day.

b Stage-discharge relation affected by ice.

Butterfield Creek at Flossmoor, Ill.

Location.--Lat 41°32'25", long 37°38'55", in NE¼NW¼ sec. 8, T. 35 N., R. 14 E., on left bank at downstream side of Reigle 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 1957.

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.

Average discharge.--9 years, 16.9 cfs.

Extremes.--Maximum discharge during year, 2,550 cfs July 13 (gage height, 11.78 ft); minimum, 0.2 cfs Dec. 20, 21.

1948-57: Maximum discharge, that of July 13, 1957; no flow at times in 1948, Oct. 1, 1953.

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

Revisions (water years).--WSP 1437: 1948(M), 1953, 1955.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 8-22, Mar. 11 to Apr 24, Aug. 27 to Sept. 30)

3.7	0.2	5.0	38
3.8	.4	6.0	105
3.9	.7	7.0	198
4.0	1.4	9.0	480
4.1	2.5	9.8	680
4.2	4.2	10.5	1,120
4.4	10	11.0	1,550
4.7	23		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.3	0.5	0.3	0.3	b0.5	5.8	2.0	a41	9.7	39	5.2	1.3
2	1.3	.5	.3	.4	.5	3.5	2.2	a31	7.1	25	5.5	1.3
3	1.2	.5	.3	.4	.6	2.2	2.5	a25	6.3	16	43	1.3
4	1.4	.5	.3	.4	.6	1.6	33	a20	5.8	12	46	1.0
5	.9	.5	*.3	.4	.5	1.4	43	15	5.5	8.4	24	1.0
6	1.0	1.0	.3	.4	.5	1.3	33	*12	8.7	5.8	14	.9
7	1.3	1.0	.3	.4	.6	1.1	31	9.4	8.4	4.0	9.0	1.0
8	1.3	1.3	.3	.5	.7	1.0	40	8.4	7.1	3.4	7.1	1.0
9	1.6	1.3	.4	.4	37	.9	26	7.1	6.0	2.8	5.8	*1.0
10	1.2	1.3	*.3	.5	15	.9	*16	8.4	5.2	2.2	7.3	.7
11	.9	.9	.4	b.4	*5.2	15	12	9.0	12	1.7	5.2	.7
12	.8	.6	.4	b.4	3.4	*23	7.4	7.1	9.2	121	4.5	2.7
13	.8	.7	.3	b.3	3.5	10	5.5	92	74	*1,500	4.0	2.0
14	.8	1.0	.3	b.4	2.0	5.2	3.9	137	68	345	4.0	1.0
15	.7	1.6	.3	b.4	1.4	3.5	3.0	62	37	154	3.4	1.0
16	.5	1.1	.4	b.3	1.2	2.1	2.5	39	25	72	3.0	1.4
17	.5	1.0	.3	b.3	.9	1.6	6.1	34	17	*60	2.7	1.3
18	.6	.6	.3	b.3	.8	3.0	7.1	29	14	49	2.4	1.0
19	.8	*.3	.3	b.4	.6	17	6.8	117	9.7	38	*2.7	1.2
20	1.0	.4	.2	b.5	.5	12	8.1	102	*6.5	31	2.2	1.7
21	.7	.7	.3	*b1.5	.5	6.5	5.8	59	5.2	25	2.2	1.6
22	*.6	.4	.4	39	.5	4.2	24	41	4.5	24	2.0	1.1
23	.6	.3	.5	13	.5	2.7	47	32	3.7	29	1.8	.8
24	1.0	.3	.7	7.1	.5	2.0	110	26	3.2	21	2.7	.6
25	.5	.3	.6	3.7	12	1.6	175	24	3.0	16	2.0	.7
26	.8	.3	.5	b1.8	24	2.0	151	21	2.8	13	1.7	1.0
27	1.8	.3	.4	b.9	21	3.2	204	16	3.6	12	1.4	.6
28	1.3	.4	.5	b.8	9.9	3.7	a120	12	230	10	3.1	.7
29	1.3	.3	.5	b.7	-	3.4	a75	10	185	8.7	2.7	.7
30	.5	.3	.4	b.5	--------	2.3	a57	8.7	66	7.4	1.7	1.0
31	.6	--------	.3	b.5	--------	1.8	--------	9.7	--------	6.5	1.3	--------
Total	29.6	20.2	11.4	77.3	144.9	145.5	1,259.9	1,064.8	849.2	2,662.9	223.6	33.3
Mean	0.95	0.67	0.37	2.49	5.18	4.69	42.0	34.3	28.3	85.9	7.21	1.11
Cfsm	0.042	0.029	0.016	0.109	0.226	0.205	1.83	1.50	1.24	3.75	0.315	0.048
In.	0.05	0.03	0.02	0.13	0.24	0.24	2.05	1.73	1.38	4.32	0.36	0.05

Calendar year 1956 :	Max 368	Min 0.1	Mean 11.0	Cfsm 0.480	In. 6.56
Water year 1956-57 :	Max 1,500	Min 0.2	Mean 17.9	Cfsm 0.782	In. 10.60

Peak discharge (base, 240 cfs).--Apr. 27 (9 a.m.) 255 cfs (7.47 ft); May 13 (9 p.m.) 248 cfs (7.38 ft); June 28 (12:30 p.m.) 420 cfs (8.55 ft); July 13 (3:30 a.m.) 2,550 cfs (11.78 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Midlothian Creek at Oak Forest.

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 1957.

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.

Average discharge.--9 years, 8.18 cfs.

Extremes.--Maximum discharge during year, 240 cfs July 13 (gage height, 8.85 ft); minimum daily, 0.1 cfs for many days.

1948-57: Maximum discharge, 461 cfs May 10 or 11, 1948 (gage height, 9.24 ft, from floodmark); maximum gage height, 10.18 ft Oct. 11, 1954; 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 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-7, Sept. 5-15)

2.6	0.1	3.4	4.9
2.7	.2	3.8	11
2.8	.5	4.2	18
2.9	.8	5.0	50
3.0	1.4	8.0	200
3.2	2.7	8.7	235

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	0.4	1.4	b0.5	b0.1	0.9	1.3	11	3.3	14	5.4	0.9
2	.4	.4	.5	b.1	b.2	.7	1.6	7.6	3.2	8.7	4.6	1.2
3	1.1	.8	.8	b.1	b.3	.6	1.4	5.9	3.5	7.6	5.4	2.4
4	.5	.3	.9	b.1	b.4	.7	8.2	4.9	3.2	5.8	5.2	2.2
5	.4	.4	.6	b.1	b.5	.6	14	4.2	3.1	3.8	5.5	2.2
6	.4	.5	.5	b.2	.6	.6	9.5	*3.8	3.3	4.1	4.3	2.2
7	.2	.3	.4	b.8	b1.5	.6	9.0	5.7	3.4	2.3	3.4	1.7
8	.5	.1	.4	b.2	3.8	.6	17	3.8	3.6	9.0	3.7	2.4
9	.5	.6	b.5	b.1	6.7	.6	8.8	3.0	3.2	4.3	3.2	1.8
10	.2	1.0	*b.4	b.1	4.0	.5	*5.7	4.0	2.9	2.7	5.5	*1.6
11	.1	.2	b1.2	b.1	2.0	*1.4	4.7	4.2	3.7	2.3	3.5	2.2
12	.8	.2	*b.4	b.1	*b1.1	2.8	*3.9	3.5	3.5	14	3.6	2.1
13	.3	.7	b.3	b.1	b2.4	2.3	3.3	46	28	*231	4.2	2.4
14	.1	.4	.2	b.1	b2.0	1.8	2.6	57	26	*188	3.6	1.7
15	.6	.8	b.8	b.1	1.2	1.6	2.6	20	11	103	3.3	2.2
16	.8	.4	b.5	b.1	b1.5	1.3	3.5	11	7.2	*52	3.3	2.4
17	.5	.2	b.4	b.1	1.2	1.2	6.3	9.6	6.3	*36	3.2	2.0
18	.4	.2	b1.5	b.1	.6	1.3	4.2	9.0	6.2	*20	3.0	2.0
19	.4	.3	.6	b.2	.5	3.4	3.9	45	5.8	14	*3.0	2.3
20	.3	*2.2	.5	b.3	.7	3.6	4.5	42	3.4	9.2	3.0	2.6
21	.2	.9	.5	b4.5	.7	2.6	3.6	18	2.9	6.6	2.9	2.2
22	*.1	.3	.2	b7.5	.6	2.2	6.1	11	4.1	7.5	2.7	2.5
23	.2	.1	1.7	5.0	.6	1.8	16	a8.8	4.9	7.0	2.7	2.1
24	.7	.3	.4	b2.0	1.1	1.5	22	a7.8	*4.0	6.9	3.2	2.1
25	.2	1.7	.2	b1.0	1.1	1.4	56	a7.0	3.6	8.1	2.6	1.8
26	.4	.5	.2	b.4	1.3	1.6	47	a7.0	2.1	8.1	2.6	2.2
27	.5	1.2	.5	b.3	1.5	1.9	70	a5.2	2.8	7.0	2.5	3.0
28	.2	.4	.4	b.2	1.0	2.0	55	a4.4	56	6.0	2.6	2.4
29	.4	.2	b.1	.2	-	1.9	29	a3.9	70	6.2	a2.5	2.8
30	.6	.1	b.7	.1		1.6	15	a3.4	29	6.9	a2.1	2.0
31	.3		b1.2	.1		1.4		3.8		6.3	a1.9	
Total	12.6	16.1	18.9	24.9	39.2	47.0	435.7	381.5	313.2	808.4	108.2	63.6
Mean	0.41	0.54	0.61	0.80	1.40	1.52	14.5	12.3	10.4	26.1	3.49	2.12
Cfsm	0.049	0.065	0.073	0.097	0.169	0.183	1.75	1.48	1.25	3.14	0.420	0.255
In.	0.06	0.07	0.08	0.11	0.18	0.21	1.95	1.71	1.40	3.62	0.48	0.28

Calendar year 1956 :	Max 261	Min 0.1	Mean 6.45	Cfsm 0.777	In. 10.56
Water year 1956-57 :	Max 231	Min 0.1	Mean 6.22	Cfsm 0.749	In. 10.15

Peak discharge (base, 140 cfs).--July 13 (3:30 a.m.) 240 cfs (8.85 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 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 1957.

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.

Average discharge.--9 years, 15.6 cfs.

Extremes.--Maximum discharge during year, 515 cfs July 13 (gage height, 8.85 ft); no flow for several days.

1948-57: Maximum discharge, 730 cfs Mar. 20, 1948 (gage height, 8.51 ft, from floodmark); maximum gage height, 8.96 ft Oct. 10, 1954; no flow at times.

Remarks.--Records good except those below 2 cfs, which are fair, and those for periods of ice effect, which are poor. Undetermined amount of flow diverted for irrigation above station.

Revisions (water years).--WSP 1337: 1948(M).

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 11 to Apr. 4, Sept. 7-18)

2.5	0	4.0	20
2.6	.1	5.0	43
2.7	.4	6.0	82
2.8	.9	6.5	113
2.9	1.7	7.0	159
3.0	2.7	7.5	232
3.2	5.3	8.0	335
3.5	10	8.5	480

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.4	0.1	b1.1	b0.2	2.5	1.9	33	7.6	30	6.7	1.3
2	0	.7	1.6	b.2	b.3	2.0	1.9	26	6.3	18	4.9	.8
3	.1	1.0	.5	0	b.4	1.3	1.8	18	5.9	13	7.2	1.6
4	.8	.9	1.3	0	b.5	1.1	16	13	5.3	10	7.4	2.0
5	.1	.3	.9	.1	b.6	1.1	32	9.8	5.0	6.6	5.9	2.3
6	.3	.8	1.0	.1	b.7	1.0	29	*7.4	5.6	6.1	5.5	2.4
7	.1	.6	.6	b1.0	.9	.9	24	7.4	6.9	4.9	3.9	2.1
8	0	.2	.8	b.5	2.4	.8	35	7.4	7.1	3.4	4.2	1.9
9	.3	.1	.5	.3	16	.9	28	4.3	6.3	4.3	3.7	2.0
10	.1	1.3	*b.8	.2	12	.8	19	4.9	5.3	4.7	5.6	*1.6
11	0	.7	*.4	.1	8.4	3.6	14	10	6.1	2.9	4.6	1.9
12	0	.2	1.5	.1	6.4	*9.3	*9.4	10	6.4	21	3.3	2.1
13	.7	.7	.5	b.2	6.4	5.5	7.2	54	38	*456	4.0	2.1
14	.1	.4	.2	b.2	7.2	3.2	5.5	106	54	321	3.8	1.8
15	0	.8	.3	b.2	4.3	2.4	4.6	58	32	210	3.3	1.9
16	.8	.9	.9	b.2	1.3	2.3	4.7	37	20	*109	3.2	1.7
17	.7	.3	.5	b.2	b1.5	1.9	10	29	15	70	2.9	1.8
18	.5	.1	.8	b.2	.9	1.9	9.4	27	13	50	3.1	1.5
19	.5	.1	1.4	b.2	.5	9.3	9.8	83	12	33	*2.8	1.6
20	.5	*1.3	.6	b.4	.3	11	11	92	6.9	25	2.6	2.3
21	.6	1.8	.9	b8.5	.4	6.7	11	56	*5.2	14	2.7	2.0
22	*.2	1.2	.6	b11	.4	4.9	16	40	5.0	12	2.7	2.1
23	0	.3	1.6	.8	.4	3.3	36	29	6.4	13	2.5	1.6
24	.6	.1	1.2	.3	.7	2.3	40	23	6.1	11	2.8	1.8
25	.9	1.2	.6	.3	2.6	1.9	87	20	4.2	11	2.9	1.6
26	.2	.7	.3	b.5	8.1	2.0	87	19	3.1	11	2.3	1.1
27	1.0	.8	.3	b.5	9.0	3.8	137	14	2.8	9.3	2.3	2.3
28	.7	1.4	.8	b.4	3.8	4.5	108	11	49	8.9	2.4	2.2
29	.2	.3	.3	b.4	-	3.4	64	9.3	106	7.2	2.4	2.3
30	.7	.1	.2	b.3		2.5	46	7.8	55	9.3	2.3	1.7
31	.8		1.2	.2		1.6		8.8		7.9	1.9	
Total	11.6	19.7	23.2	28.7	96.6	99.7	906.2	875.1	507.5	1,513.5	115.8	55.4
Mean	0.37	0.66	0.75	0.93	3.45	3.22	30.2	28.2	16.9	48.8	3.74	1.85
Cfsm	0.020	0.036	0.041	0.051	0.190	0.177	1.66	1.55	0.929	2.68	0.205	0.102
In.	0.02	0.04	0.05	0.06	0.20	0.20	1.85	1.79	1.04	3.09	0.24	0.11

Calendar year 1956: Max 274 Min 0 Mean 9.25 Cfsm 0.508 In. 6.92
Water year 1956-57: Max 456 Min 0 Mean 11.7 Cfsm 0.643 In. 8.69

Peak discharge (base, 210 cfs).--July 13 (6 a.m.) 515 cfs (8.85 ft).
* Discharge measurement made on this day.
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 1957.

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.

Average discharge.--9 years, 88.9 cfs.

Extremes.--Maximum discharge during year, 4,700 cfs July 13 (gage height, 16.00 ft); minimum daily, 6.8 cfs Oct. 7.

1948-57: Maximum discharge, that of July 13, 1957; 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. 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.--WSP 1207: Drainage area.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-22, Oct. 27 to Nov. 20, Aug. 27 to Sept. 11)

2.2	5.4	5.0	335
2.3	10	8.0	720
2.4	17	11.0	1,350
2.6	35	13.0	2,150
2.8	63	15.0	3,600
3.0	98		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	19	18	14	23	51	35	174	47	154	36	11
2	17	19	15	14	22	42	40	134	36	98	35	11
3	18	17	17	17	19	29	41	113	36	70	110	20
4	17	14	19	17	22	31	136	95	36	54	167	29
5	17	16	19	15	23	35	192	81	34	43	81	28
6	13	21	18	13	24	34	154	72	52	33	54	29
7	6.8	18	17	15	25	34	140	*63	49	29	42	26
8	10	19	18	17	26	38	198	57	47	27	35	21
9	14	20	16	17	98	35	145	52	36	27	33	23
10	14	21	15	17	56	29	108	60	35	25	48	23
11	15	16	*18	16	42	86	*100	62	63	23	31	*21
12	17	19	*19	16	*40	130	63	52	46	74	30	61
13	13	25	17	13	40	70	51	356	301	*3,250	31	46
14	8.2	33	16	13	33	51	42	810	280	2,970	33	20
15	11	39	16	16	30	45	40	417	155	1,100	31	16
16	14	31	14	16	28	32	40	198	98	451	29	19
17	16	22	16	14	25	26	62	152	74	*291	27	19
18	16	14	17	16	26	*37	67	123	77	192	25	19
19	16	17	17	16	26	96	63	408	67	131	28	20
20	16	*27	17	16	25	86	72	510	50	106	*28	20
21	12	30	18	35	27	67	63	286	42	84	28	24
22	16	21	17	*128	27	52	109	180	36	88	25	21
23	*19	19	16	48	25	44	214	126	36	101	24	20
24	19	18	20	35	23	35	316	106	*34	68	38	21
25	20	16	17	30	74	38	631	95	32	58	19	20
26	26	19	16	25	108	44	660	86	32	54	19	21
27	18	20	18	21	104	47	750	70	33	48	22	21
28	13	21	19	23	63	48	756	62	450	43	31	18
29	16	26	18	24	-	47	390	54	965	59	29	15
30	20	22	14	23	--------	39	252	43	351	54	22	19
31	19	--------	13	23	--------	32	--------	45	--------	42	16	--------
Total	484.0	639	525	723	1,104	1,510	5,930	5,142	3,630	9,847	1,207	682
Mean	15.6	21.3	16.9	23.3	39.4	48.7	198	166	121	318	38.9	22.7
Cfsm	0.147	0.201	0.159	0.220	0.372	0.459	1.87	1.57	1.14	3.00	0.367	0.214
In.	0.17	0.22	0.18	0.25	0.39	0.53	2.08	1.80	1.27	3.45	0.42	0.24

Calendar year 1956 : Max 1,670 Min 6.8 Mean 69.6 Cfsm 0.657 In. 8.93
Water year 1956-57 : Max 3,250 Min 6.8 Mean 86.1 Cfsm 0.812 In. 11.00

Peak discharge (base, 520 cfs).--Apr. 28 (12:30 a.m.) 900 cfs (9.02 ft); May 14 (11 a.m. to 12:30 p.m.) 880 cfs (8.95 ft); May 19 (9:30 to 11:30 p.m.) 617 cfs (7.24 ft); June 29 (6:30 a.m.) 1,130 cfs (10.20 ft); July 13 (6 to 8 p.m.) 4,700 cfs (16.00 ft).

* Discharge measurement made on this day.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 575.00 ft above mean sea level. Prior to Oct. 27, 1947, wire-weight gage at same site and datum. Auxiliary water-stage recorder at Dixmoor, 6.1 miles downstream. Prior to Nov. 17, 1947, auxiliary wire-weight gage at same site and read twice daily.

Average discharge.--10 years, 164 cfs.

Extremes.--Maximum discharge during year, 4,440 cfs July 14 (gage height, 20.11 ft); minimum daily, 13 cfs Oct. 8.

1947-57: Maximum discharge, that of July 14, 1957; 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).

Revisions.--Figures of maximum discharge for the water years 1950 and 1953 have been revised to 2,780 cfs Apr. 26, 1950 (gage height, 15.20 ft) and 2,420 cfs June 11, 1953 (gage height, 14.42 ft), superseding figures published in WSP 1174 and 1277, respectively.

Remarks.--Records fair except those for periods of ice effect, which are poor. Flow from about 330 sq mi of upper Little Calumet River basin above a point in Gary, Ind., is diverted to Lake Michigan by Burns ditch (see p. 103). Calumet Sag Channel, 8 miles below station, usually diverts the entire low flow to the Mississippi River basin.

Revisions.--Revised figures of discharge, in cubic feet per second, for high-water periods in the water years 1950 and 1953, superseding those published in WSP 1174 and 1277, are given herewith:

Apr. 25, 1950...........	2,120
Apr. 26, 1950...........	2,280
June 11, 1953...........	2,250

Month	Cfs-days	Maximum	Minimum	Mean
April 1950..................................	21,360	2,280	134	712
Water year 1949-50.........................	90,404	2,700	10	248
Calendar year 1950.........................	81,788.9	2,280	7.9	224
June 1953..................................	8,235	2,250	73	274
Water year 1952-53.........................	-	2,250	36	133
Calendar year 1953.........................	-	2,250	18	131

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	27	34	30	42	87	65	479	116	382	96	45
2	18	26	30	28	39	73	83	357	98	241	82	44
3	15	28	29	32	34	55	73	277	86	175	132	38
4	18	24	33	34	32	48	169	227	88	145	300	38
5	19	23	35	36	36	49	348	181	83	121	175	44
6	21	38	40	32	36	47	348	157	109	101	117	41
7	19	38	37	30	39	47	277	*131	110	89	90	41
8	13	32	34	34	40	47	366	117	122	78	75	37
9	18	32	b35	34	146	46	374	108	101	81	70	35
10	17	34	32	40	121	42	270	119	86	72	125	43
11	19	29	*34	36	85	72	*207	138	113	68	91	42
12	19	29	38	36	*72	408	157	122	116	166	68	56
13	20	29	36	34	72	*163	126	310	267	2,980	70	*93
14	15	29	34	32	62	114	104	1,090	535	*4,240	69	46
15	15	42	34	b35	52	108	91	906	400	2,860	71	38
16	19	48	32	b37	50	76	90	434	277	1,410	66	34
17	19	35	30	b37	44	58	114	300	194	840	61	37
18	18	30	34	b35	40	57	142	262	175	595	53	36
19	23	26	32	b37	b38	152	136	557	157	434	50	36
20	21	32	33	b40	37	163	152	940	118	308	*55	37
21	20	*51	35	74	36	125	157	635	*83	214	50	45
22	19	42	36	234	37	103	181	416	66	*203	53	47
23	20	31	38	126	38	88	416	300	75	252	47	38
24	23	32	46	82	36	74	555	241	66	175	63	36
25	22	29	40	59	71	71	1,040	200	63	144	65	35
26	27	36	32	46	157	77	1,200	194	56	131	43	35
27	28	39	41	41	181	86	1,350	157	57	120	49	36
28	22	34	37	38	104	89	1,440	133	373	106	58	35
29	20	45	38	42	-	88	990	117	1,320	169	94	29
30	26	36	34	42		79	655	113	852	188	61	27
31	26		29	42		67		107		126	53	
Total	613	1,006	1,075	1,515	1,777	2,859	11,676	9,825	6,362	17,214	2,552	1,224
Mean	19.8	33.5	34.7	48.9	63.5	92.2	389	317	212	555	82.3	40.8
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 2,280 Min 13 Mean 128 Cfsm - In. -
Water year 1956-57: Max 4,240 Min 13 Mean 158 Cfsm - In. -

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

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 Kilbourn Avenue Bridge in Oak Forest, 4.4 miles upstream from mouth.

Drainage area.--12.7 sq mi.

Records available.--October 1950 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 620.41 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark).

Average discharge.--7 years, 11.4 cfs.

Extremes.--Maximum discharge during year, 550 cfs July 13 (gage height, 9.00 ft); minimum, 0.3 cfs Oct. 2-9, July 12.

1950-57: Maximum discharge, 569 cfs Oct. 10, 1954 (gage height, 8.49 ft); maximum gage height, that of July 13, 1957; no flow at times most years.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diurnal fluctuation at low flow caused by small industrial plants upstream.

Revisions (water years).--WSP 1337: 1951-53.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Jan. 10 to Feb. 13, Mar. 10 to May 10, July 15 to Aug. 14, Aug. 29, Sept. 12-30)

1.3	0.1	2.2	27
1.4	.5	2.5	45
1.5	1.2	3.0	80
1.6	2.9	5.0	230
1.9	13	8.0	470

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.5	0.6	b0.7	0.7	2.7	4.2	26	4.5	83	4.5	a1.4
2	.4	.6	.7	b.9	.7	2.2	4.2	18	2.6	40	3.9	a1.3
3	.4	.6	.6	b1.0	.7	1.8	3.9	12	2.2	17	16	1.2
4	.4	.6	.7	1.1	.8	1.5	11	9.5	2.2	8.8	18	a1.1
5	.4	.6	.7	1.1	.8	1.5	14	7.5	2.0	3.2	9.2	a1.0
6	.4	.7	.8	1.0	.7	1.3	11	6.8	3.2	1.8	7.1	a.9
7	.3	.7	.7	.9	.8	1.3	11	5.8	3.9	1.2	6.1	a1.0
8	.3	.6	.8	.8	.9	1.2	10	6.4	3.9	.8	4.8	a1.0
9	.4	.5	.7	.8	13	1.1	11	7.1	2.7	.7	3.5	a.9
10	.5	.6	.7	b.8	3.5	1.2	8.5	*7.5	2.4	.5	4.8	.8
11	.4	.6	.7	b.8	3.5	5.7	7.1	8.1	6.2	.4	3.9	a.7
12	.4	.6	*.8	b.8	3.5	10	*6.1	7.5	3.9	43	3.2	*2.0
13	.4	.5	.6	b.8	*3.2	6.4	5.8	40	61	*406	2.9	3.2
14	.5	.7	.6	b.7	2.6	5.1	5.1	79	85	230	2.7	1.3
15	.5	1.0	.6	b.7	2.0	4.5	4.5	24	37	132	a2.5	1.2
16	.6	.8	.7	b.7	1.7	3.5	4.5	13	16	92	a2.2	1.0
17	.6	.6	*.6	b.8	b1.5	2.9	6.1	12	7.8	60	a2.0	.8
18	.6	.6	.7	b.9	1.3	2.6	7.8	11	41	*43	a1.8	.7
19	.5	.6	.6	b1.0	b1.2	9.4	8.5	148	35	31	2.0	.8
20	.5	.7	.6	b1.1	1.1	11	9.5	101	*10	24	a1.8	1.1
21	.6	*1.2	.7	1.7	1.0	9.8	8.1	57	2.6	18	a1.6	1.0
22	.4	.8	.7	6.1	1.1	8.1	32	28	3.5	17	*1.5	.9
23	.5	.6	.8	17	1.2	6.1	56	15	7.9	20	a1.4	.7
24	*.6	.6	.8	7.4	1.2	5.5	88	9.8	2.2	13	a1.9	.7
25	.6	.7	.7	b1.8	2.8	4.8	170	7.5	1.3	11	a1.6	.6
26	.7	.6	.6	b1.0	5.5	4.5	132	6.4	1.1	9.8	a1.4	.6
27	.6	.6	.6	.9	5.8	4.5	166	4.8	1.0	8.8	1.3	.6
28	.5	b.6	.7	.8	3.2	4.5	104	3.9	164	7.8	a2.4	.6
29	.6	.6	.7	b.8	-	5.1	64	3.9	206	6.8	3.9	.7
30	.5	.7	.7	b.8	-------	5.1	38	3.5	150	5.5	a2.5	.6
31	.5	-------	.7	b.7	-------	4.8	-------	3.2	-------	4.8	a1.6	-------
Total	15.0	19.7	21.2	56.4	66.0	139.7	1,011.9	693.2	872.1	1,340.9	124.0	30.4
Mean	0.48	0.66	0.68	1.82	2.36	4.51	33.7	22.4	29.1	43.3	4.00	1.01
Cfsm	0.038	0.052	0.053	0.143	0.186	0.355	2.65	1.76	2.29	3.41	0.315	0.080
In.	0.04	0.06	0.06	0.17	0.19	0.41	2.96	2.03	2.55	3.93	0.36	0.09

Calendar year 1956: Max	154	Min	0.3	Mean	4.30	Cfsm	0.339	In. 4.59
Water year 1956-57: Max	406	Min	0.3	Mean	12.0	Cfsm	0.945	In. 12.85

Peak discharge (base, 220 cfs).--Apr. 25 (5 p.m.) 230 cfs (4.82 ft); June 28 (3:30 p.m.) 270 cfs (5.47 ft); July 13 (6:30 a.m.) 550 cfs (9.00 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Butterfield Creek at Flossmoor.

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 1957.

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 gage height observed during year, 2.02 ft Sept. 13; portion of lake at gage drained during summer.

1939-57: Maximum mean hourly gage height, 3.00 ft Oct. 11, 12, 1954; minimum, that of summer of 1957.

Remarks.--Mean hourly values used to determine extremes in order to dampen effects of wind action.

Mean gage height, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.66	1.57	1.79	1.55	1.58	[a]1.66	[a]1.55	1.79	1.54	1.06		-
2	1.65	1.59	1.74	1.53	1.57	[a]1.63	[a]1.54	1.78	1.54	.69		-
3	1.64	1.60	1.69	1.53	1.54	[a]1.59	[a]1.54	1.76	1.50	.43		-
4	1.65	1.61	1.68	1.52	1.54	1.55	[a]1.57	1.71	1.48	-		-
5	1.65	1.61	1.67	1.52	1.54	[a]1.55	[a]1.62	1.65	1.47	-		-
6	1.63	1.61	1.66	1.52	1.54	[a]1.55	[a]1.66	1.61	1.48	-		-
7	1.58	1.60	1.64	1.51	1.54	[a]1.55	1.65	1.58	1.50	-		-
8	1.56	1.58	1.66	1.50	1.54	[a]1.55	[a]1.65	1.54	1.55	-		-
9	1.55	1.57	1.65	1.51	1.61	[a]1.55	[a]1.65	1.53	1.53	-		-
10	1.56	1.57	1.61	1.53	1.60	1.55	1.65	1.59	1.49	-		-
11	1.57	1.56	1.63	1.54	1.59	1.57	1.65	1.63	1.48	-		1.94
12	1.57	1.54	1.63	1.54	1.58	1.61	1.64	1.60	1.51	-		2.00
13	1.57	1.52	1.57	1.54	[a]1.57	1.61	1.63	1.60	1.53	-		2.02
14	1.55	1.51	1.62	1.54	[a]1.56	1.61	1.62	1.63	1.54	-		2.00
15	1.54	1.55	1.65	1.54	[a]1.54	1.49	1.62	1.63	1.39	-		1.96
16	1.55	1.56	1.66	1.55	[a]1.53	1.50	1.61	1.66	1.34	-		1.98
17	1.57	1.54	1.67	1.59	1.52	1.57	1.65	1.65	1.33	-		2.00
18	1.58	1.49	1.67	1.61	[a]1.52	1.60	1.69	1.64	1.34	-		2.00
19	1.60	1.44	1.68	1.61	1.52	1.67	1.69	1.72	1.36	-		1.98
20	1.61	1.42	1.69	1.60	[a]1.51	1.67	1.68	1.74	1.36	-		2.00
21	1.60	1.42	1.69	1.63	[a]1.51	1.67	1.67	1.72	1.37	-		1.98
22	1.60	1.36	1.69	1.70	[a]1.50	1.66	1.68	1.70	1.38	-		1.96
23	1.60	1.35	1.70	1.68	[a]1.51	1.64	1.71	1.67	1.40	-		1.94
24	1.60	1.35	1.70	1.66	1.55	1.62	1.73	1.67	1.40	-		1.94
25	1.60	1.34	1.67	1.65	[a]1.60	1.65	1.79	1.67	1.41	-		1.94
26	1.60	1.32	1.66	1.62	[a]1.65	[a]1.68	1.81	1.61	1.42	-		1.94
27	1.60	1.30	1.63	1.59	[a]1.70	[a]1.65	1.85	1.56	1.45	-		1.92
28	1.59	1.29	1.64	1.57	[a]1.69	[a]1.62	1.86	1.56	1.62	-		1.90
29	1.58	1.70	1.64	1.57	-	[a]1.59	1.83	1.55	1.69	-		1.88
30	1.57	1.86	1.61	1.58	-------	[a]1.57	1.81	1.54	1.37	-		1.86
31	1.56	-------	1.57	1.58	-------	1.56	-------	1.53	-------	-		-------

[a] Computed on basis of recorded range in stage, weather records, and records for Des Plaines River at Riverside.

Deep River at Lake George Outlet, at Hobart, Ind.

Location.--Lat 41°32'10", long 87°15'25", in NW¼ sec. 32, T. 36 N., R. 7 W., on left bank at upstream side of highway bridge, 300 ft upstream from Duck Creek and 400 ft downstream from Lake George Dam.

Drainage area.--125 sq mi.

Records available.--April 1947 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 588.17 ft above mean sea level, datum of 1929 (levels by Indiana Flood Control and Water Resources Commission). Prior to July 29, 1952, staff gage and July 30, 1952, to July 20, 1955, water-stage recorder, at site 400 ft upstream at 11.80 ft higher datum.

Average discharge.--10 years, 91.5 cfs.

Extremes.--Maximum discharge during year, 1,650 cfs July 14 (gage height, 12.35 ft); minimum, 2.0 cfs (regulated) Oct. 8 (gage height, 3.37 ft).

1947-57: Maximum discharge, 3,880 cfs Oct. 11, 1954 (gage height, 7.68 ft); minimum, that of Oct. 8, 1956.

Revisions.--The maximum discharge for the water year 1956 has been revised to 1,320 cfs May 11, 1956 (gage height, 11.15 ft, superseding figure published in WSP 1437.

Remarks.--Records good.

Revisions (water years).--WSP 1337: 1953, drainage area. Revised figures of discharge, in cubic feet per second, for the water year 1956, superseding those published in WSP 1437, are given herewith:

May 11, 1956.......... 1,220

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
May 1956....................	9,378	1,220	46	303	2.42	2.79
Water year 1955-56........	-	1,220	4.9	71.8	.574	7.81

Rating tables, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 12

3.2	3.3	5.0	153
3.3	4.9	7.0	427
3.5	9.9	9.0	820
3.7	18	11.0	1,460
4.0	37		

July 13 to Sept. 30

3.5	9.9	5.0	130
3.7	18	7.0	420
4.0	36	9.0	800
4.5	76	12.0	1,530

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.8	7.7	12	13	13	35	33	478	70	179	37	17
2	4.6	7.9	13	11	13	28	32	352	67	110	36	18
3	4.7	7.9	13	11	13	24	33	257	54	80	50	17
4	4.9	7.9	13	11	13	21	54	205	44	63	49	13
5	5.6	8.5	15	12	13	20	116	166	38	48	43	13
6	8.2	9.9	14	13	13	18	140	140	43	39	35	13
7	5.6	9.3	14	14	15	17	140	116	60	33	29	13
8	5.1	7.7	15	13	17	18	192	92	63	29	24	13
9	4.7	7.4	21	15	43	18	218	74	56	25	21	13
10	4.6	6.4	14	18	67	17	192	63	48	22	97	13
11	*5.6	7.9	14	15	60	39	166	66	56	20	118	13
12	7.1	7.7	*12	14	48	80	128	63	68	49	72	15
13	7.4	10	12	15	*40	*80	104	134	140	1,160	47	16
14	6.4	10	12	14	33	68	86	352	218	*1,420	38	15
15	4.4	16	14	12	29	62	*75	444	192	900	32	15
16	5.3	*12	15	*12	25	42	62	337	160	600	26	14
17	7.1	6.9	15	11	21	36	63	*231	*128	403	24	13
18	7.4	9.6	15	11	20	37	83	179	98	305	21	13
19	6.9	12	15	11	19	47	68	192	78	232	21	*13
20	8.2	14	15	12	17	50	86	244	62	178	18	12
21	7.4	23	16	18	16	48	92	270	49	142	16	15
22	7.1	14	17	61	16	45	104	231	45	118	16	16
23	6.2	9.6	21	63	17	41	146	179	104	154	*15	15
24	6.0	12	24	41	18	36	179	146	192	142	21	14
25	7.7	12	21	29	21	36	309	128	128	102	21	12
26	8.2	14	20	22	27	38	444	116	80	76	20	11
27	6.9	13	16	17	37	37	895	98	57	63	16	12
28	7.1	12	18	15	41	42	1,130	80	104	53	18	12
29	7.7	12	17	15	-	38	845	69	283	49	21	12
30	7.9	12	15	14	--------	36	620	56	283	53	21	13
31	7.1	--------	15	13	--------	34	--------	53	--------	45	19	--------
Total	198.9	320.3	483	566	725	1,188	6,815	5,611	3,068	6,892	1,042	414
Mean	6.42	10.7	15.6	18.3	25.9	38.3	227	181	102	222	33.6	13.8
Cfsm	0.051	0.086	0.125	0.146	0.207	0.306	1.82	1.45	0.816	1.78	0.269	0.110
In.	0.06	0.10	0.14	0.17	0.22	0.35	2.03	1.67	0.91	2.05	0.31	0.12

Calendar year 1956: Max 1,220 Min 4.4 Mean 67.2 Cfsm 0.538 In. 7.31
Water year 1956-57: Max 1,420 Min 4.4 Mean 74.9 Cfsm 0.599 In. 8.13

Peak discharge (base, 700 cfs).--Apr. 28 (2:30 a.m.) 1,230 cfs (10.35 ft); July 14 (1 a.m.) 1,650 cfs (12.35 ft).

* Discharge measurement made on this day.

Burns ditch at Gary, Ind.

Location.--Lat 41°34'30", long 87°17'20", in N½ sec. 13, T. 36 N., R. 8 W., on left bank on downstream side of bridge on Central Avenue, 0.4 mile east of Gary and 0.4 mile downstream from confluence of Deep River and Little Calumet River.

Drainage area.--About 160 sq mi.

Records available.--October 1943 to September 1957 (high-water records only, October 1950 to September 1955).

Gage.--Water-stage recorder. Datum of gage is 577.04 ft above mean sea level, datum of 1929. Prior to July 28, 1955, wire-weight gage at same site and datum.

Average discharge.--9 years (1943-50, 1955-57), 132 cfs.

Extremes.--Maximum discharge during year, 1,640 cfs July 14 (gage height, 11.90 ft), from loop rating; minimum, 8.5 cfs Oct. 15, 16.

1943-57: Maximum discharge, 3,430 cfs Oct. 11, 1954; maximum gage height, 16.44 ft Mar. 16, 1944, from graph based on gage readings; minimum determined, 1.8 cfs Oct. 14, 1946.

Remarks.--Records poor. 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).--WSP 1034: 1944. WSP 1337: Drainage area.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	14	11	18	19	66	80	644	107	182	78	28
2	12	15	12	15	19	58	83	507	107	100	74	33
3	10	15	17	16	20	47	84	379	89	68	93	33
4	21	15	17	17	21	43	114	311	79	53	100	29
5	13	15	18	18	21	41	160	262	69	41	83	21
6	12	16	19	18	21	39	198	214	75	33	64	21
7	16	18	19	20	26	37	198	190	93	26	53	21
8	12	16	21	21	31	37	230	167	100	23	44	21
9	11	14	26	22	78	38	262	144	100	19	38	20
10	9.5	12	24	42	90	39	246	137	85	16	155	22
11	10	14	19	48	86	79	214	137	100	15	198	22
12	*12	16	18	15	74	*144	174	137	107	36	137	24
13	13	16	*17	17	*63	144	144	176	160	975	92	29
14	12	18	16	17	58	122	122	328	230	*1,600	72	26
15	9.0	21	18	15	50	122	107	469	230	*1,310	62	25
16	9.0	*23	21	*14	45	93	*93	433	190	825	49	24
17	9.5	12	22	12	39	81	100	*311	*160	615	43	21
18	12	9.5	20	12	35	83	100	262	130	495	37	19
19	12	10	19	12	33	107	107	262	100	415	33	*20
20	14	15	20	14	30	114	144	311	86	345	30	21
21	14	25	21	28	28	107	160	345	73	278	28	24
22	14	19	23	101	28	107	174	311	70	246	26	29
23	20	14	27	100	33	100	214	262	100	278	*24	24
24	13	12	32	63	37	90	262	214	152	246	40	21
25	11	14	29	47	46	84	362	190	122	190	38	19
26	15	26	26	36	72	89	469	174	70	152	33	17
27	16	14	24	29	80	89	802	160	48	130	28	16
28	14	15	25	25	72	93	1,270	137	77	107	29	16
29	14	14	24	24	-	90	1,170	122	214	107	36	18
30	14	11	21	22	--------	85	874	107	294	100	37	19
31	14	--------	20	19	--------	81	--------	100	--------	90	32	--------
Total	400.0	468.5	646	877	1,255	2,549	8,717	7,903	3,617	9,116	1,886	683
Mean	12.9	15.6	20.8	28.3	44.8	82.2	291	255	121	294	60.8	22.8
Cfsm	0.081	0.098	0.130	0.177	0.280	0.514	1.82	1.59	0.756	1.84	0.380	0.142
In.	0.09	0.12	0.15	0.20	0.29	0.59	2.03	1.83	0.84	2.12	0.44	0.16

Calendar year 1956: Max 1,570 Min 7.6 Mean 100 Cfsm 0.625 In. 8.53
Water year 1956-57: Max 1,600 Min 9.0 Mean 104 Cfsm 0.650 In. 8.86

* Discharge measurement made on this day.

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.--62.9 sq mi.

Records available.--May 1945 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 603.48 ft above mean sea level, datum of 1929. Prior to June 26, 1952, wire-weight gage at same site and datum.

Average discharge.--12 years, 71.3 cfs.

Extremes.--Maximum discharge during year, 848 cfs Apr. 27 (gage height, 7.65 ft); minimum, 18 cfs Jan. 1 (result of freezeup); minimum gage height, 2.32 ft July 12.

1945-57: Maximum discharge, 3,110 cfs Oct. 10, 1954 (gage height, 11.66 ft); minimum, 18 cfs Aug. 10, 11, 1946, Sept. 30, 1953, Jan. 11-13, 1954, Jan. 1, 1957; minimum gage height, 2.14 ft Aug. 22, 1949.

Remarks.--Records fair.

Revisions (water years).--WSP 1084: 1945. WSP 1337: 1946-47, drainage area.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	29	31	26	42	44	48	141	44	32	26	38
2	22	28	32	30	42	42	54	111	40	31	25	35
3	22	28	34	30	40	38	51	88	38	29	38	36
4	22	28	34	31	40	38	82	76	36	30	57	33
5	23	28	34	31	38	39	97	66	36	29	32	31
6	22	29	35	30	38	39	94	62	36	28	28	30
7	22	29	34	31	44	39	82	57	38	28	27	30
8	22	28	33	30	46	38	122	55	41	28	26	28
9	22	26	35	31	96	35	104	50	36	28	25	28
10	23	26	32	28	88	33	76	51	35	27	153	28
11	*23	27	34	29	64	54	64	59	36	26	277	29
12	24	27	*35	34	*55	*141	57	64	37	30	97	30
13	24	27	33	32	53	88	52	62	44	122	54	35
14	24	28	32	29	52	79	49	111	42	61	55	30
15	24	*30	34	34	46	82	*47	82	38	39	48	28
16	25	31	37	32	43	66	45	*62	34	33	38	29
17	25	29	36	*32	40	57	52	57	33	32	35	27
18	26	29	35	32	40	54	55	59	*38	30	33	*26
19	27	29	33	33	40	76	53	75	46	28	32	*27
20	29	30	34	40	38	76	74	118	33	27	30	28
21	30	35	36	49	36	66	72	97	31	27	29	29
22	29	32	36	104	37	62	72	76	32	29	*28	29
23	29	30	36	82	38	55	165	64	41	43	28	28
24	29	30	40	64	40	51	149	62	35	*31	33	27
25	29	30	38	55	44	49	316	55	33	28	35	26
26	31	31	36	45	47	51	460	57	32	27	31	26
27	31	32	34	45	59	55	580	49	32	27	30	25
28	30	32	36	46	48	54	645	46	43	26	31	25
29	29	32	35	44	-	52	325	43	47	27	84	28
30	29	31	33	43		49	195	41	36	37	61	28
31	29		33	43		46		40		28	43	
Total	798	881	1,070	1,245	1,334	1,748	4,337	2,136	1,123	1,048	1,569	877
Mean	25.7	29.4	34.5	40.2	47.6	56.4	145	68.9	37.4	33.8	50.6	29.2
Cfsm	0.409	0.467	0.548	0.639	0.757	0.897	2.31	1.10	0.595	0.537	0.804	0.464
In.	0.47	0.52	0.63	0.74	0.79	1.03	2.58	1.27	0.66	0.62	0.93	0.52

Calendar year 1956: Max 773 Min 21 Mean 54.2 Cfsm 0.862 In. 11.73
Water year 1956-57: Max 645 Min 22 Mean 49.8 Cfsm 0.792 In. 10.76

Peak discharge (base, 700 cfs).--Apr. 27 (2 a.m.) 848 cfs (7.65 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., on left bank on downstream side of highway bridge, 50 ft downstream from New York Central Railroad bridge, 1¼ miles north of McCool, and 1.5 miles upstream from Little Calumet River.

Drainage area.--78.7 sq mi.

Records available.--May 1945 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 594.10 ft above mean sea level, datum of 1929 (levels by Indiana Flood Control and Water Resources Commission). Prior to July 25, 1955, wire-weight gage at same site and datum.

Average discharge.--12 years, 70.8 cfs.

Extremes.--Maximum discharge during year, 725 cfs Apr. 27 (gage height, 9.81 ft); minimum, 12 cfs Jan. 1 (result of freezeup).

1945-57: Maximum discharge, 3,180 cfs Oct. 11, 1954 (gage height, 14.12 ft); minimum, 6.3 cfs Aug. 24, 1955 (gage height, 2.31 ft).

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

Revisions (water years).--WSP 1337: 1946-48(M), 1950(M), drainage area.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Jan. 14)

2.8	19	7.0	330
2.9	23	9.0	575
4.0	74	10.0	775
5.0	143		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	25	29	28	44	49	49	119	54	42	29	56
2	23	25	29	25	42	46	54	92	49	35	29	40
3	24	25	30	30	42	42	49	74	40	33	46	37
4	24	27	30	30	42	37	88	66	35	33	64	30
5	24	26	30	30	42	37	127	62	35	30	37	29
6	24	29	33	30	40	37	135	56	44	29	30	29
7	23	29	30	30	44	37	98	54	46	29	29	27
8	22	26	30	30	52	37	167	49	56	27	27	27
9	22	26	33	30	100	37	151	46	46	27	27	26
10	23	27	30	31	98	37	105	46	42	26	169	26
11	*23	26	30	29	72	58	80	56	46	25	212	27
12	23	26	*33	40	*62	*143	69	62	46	32	86	29
13	23	26	30	35	59	86	62	98	102	341	56	30
14	22	26	29	29	56	64	56	167	105	545	44	29
15	22	*29	29	b25	54	69	*52	105	74	240	40	27
16	23	30	33	b24	49	62	49	*72	59	86	35	27
17	23	27	30	*b24	44	56	54	64	46	69	33	26
18	23	27	30	b24	42	54	59	64	*44	59	30	*25
19	24	27	30	b26	42	69	62	77	68	46	29	24
20	25	29	30	b34	40	72	86	119	52	42	29	25
21	26	35	33	54	40	64	86	98	40	49	27	27
22	24	30	33	127	40	59	74	74	37	49	*26	27
23	25	27	35	98	40	54	119	64	68	80	26	26
24	25	27	40	66	42	52	112	62	46	*52	36	25
25	25	27	37	59	46	49	250	56	40	40	37	23
26	27	29	35	49	52	52	390	59	35	35	29	23
27	29	30	33	42	66	59	545	49	35	33	27	23
28	26	29	35	46	54	56	605	46	59	30	32	24
29	29	29	35	44	-	54	380	44	92	30	72	23
30	24	29	30	40	-------	52	194	42	54	37	46	23
31	24	--------	30	44	--------	46	--------	40	--------	30	44	---------
Total	748	830	984	1,253	1,446	1,726	4,407	2,182	1,595	2,261	1,483	840
Mean	24.1	27.7	31.7	40.4	51.6	55.7	147	70.4	53.2	72.9	47.8	28.0
Cfsm	0.306	0.352	0.403	0.513	0.656	0.708	1.87	0.895	0.676	0.926	0.607	0.356
In.	0.35	0.39	0.46	0.59	0.68	0.82	2.09	1.03	0.75	1.07	0.70	0.40

Calendar year 1956: Max 847 Min 22 Mean 57.7 Cfsm 0.733 In. 9.95
Water year 1956-57: Max 605 Min 22 Mean 54.1 Cfsm 0.687 In. 9.33

Peak discharge (base, 600 cfs).--Apr. 27 (11 p.m.) 725 cfs (9.81 ft); July 14 (5 a.m.) 605 cfs (9.24 ft).

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

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 Jay Street Bridge at Coldwater, 1 mile upstream from mouth.

Drainage area.--About 60 sq mi.

Records available.--October 1937 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Wire-weight gage and crest-stage indicator; 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 Oct. 1, 1947, staff gage at site 400 ft downstream at same datum.

Average discharge.--20 years, 46.1 cfs.

Extremes.--Maximum discharge observed during year, 59 cfs Apr. 27 (gage height, 4.91 ft); maximum gage height, 5.55 ft sometime during February or March (ice jam); minimum discharge, 0.4 cfs Nov. 18, 19; minimum gage height, 3.96 ft Nov. 18, 19, 20.

1937-57: Maximum discharge, 735 cfs Apr. 24, 1950 (gage height, 6.60 ft); minimum, 0.1 cfs Dec. 13, 15-18, 1946, Sept. 12-18, 24, 1953, Sept. 21, 22, 1955.

Remarks.--Records fair. Flow infrequently affected by contribution to or from Coldwater Lake. Regulation caused by dam at outlet of Marble Lake.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 1, Apr. 30 to May 31, Sept. 27-30)

3.82	0.4	4.2	9.2
3.9	1.2	4.4	20
4.0	3.1	5.0	77
4.1	5.8		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*2.2	1.2	1.3	2.6	8.1	15	14	41	18	18	12	10
2	*2.2	1.2	1.6	3.1	7.8	14	16	38	20	18	11	9.2
3	2.0	1.2	*1.8	3.3	8.1	10	16	33	19	17	11	10
4	2.0	1.0	1.6	*3.5	7.8	15	21	32	19	17	12	8.8
5	1.8	*1.1	1.6	3.8	6.8	15	32	29	17	17	11	8.8
6	1.6	1.2	2.4	3.8	7.4	12	54	28	17	16	10	8.8
7	1.6	1.1	2.4	3.8	8.8	12	43	32	16	16	10	8.4
8	1.4	1.1	2.4	3.3	8.8	9.5	42	33	16	24	10	7.8
9	1.4	1.0	2.6	4.4	12	11	41	33	17	27	10	7.4
10	1.6	.9	2.4	2.4	14	12	*46	34	18	*22	10	7.4
11	1.6	1.0	3.3	3.1	14	11	46	32	18	21	9.2	7.4
12	1.6	1.2	2.8	4.4	10	15	44	32	18	18	9.2	8.1
13	1.4	1.2	2.4	4.1	15	14	45	33	19	20	8.4	7.8
14	1.3	1.3	2.0	3.8	13	14	44	32	25	18	*8.4	7.1
15	1.2	1.4	3.5	3.5	14	14	43	30	23	13	12	7.4
16	1.3	.8	3.3	3.3	*14	15	42	*23	23	11	9.5	*6.8
17	1.2	.6	2.6	2.8	14	14	42	24	22	10	8.8	6.8
18	1.2	.4	2.8	2.8	16	*12	44	24	22	10	8.8	6.8
19	1.2	.4	2.0	3.1	15	16	42	25	22	9.5	8.1	6.4
20	1.2	1.1	2.0	3.8	10	15	43	27	*20	10	7.8	7.1
21	1.3	2.4	3.5	5.8	12	15	39	26	19	9.5	7.4	7.1
22	1.3	1.8	4.9	13	12	15	34	26	19	9.2	7.4	7.8
23	1.3	1.4	4.1	5.8	14	15	34	28	18	11	6.8	6.8
24	1.3	1.2	4.6	7.8	11	14	36	26	16	9.2	17	6.4
25	1.3	1.4	4.6	8.1	11	14	37	23	16	9.5	9.5	6.1
26	1.3	1.3	4.9	9.2	12	14	43	26	16	9.2	8.8	6.1
27	1.3	1.2	5.2	8.4	18	15	56	25	16	9.5	8.8	6.1
28	1.3	1.1	5.2	7.8	14	14	52	22	23	14	9.2	5.2
29	1.3	1.2	3.5	8.8	-	15	45	20	20	14	10	5.2
30	1.3	1.3	4.1	8.4		15	44	20	19	15	12	*4.6
31	1.3		4.9	8.1		15		16		14	10	
Total	45.3	34.7	96.3	159.9	328.6	426.5	1,180	873	571	456.6	304.1	219.7
Mean	1.46	1.16	3.11	5.16	11.7	13.8	39.3	28.2	19.0	14.7	9.81	7.32
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 232 Min 0.4 Mean 34.9 Cfsm - In. -
Water year 1956-57: Max 56 Min 0.4 Mean 12.9 Cfsm - In. -

* Discharge measurement made on this day.

St. Joseph River at Three Rivers, Mich.

Location.--Lat 41°56'25", long 85°38'00", in S½ sec. 18, T. 6 S., R. 11 W., on right bank in Scidmore Park at Three Rivers, 250 ft downstream from Rocky River and at mile 112.

Drainage area.--1,320 sq mi, approximately.

Records available.--May 1953 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 781.34 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Extremes.--Maximum discharge during year, 2,320 cfs Apr. 30 (gage height, 5.52 ft); minimum, 78 cfs Nov. 5, 6 (gage height, 1.87 ft); minimum daily, 141 cfs Oct. 16, 25.

1953-57: Maximum discharge, 3,740 cfs May 12, 1956 (gage height, 7.34 ft); minimum daily, 96 cfs Aug. 30, 1953.

Remarks.--Records good except those for periods of ice effect, which are fair. Flow regulated by powerplants above station.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 31, July 4 to Aug. 2, Aug. 19 to Sept. 22)

1.9	125
2.0	160
2.5	370
3.0	625
6.0	2,700

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*271	299	490	588	556	933	872	2,040	898	723	377	454
2	300	270	468	608	604	868	898	1,870	786	656	262	532
3	420	444	462	646	524	872	916	1,540	792	634	334	562
4	300	425	470	644	734	897	915	1,310	766	506	400	492
5	276	*256	463	518	728	854	931	1,330	746	538	452	430
6	406	210	480	502	737	777	1,040	1,340	725	575	616	*406
7	406	413	*488	612	749	804	1,600	1,240	730	534	532	465
8	254	364	519	549	592	874	1,750	1,110	608	678	272	433
9	257	392	506	402	667	630	1,460	1,080	623	883	252	260
10	348	343	511	370	688	639	1,700	1,110	718	*698	358	304
11	400	418	514	419	884	856	1,600	898	740	678	384	418
12	398	402	502	b280	944	864	1,390	860	774	862	258	266
13	460	428	487	b350	966	844	1,380	1,020	759	692	*352	454
14	412	400	504	492	960	864	1,420	1,010	980	704	580	353
15	239	369	502	437	950	972	1,270	974	772	911	270	374
16	141	366	466	b400	842	875	1,200	*962	733	656	240	431
17	248	483	610	b370	879	790	1,220	1,010	790	630	352	449
18	396	433	602	b400	928	948	1,250	889	810	614	352	451
19	237	272	566	b380	846	*940	1,220	907	768	622	342	274
20	418	242	572	b500	*744	916	1,290	1,130	*746	504	359	352
21	433	496	558	562	768	939	1,370	1,290	809	494	459	400
22	263	502	503	592	750	948	1,240	1,240	686	375	361	443
23	270	472	502	649	668	986	1,200	1,170	625	224	266	586
24	220	508	524	651	626	980	1,230	1,110	673	478	348	483
25	141	464	526	702	800	1,050	1,300	1,050	690	414	364	494
26	314	470	614	703	838	859	1,430	1,120	665	374	386	470
27	472	469	646	656	922	764	1,650	1,090	626	396	520	350
28	430	431	630	*832	886	859	1,950	963	660	405	472	496
29	396	442	600	810	-	789	2,160	847	597	364	369	420
30	444	487	588	782	--------	676	2,120	750	629	464	512	297
31	449	--------	624	758	--------	774	--------	944	--------	498	363	--------
Total	10,419	11,970	16,497	17,164	21,780	26,641	40,972	35,204	21,924	17,784	11,764	12,599
Mean	336	399	532	554	778	859	1,366	1,136	731	574	379	420
Cfsm	0.255	0.302	0.403	0.420	0.589	0.651	1.03	0.861	0.554	0.435	0.287	0.318
In.	0.29	0.34	0.46	0.48	0.61	0.75	1.15	0.99	0.62	0.50	0.33	0.35

Calendar year 1956: Max 3,660 Min 141 Mean 976 Cfsm 0.739 In. 10.06
Water year 1956-57: Max 2,160 Min 141 Mean 670 Cfsm 0.508 In. 6.87

* 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 & Electric Co. hydroelectric plant, 4 miles upstream from Pigeon River, and at mile 96.

Drainage area.--1,860 sq mi, approximately.

Records available.--October 1923 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 755.3 ft above mean sea level (Michigan Gas & Electric Co. benchmark). Prior to Oct. 1, 1951, at site 0.4 mile upstream at datum 4.2 ft higher.

Average discharge.--34 years, 1,526 cfs.

Extremes.--Maximum discharge during year, 3,300 cfs May 1 (estimated on basis of records for nearby stations); minimum recorded, 48 cfs Oct. 19; minimum daily, 318 cfs Jan. 12.
1923-57: 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 good except those for periods of indefinite stage-discharge relation or no gage-height record, which are fair. Flow regulated by powerplants above station.

Revisions (water years).--WSP 1387: 1930, 1932, 1938, 1940-42, 1945.

Rating table, water year 1956-57, except period of indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 22 to Nov. 3, June 6 to Sept. 30)

1.9	310
2.0	355
2.5	655
3.0	1,040
4.7	2,620

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*740	711	700	730	963	1,190	1,330	2,600	1,260	1,120	682	620
2	*620	796	737	999	678	989	1,290	2,400	1,250	1,010	619	900
3	620	361	842	836	728	1,280	1,140	2,300	1,340	984	450	900
4	620	850	849	942	1,200	1,240	1,310	1,700	1,130	727	586	660
5	620	762	*892	806	954	1,270	1,290	1,700	1,100	1,060	602	720
6	550	*544	862	784	986	1,150	1,270	1,700	983	*684	788	700
7	500	636	916	900	1,000	924	1,560	1,700	1,090	786	807	*560
8	720	701	820	858	980	1,220	2,200	1,700	772	1,090	516	710
9	500	741	737	774	852	848	*1,890	1,600	890	1,340	506	675
10	410	722	995	796	1,020	810	1,810	1,500	1,030	1,120	366	622
11	500	522	725	679	1,290	1,140	2,180	1,200	1,080	908	456	610
12	520	731	884	318	1,250	1,320	1,960	1,100	1,100	1,150	664	570
13	700	766	819	760	1,350	1,260	1,660	1,400	1,190	957	418	703
14	660	752	860	820	1,270	1,160	1,850	1,300	1,140	972	*626	481
15	640	853	767	820	1,310	1,210	1,750	*1,300	1,250	1,210	622	572
16	560	564	826	660	1,120	1,120	1,620	1,350	1,120	1,180	554	786
17	480	608	864	600	966	890	1,640	1,360	988	938	359	686
18	540	808	1,000	640	1,350	1,430	1,650	1,330	1,140	936	472	614
19	560	726	929	550	1,220	*1,310	1,690	1,150	*1,140	880	598	665
20	480	698	896	816	1,070	1,310	1,560	1,470	969	722	435	571
21	560	720	934	1,150	*1,060	1,190	1,800	1,560	1,070	702	580	446
22	617	746	830	952	1,040	1,280	1,800	1,560	792	953	520	626
23	655	954	840	1,020	820	1,160	1,600	1,580	954	700	550	730
24	515	748	974	918	823	1,400	1,600	1,480	1,040	594	407	762
25	403	874	808	1,010	1,210	1,340	1,600	1,300	820	699	639	630
26	378	886	1,020	932	1,230	1,240	1,600	1,620	970	688	622	796
27	790	894	1,100	718	1,070	1,020	2,000	1,430	988	585	796	570
28	637	860	918	*1,340	1,370	1,110	2,200	1,380	1,120	584	678	450
29	614	738	888	1,130	-	1,160	2,400	1,300	784	772	850	595
30	614	868	778	1,120	--------	736	2,500	960	872	625	800	533
31	680	--------	1,140	932	--------	1,040	--------	1,170	--------	620	650	--------
Total	18,003	22,140	27,150	26,310	30,180	35,747	51,750	47,200	31,372	27,296	18,218	19,463
Mean	581	738	876	849	1,078	1,153	1,725	1,523	1,046	881	588	649
Cfsm	0.312	0.397	0.471	0.456	0.580	0.620	0.927	0.819	0.562	0.474	0.316	0.349
In.	0.36	0.44	0.54	0.53	0.60	0.71	1.03	0.94	0.63	0.55	0.36	0.39

Calendar year 1956: Max 5,020 Min 344 Mean 1,377 Cfsm 0.740 In. 10.08
Water year 1956-57: Max 2,600 Min 318 Mean 972 Cfsm 0.523 In. 7.08

* Discharge measurement made on this day.

Note.--Stage-discharge relation indefinite Oct. 1-21; discharge computed on basis of powerplant records and records for station at Niles. No gage-height record Apr. 21 to May 15, Aug. 29 to Sept. 7; discharge estimated on same basis as noted above.

Pigeon Creek at Hogback Lake Outlet, near Angola, Ind.

Location.--Lat 41°37'24", long 85°05'44", in NE¼NW¼ sec. 36, T. 37 N., R. 12 E., on right bank 200 ft north of lake outlet, 2 miles southeast of Flint, and 5.1 miles west of Angola.

Drainage area.--102 sq mi.

Records available.--October 1945 to September 1957. Prior to October 1947, published as "near Flint."

Gage.--Water-stage recorder. Datum of gage is 940.00 ft above mean sea level, datum of 1929. Prior to October 1947, wire-weight gage at site 1½ miles downstream at different datum. October 1947 to Aug. 3, 1953, staff gage at site 600 ft downstream at same datum.

Average discharge.--12 years, 81.4 cfs.

Extremes.--Maximum discharge during year, 317 cfs Apr. 14 (gage height, 11.29 ft); minimum, 15 cfs Sept. 9-12 (gage height, 7.49 ft).

1945-57: Maximum discharge, 744 cfs Apr. 8, 1950 (gage height, 14.95 ft); minimum, 5.2 cfs Oct. 19-25, 1953; minimum gage height, 7.24 ft Sept. 9, 10, 1953.

Remarks.--Records good.

Revisions (water years).--WSP 1144: 1948. WSP 1337: Drainage area.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method Oct. 1 to Dec. 27, Aug. 24 to Sept. 30)

7.3	14	9.0	93
7.5	18	11.0	284
8.0	35	12.0	394
8.5	60		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	17	25	35	54	124	48	229	69	86	*31	17
2	17	17	25	35	48	140	51	*209	69	93	29	17
3	16	17	25	33	43	149	54	189	66	90	29	17
4	*16	17	24	*33	43	132	66	169	63	82	29	17
5	16	17	24	31	41	124	90	149	60	79	27	*17
6	16	18	*24	31	39	108	132	132	57	79	26	16
7	16	18	25	29	37	93	179	116	54	76	25	16
8	16	18	26	29	37	86	229	108	51	79	24	16
9	16	17	27	29	39	79	251	100	48	82	23	15
10	16	17	29	31	46	72	262	93	46	86	23	15
11	16	17	29	29	66	66	273	86	46	*86	23	15
12	16	17	27	29	82	63	284	82	*43	86	22	16
13	16	17	27	29	93	63	306	82	51	86	21	16
14	16	17	27	27	93	60	317	79	60	79	21	16
15	16	18	26	27	90	60	306	79	66	69	21	16
16	16	18	27	27	82	60	284	79	72	63	20	16
17	16	19	27	26	76	57	262	76	72	57	20	16
18	16	19	27	25	69	57	240	72	72	51	19	16
19	16	19	27	24	63	57	229	76	69	46	19	17
20	16	20	27	23	60	57	219	82	66	43	19	18
21	16	24	29	23	54	57	219	93	63	43	19	18
22	16	25	31	27	51	57	199	100	57	41	18	19
23	16	27	31	37	48	57	189	108	54	41	18	19
24	16	29	33	51	46	57	179	108	54	39	18	18
25	16	29	35	66	46	57	169	108	51	39	18	18
26	17	29	35	72	48	54	179	108	48	37	18	18
27	17	29	37	76	*60	*54	199	93	51	35	18	17
28	17	27	37	72	86	54	229	90	57	33	18	17
29	17	27	37	*69	-	54	240	86	66	33	18	16
30	17	26	37	63		54	240	79	79	31	18	16
31	*17		37	57		51		72		31	18	
Total	504	626	904	1,195	1,640	2,313	6,124	3,332	1,780	1,901	670	501
Mean	16.3	20.9	29.2	38.5	58.6	74.6	204	107	59.3	61.3	21.6	16.7
Cfsm	0.160	0.205	0.286	0.377	0.575	0.731	2.00	1.05	0.581	0.601	0.212	0.164
In.	0.18	0.23	0.33	0.43	0.60	0.84	2.23	1.21	0.65	0.69	0.24	0.18

Calendar year 1956: Max 548 Min 16 Mean 91.5 Cfsm 0.897 In. 12.20
Water year 1956-57: Max 317 Min 15 Mean 58.9 Cfsm 0.577 In. 7.81

* Discharge measurement made on this day.

North Branch Elkhart River near Cosperville, Ind.

Location.--Lat 41°29'32", long 85°26'54", in SW¼NE¼ sec. 14, T. 35 N., R. 9 E., at downstream side of county road bridge over outlet of Waldron Lake at extreme west end of lake, 1.5 miles northeast of Cosperville, and 6.6 miles northwest of Albion.

Drainage area.--133 sq mi.

Records available.--October 1950 to September 1957.

Gage.--Wire-weight gage read twice daily. Datum of gage is 880.00 ft above mean sea level, datum of 1929. Prior to Aug. 7, 1956, staff gage at same site and datum.

Average discharge.--7 years, 121 cfs.

Extremes.--Maximum discharge during year, 406 cfs Apr. 12-14; maximum gage height observed, 7.42 ft Apr. 13; minimum daily discharge, 7.7 cfs Sept. 9-11; minimum gage height, 4.53 ft Aug. 23.

1950-57: Maximum discharge observed, 717 cfs May 13, 1956 (gage height, 8.78 ft); minimum daily, 3.5 cfs Sept. 12, Oct. 3, 1953; minimum gage height, 4.50 ft Oct. 3, 1953.

Remarks.--Records fair.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

4.5	5.8	5.5	111
4.6	12	6.0	178
4.8	28	7.0	330
5.0	48	8.0	535

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	19	35	53	85	130	85	282	98	124	*26	11
2	11	19	35	53	82	124	*98	266	92	118	23	10
3	12	19	35	52	75	124	104	250	85	104	23	11
4	11	19	36	50	73	124	124	234	81	98	21	10
5	*11	19	35	49	72	124	171	206	76	98	19	11
6	10	17	35	47	*70	*118	234	192	78	98	16	10
7	11	17	*39	*46	71	111	282	178	78	92	14	9.5
8	12	19	41	45	70	104	314	*164	78	92	14	8.9
9	13	*18	45	46	85	98	314	150	78	92	14	7.7
10	15	19	43	52	104	98	330	150	68	*92	15	7.7
11	16	16	43	53	111	98	368	137	64	80	14	*7.7
12	17	16	43	55	111	98	406	130	61	76	14	8.9
13	16	19	43	53	104	104	406	130	65	80	11	11
14	17	17	41	50	104	104	406	130	*71	78	10	12
15	17	19	41	48	104	98	387	130	111	77	13	12
16	17	22	40	46	98	98	387	124	118	70	16	16
17	17	25	41	46	98	98	368	118	118	65	14	16
18	17	23	43	45	92	98	368	111	111	60	14	16
19	17	22	42	48	92	98	368	124	98	53	12	16
20	17	24	42	43	92	98	368	137	92	48	11	22
21	17	34	46	46	85	98	368	144	84	42	10	28
22	17	48	48	76	80	92	349	144	72	39	10	31
23	17	48	50	98	80	92	330	137	68	40	8.3	30
24	17	46	50	104	80	92	314	130	65	39	10	29
25	16	43	53	104	80	92	314	130	59	36	14	27
26	17	41	53	98	85	92	314	118	52	34	13	24
27	17	39	53	92	118	85	314	118	59	31	12	21
28	18	36	55	92	130	85	314	111	98	28	11	19
29	17	36	55	92	-	85	314	104	130	28	11	18
30	17	36	54	85	--------	85	298	98	130	28	11	17
31	18	--------	53	85	--------	85	--------	104	--------	28	11	--------
Total	474	795	1,368	1,952	2,531	3,130	9,117	4,681	2,538	2,068	435.3	478.4
Mean	15.3	26.5	44.1	63.0	90.4	101	304	151	84.6	66.7	14.0	15.9
Cfsm	0.115	0.199	0.332	0.474	0.680	0.759	2.29	1.14	0.636	0.502	0.105	0.120
In.	0.13	0.22	0.38	0.55	0.71	0.87	2.56	1.31	0.71	0.58	0.12	0.13

Calendar year 1956:	Max	717	Min	10	Mean	123	Cfsm	0.925	In.	12.55
Water year 1956-57:	Max	406	Min	7.7	Mean	81.0	Cfsm	0.609	In.	8.27

* 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.--580 sq mi.

Records available.--April 1931 to September 1957 in reports of Geological Survey. September 1924 to March 1928 in reports of Indiana Department of Conservation.

Gage.--Water-stage recorder. Datum of gage is 769.43 ft above mean sea level, datum of 1929. Prior to Nov. 20, 1931, chain gage at same site and datum.

Average discharge.--29 years (1924-27, 1931-57), 498 cfs.

Extremes.--Maximum discharge during year, 1,820 cfs Apr. 12 (gage height, 5.52 ft); minimum daily, 34 cfs Sept. 1.

1931-57: Maximum discharge, 5,440 cfs Apr. 4, 1950 (gage height, 10.15 ft); maximum gage height, 10.33 ft July 10, 1951; minimum daily, 11 cfs Oct. 15, 1953.

Remarks.--Records fair. Flow regulated by three powerplants above station.

Revisions (water years).--WSP 1337: 1939(M), drainage area.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	156	153	218	257	383	478	334	940	352	590	194	34
2	162	137	206	166	372	456	341	858	344	512	185	159
3	157	142	154	179	362	436	404	805	348	478	118	167
4	102	92	142	240	358	418	512	735	348	456	66	46
5	156	158	218	257	352	418	885	690	310	453	226	40
6	108	142	157	246	344	411	1,080	650	310	460	212	164
7	42	218	162	243	334	411	995	610	313	436	185	126
8	170	218	229	236	344	386	995	590	306	428	90	68
9	164	154	226	236	418	369	1,190	550	299	404	39	156
10	*105	40	222	136	550	362	1,350	530	296	386	132	107
11	146	82	*212	155	570	362	*1,660	530	296	369	194	51
12	157	203	209	260	512	369	1,760	512	288	362	212	194
13	44	*229	155	243	478	372	1,490	495	313	358	95	150
14	122	158	183	246	478	*369	1,380	*495	327	352	36	90
15	176	118	260	299	460	362	1,350	495	355	327	176	90
16	154	197	250	211	450	344	1,270	478	408	302	167	188
17	144	132	246	110	408	324	1,240	453	408	278	74	*133
18	133	51	243	272	376	313	1,300	453	390	260	72	51
19	114	185	222	282	386	330	1,440	460	425	209	182	184
20	110	222	162	257	369	397	1,350	478	*394	173	*173	119
21	138	222	220	246	352	404	1,300	495	369	179	72	77
22	173	215	254	320	341	366	1,190	670	341	200	72	167
23	226	240	271	512	285	358	1,130	758	306	*246	161	254
24	157	226	282	512	285	341	1,100	610	278	215	148	191
25	122	218	260	460	*338	334	1,190	530	264	203	76	88
26	188	215	260	450	348	338	1,350	495	264	209	182	92
27	154	212	268	422	372	296	1,380	478	250	191	170	191
28	89	110	268	*411	495	282	1,320	422	432	176	70	148
29	236	193	260	418	-	324	1,160	404	780	185	88	76
30	184	236	260	446	--------	341	1,020	408	735	188	194	185
31	145	--------	264	394	--------	334	--------	383	--------	194	158	--------
Total	4,434	5,118	6,943	9,122	11,120	11,405	34,466	17,460	10,849	9,779	4,219	3,786
Mean	143	171	224	294	397	368	1,149	563	362	315	136	126
Cfsm	0.247	0.295	0.386	0.507	0.684	0.634	1.98	0.971	0.624	0.543	0.234	0.217
In.	0.28	0.33	0.45	0.58	0.71	0.73	2.21	1.12	0.70	0.63	0.27	0.24

Calendar year 1956: Max 4,000 Min 40 Mean 536 Cfsm 0.924 In. 12.58
Water year 1956-57: Max 1,760 Min 34 Mean 353 Cfsm 0.609 In. 8.25

Peak discharge (base, 1,300 cfs).--Apr. 12 (3 a.m.) 1,820 cfs (5.52 ft); Apr. 26 (12 p.m.) 1,440 cfs (4.77 ft).

* Discharge measurement made on this day.

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 Elkhart River, 200 ft upstream from Main Street Bridge in Elkhart, and 1,900 ft downstream from Christiana Creek.

Drainage area.--3,339 sq mi.

Records available.--August 1947 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 700.00 ft above mean sea level, datum of 1929.

Average discharge.--10 years, 3,225 cfs.

Extremes.--Maximum discharge during year, 5,480 cfs Nov. 6 (gage height, 21.25 ft), result of regulation; minimum daily, 564 cfs Nov. 1, 5.

1947-57: Maximum discharge, 18,400 cfs Apr. 5, 1950 (gage height, 27.82 ft); minimum daily, that of Nov. 1, 5, 1956.

Remarks.--Records good except those below 600 cfs, which are poor. Flow regulated by Elkhart Hydroelectric Plant, 2,400 ft upstream, and by hydroelectric plant on Elkhart River at Goshen.

Revisions.--WSP 1337: Drainage area.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,550	564	1,580	1,890	2,260	2,740	2,310	4,880	2,470	2,620	1,430	1,130
2	1,620	785	1,730	2,040	1,960	2,510	2,470	4,550	2,410	2,330	1,400	1,480
3	2,460	1,100	1,710	1,520	2,220	2,670	2,320	4,200	2,480	2,270	1,170	1,320
4	1,380	1,110	1,640	1,890	2,280	2,740	2,700	3,920	2,330	2,090	1,270	1,320
5	1,220	564	1,760	1,720	2,280	2,440	2,990	3,670	2,170	2,260	1,470	1,440
6	1,320	1,140	1,790	1,820	2,120	2,710	3,360	3,580	2,160	2,130	1,470	1,460
7	1,090	1,190	1,700	1,890	2,180	2,240	3,580	3,460	2,150	1,970	1,640	1,250
8	1,220	932	1,820	1,870	2,240	2,390	4,290	3,310	1,990	2,050	1,400	1,300
9	1,330	1,400	1,770	1,710	2,250	2,350	4,200	3,120	2,010	2,760	1,110	1,590
10	*1,020	1,340	1,880	1,580	2,670	2,190	4,260	2,990	2,050	2,360	808	1,100
11	1,100	1,290	*1,800	1,270	2,960	2,140	*4,790	2,720	2,160	2,230	1,150	1,490
12	1,170	1,400	1,790	1,430	2,700	2,720	4,970	2,850	2,110	2,090	1,550	1,220
13	1,080	*1,490	1,780	1,400	2,940	2,590	4,350	2,760	2,460	2,350	1,040	1,230
14	1,130	1,500	1,720	1,640	*2,790	*2,480	4,250	*2,940	2,470	2,300	1,170	1,300
15	1,210	1,490	1,730	1,540	2,770	2,500	4,260	2,940	2,470	2,250	1,340	1,290
16	1,210	1,340	1,830	1,070	2,740	2,550	4,040	2,680	2,600	2,260	1,240	1,520
17	1,020	1,390	1,980	1,020	2,370	2,180	4,060	2,580	2,500	1,930	1,020	1,480
18	1,040	1,340	1,740	894	2,550	2,540	4,180	2,700	2,380	1,810	1,040	*1,260
19	1,120	*1,720	2,290	1,160	2,640	2,650	4,350	2,630	2,510	1,740	1,020	1,280
20	1,210	1,610	1,730	1,690	2,370	2,690	4,250	2,860	*2,270	1,520	*1,180	1,120
21	994	1,680	1,810	1,910	2,190	2,550	4,310	3,060	2,110	1,690	808	1,160
22	1,260	1,620	1,880	2,500	2,260	2,600	4,220	3,240	1,940	1,890	1,080	1,230
23	1,250	2,030	1,940	2,580	2,060	2,470	3,990	3,490	1,910	*1,760	1,200	1,600
24	1,260	1,620	1,980	2,320	2,070	2,680	4,010	3,250	2,200	1,470	1,060	1,490
25	1,070	1,910	2,000	2,530	2,280	2,580	3,910	3,100	1,790	1,480	1,230	1,210
26	991	1,960	2,010	2,280	2,540	2,420	4,290	3,070	1,800	1,540	1,460	1,510
27	1,310	1,620	2,130	2,180	2,610	2,890	4,690	3,000	1,980	1,220	1,310	1,120
28	1,220	1,860	2,120	*2,310	2,700	1,650	5,030	2,840	2,180	1,570	1,540	1,130
29	1,160	1,450	2,040	2,570	-	2,240	4,870	2,720	2,690	1,690	1,490	1,190
30	1,330	1,610	1,860	2,480	--------	2,160	4,980	2,470	2,430	1,470	1,560	1,220
31	1,120	--------	2,140	2,340	--------	2,150	--------	2,390	--------	1,360	1,650	--------
Total	38,465	42,055	57,680	57,044	68,000	76,410	120,280	97,970	67,180	60,460	39,306	39,440
Mean	1,241	1,402	1,861	1,840	2,429	2,465	4,009	3,160	2,239	1,950	1,268	1,315
Cfsm	0.372	0.420	0.557	0.551	0.727	0.738	1.20	0.946	0.671	0.584	0.380	0.394
In.	0.43	0.47	0.64	0.64	0.76	0.85	1.34	1.09	0.75	0.67	0.44	0.44

Calendar year 1956: Max 13,000 Min 564 Mean 2,956 Cfsm 0.885 In. 12.05
Water year 1956-57: Max 5,030 Min 564 Mean 2,094 Cfsm 0.627 In. 8.52

* 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, 0.6 mile downstream from dam of French Paper Co., 1 mile upstream from Dowagiac River, and at mile 44.

Drainage area.--3,620 sq mi, approximately.

Records available.--October 1930 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

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 to June 30, 1931, staff gage at site 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.--27 years, 3,124 cfs.

Extremes.--Maximum discharge during year, 6,500 cfs Apr. 27 (gage height, 6.18 ft); minimum daily, 977 cfs Aug. 11.

1930-57: Maximum discharge, 20,200 cfs Apr. 5, 1950 (gage height, 13.10 ft); minimum daily, 420 cfs Aug. 30, 1931.

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 auxiliary gage furnished by Indiana & Michigan Electric Co.

Revisions (water years).--WSP 1387: 1931, 1933-36, 1940-43, 1945-46(M), 1949(M).

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a1,500	2,140	1,980	2,180	2,320	3,000	2,540	5,730	2,660	2,760	1,380	1,490
2	a1,800	1,330	1,270	2,090	2,280	2,860	2,930	5,640	2,640	2,770	1,340	1,500
3	*a3,000	1,510	1,980	1,930	2,170	2,690	2,840	4,930	2,550	2,370	1,250	2,040
4	a1,500	1,770	1,840	1,750	2,160	3,000	3,030	4,220	2,510	1,880	1,400	1,970
5	a1,600	1,540	*1,760	1,780	2,580	2,710	3,560	4,150	2,500	2,310	1,290	1,540
6	a1,600	1,800	1,870	1,560	2,260	2,970	4,030	4,020	2,430	*2,260	1,390	1,620
7	a1,200	*1,680	1,970	2,120	2,320	2,690	3,880	3,940	2,080	1,970	1,450	*1,400
8	a1,400	1,340	1,730	1,890	2,170	2,370	4,620	4,100	2,420	2,200	1,460	1,410
9	a1,700	1,230	2,010	1,890	2,640	2,620	*4,820	3,370	2,000	2,520	*1,310	1,560
10	a1,500	1,570	1,980	1,900	2,910	2,360	4,950	3,550	2,350	2,350	997	1,760
11	a1,300	1,430	2,100	1,720	3,120	2,300	5,300	3,200	2,290	2,460	977	1,430
12	1,140	1,480	1,760	1,440	2,880	2,940	5,530	3,230	2,290	2,030	1,340	1,640
13	1,460	1,700	1,920	1,290	3,130	2,830	5,190	3,100	2,470	2,300	1,400	1,730
14	1,300	1,840	1,710	1,860	3,020	2,860	4,890	3,230	2,600	2,290	1,170	1,460
15	1,570	1,660	1,590	1,520	2,900	2,780	4,900	*3,370	a2,600	2,120	1,220	1,170
16	1,360	1,730	1,840	1,650	2,690	2,820	4,630	3,570	a2,600	2,210	1,290	1,610
17	1,460	1,200	2,120	*1,760	2,480	2,680	4,730	2,660	2,690	2,380	1,070	1,800
18	1,250	1,110	1,900	1,520	2,710	2,320	4,610	2,940	2,790	1,880	1,040	1,660
19	1,310	1,650	2,180	1,340	2,620	*3,130	5,020	3,350	*3,200	1,950	1,190	1,520
20	1,330	1,880	1,940	1,390	*2,560	3,080	5,060	3,100	2,630	1,650	1,250	1,460
21	1,340	1,860	1,980	1,930	2,320	3,030	4,920	3,340	2,290	1,630	1,170	1,330
22	1,580	1,660	1,750	2,850	2,490	2,900	5,100	3,420	2,270	1,970	1,120	1,420
23	1,590	1,930	1,950	2,880	2,230	2,890	4,780	3,780	1,850	1,980	1,170	2,030
24	1,930	1,860	1,940	2,560	2,140	2,590	4,470	3,570	2,400	1,580	1,350	2,030
25	1,520	1,950	2,090	2,630	2,310	3,270	5,130	3,390	1,920	1,470	1,320	1,890
26	1,110	2,100	2,060	2,660	2,820	2,700	4,960	3,110	1,760	1,640	1,350	1,690
27	1,180	1,800	2,110	2,190	2,830	3,230	6,100	3,560	2,070	1,560	1,600	1,560
28	1,540	1,970	2,350	1,970	2,630	3,940	6,360	3,030	2,440	1,040	1,710	1,140
29	1,520	2,220	2,170	2,750	-	2,720	5,870	2,790	2,870	1,820	2,220	1,410
30	1,390	2,110	1,990	2,760	--------	2,630	5,520	2,680	2,560	1,590	1,810	1,290
31	1,680	--------	2,010	2,420	--------	2,100	--------	2,580	--------	1,360	1,730	--------
Total	46,660	51,050	59,850	62,180	71,690	87,010	140,270	110,650	72,730	62,300	41,764	47,560
Mean	1,505	1,702	1,931	2,006	2,560	2,807	4,676	3,569	2,424	2,010	1,347	1,585
Cfsm	0.416	0.470	0.533	0.554	0.707	0.775	1.29	0.986	0.670	0.555	0.372	0.438
In.	0.48	0.52	0.61	0.64	0.74	0.89	1.44	1.14	0.75	0.64	0.43	0.49

Calendar year 1956: Max 14,200 Min 800 Mean 3,154 Cfsm 0.871 In. 11.85
Water year 1956-57: Max 6,360 Min 977 Mean 2,339 Cfsm 0.646 In. 8.77

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* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of powerplant records and record for station at Mottville.

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 county highway bridge, three-quarters of a mile east of Riverside.

Drainage area.--391 sq mi.

Records available.--October 1951 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 588.80 ft above mean sea level, datum of 1929.

Average discharge.--6 years, 412 cfs.

Extremes.--Maximum discharge during year, 815 cfs Apr. 28 (gage height, 7.73 ft); minimum, 164 cfs Aug. 12 (gage height, 3.25 ft).

1951-57: Maximum discharge, 1,650 cfs Jan. 23, 1952 (gage height, 8.72 ft); minimum, 151 cfs Sept. 7, 28, Oct. 5, 1953; minimum gage height, 2.92 ft Sept 7, 1953.

Remarks.--Records good except those for period of ice effect, which are fair. Diurnal fluctuation, principally during low flow, caused by paper mill above station.

Revisions.--WSP 1337: Drainage area.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	190	209	258	286	363	434	345	768	293	243	197	238
2	189	219	250	271	344	422	390	760	278	235	192	224
3	*191	217	266	262	278	348	395	724	256	236	192	226
4	193	211	272	262	292	317	407	660	276	231	188	244
5	205	218	264	266	347	354	467	592	267	*231	175	*252
6	195	222	*274	268	332	350	541	537	271	220	188	248
7	190	217	280	273	329	337	549	511	260	225	184	231
8	197	221	280	276	334	315	*551	352	262	231	*174	217
9	196	226	278	275	344	304	559	313	252	266	179	205
10	187	216	281	271	330	272	566	306	236	259	178	225
11	185	212	278	260	358	290	573	305	237	264	178	222
12	188	229	276	246	457	407	557	325	249	262	170	224
13	200	222	268	244	489	462	521	375	256	277	178	225
14	196	221	269	b240	488	469	493	*450	252	266	178	226
15	195	230	262	b230	455	509	447	457	260	257	177	218
16	205	243	258	b230	414	523	399	345	259	262	179	215
17	199	237	274	b230	323	489	373	335	249	254	181	228
18	202	234	279	b230	320	416	361	330	254	245	177	227
19	203	238	275	b230	359	387	348	390	*253	238	179	231
20	199	239	273	b250	*343	*434	375	582	242	229	181	222
21	194	250	273	282	326	450	422	633	240	215	187	219
22	188	252	268	353	330	462	404	618	242	213	187	197
23	203	246	271	452	351	465	414	608	236	253	184	202
24	204	249	247	471	335	414	424	600	231	232	185	218
25	195	246	257	476	297	336	515	575	249	232	187	210
26	199	245	286	471	352	369	657	529	243	221	190	208
27	*204	258	322	472	381	363	736	460	247	212	196	207
28	199	256	322	486	410	357	788	422	255	208	201	178
29	212	256	306	*466	-	352	792	322	276	196	212	172
30	211	258	303	417	--------	350	768	312	266	202	226	178
31	209	--------	304	382	--------	332	--------	300	--------	201	234	--------
Total	6,123	6,997	8,574	9,828	10,081	12,089	15,137	14,796	7,647	7,316	5,814	6,537
Mean	198	233	277	317	360	390	505	477	255	236	188	218
Cfsm	0.506	0.596	0.708	0.811	0.921	0.997	1.29	1.22	0.652	0.604	0.481	0.558
In.	0.58	0.67	0.82	0.93	0.96	1.15	1.44	1.41	0.73	0.70	0.55	0.62

Calendar year 1956:	Max	1,480	Min	185	Mean	362	Cfsm	0.926	In.	12.60
Water year 1956-57:	Max	792	Min	170	Mean	304	Cfsm	0.777	In.	10.57

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

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.--October 1948 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 877.09 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to Nov. 11, 1948, wire-weight gage at same site and datum

Average discharge.--9 years, 345 cfs.

Extremes.--Maximum discharge during year, 724 cfs Apr. 27, 28 (gage height, 5.53 ft); minimum, 40 cfs Sept. 28, 29 (gage height, 3.37 ft); minimum daily, 86 cfs Sept. 17.
1948-57: Maximum discharge, 2,130 cfs Mar. 29, 1950 (gage height, 8.20 ft); minimum, 26 cfs Aug. 30, 1952; minimum daily, 78 cfs Aug. 24, 1953.

Remarks.--Records good except those for period of indefinite stage-discharge relation, which are fair. Diurnal fluctuation caused by powerplant above station.

Rating table, water year 1956-57, except period of indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 28 to Aug. 12)

3.6	77	5.0	495
4.0	158	6.0	950
4.5	307		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*150	170	190	200	252	314	242	468	239	136	149	194
2	140	160	190	202	246	325	260	383	208	176	144	151
3	150	160	*154	222	262	298	311	347	160	192	135	184
4	170	170	250	*206	188	282	258	274	244	178	153	106
5	150	*150	211	247	226	230	398	290	196	151	135	207
6	170	200	252	196	270	276	520	315	203	151	135	170
7	110	140	238	196	194	238	533	228	160	144	151	120
8	130	150	249	207	243	240	549	238	163	268	158	180
9	150	160	224	242	278	229	478	315	205	*328	151	90
10	140	150	176	165	376	230	406	250	158	286	137	*174
11	140	160	244	222	460	286	406	222	183	272	133	118
12	150	140	235	234	340	320	357	249	176	263	*121	171
13	140	170	218	218	360	379	306	220	195	248	120	132
14	130	170	220	191	306	371	330	236	224	230	175	190
15	110	170	248	138	290	288	298	284	144	212	159	104
16	150	170	200	192	*270	316	352	251	224	206	174	158
17	140	170	200	180	294	340	303	202	130	203	108	86
18	150	170	240	200	240	*222	312	250	246	195	146	172
19	150	150	266	134	300	408	318	284	200	180	122	164
20	130	160	218	210	273	282	297	432	*243	180	126	145
21	160	160	230	242	172	294	332	344	192	166	116	125
22	130	210	284	372	242	331	291	*348	231	185	154	138
23	150	190	252	348	272	282	312	374	156	212	108	173
24	170	200	267	322	204	339	314	326	176	186	142	115
25	160	200	266	414	220	180	*412	226	148	178	143	172
26	170	210	286	304	354	289	490	287	198	173	105	162
27	140	180	281	239	387	254	554	260	184	173	192	178
28	160	190	285	308	361	265	595	279	224	156	94	138
29	150	200	294	250	-	262	560	206	228	137	184	106
30	150	190	204	310		265	523	200	206	133	180	161
31	150		228	202		231		206		146	170	
Total	4,540	5,170	7,300	7,313	7,880	8,866	11,617	8,794	5,844	6,044	4,420	4,484
Mean	146	172	235	236	281	286	387	284	195	195	143	149
Cfsm	0.325	0.383	0.523	0.526	0.626	0.637	0.862	0.633	0.434	0.434	0.318	0.332
In.	0.38	0.43	0.60	0.61	0.65	0.73	0.96	0.73	0.48	0.50	0.37	0.37

Calendar year 1956:	Max	1,260	Min	110	Mean	310	Cfsm	0.690	In.	9.39
Water year 1956-57:	Max	595	Min	86	Mean	225	Cfsm	0.501	In.	6.81

* Discharge measurement made on this day.

Note.--Stage-discharge relation indefinite Oct. 1 to Dec. 2; discharge estimated on basis of powerplant records and records for stations near Battle Creek and at Comstock.

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 September 1931, October 1932 to July 1933, January 1934 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

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.--24 years (1930-31, 1934-57), 200 cfs.

Extremes.--1955-56: Maximum discharge during year, 1,840 cfs May 1 (gage height, 2.91 ft); minimum, 48 cfs Oct. 2, 3; minimum gage height, 0.58 ft Oct. 2, 3, Sept. 23-25.

1956-57: Maximum discharge during year, 1,000 cfs May 22 (gage height, 2.10 ft); minimum, 36 cfs Aug. 19, 20; minimum gage height, 0.56 ft Oct. 9, Aug. 19, 20.

1930-31, 1932-57: 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. Occasional slight regulation prior to November 1943.

Revisions (water years).--WSP 1387: 1931, 1944. Revised figures of discharge, in cubic feet per second, for the water year 1956, superseding those published in WSP 1437, are given herein.

Rating tables, Oct. 1, 1955, to Sept. 30, 1957, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1, 1955, to July 4, 1956

0.5	32	1.5	480
.6	52	2.0	910
.8	105	2.9	1,840
1.0	190		

July 5, 1956, to Sept. 30, 1957

0.5	32	1.0	203
.6	54	1.5	480
.8	118	2.1	1,000

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	75	105	86	75	113	431	1,840	200	92	78	75
2	57	83	113	89	78	154	488	1,620	190	86	75	75
3	50	121	113	92	78	346	520	1,300	181	86	69	72
4	52	145	129	94	78	560	536	1,050	172	83	69	69
5	65	158	145	83	75	800	536	892	168	*91	66	66
6	97	158	154	94	75	1,000	488	793	163	101	*60	66
7	102	145	158	89	78	*1,140	438	685	145	101	63	63
8	109	137	150	73	83	1,230	380	600	137	91	66	57
9	113	125	133	*b70	83	1,250	339	544	129	84	69	60
10	105	121	100	b74	92	1,070	317	600	117	81	94	57
11	92	113	121	86	92	865	306	892	109	81	94	57
12	89	109	*117	83	89	640	295	1,180	105	104	101	60
13	92	109	109	78	92	520	273	1,300	97	104	98	60
14	92	*102	109	78	92	445	246	1,460	94	104	98	57
15	92	113	89	81	94	356	215	1,460	92	94	91	54
16	86	133	b90	78	92	300	200	1,300	94	84	94	57
17	83	154	b90	78	86	262	190	1,050	113	98	94	54
18	89	168	b90	78	113	235	186	838	137	101	94	57
19	92	176	b88	78	97	205	176	694	141	94	98	60
20	89	158	b86	81	97	190	163	576	141	94	91	57
21	86	145	b86	81	97	172	154	466	129	94	84	57
22	81	133	b90	78	89	172	145	410	117	94	81	52
23	81	133	92	70	86	176	141	374	113	91	78	50
24	81	133	100	b70	94	168	137	339	109	84	75	50
25	83	133	113	b70	117	168	133	306	109	84	75	50
26	89	133	109	b70	121	168	137	*278	117	84	75	54
27	86	125	92	b74	121	181	168	268	117	81	69	57
28	78	109	100	78	105	215	262	256	113	78	69	54
29	75	92	100	81	125	251	466	246	105	75	69	54
30	75	117	92	75	--------	306	1,400	230	97	69	69	54
31	75	--------	89	81	--------	368	--------	215	--------	72	72	--------
Total	2,593	3,856	3,352	2,471	2,694	14,026	9,866	24,062	3,851	2,760	2,478	1,765
Mean	83.6	129	108	79.7	92.9	452	329	776	128	89.0	79.9	58.8
Cfsm	0.347	0.535	0.448	0.331	0.385	1.88	1.37	3.22	0.531	0.369	0.332	0.244
In.	0.40	0.60	0.52	0.38	0.42	2.16	1.52	3.71	0.59	0.43	0.38	0.27

Calendar year 1955: Max 811 Min 37 Mean 156 Cfsm 0.647 In. 8.79
Water year 1955-56: Max 1,840 Min 50 Mean 202 Cfsm 0.838 In. 11.38

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

Battle Creek at Battle Creek, Mich.--Continued

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*50	66	75	75	118	203	142	730	190	98	a48	50
2	50	66	75	81	115	180	150	568	176	91	a47	47
3	52	63	81	78	111	150	158	454	162	84	a46	52
4	52	66	84	78	104	126	162	371	158	78	a46	52
5	52	63	91	75	104	134	194	300	146	75	a46	52
6	52	66	98	72	*104	126	268	247	138	75	a45	50
7	52	66	*94	72	101	118	338	213	130	75	a45	45
8	50	69	94	72	104	115	460	190	126	108	a44	43
9	47	69	91	75	138	111	528	172	115	167	a43	45
10	52	69	84	60	190	108	480	172	115	218	a43	45
11	54	66	84	78	213	118	404	185	115	278	a42	43
12	60	66	84	75	218	176	344	203	115	289	*41	45
13	63	66	72	75	252	213	278	218	122	247	41	45
14	60	69	81	69	213	232	242	223	138	185	43	45
15	52	72	81	72	154	247	218	213	*138	142	47	45
16	50	75	84	72	172	237	203	203	138	118	50	47
17	52	75	84	72	138	218	190	203	134	104	47	47
18	54	72	87	66	138	194	190	203	134	94	41	47
19	52	69	75	66	126	194	185	252	150	84	36	47
20	54	72	91	69	118	213	*180	376	142	78	36	47
21	54	78	87	75	118	228	176	766	122	72	41	50
22	54	91	98	138	122	237	172	973	111	75	41	50
23	54	87	104	172	118	232	176	865	108	84	41	47
24	57	84	115	208	122	203	190	703	108	78	45	47
25	57	84	122	242	142	180	232	568	111	75	47	52
26	60	78	122	232	180	172	284	454	104	72	41	50
27	63	78	118	203	213	158	376	360	101	69	39	50
28	60	81	115	172	213	154	560	294	104	63	43	47
29	54	78	104	154	-	150	784	257	111	54	47	47
30	54	75	87	138	--------	150	874	228	108	54	57	43
31	57	--------	94	122	--------	142	--------	194	--------	a52	60	--------
Total	1,684	2,179	2,856	3,308	4,159	5,419	9,138	11,358	3,870	3,436	1,379	1,422
Mean	54.3	72.6	92.1	107	149	175	305	366	129	111	44.5	47.4
Cfsm	0.225	0.301	0.382	0.444	0.618	0.726	1.27	1.52	0.535	0.461	0.185	0.197
In.	0.26	0.34	0.44	0.51	0.64	0.84	1.41	1.75	0.60	0.53	0.21	0.22

Calendar year 1956:	Max	1,840	Min	47	Mean	193	Cfsm	0.801	In.	10.90
Water year 1956-57:	Max	973	Min	36	Mean	138	Cfsm	0.573	In.	7.75

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Kalamazoo River at Marshall and Thornapple River near Hastings.

Kalamazoo River near Battle Creek, Mich.

Location.--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 mouth of Battle Creek in city of Battle Creek.

Drainage area.--849 sq mi.

Records available.--July 1937 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 796.49 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1937, at datum 2.00 ft higher.

Average discharge.--20 years, 686 cfs.

Extremes.--Maximum discharge during year, 1,530 cfs Apr. 30 (gage height, 5.16 ft); minimum recorded, 122 cfs Oct. 3, Sept. 28; minimum daily, 194 cfs Oct. 9; minimum gage height, 2.03 ft June 7.

1937-57: 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 indefinite stage-discharge relation or no gage-height record, which are fair. Diurnal fluctuation, below 1,500 cfs, caused by powerplants above station.

Revisions (water years).--WSP 924: 1938-39. WSP 1387: 1938, 1945-46, 1948.

Rating table, water year 1956-57, except period of indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 10, June 5 to July 15, Sept. 1-30)

1.9	185
2.0	230
3.0	655
5.2	1,550

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	306	293	347	352	424	667	475	1,400	587	459	300	388
2	298	334	356	360	428	611	515	1,160	751	383	300	388
3	257	288	356	338	424	559	523	953	603	388	280	383
4	*293	293	320	370	446	507	595	835	515	396	310	392
5	320	316	406	352	374	499	647	698	511	360	280	293
6	270	280	401	378	406	455	877	655	342	320	280	378
7	280	410	*428	334	446	475	965	615	356	316	300	342
8	230	*257	401	324	396	437	1,060	535	424	563	320	266
9	194	252	410	320	531	419	1,130	527	414	*667	310	*311
10	288	298	378	320	643	401	1,050	575	450	639	280	234
11	288	280	338	320	730	455	941	583	446	635	270	342
12	280	306	396	320	737	619	856	551	455	655	250	293
13	280	248	365	320	706	675	734	583	487	631	250	311
14	280	302	370	320	687	709	643	575	567	547	330	293
15	262	311	374	310	563	726	639	607	*551	475	320	342
16	208	320	396	310	567	651	603	627	467	450	350	316
17	252	338	360	300	491	647	627	595	511	420	250	275
18	298	320	370	300	487	623	603	603	467	400	280	248
19	239	316	378	300	*446	615	595	807	579	380	240	298
20	284	284	419	310	479	730	*583	981	535	360	250	342
21	239	356	383	350	459	*639	571	1,190	531	340	250	324
22	320	356	419	500	365	643	567	*1,410	483	370	290	306
23	244	406	471	580	437	659	559	1,410	511	410	230	306
24	284	356	467	650	459	595	619	1,280	446	390	290	342
25	338	365	495	*712	483	603	737	1,090	463	360	290	288
26	298	388	483	716	547	487	849	929	437	350	230	360
27	324	383	487	599	709	539	1,100	860	467	340	260	365
28	257	334	483	559	702	511	1,330	758	503	300	280	320
29	284	342	467	551	-	511	1,450	712	535	270	380	311
30	270	356	437	483	--------	507	1,510	615	503	270	370	252
31	270	--------	383	503	--------	491	--------	559	--------	290	360	--------
Total	8,535	9,688	12,544	12,761	14,572	17,665	23,953	25,278	14,897	13,134	8,980	9,609
Mean	275	323	405	412	520	570	798	815	497	424	290	320
Cfsm	0.324	0.380	0.477	0.485	0.612	0.671	0.940	0.960	0.585	0.499	0.342	0.377
In.	0.37	0.42	0.55	0.56	0.64	0.77	1.05	1.11	0.65	0.58	0.39	0.42

Calendar year 1956: Max 3,350 Min 194 Mean 614 Cfsm 0.723 In. 9.83
Water year 1956-57: Max 1,510 Min 194 Mean 470 Cfsm 0.554 In. 7.51

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 9-24; discharge estimated on basis of records for Kalamazoo River at Marshall, Kalamazoo River at Comstock, and Battle Creek at Battle Creek. Stage-discharge relation indefinite July 16 to Aug. 31; discharge computed on same basis as indicated above plus the sum of Kalamazoo River at Marshall and Battle Creek at Battle Creek.

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, in Comstock, a quarter of a mile downstream from Comstock Creek.

Drainage area.--1,010 sq mi, approximately.

Records available.--April to August 1931, October 1932 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 759.12 ft above mean sea level, datum of 1929. Prior to October 1936, staff gage and October 1936 to October 1945 wire-weight gage, at same site and datum.

Average discharge.--25 years (1932-57), 851 cfs.

Extremes.--Maximum discharge during year, 1,780 cfs Apr. 30 (gage height, 2.80 ft); minimum not determined; minimum daily, 250 cfs Aug. 10.

1931, 1932-57: Maximum discharge, 6,910 cfs Apr. 8, 1947 (gage height, 7.94 ft); minimum observed, 185 cfs Aug. 7, 1934; minimum gage height observed, 0.56 ft May 4, 1931.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by powerplants above station.

Revisions (water years).--WSP 824: 1933-36. WSP 1387: 1933, 1934(M), 1935, 1936(M), 1938(M), 1940(M), 1941.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 21 to Jan. 13, July 5 to Aug. 25)

Oct. 1-27		Oct. 28 to Sept. 30			
0.8	260	0.7	245	2.0	1,200
1.0	360	1.0	400	3.0	1,920
1.5	710	1.5	760		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	396	436	496	562	b600	850	614	1,680	697	583	412	a530
2	378	424	520	424	b580	769	614	1,640	724	508	412	a550
3	345	430	583	418	b570	751	638	1,370	985	352	340	555
4	*340	418	*541	569	b570	630	670	1,170	709	370	330	490
5	345	430	466	*569	562	590	931	960	436	520	a330	412
6	366	430	682	541	562	598	1,070	662	591	478	a350	*358
7	414	*418	606	569	569	590	1,230	820	490	a480	a370	340
8	340	484	541	520	606	576	1,250	832	388	a600	a330	424
9	330	412	614	466	688	520	*1,330	622	490	a800	a280	436
10	325	352	614	496	832	534	1,380	787	555	*868	250	a420
11	345	376	448	484	958	555	1,210	850	614	733	254	a400
12	390	400	576	478	967	723	1,110	646	598	805	400	a380
13	396	442	590	590	913	886	1,050	796	527	850	*388	a380
14	378	430	606	520	913	850	790	787	576	679	412	a380
15	355	436	534	430	751	841	751	706	630	679	418	a390
16	305	442	555	442	706	868	886	733	688	548	406	a370
17	320	490	576	412	697	823	688	760	614	534	305	a350
18	330	472	562	436	630	823	850	724	*518	490	290	a370
19	355	472	555	496	*590	832	724	1,070	548	442	406	a390
20	396	424	527	576	562	*850	688	1,410	654	412	418	a410
21	384	460	590	569	583	967	814	1,410	646	376	a360	a400
22	384	541	622	b820	569	769	787	1,530	527	490	a350	a400
23	396	555	555	b870	484	715	679	1,690	508	541	a330	a400
24	366	583	697	940	527	859	814	1,670	622	590	a360	a400
25	340	484	724	945	724	769	1,020	1,570	514	502	a360	a400
26	384	520	751	912	598	630	1,100	1,180	454	430	a330	a430
27	494	590	638	958	724	569	1,380	1,150	520	358	394	a420
28	400	520	670	715	949	630	1,500	994	638	388	400	a410
29	346	442	638	b670	-	622	1,650	877	562	454	400	a400
30	358	472	646	b640	--------	614	1,760	751	569	430	a440	418
31	412	--------	614	b610	--------	606	--------	769	--------	406	a490	--------
Total	11,413	13,785	18,337	18,647	18,984	22,209	29,978	32,616	17,592	16,696	11,315	12,413
Mean	368	460	592	602	678	716	999	1,052	586	539	365	414
Cfsm	0.364	0.455	0.586	0.596	0.671	0.709	0.989	1.04	0.580	0.534	0.361	0.410
In.	0.42	0.51	0.68	0.69	0.70	0.82	1.10	1.20	0.65	0.61	0.42	0.46

Calendar year 1956: Max 3,560 Min 305 Mean 805 Cfsm 0.797 In. 10.85
Water year 1956-57: Max 1,760 Min 250 Mean 614 Cfsm 0.608 In. 8.26

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage and records for Battle Creek at Battle Creek, Kalamazoo River at Marshall, and Thornapple River near Hastings.
b Stage-discharge relation affected by ice.

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, 1½ miles upstream from mouth.

Drainage area.--48 sq mi, approximately.

Records available.--October 1947 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 761.50 ft above mean sea level, datum of 1929. December 1947 to Feb. 24, 1948, staff gage and Feb. 25, 1948, to Dec. 7, 1955, wire-weight gage, at same site and datum.

Average discharge.--10 years, 57.5 cfs.

Extremes.--Maximum discharge during year, 230 cfs July 8 (gage height, 3.89 ft); minimum recorded, 5.2 cfs May 7 (gage height, 1.64 ft).

1947-57: Maximum discharge, 580 cfs sometime in July 1954, from rating curve extended above 165 cfs by logarithmic plotting (gage height, 5.25 ft), caused by momentary gate opening of mill pond; minimum, 2.0 cfs May 8, 1956 (gage height, 1.50 ft).

Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow regulated by St. Regis Paper Co. ponds above station.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

2.0	20
2.3	39
3.0	110
3.5	171

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	47	a46	45	41	50	48	60	46	41	39	41
2	a56	47	a47	46	41	46	50	54	41	41	38	42
3	a53	44	48	47	40	41	47	52	41	40	44	47
4	*47	41	*46	48	41	42	55	49	44	36	41	50
5	48	43	46	*48	40	45	69	45	42	36	39	47
6	47	45	46	49	*41	45	62	49	40	36	37	*41
7	45	*43	48	50	42	45	57	52	41	37	37	41
8	47	43	46	51	45	45	53	44	38	112	36	a41
9	49	42	41	50	61	44	*51	48	35	82	36	a40
10	48	a42	41	46	54	40	49	55	40	*63	34	a40
11	51	a43	44	48	55	53	48	58	47	65	32	a42
12	51	a44	43	44	54	60	47	50	45	69	35	a45
13	a49	a44	42	42	51	54	43	54	44	56	*36	a44
14	a46	45	a45	45	49	53	41	58	51	50	40	55
15	a45	a50	a47	45	46	53	45	55	43	52	43	48
16	a45	a50	a45	45	47	49	49	48	38	48	40	47
17	a45	a50	a45	43	41	45	52	*49	41	45	35	45
18	a45	a51	a45	45	43	a46	52	52	*45	43	30	45
19	a45	a51	a45	41	44	a47	52	68	42	42	32	20
20	a45	a52	a42	42	43	49	44	65	40	39	34	36
21	a45	52	50	57	43	*58	41	58	38	38	36	40
22	a45	a52	83	102	44	52	45	57	38	54	36	38
23	a45	a52	37	69	42	49	52	54	38	59	41	38
24	a45	a52	37	65	a48	45	70	52	38	47	50	38
25	a45	a49	49	60	56	46	76	51	41	45	43	39
26	a45	a46	51	51	54	50	69	48	41	45	47	33
27	a45	a44	49	47	52	49	101	49	42	45	a47	32
28	a45	42	52	45	50	48	94	47	56	41	a47	33
29	a45	a46	49	45	-	49	77	48	49	42	a49	30
30	a46	a46	44	44	--------	46	67	43	40	45	a55	35
31	a46	--------	48	42	--------	41	--------	43	--------	43	46	--------
Total	1,462	1,398	1,447	1,547	1,308	1,485	1,706	1,615	1,265	1,537	1,235	1,213
Mean	47.2	46.6	46.7	49.9	46.7	47.9	56.9	52.1	42.2	49.6	39.8	40.4
Cfsm	0.983	0.971	0.973	1.04	0.973	0.998	1.19	1.09	0.879	1.03	0.829	0.842
In.	1.13	1.08	1.12	1.20	1.01	1.15	1.32	1.25	0.98	1.19	0.96	0.94

Calendar year 1956: Max 157 Min 22 Mean 53.9 Cfsm 1.12 In. 15.30
Water year 1956-57: Max 112 Min 20 Mean 47.2 Cfsm 0.983 In. 13.33

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Kalamazoo River at Comstock and Battle Creek at Battle Creek.

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 bridge on State Highway 89, 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 1957. Monthly discharge only for some periods, published in WSP 1307. Published as "near Allegan" April 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.--27 years, 1,351 cfs.

Extremes.--Maximum discharge during year, 2,830 cfs May 20 (gage height, 11.48 ft); minimum, 137 cfs Nov. 11; minimum daily, 402 cfs Sept. 28; minimum gage height, 3.78 ft Sept. 15.

1929-36, 1937-57: Maximum discharge, 17,500 cfs Apr. 11, 1947 (elevation, 606.76 ft, site and datum then in use); minimum daily, 73 cfs Aug. 31, 1941.

Remarks.--Records fair. Flow regulated at low and medium stages by powerplants above station, and since June 1936 by Calkins Dam and powerplant 3½ miles above station.

Revisions (water years).--WSP 1387: 1929(M), 1930, 1933, 1934-36(M), 1938(M), 1939-40, 1942.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Oct. 1 to Jan. 14, May 26 to June 30, Aug. 20 to Sept. 30)

5.0	390
8.0	1,300
11.0	2,430
12.0	3,550

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	948	945	842	896	1,490	1,570	1,340	2,220	1,540	1,060	868	884
2	1,110	800	798	1,010	1,280	*1,550	1,320	2,200	1,440	927	888	974
3	*814	728	966	994	1,040	1,510	1,160	2,140	1,430	1,100	872	1,170
4	702	570	804	856	1,320	1,510	1,300	2,080	1,360	1,130	728	1,130
5	808	864	1,040	886	1,410	1,440	1,460	1,890	1,380	*1,240	782	*1,130
6	882	868	*1,090	740	932	1,400	1,590	1,640	1,340	945	820	1,100
7	662	692	864	998	1,130	1,360	1,880	1,530	1,280	958	862	1,090
8	648	690	993	903	1,070	1,140	*2,020	1,410	1,120	1,200	*859	742
9	668	652	907	1,060	1,300	1,020	1,890	1,390	935	1,320	800	662
10	720	626	1,020	986	1,200	1,080	1,850	1,520	910	1,360	777	772
11	690	494	1,080	924	1,500	1,100	1,860	1,570	1,210	1,470	564	846
12	658	706	964	926	1,570	1,460	1,930	1,770	1,140	1,560	676	796
13	626	671	928	788	1,560	1,550	1,900	1,650	1,110	1,540	762	806
14	594	656	898	964	1,540	1,570	1,700	*1,400	1,330	1,430	818	662
15	770	680	968	b970	1,580	1,600	1,740	1,640	934	1,470	800	448
16	673	802	801	b900	1,490	1,540	1,580	1,580	918	1,420	821	658
17	670	894	1,030	b850	1,390	1,460	1,490	1,520	1,200	1,380	768	638
18	674	726	888	b850	1,480	1,500	1,460	1,600	*1,310	1,340	598	949
19	684	834	870	b750	1,390	1,500	1,440	1,980	1,090	1,230	712	946
20	694	858	1,030	b700	1,110	1,580	1,500	2,620	790	899	812	1,050
21	627	1,020	940	1,090	1,130	1,590	1,410	2,680	788	776	830	908
22	727	787	895	1,480	1,170	1,480	1,440	2,320	830	762	804	636
23	767	808	866	b1,500	1,020	1,530	1,400	2,200	1,060	787	861	914
24	714	948	1,090	b1,500	1,100	1,440	1,500	2,180	1,190	901	1,000	792
25	657	952	1,220	b1,600	1,410	1,520	1,610	2,150	1,250	928	852	941
26	842	896	1,050	b1,500	1,560	1,180	1,980	2,180	1,080	963	1,010	722
27	*674	819	1,130	b1,300	1,540	1,560	1,980	2,080	1,110	977	964	563
28	640	955	1,140	b1,500	1,490	1,560	2,220	1,770	1,120	778	972	402
29	685	814	1,140	*b1,300	-	1,170	2,490	1,660	690	854	804	602
30	696	842	1,140	1,480	--------	970	2,320	1,600	984	853	849	1,010
31	700	--------	1,050	1,490	--------	1,110	--------	1,510	--------	906	947	--------
Total	22,424	23,597	30,442	33,691	37,202	43,550	50,760	57,680	33,869	34,464	25,480	24,943
Mean	723	787	982	1,087	1,329	1,405	1,692	1,861	1,129	1,112	822	831
Cfsm	0.452	0.492	0.614	0.679	0.831	0.878	1.06	1.16	0.706	0.695	0.514	0.519
In.	0.52	0.55	0.71	0.78	0.86	1.01	1.18	1.34	0.79	0.80	0.59	0.58

Calendar year 1956: Max 4,900 Min 494 Mean 1,421 Cfsm 0.888 In. 12.08
Water year 1956-57: Max 2,680 Min 402 Mean 1,145 Cfsm 0.716 In. 9.71

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

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 1957. Monthly discharge only for some periods, published in WSP 1307.

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.--22 years, 121 cfs.

Extremes.--Maximum discharge during year, 603 cfs July 8 (gage height, 11.68 ft); minimum, 18 cfs Aug. 3; minimum daily, 25 cfs July 28, Aug. 18.

1935-57: Maximum discharge, 1,070 cfs June 25, 1937 (gage height, 13.50 ft); minimum, 9.2 cfs Aug. 22, 1936.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Slight regulation by mills above station.

Revisions (water years).--WSP 974: 1937(M). WSP 1387: 1936.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 2, June 26 to Sept. 30)

8.4	25
8.5	34
9.0	95
10.0	269

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	46	64	94	88	194	87	104	140	122	34	58
2	30	48	60	122	76	189	88	95	118	68	34	58
3	30	42	71	73	67	178	92	88	120	66	52	72
4	35	38	74	68	76	176	185	77	80	50	27	71
5	35	46	77	57	73	163	222	67	73	52	48	68
6	35	51	85	50	76	101	261	73	71	48	61	63
7	30	49	141	58	76	89	269	72	68	42	63	54
8	32	50	150	58	76	80	265	71	55	161	64	41
9	32	46	146	60	127	71	153	73	49	78	63	46
10	35	40	138	49	106	63	127	76	58	71	51	*50
11	40	35	156	61	124	103	120	61	70	*84	42	49
12	40	44	136	54	171	106	114	58	60	76	48	57
13	40	46	78	46	198	112	101	67	75	71	48	56
14	30	45	84	57	196	124	87	76	73	62	94	45
15	35	*64	78	*58	174	190	95	72	67	71	50	48
16	35	51	73	57	178	178	143	68	69	67	*45	52
17	35	43	85	55	146	167	150	69	82	62	32	54
18	*45	37	84	54	158	174	151	77	157	58	25	52
19	40	46	80	48	144	198	148	127	74	56	37	52
20	35	56	91	44	141	222	148	122	66	45	40	60
21	32	96	*88	81	128	229	141	176	62	31	38	83
22	40	63	94	136	84	222	146	194	56	72	39	52
23	43	67	87	156	*69	172	164	201	52	49	38	57
24	43	67	92	165	62	155	164	196	57	43	65	56
25	44	64	89	165	81	155	175	192	58	41	30	56
26	42	74	101	156	132	148	133	187	55	40	40	51
27	37	74	102	148	187	95	130	194	72	32	46	48
28	31	74	102	156	190	*84	120	180	102	25	56	39
29	40	73	135	156	-	87	120	150	124	35	63	33
30	45	71	130	148	--------	76	*110	125	120	38	78	41
31	46	--------	131	91	--------	68	--------	124	--------	35	131	--------
Total	1,142	1,646	3,102	2,781	3,404	4,369	4,409	3,512	2,383	1,851	1,582	1,622
Mean	36.8	54.9	100	89.7	122	141	147	113	79.4	59.7	51.0	54.1
Cfsm	0.211	0.316	0.575	0.516	0.701	0.810	0.845	0.649	0.456	0.343	0.293	0.311
In.	0.24	0.35	0.66	0.59	0.73	0.93	0.94	0.75	0.51	0.40	0.34	0.35

Calendar year 1956: Max 598 Min 30 Mean 124 Cfsm 0.713 In. 9.71
Water year 1956-57: Max 269 Min 25 Mean 87.1 Cfsm 0.501 In. 6.79

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 1-17, Apr. 27-29; discharge estimated on basis of records for Grand River near Eaton Rapids and Battle Creek at Battle Creek.

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 upstream from bridge on Petrieville Highway, 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 1957. Gage-height records for flood seasons collected in this vicinity 1905-28 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 852.68 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--7 years, 486 cfs.

Extremes.--Maximum discharge during year, 1,290 cfs Apr. 27 (gage height, 4.27 ft); minimum, 27 cfs Aug. 26 (gage height, 0.94 ft); minimum daily, 66 cfs Aug. 22.

1950-57: Maximum discharge, 3,360 cfs May 1, 1956 (gage height, 7.65 ft, from high-water mark); minimum, 18 cfs Sept. 12, 1951; minimum daily, 44 cfs Sept. 22, 1955.

Remarks.--Records good except those for periods of ice effect, which are fair. Diurnal fluctuation caused by powerplant at Smithville and mills at Eaton Rapids.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 27		Nov. 28 to Sept. 30			
1.5	85	1.3	64	2.5	385
2.0	197	1.5	94	3.0	605
2.5	365	2.0	206	5.0	1,690

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	88	137	190	308	394	646	422	860	474	290	116	291
2	89	139	198	260	283	662	406	765	450	275	118	230
3	98	139	204	286	268	604	464	646	450	268	120	258
4	117	160	204	253	295	607	464	538	394	226	120	180
5	113	138	225	236	264	520	652	492	321	210	100	182
6	*110	131	237	b200	276	503	852	485	310	210	100	172
7	152	139	242	198	264	464	909	333	254	190	*104	160
8	91	153	256	202	286	342	952	329	238	375	108	164
9	101	142	279	172	482	348	965	356	250	*540	106	*112
10	98	*170	290	b160	675	322	918	348	262	452	117	153
11	103	170	284	b180	664	350	834	383	200	453	122	139
12	110	120	262	b200	612	551	748	408	249	407	108	140
13	109	137	297	b200	584	596	631	394	273	332	108	140
14	136	139	343	b190	568	609	570	342	363	348	109	168
15	86	144	226	b190	588	617	522	374	338	428	106	168
16	116	200	237	b160	518	593	451	378	258	329	116	118
17	113	178	279	b180	479	574	442	367	283	310	122	136
18	106	173	212	b150	b460	580	464	376	254	287	119	175
19	118	173	234	b170	b450	624	530	849	282	256	110	90
20	120	146	204	b180	436	616	490	1,080	299	216	100	131
21	118	206	*227	b160	417	659	528	972	279	194	98	172
22	120	223	336	*410	392	646	524	945	226	197	66	136
23	134	260	288	556	*346	638	472	921	200	197	72	138
24	117	214	362	b500	304	625	492	853	280	194	134	174
25	128	209	306	b450	372	596	681	811	242	172	123	144
26	134	214	386	b460	512	498	788	766	192	165	88	140
27	142	189	353	b520	608	507	1,070	696	228	165	106	140
28	137	251	336	b450	644	*484	1,250	642	236	190	110	162
29	129	200	304	b400	-	454	1,170	586	258	138	132	158
30	132	198	262	b350	--------	345	1,040	568	314	126	131	98
31	135	--------	316	b400	--------	449	--------	*496	--------	128	224	--------
Total	3,600	5,192	8,379	8,731	12,441	16,629	20,701	18,359	8,657	8,268	3,513	4,769
Mean	116	173	270	282	444	536	690	592	289	267	113	159
Cfsm	0.175	0.262	0.408	0.427	0.672	0.811	1.04	0.896	0.437	0.404	0.171	0.241
In.	0.20	0.29	0.47	0.49	0.70	0.94	1.16	1.03	0.49	0.47	0.20	0.27

Calendar year 1956:	Max 3,300	Min	86	Mean	512	Cfsm	0.775	In.	10.52
Water year 1956-57:	Max 1,250	Min	66	Mean	327	Cfsm	0.495	In.	6.71

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

Deer Creek near Dansville, Mich.

Location.--Lat 42°36'30", long 84°19'15", in E½ sec. 33, T. 3 N., R. 1 E., on right bank 15 ft upstream from bridge on Clark Road, 3½ miles north of Dansville, and 7¼ miles upstream from mouth.

Drainage area.--16.3 mi.

Records available.--May 1954 to September 1957.

Gage.--Water-stage recorder and concrete control. Datum of gage is 889.08 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Extremes.--Maximum discharge during year, 345 cfs July 12 (gage height, 7.67 ft); minimum, 0.1 cfs Dec. 9, result of freezeup.

1954-57: Maximum discharge, 570 cfs May 13, 1956 (gage height, 8.83 ft); minimum, that of Dec. 9, 1956.

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

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 10, July 13 to Sept. 30				July 11, 12	
2.7	0.4	3.3	20	5.0	152
2.8	1.2	3.5	41	7.0	291
2.9	2.8	4.0	92		
3.0	5.3	5.0	152		
3.1	8.3	6.0	251		
3.2	13				

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.9	1.2	1.6	2.1	3	7.1	8.8	13	11	4.2	2.3	2.1
2	*.8	1.2	1.8	1.8	2.5	5.9	17	10	12	3.3	2.1	1.8
3	.9	*1.1	2.1	1.6	2.5	4.5	12	8.3	8.3	3.1	2.1	1.6
4	.9	1.1	2.1	1.9	2.5	4.0	20	7.4	7.1	19	1.9	1.5
5	.9	1.2	2.3	1.9	2	3.3	40	6.8	6.2	70	1.8	1.2
6	.9	1.2	2.6	1.8	2	3.5	41	5.9	5.6	23	*1.6	1.2
7	.9	1.2	2.4	1.6	2.5	3.3	27	5.3	5.0	13	1.5	1.1
8	.9	1.1	2.3	1.4	5	2.8	20	4.8	4.8	*83	1.5	1.1
9	.8	1.1	2.1	1.2	45	2.6	15	4.8	4.0	63	1.5	1.0
10	.8	1.0	1.8	1.1	40	2.4	13	8.0	3.7	26	1.6	1.2
11	.9	1.1	2.3	2.1	20	7.8	12	11	4.2	*155	1.2	1.2
12	.9	1.1	1.6	*1.9	13	25	11	15	4.4	*230	1.1	1.1
13	.8	1.1	1.6	1.7	11	14	9.7	12	4.4	*80	1.1	1.2
14	.8	1.1	1.8	1.5	*9.2	12	8.8	11	12	43	1.2	1.0
15	.9	1.3	2.3	1.4	7.4	11	8.3	14	8.0	27	1.2	1.1
16	.9	1.6	2.6	1.3	5.6	8.8	8.0	11	5.9	19	1.1	1.0
17	.9	1.3	2.4	1.2	4.5	7.4	7.7	8.8	4.5	13	1.0	.9
18	.9	1.3	1.9	1.2	4	6.5	8.0	19	5.0	10	.9	.9
19	.9	1.3	1.9	1.2	3.5	9.9	8.3	156	4.2	8.0	.9	.8
20	.9	1.3	2.1	1.2	3.3	13	8.0	*121	3.5	7.1	.8	*.9
21	1.0	2.6	2.3	2.5	3.1	11	7.1	53	2.8	5.9	.6	1.2
22	1.0	2.3	4.2	20	3.3	11	6.8	37	2.8	5.9	.6	1.2
23	1.1	1.8	5.3	15	3.3	9.2	7.7	27	12	5.9	*.6	1.2
24	1.1	1.6	5.3	11	4.0	8.3	13	21	6.2	4.8	1.1	1.1
25	1.1	1.5	5.6	7	12	7.4	*33	17	*5.0	4.2	1.2	1.0
26	1.1	1.6	5.0	6	19	7.7	*30	17	4.2	3.7	1.0	.9
27	1.1	1.8	4.5	5	16	8.3	50	13	3.7	3.5	.8	.9
28	1.1	1.6	4.2	4	9.7	*8.3	50	11	5.7	3.1	1.0	.9
29	1.1	1.6	*3.3	3.5	-	9.2	28	8.8	10	2.8	1.3	.9
30	1.1	1.5	2.7	3.5	--------	10	18	7.7	6.2	2.6	1.8	.9
31	1.1	--------	2.6	3	--------	8.8	--------	6.8	--------	2.4	2.1	--------
Total	29.4	41.8	86.6	111.6	258.9	254.0	547.2	672.4	182.4	944.5	40.5	34.1
Mean	0.95	1.39	2.79	3.60	9.25	8.19	18.2	21.7	6.08	30.5	1.31	1.14
Cfsm	0.058	0.085	0.171	0.221	0.567	0.502	1.12	1.33	0.373	1.87	0.080	0.070
In.	0.07	0.10	0.20	0.25	0.59	0.58	1.25	1.53	0.42	2.15	0.09	0.08

Calendar year 1956:	Max 415	Min 0.8	Mean	12.9	Cfsm	0.791	In.	10.79
Water year 1956-57:	Max 230	Min 0.6	Mean	8.78	Cfsm	0.539	In.	7.31

Peak discharge (base, 100 cfs).--Feb. 9 (time unknown) about 100 cfs; May 19 (7 p.m.) 254 cfs (6.03 ft); July 4 (12 p.m.) 120 cfs (4.40 ft); July 8 (3:30 p.m.) 152 cfs (5.00 ft); July 12 (1 to 2 a.m.) 345 cfs (7.67 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 7-9, Jan. 13 to Feb. 9, Feb. 17-20.

Sloan Creek near Williamston, Mich.

Location.--Lat 42°40'30", long 84°21'50", in E½ sec. 1, T. 3 N., R. 1 W., on left bank 30 ft downstream from bridge on Meridian Road, 2 miles upstream from mouth, and 4¼ miles west of Williamston.

Drainage area.--9.34 sq mi.

Records available.--June 1954 to September 1957.

Gage.--Water-stage recorder and concrete control with V-notch sharp-crested weir. Datum of gage is 862.12 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Extremes.--Maximum discharge during year, 685 cfs July 11 (gage height, 7.35 ft); minimum, 0.01 cfs Jan. 18 (gage height, 1.10 ft), caused by siphon action; minimum natural discharge, 0.19 cfs Oct. 18, 19 (gage height, 1.38 ft).

1954-57: Maximum discharge, that of July 11, 1957; minimum, 0.01 cfs Sept. 11, 1954 Jan. 18, 1957 (gage height, 1.10 ft), caused by unusual regulation; minimum natural discharge, 0.04 cfs Sept. 18-21, 1955.

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

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 3-8, July 30 to Aug. 6, Aug. 16-21)

1.3	0.10	2.4	9.0
1.4	.22	2.8	22
1.5	.41	3.0	34
1.6	.70	3.5	89
1.8	1.6	4.0	153
2.0	3.0	5.0	300
2.1	4.0		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.20	0.28	0.28	0.44	b1.1	4.0	5.2	7.2	3.6	1.8	1.4	0.64
2	.22	.28	.32	.35	b1.0	3.5	9.9	5.6	3.4	1.4	1.3	.56
3	.22	*.28	.35	.35	b1.0	2.8	6.4	4.4	2.8	1.2	1.2	.53
4	.22	.28	.35	.35	b.9	2.6	17	3.7	2.6	6.9	1.1	.44
5	.22	a.28	.35	.37	.90	2.4	40	3.3	2.3	54	1.0	.35
6	.22	.28	.35	.35	.86	2.3	34	2.9	2.2	60	*.82	.35
7	.22	.28	.33	.33	1.0	2.2	16	2.6	2.0	10	.78	.33
8	.20	.26	.35	.33	2.0	2.1	10	2.4	1.8	*37	.70	.33
9	.20	.26	.33	.33	47	1.9	7.6	2.2	1.6	28	.70	.33
10	.22	.24	.30	.33	23	1.8	6.2	5.2	1.5	12	.64	.35
11	.22	.24	.30	.33	11	7.3	6.0	8.7	1.7	*199	.61	.35
12	.22	.24	.30	.33	6.0	21	5.0	16	1.5	*192	.56	.35
13	.22	.22	.28	.33	4.9	8.6	4.4	9.6	1.7	*65	.53	.39
14	.22	.22	.26	.30	*4.0	6.4	3.9	7.0	4.0	38	.53	.33
15	.20	.26	.32	b.2	3.4	5.4	3.6	33	3.2	28	.50	.35
16	.20	.32	.39	b.2	3.0	4.2	3.4	14	2.4	19	.50	.39
17	.20	.28	.39	b.2	2.6	3.5	3.3	9.0	1.9	14	.50	.33
18	.20	.26	.33	b.2	2.5	3.3	3.2	9.0	2.1	9.6	.47	.30
19	.19	.24	.30	b.2	2.1	4.8	3.0	146	2.7	6.8	.44	.30
20	.22	.26	.32	b.2	1.9	6.7	2.8	82	2.1	5.4	.39	*.30
21	.22	.58	.39	.94	1.7	6.0	2.7	39	1.6	4.4	.37	.35
22	.24	.50	.78	17	1.8	5.0	2.5	28	1.4	4.6	.33	.39
23	.24	.35	1.0	7.2	1.9	4.2	2.6	19	2.3	4.2	*.32	.37
24	.24	.30	a1.0	3.9	2.2	3.5	11	15	2.1	3.3	.61	.30
25	.24	.28	a1.0	2.8	11	3.1	30	10	*1.7	2.8	.58	.28
26	.24	.28	a.9	2.3	15	3.0	*21	8.6	1.4	2.6	.41	.26
27	.26	.28	a.9	2.0	8.8	3.1	65	6.4	1.3	2.2	.35	.26
28	.28	.30	a.8	b1.7	4.9	3.0	40	5.5	2.1	2.0	.41	.26
29	.28	.30	*.67	b1.5	-	3.5	20	4.4	3.4	1.9	.53	.26
30	.30	.28	a.6	b1.3	--------	6.7	11	3.6	2.6	1.8	.61	.26
31	.30	--------	.58	b1.2	--------	5.5	--------	3.1	--------	1.6	.64	--------
Total	7.07	8.71	15.12	47.86	167.46	143.4	396.7	516.4	67.0	820.5	19.83	10.59
Mean	0.228	0.290	0.488	1.54	5.98	4.63	13.2	16.7	2.23	26.5	0.640	0.353
Cfsm	0.024	0.031	0.052	0.165	0.640	0.496	1.41	1.79	0.239	2.84	0.069	0.038
In.	0.03	0.03	0.06	0.19	0.67	0.57	1.58	2.06	0.27	3.27	0.08	0.04

Calendar year 1956:	Max 195	Min 0.18	Mean 7.53	Cfsm 0.806	In. 10.97
Water year 1956-57:	Max 199	Min 0.19	Mean 6.08	Cfsm 0.651	In. 8.85

Peak discharge (base, 60 cfs).--Feb. 9 (8 a.m.) 65 cfs (3.30 ft); Apr. 5 (7:30 p.m.) 78 cfs (3.41 ft); Apr. 27 (2 p.m.) 137 cfs (3.88 ft); May 15 (2:30 a.m.) 79 cfs (3.42 ft); May 19 (2 p.m.) 236 cfs (4.57 ft); July 4 (12 p.m.) 90 cfs (3.51 ft); July 8 (2 p.m.) 61 cfs (3.26 ft); July 11 (9 p.m.) 685 cfs (7.35 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Deer Creek near Dansville and Cedar River at East Lansing.

b Stage-discharge relation affected by ice.

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 University Campus in East Lansing, 3 miles upstream from Sycamore Creek and 4 miles upstream from mouth.

Drainage area.--355 sq mi.

Records available.--August 1902 to December 1903, March 1931 to September 1957. Monthly discharge only for some periods, published in WSP 1307. 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 U. S. 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 site three-quarters of a mile downstream at different datum. March 1931 to November 1940 water-stage recorder at site 250 ft upstream at present datum.

Average discharge.--27 years, 209 cfs.

Extremes.--Maximum discharge during year, 2,400 cfs July 13 (gage height, 7.49 ft); minimum, 23 cfs Dec. 13 (gage height, 3.15 ft).

1902-3, 1931-57: Maximum discharge, 5,920 cfs Apr. 7, 1947 (gage height, 11.58 ft); minimum, 3 cfs July 31, 1931.

Remarks.--Records good. Occasional regulation at low flow by mill at Williamston 16 miles above station.

Rating tables, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 22		Jan. 23 to Sept. 30			
3.1	14	3.2	35	5.0	718
3.2	32	3.5	108	6.0	1,290
3.4	77	4.0	262	8.0	2,830
3.6	131				

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36	*42	55	55	89	242	199	550	196	122	100	52
2	36	42	47	67	89	206	228	*409	212	103	97	58
3	34	45	47	67	89	162	266	298	212	92	92	66
4	34	45	53	67	86	142	262	235	184	100	81	61
5	34	42	51	65	89	145	387	202	165	367	71	58
6	34	60	55	63	84	136	555	180	153	482	68	48
7	32	49	58	53	78	125	536	165	142	329	68	46
8	30	53	58	40	86	116	445	150	136	383	71	46
9	30	49	58	40	260	114	382	139	128	739	66	46
10	30	42	55	40	536	111	329	245	120	671	61	48
11	30	38	58	45	521	122	280	337	108	706	61	46
12	32	38	53	47	362	291	245	404	105	1,940	58	46
13	32	36	42	45	262	349	222	366	100	*2,290	56	46
14	34	36	58	42	218	298	199	298	136	1,740	54	46
15	36	51	58	42	177	273	187	496	180	1,290	52	48
16	36	60	58	42	171	255	174	459	145	1,020	54	54
17	36	60	58	42	145	228	168	310	125	728	52	50
18	36	51	51	40	133	202	165	280	111	536	52	48
19	34	34	47	40	128	196	165	794	116	400	50	48
20	34	34	60	40	116	245	165	1,350	119	306	50	*48
21	36	47	55	47	111	273	162	1,740	105	248	48	48
22	36	65	67	123	111	259	148	1,280	100	259	46	48
23	36	67	70	202	*108	231	153	968	114	329	46	46
24	36	67	95	202	105	209	184	765	128	273	54	58
25	36	60	100	*180	168	190	374	605	*111	218	54	56
26	36	36	98	148	302	174	651	502	103	187	52	48
27	38	30	93	128	349	171	*760	409	97	168	50	43
28	40	32	87	116	294	*174	962	321	103	150	50	43
29	42	*56	*82	105	-	180	962	273	142	139	54	41
30	42	53	63	103		199	734	235	150	128	*54	41
31	42		77	94		209		202		111	52	
Total	1,090	1,420	1,967	2,430	5,267	6,227	10,649	14,967	4,046	16,554	1,874	1,481
Mean	35.2	47.3	63.5	78.4	188	201	355	483	135	534	60.5	49.4
Cfsm	0.099	0.133	0.179	0.221	0.530	0.566	1.00	1.36	0.380	1.50	0.170	0.139
In.	0.11	0.15	0.21	0.25	0.55	0.65	1.12	1.57	0.42	1.73	0.20	0.16

	Max	Min	Mean	Cfsm	In.
Calendar year 1956	3,130	21	270	0.761	10.35
Water year 1956-57	2,290	30	186	0.524	7.12

Peak discharge (base, 1,100 cfs).--May 20 (9 to 12 p.m.) 1,940 cfs (6.93 ft); July 13 (5 to 6 a.m.) 2,400 cfs (7.49 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 September 1906, October 1934 to September 1957. Monthly discharge only for some periods, published in WSP 1307. 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 U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 805.53 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to August 1906, staff gage at same site at different datum. November 1934 to June 1949 water-stage recorder at site 1¾ miles downstream at datum 2.42 ft lower.

Average discharge.--28 years, 857 cfs.

Extremes.--Maximum discharge during year, 4,100 cfs May 20 (gage height, 8.56 ft); minimum, 11 cfs Nov. 14 (gage height, 1.20 ft); minimum daily, 123 cfs Aug. 10.

1901-6, 1934-57: Maximum discharge, 24,500 cfs Mar. 26, 1904 (gage height, 18.60 ft, datum then in use), from rating curve extended above 15,000 cfs by logarithmic plotting; minimum, 4.0 cfs Aug. 28, 1952, July 17, 1954 (gage height, 0.90 ft); minimum daily, 20 cfs Aug. 25, 1941.

Maximum discharge since 1901, 24,500 cfs Mar. 26, 1904.

Remarks.--Records good. Large diurnal fluctuation at medium and low flows caused by powerplants above station.

Revisions (water years).--WSP 1174: 1949. WSP 1387: 1901, 1903-4, 1935, 1937, 1942.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 22 to Nov. 15; stage-discharge relation affected by ice Jan. 9, 10)

1.7	120	7.0	2,930
2.0	220	9.0	4,450
4.0	1,100		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	188	184	287	326	546	1,080	767	1,830	884	493	256	398
2	156	188	302	294	495	1,040	788	1,460	826	431	240	360
3	144	*200	284	324	361	957	842	1,200	798	410	226	343
4	139	184	296	362	404	821	956	1,060	737	588	190	323
5	154	224	288	336	425	779	1,240	829	678	1,040	230	293
6	152	224	342	342	379	792	1,860	740	552	1,150	213	276
7	172	216	336	266	360	667	1,880	727	518	946	200	239
8	171	216	349	222	440	637	1,800	577	442	1,360	187	227
9	170	216	349	210	884	539	1,660	580	434	1,790	180	224
10	178	210	382	210	1,310	529	1,530	1,010	420	1,760	123	192
11	165	167	372	226	1,460	594	1,430	1,000	428	1,920	176	251
12	147	201	374	272	1,250	832	1,240	1,060	386	2,590	204	194
13	138	187	333	250	1,010	1,280	1,100	1,040	498	3,020	182	248
14	149	154	346	269	*912	1,110	950	926	566	2,690	201	216
15	160	215	409	235	834	1,120	868	1,220	775	2,140	170	283
16	162	235	346	245	814	1,030	776	1,230	578	1,830	178	231
17	132	223	332	238	760	962	762	972	426	1,350	154	177
18	156	255	390	227	668	912	764	949	592	1,040	196	234
19	153	221	279	197	656	994	804	2,360	448	828	214	262
20	156	227	376	237	634	1,050	928	3,710	492	746	192	*163
21	162	287	310	288	559	1,080	682	3,880	466	555	160	172
22	177	290	463	566	571	1,080	804	3,110	523	710	156	228
23	156	358	504	792	584	1,050	884	2,560	426	656	169	249
24	174	318	495	846	542	966	900	2,130	438	578	182	212
25	174	282	565	847	672	926	1,300	1,860	432	486	191	268
26	174	294	498	720	1,000	830	1,800	1,640	413	*424	216	196
27	171	262	529	656	1,180	789	2,200	1,470	338	386	176	214
28	177	240	526	698	1,180	802	2,600	1,170	462	380	194	204
29	204	*290	*472	633	-	*761	2,660	1,130	460	332	202	239
30	188	328	388	593	--------	780	2,310	1,000	562	300	*244	212
31	184	--------	409	511	--------	660	--------	858	--------	265	244	--------
Total	5,083	7,096	11,931	12,438	20,890	27,449	39,085	45,288	15,998	33,194	6,046	7,328
Mean	164	237	385	401	746	885	1,303	1,461	533	1,071	195	244
Cfsm	0.133	0.193	0.313	0.326	0.607	0.720	1.06	1.19	0.433	0.871	0.159	0.198
In.	0.15	0.21	0.36	0.38	0.63	0.83	1.18	1.37	0.48	1.00	0.18	0.22

Calendar year 1956: Max 7,500 Min 101 Mean 930 Cfsm 0.756 In. 10.29
Water year 1956-57: Max 3,880 Min 123 Mean 635 Cfsm 0.516 In. 6.99

Peak discharge (base, 2,800 cfs).--May 20 (10 p.m.) 4,100 cfs (8.56 ft); July 11 (6 p.m.) 3,270 cfs (7.49 ft).

* Discharge measurement made on this day.

Grand River at Portland, Mich.

Location.--Lat 42°51'20", long 84°54'45", in NW¼ sec. 4, T. 5 N., R. 5 W., on left bank at downstream side of bridge on Kent Street, 1.0 mile south of Portland, 1.9 miles upstream from Lookingglass River, and at mile 115.

Drainage area.--1,385 sq mi.

Records available.--August 1952 to September 1957. Gage-height records for flood seasons collected in this vicinity 1907-28 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 705.00 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to July 6, 1953, wire-weight gage at same site and datum.

Average discharge.--5 years, 852 cfs.

Extremes.--Maximum discharge during year, 5,370 cfs May 21 (gage height, 9.65 ft); minimum recorded, 89 cfs Oct. 21; minimum daily, 138 cfs Oct. 1.

1952-57: Maximum discharge, 9,100 cfs May 13, 1956 (gage height, 11.51 ft); minimum, 55 cfs Sept. 9, 1953 (gage height, 4.07 ft); minimum daily, 68 cfs Sept. 9, 1953.

Remarks.--Records good except those for periods of ice effect, indefinite stage-discharge relation, or no gage-height record, which are fair. Slight diurnal fluctuation caused by powerplants above station.

Rating table, water year 1956-57, except periods of ice effect and indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Jan. 9, June 24 to July 14)

4.3	132	6.0	1,050
4.5	194	8.0	3,040
5.0	400	10.0	5,960

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	138	200	391	450	600	a1,200	*753	2,310	*982	547	382	329
2	187	210	378	380	650	a1,200	900	1,770	1,000	*500	324	445
3	181	220	337	350	550	a1,100	886	*1,500	879	450	253	*435
4	168	230	333	400	450	a950	968	1,220	865	435	246	386
5	171	240	368	430	480	a900	1,190	1,050	788	685	*269	420
6	256	250	378	400	500	a900	2,210	865	725	1,040	269	311
7	178	250	400	400	450	a800	2,320	802	632	1,100	273	311
8	191	250	430	300	420	a700	2,110	746	601	1,210	257	294
9	201	250	440	270	600	a600	1,940	625	505	1,940	246	273
10	216	240	456	250	1,100	a560	1,760	1,250	505	1,980	246	290
11	219	200	466	250	1,500	*583	1,610	2,050	511	1,770	205	242
12	234	200	466	260	1,660	760	1,450	2,010	523	2,400	184	273
13	*226	200	450	300	1,370	1,110	1,290	1,650	488	3,190	238	286
14	212	200	400	300	1,160	1,260	1,130	1,420	638	3,190	238	265
15	171	250	400	300	1,030	1,260	990	1,500	732	2,550	246	253
16	168	294	450	280	945	1,170	915	1,660	952	2,110	246	329
17	194	*307	415	280	900	1,070	823	1,390	670	1,670	208	294
18	*198	333	391	280	844	990	809	1,280	577	1,270	205	230
19	181	311	488	260	780	1,020	816	2,640	684	1,000	201	238
20	173	311	351	230	740	1,100	858	5,080	559	830	253	315
21	170	298	440	300	739	1,130	908	5,190	529	725	238	253
22	180	382	368	400	613	1,180	697	4,430	517	718	216	216
23	190	333	553	700	619	1,130	960	3,420	613	990	201	269
24	200	391	*607	1,000	619	1,070	968	2,760	505	753	212	273
25	200	400	595	1,000	664	982	1,340	2,310	456	644	273	250
26	200	330	651	900	960	960	2,000	2,070	494	535	234	286
27	200	350	595	800	1,260	830	2,250	1,760	450	483	250	234
28	200	300	644	800	a1,300	816	3,230	1,530	420	440	212	238
29	200	280	613	800	-	837	3,160	1,310	577	400	257	234
30	200	355	571	*700	--------	816	2,810	1,200	456	410	273	253
31	200	--------	461	700	--------	816	--------	1,090	--------	364	320	--------
Total	6,003	8,365	14,286	14,470	23,503	29,800	44,051	59,888	18,833	36,329	7,675	8,725
Mean	194	279	461	467	839	961	1,468	1,932	628	1,172	248	291
Cfsm	0.140	0.201	0.333	0.337	0.606	0.694	1.06	1.39	0.453	0.846	0.179	0.210
In.	0.16	0.22	0.38	0.39	0.63	0.80	1.18	1.61	0.51	0.98	0.21	0.23

Calendar year 1956: Max 8,850 Min 138 Mean 1,079 Cfsm 0.779 In. 10.59
Water year 1956-57: Max 5,190 Min 138 Mean 745 Cfsm 0.538 In. 7.30

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage and records for stations at Lansing and at Ionia.

Note.--Stage-discharge relation indefinite Oct. 22 to Nov. 15; discharge estimated on basis of records for stations at Lansing and at Ionia. Stage-discharge relation affected by ice Nov. 25-29, Dec. 13-16, Jan. 1 to Feb. 11, Feb. 19, 20.

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 side 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 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Wire-weight gage read twice daily. Datum of gage is 747.09 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--13 years, 187 cfs.

Extremes.--Maximum discharge during year, 1,340 cfs July 12 (gage height, 5.4 ft, from graph based on gage readings); minimum, 32 cfs Oct. 8; minimum gage height, 1.35 ft Sept. 30.

1944-57: 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, 18 cfs Aug. 31, 1953 (gage height, 1.11 ft).

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

Revisions (water years).--WSP 1387: 1946-47.

Rating table, water year 1956-57, 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)

1.2	25	3.0	350
1.5	55	4.0	650
2.0	125	5.0	1,110
2.5	225		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	35	44	63	a65	70	210	161	368	*445	86	129	a60
2	36	43	a60	60	70	200	169	352	a400	*129	106	a60
3	36	43	56	60	a70	a190	*165	*350	338	77	92	*56
4	37	a43	56	65	70	180	179	368	290	a80	a80	50
5	37	43	52	65	65	170	201	a330	255	80	*75	44
6	36	43	55	a60	65	150	350	295	213	75	68	43
7	a35	46	56	50	70	*135	a300	250	177	a150	66	42
8	32	44	61	45	80	120	295	197	155	308	62	a40
9	34	42	a70	45	120	102	298	163	a150	228	55	37
10	37	42	75	45	a180	a95	302	400	141	181	54	38
11	35	a42	75	50	210	108	302	510	125	300	a54	43
12	35	a41	70	50	210	159	302	a450	104	1,160	54	45
13	*36	41	60	a50	210	171	a280	430	96	940	53	46
14	*36	44	60	45	200	189	a250	435	106	a700	51	45
15	35	42	65	45	180	201	223	670	112	658	51	a50
16	33	43	a70	45	170	215	203	546	a130	578	50	54
17	33	*44	79	45	a150	a220	181	521	145	574	50	45
18	37	a44	71	45	140	230	165	538	165	524	a45	43
19	42	45	61	45	120	238	155	a600	155	492	44	45
20	43	45	59	a50	110	219	149	1,020	141	452	42	42
21	a45	50	56	60	100	215	a140	925	120	a450	42	40
22	46	a55	63	100	a100	219	131	770	102	442	41	a40
23	51	62	a70	120	100	217	165	730	a90	455	38	40
24	38	62	*83	140	a100	a220	155	730	90	412	40	43
25	38	a60	a90	150	120	221	213	714	96	402	a45	43
26	41	60	95	150	180	221	272	a714	95	395	48	35
27	45	61	95	a130	220	209	288	714	88	365	45	36
28	a44	46	88	110	220	189	a350	678	92	a300	42	41
29	41	67	82	90	-	179	370	618	161	238	47	a40
30	48	60	a75	*80	--------	169	362	a550	a110	201	50	34
31	43	--------	70	75	--------	a160	--------	488	--------	165	54	--------
Total	1,200	1,447	2,141	2,235	3,700	5,721	7,076	16,424	4,887	11,597	1,773	1,320
Mean	38.7	48.2	69.1	72.1	132	185	236	530	163	374	57.2	44.0
Cfsm	0.138	0.172	0.246	0.257	0.470	0.658	0.840	1.89	0.580	1.33	0.204	0.157
In.	0.16	0.19	0.28	0.30	0.49	0.76	0.94	2.17	0.65	1.53	0.23	0.17

Calendar year 1956: Max 1,520 Min 32 Mean 203 Cfsm 0.722 In. 9.84
Water year 1956-57: Max 1,160 Min 32 Mean 163 Cfsm 0.580 In. 7.87

* Discharge measurement made on this day.

a No gage-height record; discharge interpolated or estimated on basis of records for Grand River at Lansing and Cedar River at East Lansing.

Note.--Stage-discharge relation affected by ice Dec. 10-15, Dec. 31 to Mar. 6.

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, 30 ft (corrected) 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 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Wire-weight gage read twice daily. Datum of gage is 642.58 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--13 years, 262 cfs.

Extremes.--Maximum discharge during year, 1,190 cfs July 15 (gage height, 8.30 ft); maximum gage height, 8.36 ft May 23; minimum discharge, 27 cfs Oct. 13; minimum gage height, 2.72 ft Sept. 10.

1944-57: 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 fair.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	40	42	66	60	694	251	409	409	344	326	49
2	32	39	42	62	60	688	252	389	387	*340	308	50
3	33	38	42	60	55	667	251	361	350	332	279	50
4	32	39	44	60	55	580	260	332	325	314	255	48
5	30	38	46	59	55	495	275	310	305	295	226	45
6	28	38	48	58	55	441	*379	280	284	269	201	40
7	28	39	50	50	60	401	495	258	264	249	177	38
8	28	38	50	45	70	*365	589	236	*251	260	158	36
9	29	38	50	40	100	337	586	218	237	303	140	34
10	28	38	48	40	200	317	544	222	212	321	125	33
11	28	38	46	40	267	301	495	249	200	568	112	35
12	28	38	43	40	279	309	450	*291	183	*607	98	40
13	*28	37	*41	40	295	316	411	382	166	820	80	44
14	28	38	40	40	303	321	385	490	154	1,000	68	46
15	28	*38	40	40	308	334	350	547	147	*1,170	60	44
16	30	40	44	40	295	349	326	568	143	1,070	55	*48
17	32	42	47	35	286	342	305	565	133	958	50	48
18	34	41	50	35	260	342	290	562	132	791	48	46
19	36	40	50	35	250	329	275	577	134	688	*42	44
20	36	40	50	35	226	318	252	767	131	592	41	42
21	36	45	53	45	209	316	240	900	124	520	39	46
22	38	48	55	77	195	322	225	1,030	117	498	38	54
23	39	46	58	110	175	332	215	1,090	114	631	36	54
24	39	45	65	117	162	334	206	1,040	111	640	35	52
25	39	44	70	122	222	340	252	940	103	652	35	48
26	38	46	75	110	415	330	290	851	98	622	34	46
27	38	44	79	100	541	316	316	747	128	556	34	40
28	38	42	80	90	631	301	349	664	150	500	36	37
29	39	42	80	80	-	290	389	583	287	437	42	34
30	39	41	77	*70	--------	275	413	518	325	394	46	32
31	39	--------	75	60	--------	264	--------	462	--------	357	48	--------
Total	1,030	1,220	1,680	1,901	6,089	11,666	10,316	16,838	6,104	17,098	3,272	1,303
Mean	33.2	40.7	54.2	61.3	217	376	344	543	203	552	106	43.4
Cfsm	0.076	0.094	0.125	0.141	0.500	0.866	0.793	1.25	0.468	1.27	0.244	0.100
In.	0.09	0.10	0.14	0.16	0.52	1.00	0.88	1.44	0.52	1.47	0.28	0.11

Calendar year 1956 :	Max	4,480	Min	26	Mean	356	Cfsm	0.820	In. 11.15
Water year 1956-57 :	Max	1,170	Min	28	Mean	215	Cfsm	0.495	In. 6.71

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 7-21, Jan. 26 to Feb. 10.

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, 2.7 miles downstream from Prairie Creek, and at mile 87.

Drainage area.--2,840 sq mi, approximately.

Records available.--March to June 1931, July and September 1931 (fragmentary), July 1951 to September 1957. Monthly discharge only for some periods, published in WSP 1307. Gage-height records for flood seasons collected in this vicinity 1907-28 are contained in reports of U. S. 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.

Average discharge.--6 years (1951-57), 1,898 cfs.

Extremes.--Maximum discharge during year, 9,840 cfs May 22 (gage height, 18.53 ft); minimum, 174 cfs Oct. 6; minimum gage height, 6.59 ft Oct. 31; minimum daily discharge, 190 cfs Oct. 5, 31.

1931, 1951-57: Maximum discharge, 19,000 cfs May 11, 1956 (gage height, 21.87 ft); minimum, 105 cfs Sept. 8, 9, 1954 (gage height, 6.20 ft); minimum daily, 115 cfs Aug. 27, 1953.

Remarks.--Records fair prior to Feb. 7, good thereafter. Diurnal fluctuation below about 5,000 cfs caused by powerplants above station.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-24)

6.5	174	13.0	4,100
7.0	330	17.0	7,600
9.0	1,320	19.0	10,700

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	501	483	663	671	1,300	3,140	1,720	4,450	*2,920	1,350	1,270	696
2	694	508	608	673	1,200	2,920	*1,750	3,810	2,660	1,480	1,280	649
3	600	396	628	778	1,100	2,560	1,860	3,160	2,240	*1,420	1,080	*726
4	305	460	608	776	1,000	2,200	1,810	2,650	2,090	1,320	881	713
5	190	494	638	820	*950	2,080	2,400	*2,470	2,050	1,170	*796	648
6	410	494	654	783	b950	2,090	4,090	2,270	1,940	1,580	898	628
7	648	476	700	764	b1,000	1,820	5,180	1,890	1,620	1,750	738	568
8	304	437	714	700	1,050	1,860	4,880	1,730	1,420	2,160	762	514
9	240	512	965	622	2,020	1,550	4,450	1,570	1,340	3,330	743	554
10	304	501	811	b600	2,950	1,420	4,000	2,160	1,480	3,230	690	473
11	322	463	936	b600	2,920	*1,510	3,720	4,420	1,260	3,130	600	566
12	435	504	676	b580	3,220	1,780	3,430	5,250	1,170	4,910	650	478
13	493	524	636	b580	2,910	1,890	2,980	5,110	1,200	7,560	441	604
14	512	498	852	b600	2,600	2,450	2,800	4,240	1,060	8,780	500	568
15	363	524	912	b480	2,360	2,370	2,470	4,440	1,050	8,180	562	548
16	347	553	833	b560	2,090	2,430	2,230	4,880	1,410	7,050	654	668
17	*344	511	712	b600	2,030	2,200	2,100	4,550	1,600	5,860	389	485
18	322	522	710	b520	1,880	2,030	1,880	4,000	1,180	4,590	466	618
19	346	534	676	500	1,620	2,120	1,880	5,010	1,140	3,500	551	472
20	554	590	689	600	1,580	2,020	1,740	8,280	1,160	2,980	543	518
21	522	676	682	800	1,620	2,090	1,800	9,520	1,120	2,560	460	680
22	276	*630	738	1,300	1,510	2,400	1,630	9,650	1,070	2,740	462	590
23	338	632	685	1,200	1,450	2,450	1,710	8,640	1,050	4,460	432	654
24	366	588	891	1,300	1,340	2,180	2,030	7,480	1,070	4,050	478	691
25	392	664	1,000	1,300	1,950	2,320	2,680	6,500	1,010	3,180	447	651
26	194	680	*971	1,400	3,500	2,070	3,560	5,790	1,030	2,660	460	472
27	510	684	850	1,400	3,640	1,980	3,880	5,140	1,030	2,330	460	560
28	740	623	910	1,400	3,350	1,840	5,100	4,510	1,200	1,710	418	565
29	492	588	888	1,400	-	1,740	5,440	3,900	1,620	1,920	601	510
30	224	527	814	1,400	--------	1,710	5,260	3,560	1,670	1,510	600	482
31	190	--------	*792	1,300	--------	1,720	--------	3,030	--------	1,350	516	--------
Total	12,478	16,276	23,842	27,007	55,090	64,940	90,460	144,060	43,860	103,800	19,828	17,549
Mean	403	543	769	871	1,968	2,095	3,015	4,647	1,462	3,348	640	585
Cfsm	0.142	0.191	0.271	0.307	0.693	0.738	1.06	1.64	0.515	1.18	0.225	0.206
In.	0.16	0.21	0.31	0.35	0.72	0.85	1.18	1.89	0.57	1.36	0.26	0.23

Calendar year 1956 : Max 18,600 Min 190 Mean 2,302 Cfsm 0.817 In. 11.11
Water year 1956-57 : Max 9,650 Min 190 Mean 1,696 Cfsm 0.597 In. 8.09

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Jan. 19 to Feb. 5; discharge estimated on basis of weather records, powerplant records, and records for stations at Portland and at Grand Rapids.

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. powerplant and half a mile south of Smyrna.

Drainage area.--528 sq mi.

Records available.--December 1950 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 729.53 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--6 years (1951-57), 418 cfs.

Extremes.--Maximum discharge during year, 1,830 cfs July 22 (gage height, 6.65 ft), caused by momentary gate opening; maximum natural discharge, 1,140 cfs Feb. 27 (gage height, 5.30 ft); minimum, 8.6 cfs July 25; minimum gage height, 2.25 ft Oct. 27; minimum daily, discharge, 109 cfs Oct. 20.

1950-57: Maximum discharge, 2,380 cfs May 9, 1956 (gage height 6.75 ft); minimum, 7.4 cfs Sept. 9, 1953; minimum daily, 107 cfs Sept. 7, 1954.

Remarks.--Records good. Diurnal fluctuation caused by powerplants above station prior to September 1956; occasional diurnal fluctuation since.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-11, June 26 to Sept. 30)

2.9	84	5.0	960
3.5	260	6.0	1,640
4.0	440		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	221	314	263	245	296	930	392	625	480	700	305	293
2	221	251	257	215	*272	870	*420	420	472	705	233	336
3	221	230	263	209	278	680	420	392	254	*585	191	305
4	221	215	263	227	275	539	420	384	368	508	248	*221
5	215	215	272	251	245	496	456	290	311	472	251	206
6	221	221	290	248	260	218	540	290	275	440	*212	266
7	224	227	299	251	260	396	585	340	290	340	161	233
8	215	221	305	239	260	388	670	344	*284	420	197	142
9	206	281	299	251	305	*368	732	336	254	468	212	164
10	173	257	296	230	311	364	580	328	293	500	215	215
11	129	242	290	233	388	376	570	*436	254	424	197	245
12	194	233	290	269	336	428	545	620	227	512	212	206
13	263	239	230	239	372	444	352	545	348	535	215	263
14	227	239	221	230	348	460	328	530	284	585	164	290
15	206	245	299	248	308	488	452	570	296	590	185	215
16	215	251	317	245	340	520	595	555	356	595	230	239
17	*218	160	290	230	281	570	436	516	308	580	126	218
18	224	251	284	230	308	508	281	484	263	504	218	254
19	192	332	263	*233	284	500	299	565	372	464	221	260
20	109	340	305	230	263	484	452	700	344	348	155	349
21	288	317	269	239	272	480	480	655	269	353	179	442
22	248	*260	305	376	281	484	281	680	287	448	224	396
23	152	254	272	380	269	400	324	645	278	504	212	311
24	174	245	311	296	272	392	408	508	328	516	206	227
25	280	248	311	308	360	432	605	480	340	387	203	254
26	290	254	*308	305	638	480	452	484	302	372	200	278
27	145	320	364	302	996	448	545	476	396	384	200	227
28	203	308	364	314	1,010	424	732	520	504	242	149	176
29	194	299	348	311	-	424	570	480	630	315	197	194
30	165	272	302	305	--------	408	372	420	705	272	254	272
31	206	--------	324	275	--------	408	--------	392	--------	239	257	--------
Total	6,460	7,741	9,074	8,164	10,088	14,807	14,294	15,010	10,372	14,307	6,429	7,697
Mean	208	258	293	263	360	478	476	484	346	462	207	257
Cfsm	0.394	0.489	0.555	0.498	0.682	0.905	0.902	0.917	0.655	0.875	0.392	0.487
In.	0.46	0.55	0.64	0.58	0.71	1.04	1.01	1.06	0.73	1.01	0.45	0.54

Calendar year 1956: Max 2,100 Min 109 Mean 403 Cfsm 0.763 In. 10.40
Water year 1956-57: Max 1,010 Min 109 Mean 341 Cfsm 0.646 In. 8.78

* Discharge measurement made on this day.

Quaker Brook near Nashville, Mich.

Location.--Lat 42°33'57", long 85°05'37", in NW¼ sec. 13, T. 2 N., R. 7 W., on left bank 150 ft upstream from culvert on county road, 500 ft upstream from small tributary, and 2½ miles south of Nashville.

Drainage area.--7.60 sq mi.

Records available.--August 1954 to September 1957.

Gage.--Water-stage recorder and concrete control. Datum of gage is 821.89 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Extremes.--Maximum discharge during year, 113 cfs May 19 (gage height, 3.31 ft); maximum gage height, 3.39 ft July 8; minimum discharge, 1.5 cfs Aug. 12, 13; minimum gage height, 1.60 ft Dec. 31, Jan. 1, Aug. 12, 13.

1954-57: Maximum discharge, 294 cfs Oct. 4, 1954 (gage height, 5.47 ft), from rating curve extended above 140 cfs; minimum, 1.4 cfs Jan. 8, 1956 (gage height, 1.53 ft), result of freezeup.

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

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.58	1.6	2.1	7.7
1.6	1.7	2.2	11
1.8	3.2	2.3	17
2.0	5.6	3.0	86

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.6	3.2	3.2	2.7	3.4	4.2	4.5	5.2	4.0	2.6	1.8	2.6
2	2.6	3.2	3.4	2.9	3.3	3.8	6.1	4.2	4.0	2.3	1.8	2.7
3	2.5	3.2	3.9	2.9	3.3	3.5	4.4	3.8	4.0	2.3	1.9	3.3
4	*2.6	3.2	4.1	3.1	3.3	3.5	6.9	3.8	3.0	4.6	1.9	2.4
5	2.6	3.3	4.4	3.1	3.3	3.4	14	4.0	2.9	7.4	1.8	2.1
6	2.6	3.3	4.3	3.1	3.4	3.4	24	3.5	3.1	3.1	1.8	2.1
7	2.7	3.2	3.8	3.1	3.5	3.4	11	3.2	3.2	2.8	*1.8	2.1
8	2.6	*3.0	3.5	3.0	4.1	3.4	9.2	3.0	3.4	*49	1.7	2.1
9	2.6	3.2	3.3	2.9	16	3.5	6.1	3.0	3.2	29	1.7	*2.0
10	2.6	3.1	3.1	2.8	13	3.5	5.6	11	3.0	7.6	1.8	2.1
11	2.7	3.2	3.3	2.8	6.5	6.1	5.4	14	3.2	*4.4	1.9	2.1
12	2.8	3.3	3.1	2.8	4.4	13	4.8	12	3.1	3.8	1.8	2.3
13	2.8	3.3	3.0	2.8	4.5	6.9	4.4	6.7	3.0	4.6	1.6	2.9
14	2.7	3.2	3.0	2.8	4.0	5.6	4.2	5.6	3.9	3.7	1.8	2.5
15	2.7	3.6	3.6	2.8	3.7	7.1	4.2	7.2	*3.5	3.1	2.5	2.6
16	2.8	3.8	4.0	*2.9	3.6	5.9	4.2	5.4	3.1	2.6	2.3	2.8
17	2.8	3.4	3.8	2.7	3.6	4.8	4.3	4.4	2.7	2.4	2.0	2.3
18	2.8	3.2	3.3	2.8	3.5	4.7	4.6	16	3.7	2.3	2.0	2.2
19	2.8	3.3	3.1	2.8	3.5	8.9	4.4	71	3.1	2.2	1.9	2.1
20	2.9	3.4	3.5	3.0	3.4	8.9	*4.9	44	2.6	2.2	1.8	2.3
21	3.1	4.6	3.7	4.5	*3.4	*6.7	4.0	16	2.5	2.3	1.8	2.4
22	3.1	4.0	4.9	15	3.6	5.6	3.8	10	2.5	2.6	1.8	2.5
23	3.0	3.5	4.8	13	3.9	4.7	14	7.7	2.6	2.8	1.7	2.3
24	3.0	3.6	6.3	6.7	4.4	4.4	17	12	2.4	2.3	2.4	2.2
25	3.0	3.6	5.1	*5.1	15	4.1	28	6.1	2.5	2.1	2.3	2.1
26	3.4	3.7	4.1	4.4	15	4.2	18	6.9	2.5	2.1	1.9	2.0
27	3.6	3.6	4.0	4.0	8.3	4.7	30	4.8	2.6	2.1	1.8	2.0
28	3.2	3.6	*3.8	3.8	5.1	4.4	29	4.3	4.4	2.1	2.1	2.1
29	3.2	3.3	3.3	3.7	-	4.4	11	4.0	4.9	2.1	2.4	2.3
30	3.2	3.2	3.1	3.6	--------	4.2	6.7	4.0	2.9	1.9	4.0	2.1
31	3.2	--------	*3.4	3.5	--------	3.9	--------	4.0	--------	1.9	3.0	--------
Total	88.8	102.3	117.2	125.1	156.0	158.8	298.7	310.8	95.5	166.3	62.8	69.6
Mean	2.86	3.41	3.78	4.04	5.57	5.12	9.96	10.0	3.18	5.36	2.03	2.32
Cfsm	0.376	0.449	0.497	0.532	0.733	0.674	1.31	1.32	0.418	0.705	0.267	0.305
In.	0.43	0.50	0.57	0.61	0.76	0.78	1.46	1.52	0.47	0.81	0.31	0.34

Calendar year 1956: Max 88 Min 2.4 Mean 6.41 Cfsm 0.843 In. 11.47
Water year 1956-57: Max 71 Min 1.6 Mean 4.80 Cfsm 0.632 In. 8.56

Peak discharge (base, 50 cfs).--Apr. 27 (8 to 9 p.m.) 51 cfs (2.65 ft); May 19 (2 to 3 p.m.) 113 cfs (3.31 ft); July 8 (9 a.m.) 103 cfs (3.39 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 9-14, 19-22, Jan. 27 to Feb. 7, Feb. 13-19, Mar. 1-7.

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 1957.

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.--13 years, 320 cfs.

Extremes.--Maximum discharge during year, 2,350 cfs May 22 (gage height, 6.75 ft); minimum, 63 cfs Aug. 23; minimum gage height, 2.91 ft Oct. 1, Aug. 23.
1944-57: 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.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

2.8	54	4.0	440
3.0	90	5.0	1,030
3.5	230	7.0	2,560

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	76	102	110	110	132	292	200	967	280	164	105	118
2	79	108	112	100	128	242	215	728	251	140	100	138
3	81	105	115	100	130	215	227	540	239	125	95	135
4	*79	108	120	98	125	182	248	410	218	125	92	128
5	79	105	125	100	122	179	288	345	206	179	88	120
6	79	105	130	102	125	173	460	276	191	236	85	105
7	77	105	132	100	125	158	590	248	188	264	*79	95
8	79	*105	130	100	125	152	734	221	179	480	76	92
9	81	100	128	102	161	149	710	200	167	*770	74	*88
10	81	100	125	95	245	143	614	322	164	904	76	88
11	81	98	120	95	300	152	500	602	167	830	76	88
12	81	100	115	92	268	236	420	911	173	734	76	92
13	83	102	102	95	239	292	354	*1,100	185	638	70	98
14	85	100	100	100	218	284	327	1,010	212	545	70	98
15	88	102	105	98	185	268	284	812	*188	440	77	100
16	88	100	115	*95	182	260	257	710	179	336	85	102
17	90	108	122	100	173	254	242	680	170	272	81	102
18	90	105	115	98	158	242	233	674	164	227	77	98
19	86	105	108	100	155	230	224	860	152	197	74	92
20	86	105	115	95	140	248	*218	1,680	146	176	68	88
21	90	108	118	105	*130	*268	212	2,220	135	164	68	90
22	95	118	122	188	143	276	200	2,320	125	164	65	90
23	92	115	128	236	140	254	236	2,100	143	173	63	88
24	95	115	152	239	140	254	300	1,730	143	176	68	88
25	95	120	164	239	188	218	430	1,380	146	167	72	86
26	98	120	164	212	327	206	638	1,080	140	152	74	85
27	100	118	155	191	400	191	836	752	140	140	74	81
28	100	115	*146	176	345	194	995	580	146	130	70	79
29	102	112	138	167	-	200	1,130	480	176	122	77	79
30	102	110	120	152	--------	200	1,110	390	176	118	88	79
31	100	--------	120	138	--------	197	--------	327	--------	110	102	--------
Total	2,718	3,219	3,871	4,018	5,249	6,809	13,432	26,655	5,289	9,398	2,445	2,910
Mean	87.7	107	125	130	187	220	448	860	176	303	78.9	97.0
Cfsm	0.228	0.278	0.325	0.338	0.486	0.571	1.16	2.23	0.457	0.787	0.205	0.252
In.	0.26	0.31	0.37	0.39	0.51	0.66	1.30	2.57	0.51	0.91	0.24	0.28

Calendar year 1956: Max 3,560 Min 65 Mean 342 Cfsm 0.888 In. 12.09
Water year 1956-57: Max 2,320 Min 63 Mean 236 Cfsm 0.613 In. 8.31

* Discharge measurement made on this day.

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 La Barge 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 1957. Monthly discharge only for some periods, published in WSP 1307. Figures of daily discharge for Oct. 1 to Nov. 30, 1930, May 1-31, July 1-31, 1931, June 12 to Oct. 27, 1932, June 11-30, July 8 to Sept. 30, 1933, May 3 to Nov. 20, 1934, Dec. 5, 1934, to Jan. 7, 1935, Feb. 1-13, Sept. 1 to Oct. 31, 1935, Jan. 1-14, Jan. 22 to Feb. 23, May 16 to Sept. 11, Oct. 1 to Dec. 26, 1936, and Aug. 1 to Sept. 30, 1937, published in WSP 714, 729, 744, 759, 784, 804, 824, have been found to be unreliable and should not be used.

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.--14 years, 510 cfs.

Extremes.--Maximum discharge during year, 3,480 cfs May 22 (gage height, 8.35 ft); minimum, 7.4 cfs Sept. 30 (gage height, 2.37 ft); minimum daily, 133 cfs Oct. 1.

1930-38, 1951-57: Maximum discharge, 6,290 cfs May 10, 1956 (gage height, 10.79 ft); minimum not determined.

Flood of Apr. 7, 1947, reached a stage of 14.4 ft, from information by powerplant operator.

Remarks.--Records good. Large diurnal fluctuation at low and medium flow caused by powerplant above station.

Revisions (water years).--WSP 824: 1931-36: See also Records available.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

3.3	126	6.0	1,650
3.5	181	9.0	4,100
4.0	402		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	133	274	230	290	286	712	494	1,490	772	400	328	324
2	230	239	300	223	336	640	537	1,310	682	402	306	275
3	244	239	256	216	282	586	488	1,070	628	404	292	314
4	201	216	281	253	367	459	556	868	616	*242	258	*262
5	199	274	296	244	334	404	610	736	580	518	234	338
6	221	272	297	268	234	405	1,040	646	562	516	276	254
7	182	242	312	240	238	391	1,190	598	375	408	*246	267
8	232	*250	266	224	282	384	1,200	550	519	1,080	248	225
9	177	266	302	220	460	361	1,170	448	426	2,000	251	253
10	201	232	241	256	598	358	1,100	804	476	1,860	227	226
11	196	197	304	219	532	332	988	1,440	430	1,690	203	243
12	230	275	238	259	472	486	868	1,800	508	1,470	231	228
13	195	232	212	204	538	556	772	*1,910	439	1,310	253	338
14	206	244	254	261	484	604	694	1,840	474	1,140	228	260
15	158	264	250	142	386	610	634	1,840	496	964	223	239
16	*195	251	268	*282	354	592	610	1,680	430	832	250	264
17	375	254	302	232	399	550	562	1,430	*468	712	260	266
18	250	230	216	284	462	544	538	1,420	428	646	227	267
19	198	280	275	160	328	488	526	2,120	394	590	252	252
20	202	250	222	283	313	*494	464	3,220	368	472	176	275
21	212	276	286	406	*308	500	441	3,260	367	427	244	245
22	205	221	230	396	242	562	458	3,370	362	511	212	256
23	215	302	322	447	339	562	526	3,290	379	624	181	254
24	223	290	322	439	242	556	526	2,960	400	637	238	252
25	225	252	322	492	514	468	892	2,490	372	594	255	289
26	236	266	327	456	778	462	1,170	2,100	368	435	208	164
27	236	285	*332	378	946	421	1,310	1,720	372	398	212	242
28	194	269	332	401	796	418	1,550	1,320	462	424	213	242
29	254	212	327	391	-	422	1,640	1,120	568	368	255	246
30	236	292	302	365		423	1,580	946	574	368	243	189
31	240		222	316		427		838		294	262	
Total	6,701	7,646	8,646	9,247	11,850	15,177	25,134	50,634	14,295	22,736	7,492	7,749
Mean	216	255	279	298	423	490	838	1,633	476	733	242	258
Cfsm	0.279	0.330	0.361	0.386	0.547	0.634	1.08	2.11	0.616	0.948	0.313	0.334
In.	0.32	0.37	0.42	0.44	0.57	0.73	1.21	2.44	0.69	1.09	0.36	0.37

Calendar year 1956: Max 5,120 Min 90 Mean 682 Cfsm 0.882 In. 12.00
Water year 1956-57: Max 3,370 Min 133 Mean 513 Cfsm 0.664 In. 9.01

* Discharge measurement made on this day.

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 upstream from mouth and 3.0 miles southwest of Rockford.

Drainage area.--234 sq mi.

Records available.--February 1952 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 625.2 ft above mean sea level (levels by Blass Survey Co.). Prior to Aug. 30, 1952, wire-weight gage at same site and datum.

Average discharge.--5 years, 208 cfs.

Extremes.--Maximum discharge during year, 1,080 cfs Feb. 26 (gage height, 6.60 ft); minimum, 52 cfs Aug. 6, 12, 13, Sept. 26; minimum gage height, 3.66 ft Sept. 26; minimum daily discharge, 56 cfs Aug. 13.

1952-57: Maximum discharge, 1,820 cfs May 7, 1956 (gage height, 7.77 ft); minimum, 30 cfs Oct. 5, 13, 1952 (gage height, 3.55 ft); minimum daily, 49 cfs Aug. 27, 1955.

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

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.6	44	4.5	243
3.8	72	6.0	785
4.0	109	7.0	1,260

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	109	116	123	120	160	585	219	249	202	478	75	150
2	116	116	125	b120	*179	444	*219	207	177	436	137	144
3	111	116	132	b120	147	326	210	182	185	352	94	132
4	111	116	140	b120	160	307	216	168	165	*259	64	*130
5	109	116	150	b130	196	237	278	147	154	210	119	142
6	107	116	163	127	140	237	385	157	150	199	*97	98
7	105	118	174	127	134	210	444	142	147	188	60	80
8	103	118	177	142	147	196	478	137	*142	213	116	103
9	103	*114	165	127	265	*185	444	130	122	234	98	127
10	103	111	152	125	269	165	379	207	154	193	84	90
11	118	111	144	134	307	210	336	*262	142	213	100	89
12	93	111	140	123	301	288	288	320	140	202	88	144
13	109	114	102	b120	262	310	259	349	134	191	56	157
14	111	114	137	b120	213	329	231	336	132	185	79	150
15	109	132	142	*b110	179	369	234	329	140	207	114	118
16	109	150	147	b120	168	352	213	285	147	182	140	144
17	*109	154	150	b120	163	336	205	265	165	140	150	132
18	105	152	142	b120	196	320	199	281	177	154	101	74
19	103	140	137	b120	147	320	196	352	199	140	72	103
20	105	132	140	119	147	291	193	385	199	134	132	118
21	109	152	144	157	137	269	179	408	179	96	62	140
22	109	150	150	b300	132	281	193	395	154	157	87	142
23	111	147	163	272	142	285	182	365	297	171	95	142
24	109	137	199	b250	131	272	202	313	243	168	147	142
25	109	134	202	b230	679	265	285	272	225	154	69	132
26	111	137	202	b210	902	240	313	281	253	142	105	74
27	114	132	*199	b190	916	222	339	285	285	132	101	97
28	114	130	188	b180	803	213	342	262	540	110	121	103
29	116	127	171	b170	-	210	352	237	524	94	103	101
30	116	125	147	b160	--------	213	297	210	520	100	130	101
31	116	--------	142	b160	--------	205	--------	213	--------	113	142	--------
Total	3,382	3,838	4,789	4,743	7,722	8,692	8,310	8,131	6,393	5,947	3,138	3,599
Mean	109	128	154	153	276	280	277	262	213	192	101	120
Cfsm	0.466	0.547	0.658	0.654	1.18	1.20	1.18	1.12	0.910	0.821	0.432	0.513
In.	0.54	0.61	0.76	0.75	1.23	1.38	1.32	1.29	1.02	0.95	0.50	0.57

Calendar year 1956: Max	1,540	Min	82	Mean	216	Cfsm	0.923	In.	12.55
Water year 1956-57: Max	916	Min	56	Mean	188	Cfsm	0.803	In.	10.92

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

Grand River at Grand Rapids, Mich.

Location.--Lat 42°57'50", long 85°40'35", in NE¼ sec. 25, T. 7 N., R. 12 W., on right bank 500 ft upstream from bridge on Fulton Street, 1.7 miles upstream from Plaster Creek, and at mile 41.

Drainage area.--4,900 sq mi, approximately.

Records available.--March 1901 to December 1905, January 1906 to August 1918 (gage heights only), October 1930 to September 1957. Monthly discharge only for some periods, published in WSP 1307. Gage-height records collected in this vicinity since 1907 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 585.70 ft above mean sea level, datum of 1929 (levels by city of Grand Rapids). March 1901 to December 1905 and January 1906 to August 1918 staff gage at Fulton Street Bridge 500 ft downstream and Oct. 1, 1930, to Oct. 26, 1953, water-stage recorder at sewage pumping station 1 mile downstream at datum 2.99 ft higher.

Average discharge.--31 years, 3,545 cfs.

Extremes.--Maximum discharge during year, 13,800 cfs May 24 (gage height, 12.35 ft); minimum, 860 cfs Jan. 10 (gage height, 2.68 ft); minimum daily, 970 cfs Oct. 23.

1901-5, 1930-57: Maximum discharge, 54,000 cfs Mar. 28, 1904 (gage height, 19.5 ft, from graph based on gage readings, 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 period of ice effect, which are fair. Moderate diurnal fluctuation at low and medium flow caused by powerplants above station.

Revisions (water years).--WSP 924: 1938(M). WSP 1277: 1904(M). WSP 1387: 1901-5, 1940.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.7	890	4.0	3,860
3.0	1,420	10.0	10,400
3.5	3,050	13.0	15,100

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,700	1,020	1,700	1,520	1,950	6,010	*3,130	7,500	5,160	3,820	2,260	1,280
2	1,420	1,100	1,640	1,380	1,900	*5,570	3,440	6,790	4,760	3,520	2,090	1,320
3	1,670	1,240	1,730	1,500	1,900	5,130	3,360	*5,890	4,390	3,600	2,120	1,380
4	1,520	1,220	1,620	1,570	1,800	4,450	3,460	5,060	3,870	*3,290	1,730	*1,420
5	1,240	1,240	1,640	1,640	1,800	4,000	3,750	4,340	3,440	2,990	1,600	1,470
6	1,020	1,240	1,750	1,540	1,700	3,460	5,660	*3,960	3,380	3,020	*1,500	1,320
7	1,020	1,260	1,870	1,470	1,570	3,330	7,110	3,670	3,050	3,270	1,620	1,260
8	1,570	1,190	1,890	1,540	1,670	3,050	7,440	3,090	2,570	3,860	1,400	1,170
9	1,360	*1,360	1,890	1,400	2,300	2,930	7,250	2,810	2,300	5,500	1,440	1,220
10	1,220	1,420	1,920	1,030	3,330	2,480	6,810	3,330	2,200	6,200	1,380	1,150
11	1,220	1,520	1,890	1,340	3,830	2,480	6,390	5,060	2,300	5,990	1,340	1,190
12	1,240	1,420	1,870	1,470	3,810	3,230	5,860	7,090	2,160	5,820	1,280	1,220
13	1,200	1,500	1,260	1,200	3,960	3,570	5,430	8,070	2,120	6,680	1,220	1,320
14	1,150	1,500	1,400	1,200	3,780	3,770	4,870	8,110	2,020	8,040	1,170	1,260
15	1,260	1,470	1,520	*1,200	3,490	4,290	4,400	7,590	2,090	8,950	1,220	1,280
16	*1,070	1,640	1,750	1,200	3,050	4,280	4,090	7,590	2,060	9,330	1,320	1,320
17	986	1,640	2,020	1,300	2,900	4,170	3,960	7,410	*2,480	8,980	1,320	1,240
18	1,200	1,540	1,810	1,300	3,110	3,970	3,760	7,110	2,840	7,920	1,170	1,170
19	986	1,570	1,640	1,100	3,050	3,960	3,440	7,730	2,300	6,290	1,100	1,190
20	1,030	1,620	1,700	1,300	2,700	3,820	3,110	10,300	2,120	4,910	1,140	1,380
21	1,080	1,810	1,730	1,500	2,390	3,770	3,020	11,300	2,120	4,220	1,140	1,540
22	1,120	2,060	1,730	2,500	1,980	3,960	3,090	12,500	1,980	4,280	1,100	1,620
23	970	1,870	1,870	2,500	1,890	4,120	3,050	13,500	2,200	4,730	1,070	1,380
24	1,050	1,700	1,950	2,400	1,950	4,070	3,280	13,700	2,230	5,680	1,120	1,340
25	1,000	1,780	2,060	2,200	3,080	3,730	4,240	12,900	2,120	5,400	1,120	1,340
26	1,080	1,780	2,230	2,500	5,420	3,650	5,430	11,500	2,230	4,510	1,080	1,220
27	1,100	1,780	*2,340	2,600	6,560	3,550	6,100	9,900	2,300	3,900	1,030	1,100
28	1,240	1,780	2,090	2,700	6,500	3,440	6,390	8,280	3,440	3,440	1,070	1,140
29	1,470	1,810	2,200	2,500	-	3,420	7,450	6,970	4,390	3,050	1,080	1,140
30	1,320	1,700	2,060	2,300	--------	3,050	7,790	6,110	4,060	2,810	1,320	1,070
31	1,120	--------	1,810	2,100	--------	3,050	--------	5,480	--------	2,480	1,220	--------
Total	37,632	45,780	56,580	53,000	83,370	117,760	146,560	234,540	84,680	156,480	41,770	38,450
Mean	1,214	1,526	1,825	1,710	2,978	3,799	4,885	7,566	2,823	5,048	1,347	1,282
Cfsm	0.248	0.311	0.372	0.349	0.608	0.775	0.997	1.54	0.576	1.03	0.275	0.262
In.	0.29	0.35	0.43	0.40	0.63	0.89	1.11	1.78	0.64	1.19	0.32	0.29

Calendar year 1956: Max 25,800 Min 970 Mean 4,052 Cfsm 0.827 In. 11.27
Water year 1956-57: Max 13,700 Min 970 Mean 3,004 Cfsm 0.613 In. 8.32

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Jan. 14 to Feb. 5.

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, 2¾ 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 1957.

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.--11 years, 223 cfs.

Extremes.--Maximum discharge during year, 962 cfs July 11 (gage height, 8.25 ft); minimum, 98 cfs Nov. 16.

1946-57: Maximum discharge, 1,050 cfs Mar. 31, 1953; maximum gage height, that of July 11, 1957; minimum discharge, 36 cfs Sept. 26, 1949.

Remarks.--Records good except those for periods of ice effect, which are poor. Occasional regulation by operation of gates at Reedsburg Dam.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-22, Feb. 26, Mar. 7-25, Sept. 24-30)

3.8	120
5.0	240
6.0	356
7.0	570
8.3	980

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	134	146	161	b175	b175	b160	290	359	372	310	294	216
2	142	143	164	b180	173	b160	300	331	370	297	284	216
3	146	142	168	b180	160	b155	297	298	337	274	264	209
4	149	142	175	182	159	b150	332	266	316	271	263	237
5	*146	141	182	179	b155	b150	330	259	300	271	249	221
6	136	141	194	173	156	b150	364	241	273	264	232	210
7	152	142	*203	171	*152	*155	397	199	238	250	226	207
8	140	148	204	b165	b150	152	419	173	234	*652	*228	202
9	149	*144	199	b160	152	152	439	190	229	875	256	198
10	142	142	193	*b165	150	149	423	272	221	*959	305	199
11	139	136	b180	b170	b150	153	*397	305	209	956	291	195
12	138	147	b175	b180	b150	176	389	288	220	914	270	*205
13	140	134	b170	b175	144	198	379	280	*227	828	230	208
14	140	144	b165	b170	143	219	367	277	238	747	251	204
15	147	164	173	b170	b145	260	340	326	237	687	251	199
16	146	127	173	b170	142	290	291	362	241	615	248	199
17	142	191	173	b170	b140	302	282	345	238	555	239	199
18	144	191	178	b170	138	283	310	326	220	498	231	196
19	138	187	167	b170	b140	284	334	325	216	460	227	189
20	136	188	167	b180	b140	276	334	317	205	419	221	198
21	138	169	166	196	b140	264	355	*288	170	407	218	194
22	138	b180	169	246	143	272	373	295	144	419	211	194
23	146	b190	172	b240	144	282	389	355	163	429	205	191
24	142	b180	179	b220	142	291	405	359	178	405	212	174
25	134	174	176	b210	155	310	397	342	186	369	212	165
26	134	168	174	b200	182	367	403	329	199	357	193	172
27	147	165	176	b190	b175	335	403	328	222	350	186	172
28	142	165	178	b185	b165	310	401	316	242	342	189	172
29	142	164	172	b180	-	304	379	270	295	323	193	171
30	142	161	176	b175	--------	325	372	270	306	308	204	166
31	147	--------	173	b175	--------	298	--------	297	--------	302	220	--------
Total	4,398	4,756	5,475	5,672	4,260	7,332	10,891	9,188	7,246	15,113	7,303	5,878
Mean	142	159	177	183	152	237	363	296	242	488	236	196
Cfsm	0.460	0.515	0.573	0.592	0.492	0.767	1.17	0.958	0.783	1.58	0.764	0.634
In.	0.53	0.57	0.66	0.68	0.51	0.88	1.30	1.10	0.87	1.82	0.88	0.71

Calendar year 1956: Max 930 Min 50 Mean 183 Cfsm 0.592 In. 8.06
Water year 1956-57: Max 959 Min 127 Mean 240 Cfsm 0.777 In. 10.51

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

Muskegon River at Evart, Mich.

Location.--Lat 43°54'00", long 84°15'45", in NE¼ sec. 3, T. 17 N., R. 8 W., on right bank 500 ft downstream from bridge on U. S. Highway 10 at Evart, 0.4 mile upstream from Twin Creek, and at mile 123.9. Prior to Nov. 8, 1957, at site 500 ft upstream.

Drainage area.--1,450 sq mi, approximately.

Records available.--October 1930 to September 1931, October 1933 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 977.72 ft above mean sea level, datum of 1929. Prior to Apr. 12, 1934, chain gage at site 500 ft upstream, Apr. 12, 1934, to May 22, 1935, chain gage at site 400 ft upstream, and May 23, 1935, to Nov. 7, 1957, wire-weight gage at site 500 ft upstream at present datum.

Average discharge.--25 years, 959 cfs.

Extremes.--Maximum discharge during year, 7,320 cfs July 12 (gage height, 14.13 ft); minimum, 492 cfs Oct. 24, 25.

1930-31, 1933-57: Maximum discharge, that of July 12, 1957; minimum observed, 164 cfs Dec. 20, 1947 (result of freezeup).

Remarks.--Records good except those for periods of ice effect, which are fair. Records of water temperatures for the water year 1957 are given in WSP 1520.

Revisions (water years).--WSP 1437: 1934, 1947(M).

Rating tables, water year 1956-57, 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	
7.1	470	7.0	520
7.6	755	8.0	1,200
		10.0	3,000
		14.1	7,290

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	525	525	632	668	620	850	1,030	1,490	1,200	1,670	960	674
2	536	525	626	660	620	800	1,110	1,400	1,130	1,590	904	674
3	547	514	632	660	656	730	1,110	1,300	1,100	1,500	848	674
4	*552	536	644	650	610	670	1,090	1,170	1,070	1,450	806	680
5	547	530	632	640	600	610	1,240	1,070	1,070	1,410	778	687
6	542	530	*680	640	590	644	1,720	984	1,060	1,310	750	694
7	547	552	729	640	*585	*668	1,880	876	1,010	1,190	743	687
8	525	530	736	630	590	660	1,900	834	946	*2,540	*708	656
9	530	*530	722	620	590	640	1,740	*778	855	*4,120	694	626
10	525	525	736	*620	595	600	1,610	855	799	*6,430	729	610
11	514	530	736	620	590	638	*1,570	911	757	6,740	729	605
12	536	535	736	610	580	946	1,560	960	*736	*7,290	743	*638
13	520	535	701	600	580	1,040	1,540	1,000	764	7,110	771	680
14	525	535	662	590	580	1,110	1,460	1,060	820	6,230	799	674
15	536	560	680	580	550	1,340	1,380	1,340	876	5,230	778	694
16	530	595	708	580	540	1,390	1,330	1,540	862	4,360	764	680
17	520	605	757	580	530	1,350	1,290	1,510	848	3,660	757	662
18	525	615	729	580	540	1,330	1,250	1,470	827	3,090	750	644
19	530	610	656	580	530	1,260	1,210	1,500	848	2,730	743	638
20	530	632	662	590	530	1,200	1,200	1,570	869	2,410	736	638
21	530	656	662	600	530	1,140	1,200	1,500	813	2,200	729	656
22	525	701	674	850	540	1,150	1,220	1,930	799	2,210	729	656
23	525	694	668	950	565	1,180	1,220	2,010	897	2,210	722	650
24	498	638	674	900	560	1,220	1,260	1,950	968	1,960	722	638
25	498	662	680	850	729	1,200	1,550	1,790	939	1,700	694	626
26	503	668	668	820	1,060	1,170	1,920	1,740	1,020	1,520	668	605
27	520	662	674	780	1,000	1,130	1,880	1,670	1,170	1,390	662	585
28	503	668	680	720	920	1,110	1,820	1,600	1,300	1,300	656	565
29	503	662	687	680	-	1,100	1,720	1,500	1,700	1,210	650	570
30	520	638	656	660	--------	1,110	1,590	1,390	1,740	1,130	650	570
31	514	--------	662	640	--------	1,060	--------	1,290	--------	1,040	662	--------
Total	16,281	17,698	21,181	20,788	17,510	31,046	43,600	41,988	29,793	89,930	23,034	19,336
Mean	525	590	683	671	625	1,001	1,453	1,354	993	2,901	743	645
Cfsm	0.362	0.407	0.471	0.463	0.431	0.690	1.00	0.934	0.685	2.00	0.512	0.445
In.	0.42	0.45	0.54	0.53	0.45	0.80	1.12	1.08	0.76	2.31	0.59	0.50

Calendar year 1956:	Max	4,630	Min	390	Mean	895	Cfsm	0.617	In. 8.41
Water year 1956-57:	Max	7,290	Min	498	Mean	1,020	Cfsm	0.703	In. 9.55

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 2-31, Feb. 4, 5, 8, 11, 12, 14, 15, 17, 19-21, Feb. 27 to Mar. 5, Mar. 8-10 (no gage-height record Jan. 2-10).

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.--July to December 1908, July 1909 to July 1915, January 1916 to December 1919, October 1930 to September 1957. Monthly discharge only for some periods, published in WSP 1307. Records for June 1901 to December 1906, published in WSP 129, 170, and 206, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 585.83 ft above mean sea level. October 1930 to January 1939 staff gage at present site and datum.

Average discharge.--35 years (1909-14, 1916-19, 1930-57), 1,913 cfs.

Extremes.--Maximum discharge during year, 10,000 cfs July 12 (gage height, 52.83 ft); minimum not determined; minimum daily, 800 cfs Oct. 13, 20, 27, 28, Nov. 4, 10, 11, 17, 18.
1908-19, 1930-57: Maximum daily discharge observed, 14,950 cfs Mar. 25, 1913; minimum discharge, about 150 cfs June 4, 1941, July 7, 1950; minimum daily observed, 330 cfs Feb. 15, 1914.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow regulated by powerplants above station, the largest of which are at Croton Dam, Hardy Dam (since 1931), and Rogers Dam.

Revisions (water years).--WSP 974: 1933, 1935, 1937-38. See also Records available.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

46.7	760
47.5	1,570
48.0	2,310
53.0	10,300

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,200	1,300	1,000	1,090	1,710	2,410	1,600	2,890	2,110	3,290	2,200	1,250
2	1,250	1,200	1,100	1,690	1,570	1,860	2,140	2,890	1,810	3,300	1,900	1,250
3	*1,400	950	1,800	1,700	1,270	1,900	2,280	2,530	2,020	3,290	1,200	1,250
4	1,200	800	1,800	1,810	1,780	2,280	2,330	1,820	2,260	2,460	1,200	1,760
5	1,200	1,200	*1,700	1,050	*1,760	*2,630	1,790	1,790	2,260	2,310	1,350	2,120
6	850	1,200	1,660	894	1,780	2,610	1,850	1,960	2,260	2,090	*1,800	1,490
7	900	1,200	1,650	1,680	1,770	2,550	2,520	*2,250	2,260	1,130	1,800	1,120
8	1,100	*1,350	894	*1,800	1,760	2,580	2,680	2,100	1,230	2,550	1,800	1,110
9	1,350	1,150	894	1,700	1,460	2,440	*3,170	1,670	1,170	*4,570	1,100	1,410
10	1,350	800	1,700	1,680	1,170	1,880	3,330	1,300	1,800	4,920	1,100	1,800
11	1,400	800	1,740	1,650	1,780	2,700	3,160	1,270	*2,260	*6,240	1,100	*1,600
12	1,150	900	1,760	876	1,950	3,330	2,440	1,250	2,250	*9,180	1,300	1,180
13	800	1,100	1,780	867	1,340	3,320	1,220	1,550	1,990	8,580	1,790	1,160
14	900	1,200	1,680	940	1,920	3,320	1,200	1,900	1,290	8,200	1,590	1,150
15	1,200	1,200	1,100	1,330	1,260	3,240	1,950	2,000	1,290	6,950	1,080	1,160
16	1,350	1,100	1,000	1,490	1,300	2,440	2,550	2,330	1,230	6,300	1,110	1,200
17	1,350	800	1,660	1,500	1,320	2,370	2,550	2,390	1,740	5,300	1,030	1,780
18	1,400	800	1,770	1,550	2,030	2,700	2,490	2,390	2,210	5,300	1,070	1,540
19	1,100	1,300	1,790	1,250	2,030	2,970	2,500	2,410	2,280	4,880	1,100	1,290
20	800	1,700	1,810	1,100	2,020	2,950	1,200	2,880	2,260	4,070	1,090	1,330
21	900	1,550	1,780	1,400	1,910	2,950	1,140	3,250	1,240	3,180	1,100	1,310
22	1,200	1,250	921	1,930	1,640	2,840	1,900	3,490	1,140	2,810	1,100	1,310
23	1,300	1,250	903	1,630	1,110	2,340	2,470	3,720	1,110	3,350	1,250	1,360
24	1,300	1,100	1,340	1,900	1,110	1,960	1,970	3,500	1,810	3,350	1,200	1,590
25	1,300	1,300	1,280	2,310	2,540	2,040	2,470	2,470	2,420	3,330	1,000	1,860
26	1,200	1,700	1,800	1,100	3,730	2,140	2,950	2,280	2,580	2,610	1,100	1,850
27	800	1,700	1,800	1,070	3,830	2,360	3,290	2,790	2,610	2,080	1,200	1,660
28	800	1,700	1,720	1,860	3,280	2,340	2,930	3,330	2,530	1,900	1,050	1,130
29	1,200	1,700	1,120	2,340	-	2,090	2,770	3,120	2,840	2,100	1,150	1,150
30	1,300	1,700	1,110	1,740	--------	1,770	2,920	2,410	3,300	2,260	1,200	1,400
31	1,400	--------	1,120	1,700	--------	1,140	--------	2,390	--------	2,250	1,250	--------
Total	35,950	37,000	45,182	46,627	52,130	76,450	69,760	74,320	59,560	124,130	40,310	42,570
Mean	1,160	1,233	1,457	1,504	1,862	2,466	2,325	2,397	1,985	4,004	1,300	1,419
Cfsm	0.494	0.525	0.620	0.640	0.792	1.05	0.989	1.02	0.845	1.70	0.553	0.604
In.	0.57	0.59	0.71	0.74	0.82	1.21	1.10	1.18	0.94	1.96	0.64	0.67

Calendar year 1956: Max 7,000 Min 800 Mean 1,846 Cfsm 0.786 In. 10.69
Water year 1956-57: Max 9,180 Min 800 Mean 1,929 Cfsm 0.821 In. 11.13

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 1 to Dec. 5, Dec. 27, Jan. 17-21, Apr. 14, May 14, 15, Aug. 1-12, Aug. 21 to Sept. 1, Sept. 10, 11; discharge estimated on basis of powerplant records and records for station 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 1957. 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.--18 years, 615 cfs.

Extremes.--Maximum discharge during year, 825 cfs Mar. 17 (gage height, 3.40 ft); maximum gage height, 4.07 ft Jan. 24 (backwater from ice); minimum discharge, 342 cfs Aug. 23.
1939-57: Maximum discharge, 2,550 cfs Apr. 6, 1956 (gage height, 6.00 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.

Revisions (water years).--WSP 1437: 1941(M), 1943(M), 1949(M), 1950.

Rating tables, water year 1956-57, 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 Feb. 10		Feb. 11 to Sept. 30	
1.7	360	1.6	345
3.0	630	2.5	525
4.0	1,040	4.0	1,090

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	360	404	469	480	520	540	546	612	543	696	392	412
2	368	400	471	470	520	560	549	567	522	612	386	420
3	*368	400	475	470	530	560	558	537	505	537	382	396
4	369	400	*477	470	540	552	576	515	488	520	378	390
5	368	400	483	470	*540	*555	591	502	475	522	374	387
6	369	402	499	460	540	567	654	492	468	510	*370	381
7	368	405	512	460	540	540	714	*482	462	490	368	374
8	369	*413	520	*460	540	518	773	475	452	520	366	370
9	368	413	505	450	540	505	781	462	444	*570	368	366
10	368	411	493	440	540	495	*757	480	436	639	372	*368
11	372	411	487	460	520	505	720	500	*434	624	374	368
12	375	409	460	500	510	561	692	531	430	606	364	375
13	378	421	440	480	500	648	682	531	436	630	358	384
14	378	421	440	460	500	731	654	528	492	682	362	394
15	378	441	460	450	480	773	624	564	520	654	370	390
16	378	453	460	450	470	785	603	573	525	594	369	386
17	378	485	460	450	480	817	588	585	534	537	364	384
18	378	483	460	450	470	785	576	549	522	495	359	380
19	380	469	457	460	470	742	573	531	478	465	359	374
20	378	463	461	500	470	717	576	540	455	446	356	380
21	382	477	465	570	460	678	576	576	440	436	354	400
22	384	491	467	680	460	657	567	669	430	446	352	422
23	386	501	475	650	460	657	558	717	434	478	350	416
24	384	493	505	610	460	663	552	777	442	490	355	404
25	384	491	540	580	549	657	585	777	482	462	360	394
26	388	489	555	550	633	636	660	714	495	440	360	388
27	396	479	540	540	600	612	731	660	525	434	355	384
28	402	479	522	530	560	588	765	627	564	426	354	381
29	400	479	510	520	-	576	720	591	594	418	358	381
30	399	475	495	520	--------	570	660	570	663	408	364	381
31	399	--------	485	520	--------	558	--------	561	--------	402	384	--------
Total	11,752	13,358	15,048	15,560	14,402	19,308	19,161	17,795	14,690	16,189	11,337	11,630
Mean	379	445	485	502	514	623	639	574	490	522	366	388
Cfsm	0.535	0.628	0.684	0.708	0.725	0.879	0.901	0.810	0.691	0.736	0.516	0.547
In.	0.62	0.70	0.79	0.82	0.76	1.01	1.01	0.93	0.77	0.85	0.59	0.61

Calendar year 1956: Max 2,350 Min 360 Mean 558 Cfsm 0.787 In. 10.73
Water year 1956-57: Max 817 Min 350 Mean 494 Cfsm 0.697 In. 9.46

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 12-18, Jan. 1 to Feb. 24, Feb. 27 to Mar. 3.

Big Sable River near Freesoil, 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, 2¼ miles northwest of Freesoil, and 6 miles upstream from Hamlin Lake.

Drainage area.--127 sq mi.

Records available.--May 1942 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

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.--15 years, 137 cfs.

Extremes.--Maximum discharge during year, 176 cfs Mar. 15 (gage height, 1.76 ft); minimum, 81 cfs Aug. 7.

1942-57: Maximum discharge, 495 cfs Mar. 8, 1946 (gage height, 3.20 ft, from graph based on gage readings); maximum gage height observed, 3.26 ft Jan. 20, 1943 (ice jam); minimum discharge, 81 cfs Aug. 14, 1944, Aug. 7, 1957.

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

Revisions (water years).--WSP 1437: 1946(M), 1947.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 2-10)

0.8	76
1.5	144
1.8	181

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	90	94	111	110	120	125	135	a130	114	126	95	99
2	90	94	111	108	120	125	134	120	112	124	92	98
3	*94	94	111	108	120	125	132	120	111	115	a92	98
4	90	94	*111	108	120	128	132	121	109	a110	91	98
5	89	94	111	107	120	130	134	118	110	110	89	98
6	89	94	112	107	*123	*133	143	115	109	107	86	98
7	89	*97	113	109	128	128	154	112	110	109	*82	98
8	86	98	114	112	129	125	161	*110	110	121	82	96
9	86	98	112	*118	124	125	158	112	110	126	82	95
10	86	98	112	114	122	127	*148	115	108	*135	85	*93
11	85	99	110	115	121	133	151	117	*107	122	89	94
12	84	100	110	112	119	135	150	120	110	a127	91	95
13	84	101	105	110	115	135	146	119	112	a135	93	96
14	84	102	105	110	115	144	135	119	115	a130	95	96
15	86	104	110	110	115	162	134	125	117	a125	95	96
16	90	107	113	110	115	a160	133	132	117	a120	96	96
17	94	104	112	110	115	157	133	133	118	a115	97	95
18	93	104	112	110	115	156	133	a130	120	a110	98	94
19	94	103	110	115	115	156	130	a130	a115	a105	100	94
20	92	102	105	125	115	152	128	a130	a110	a105	99	94
21	92	103	105	135	115	149	125	145	a110	a105	98	a100
22	92	106	110	135	115	149	120	152	a110	a105	98	a105
23	92	106	110	135	115	149	121	154	a115	107	98	a100
24	92	106	a120	130	117	150	128	146	a115	105	99	a100
25	93	108	a120	125	123	148	129	142	128	103	100	a95
26	92	108	a120	125	125	148	a140	135	132	103	100	a93
27	92	109	a115	120	131	144	a155	123	133	102	100	92
28	93	111	112	120	127	142	a155	121	133	101	100	a92
29	94	111	112	120	-	138	a145	117	133	101	100	a92
30	94	110	110	120	--------	137	a135	114	130	98	100	92
31	94	--------	110	120	--------	135	--------	113	--------	96	a100	--------
Total	2,795	3,059	3,454	3,613	3,354	4,350	4,157	3,890	3,483	3,503	2,922	2,882
Mean	90.2	102	111	117	120	140	139	125	116	113	94.3	96.1
Cfsm	0.710	0.803	0.874	0.921	0.945	1.10	1.09	0.984	0.913	0.890	0.743	0.757
In.	0.82	0.90	1.01	1.06	0.98	1.27	1.22	1.13	1.02	1.03	0.86	0.84

Calendar year 1956: Max 328 Min 84 Mean 126 Cfsm 0.992 In. 13.50
Water year 1956-57: Max 162 Min 82 Mean 114 Cfsm 0.898 In. 12.14

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* 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 Dec. 11-15, 19-21, Dec. 30 to Jan. 8, Jan. 12-20, Jan. 24 to Feb. 5, Feb. 13-24, Feb. 28 to Mar. 5, Mar. 7-13.

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 bridge on State Highway 72, 2½ miles downstream from Goose Creek, and 6½ miles northwest of Grayling.

Drainage area.--159 sq mi.

Records available.--October 1942 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

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.--15 years, 184 cfs.

Extremes.--Maximum discharge during year, 244 cfs Apr. 26 (gage height, 1.07 ft); minimum, 135 cfs Jan. 10.

1942-57: 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, which are fair. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 16 to Apr. 18, Sept. 2-5)

Oct. 1 to July 7		July 8 to Sept. 30	
0.5	141	0.6	150
1.1	250	1.1	238

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	172	172	174	155	b160	167	187	*185	172	202	*164	189
2	180	172	174	*169	158	165	*193	185	170	189	164	206
3	178	170	176	170	155	162	191	183	172	193	163	*196
4	*176	169	176	167	154	172	189	182	174	202	163	212
5	170	*169	178	164	152	*174	197	180	170	199	163	187
6	172	172	187	160	152	164	222	178	*172	185	161	177
7	178	176	189	160	*152	162	218	175	170	182	160	174
8	178	176	183	158	152	158	208	175	167	*222	160	172
9	174	172	178	158	155	160	199	175	165	214	174	170
10	172	172	176	151	152	158	199	180	165	191	180	172
11	170	172	176	160	151	162	199	182	167	*189	170	172
12	172	174	172	160	151	170	199	178	189	*193	164	177
13	172	172	b175	154	152	170	199	178	183	198	164	182
14	172	172	b175	148	152	176	197	182	193	193	174	175
15	174	199	176	b150	154	206	195	216	195	185	169	174
16	176	224	170	b155	158	214	197	222	183	182	167	174
17	176	212	172	b155	154	200	199	*199	183	180	164	167
18	174	195	169	b155	154	189	202	187	193	177	161	166
19	172	187	167	b155	152	185	202	182	183	175	160	169
20	172	183	167	b160	152	185	208	178	178	175	158	189
21	172	191	169	b165	152	182	200	172	174	175	157	187
22	170	199	167	200	152	183	191	220	170	177	157	177
23	172	187	167	169	152	189	185	220	176	174	158	172
24	169	195	170	b165	152	193	185	199	172	172	175	167
25	169	185	167	b160	162	191	216	183	178	169	174	167
26	170	180	*169	b160	172	187	236	182	185	169	169	164
27	172	176	170	160	165	185	218	180	191	169	166	163
28	170	176	169	164	165	185	200	176	193	169	164	161
29	170	176	167	164	-	185	193	174	214	167	170	161
30	170	174	160	160	--------	183	185	180	222	167	170	161
31	172	--------	b155	158	--------	183	--------	180	--------	164	170	--------
Total	5,356	5,449	5,340	4,989	4,344	5,545	6,009	5,768	5,419	5,698	5,133	5,280
Mean	173	182	172	161	155	179	200	186	181	184	166	176
Cfsm	1.09	1.14	1.08	1.01	0.975	1.13	1.26	1.17	1.14	1.16	1.04	1.11
In.	1.26	1.27	1.24	1.16	1.02	1.30	1.41	1.35	1.27	1.34	1.20	1.24

Calendar year 1956:	Max 290	Min 145	Mean 175	Cfsm 1.10	In. 14.99
Water year 1956-57:	Max 236	Min 148	Mean 176	Cfsm 1.11	In. 15.06

* Discharge measurement made on this day.
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 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, October 1930 to September 1931, October 1933 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

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.--37 years (1903-15, 1930-31, 1933-57), 1,074 cfs.

Extremes.--Maximum discharge during year, 2,900 cfs July 10 (gage height, 15.01 ft); minimum, 828 cfs Sept. 28, 29.

1903-16, 1930-31, 1933-57: Maximum discharge, 3,570 cfs Mar. 25, 1913 (gage height, 7.1 ft, from graph based on gage readings, datum then in use); minimum observed, 540 cfs Feb. 21-23, 1936.

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

Revisions (water years).--WSP 1004: 1936(m). WSP 1437: 1911, 1913-14(M), 1936(M), 1937, 1940(M).

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 25 to May 15, July 9-14)

10.3	825
12.0	1,480
14.0	2,570
14.4	2,970

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	850	846	958	926	950	958	1,090	1,090	1,190	1,330	916	934
2	895	846	954	950	950	965	1,100	1,040	1,110	1,250	906	906
3	906	856	958	950	970	962	1,110	996	1,070	1,140	898	923
4	909	856	976	950	970	916	1,110	972	1,030	1,080	881	976
5	888	856	1,000	950	980	867	1,120	948	1,000	1,070	874	958
6	874	856	1,060	950	1,000	906	1,370	937	990	1,080	864	923
7	870	860	1,110	950	965	912	1,530	923	986	1,060	856	909
8	878	874	1,120	950	976	888	1,530	916	972	1,250	846	884
9	884	870	1,090	954	990	874	1,470	923	958	2,000	888	867
10	874	867	1,050	920	954	867	1,350	944	951	*2,740	993	864
11	864	853	1,010	950	930	895	1,300	958	948	2,200	1,000	860
12	860	860	972	970	916	962	1,270	972	958	*2,040	944	878
13	867	864	923	930	902	1,010	1,230	976	982	1,840	940	892
14	870	888	906	930	902	1,140	1,190	982	1,020	1,560	940	895
15	874	923	958	930	892	1,320	1,160	1,220	1,020	1,460	948	884
16	884	982	972	900	892	1,430	1,160	1,540	1,040	1,320	920	884
17	884	1,050	951	900	892	1,340	1,160	1,440	1,040	1,240	892	864
18	870	1,050	948	920	892	1,270	1,190	1,350	1,020	1,180	884	850
19	860	1,030	948	920	881	1,200	1,220	1,250	1,020	1,130	864	842
20	853	996	909	1,000	874	1,150	1,340	1,160	1,020	1,100	870	856
21	853	1,010	926	1,200	870	1,130	1,400	1,110	979	1,060	846	864
22	864	1,040	923	1,370	870	1,140	1,400	1,310	965	1,040	846	895
23	860	1,030	926	1,290	878	1,170	1,360	1,530	937	1,040	846	892
24	853	954	951	1,200	878	1,240	1,330	1,540	934	1,010	867	874
25	846	1,000	948	1,100	965	1,220	1,420	1,520	940	986	870	860
26	853	1,020	940	1,050	1,090	1,200	1,500	1,390	982	972	878	850
27	860	1,010	*937	1,040	*1,050	1,160	1,450	1,300	1,050	972	870	*836
28	856	979	926	1,000	990	*1,120	1,390	1,210	*1,070	965	856	832
29	856	*976	916	950	-	1,110	*1,290	*1,150	1,160	951	*860	836
30	*853	986	920	*950	--------	1,090	1,170	1,120	1,270	940	867	836
31	850	--------	884	950	--------	1,090	--------	1,140	--------	*926	902	--------
Total	26,918	28,088	29,970	30,900	26,269	33,502	38,710	35,857	30,612	39,932	27,632	26,424
Mean	868	936	967	997	938	1,081	1,290	1,157	1,020	1,288	891	881
Cfsm	0.964	1.04	1.07	1.11	1.04	1.20	1.43	1.29	1.13	1.43	0.990	0.979
In.	1.11	1.16	1.23	1.28	1.08	1.38	1.60	1.49	1.26	1.65	1.14	1.09

Calendar year 1956: Max 2,480 Min 760 Mean 985 Cfsm 1.09 In. 14.89
Water year 1956-57: Max 2,740 Min 832 Mean 1,027 Cfsm 1.14 In. 15.47

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Jan. 2-8, 11-21, 25, 26, Jan. 29 to Feb. 5.

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 1952 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 1,077.65 ft above mean sea level, unadjusted (levels by Michigan Department of Conservation).

Average discharge.--5 years, 26.4 cfs.

Extremes.--Maximum discharge during year, 195 cfs July 8 (gage height, 3.65 ft); minimum, 4.8 cfs Aug. 5.

1952-57: Maximum discharge, 1,410 cfs Aug. 4, 1956 (gage height, 6.23 ft), from rating curve extended above 360 cfs by logarithmic plotting; minimum, that of Aug. 5, 1957.

Remarks.--Records good except those for periods of ice effect, which are fair. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year, 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 10				July 11 to Sept. 30			
1.7	8.5	3.0	94	1.6	4.0	2.5	49
2.0	19	3.5	165	1.8	10	3.0	94
2.5	49			2.0	19		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	13	16	13	b15	b31	33	24	52	24	6.3	9.0
2	*13	13	16	13	15	b28	41	22	36	17	6.1	8.0
3	13	13	*17	13	15	26	34	19	27	14	5.8	8.3
4	12	13	20	13	*14	*22	29	18	23	15	5.8	14
5	12	13	22	13	14	20	43	17	20	18	5.6	9.0
6	12	14	36	13	14	19	95	*16	17	14	5.6	7.6
7	12	*16	36	*13	14	b18	84	15	15	12	5.6	7.3
8	12	15	28	b12	14	b17	*82	14	14	116	*5.6	6.6
9	11	14	22	b12	14	b16	57	14	12	136	7.6	*6.6
10	11	13	18	b11	b14	16	46	23	*12	*87	8.3	6.6
11	11	13	17	b11	14	20	52	26	11	55	6.6	6.6
12	12	14	15	b11	14	58	46	26	12	39	6.1	8.3
13	12	14	14	b11	14	68	40	26	17	33	6.1	9.3
14	12	14	13	b10	14	83	35	25	20	26	7.6	8.0
15	12	21	13	b10	b13	142	33	48	19	20	6.6	8.0
16	15	28	14	b10	b13	73	33	38	15	16	6.1	7.6
17	15	24	15	b10	b13	61	35	30	14	13	6.1	7.3
18	13	19	14	10	b12	55	37	33	14	12	5.8	6.9
19	12	17	13	10	13	51	40	33	14	9.7	6.1	6.9
20	12	17	13	11	13	43	45	30	13	9.0	5.8	7.3
21	12	27	14	12	b13	44	41	25	12	18	5.8	8.0
22	12	26	15	49	13	52	34	97	10	35	5.6	8.3
23	12	21	16	36	13	55	37	78	12	27	5.6	8.0
24	12	18	18	b30	13	55	46	59	11	18	6.6	7.6
25	12	17	19	b25	b25	48	70	42	13	13	6.3	7.6
26	12	17	18	b21	b45	39	77	49	18	11	6.1	7.3
27	13	17	17	b18	b40	35	58	41	26	10	5.8	7.3
28	13	17	16	b17	b35	33	43	31	33	8.6	5.8	7.3
29	13	16	b15	b16	-	33	34	26	57	8.0	6.6	7.3
30	13	16	b13	b16	--------	33	28	24	38	7.3	6.6	7.3
31	13	--------	b13	b15	--------	31	--------	30	--------	6.6	9.0	--------
Total	382	510	546	485	473	1,325	1,408	999	607	848.2	195.0	235.2
Mean	12.3	17.0	17.6	15.6	16.9	42.7	46.9	32.2	20.2	27.4	6.29	7.84
Cfsm	0.195	0.270	0.279	0.248	0.268	0.678	0.744	0.511	0.321	0.435	0.100	0.124
In.	0.22	0.30	0.32	0.29	0.28	0.78	0.83	0.59	0.36	0.50	0.12	0.14

Calendar year 1956:	Max	753	Min	6.6	Mean	27.6	Cfsm	0.438	In. 5.95
Water year 1956-57:	Max	142	Min	5.6	Mean	22.0	Cfsm	0.349	In. 4.73

Peak discharge (base, 130 cfs).--Mar. 15 (5 a.m.) 171 cfs (3.48 ft); July 8 (4 to 6 p.m.) 195 cfs (3.65 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

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 1952 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 1,040 ft (by barometer).

Average discharge.--5 years, 90.7 cfs.

Extremes.--Maximum discharge during year, 444 cfs July 9 (gage height, 5.15 ft); minimum, 45 cfs Aug. 7.

1952-57: Maximum discharge, 1,550 cfs Aug. 4, 1956 (gage height, 10.02 ft, from floodmark), from rating curve extended above 700 cfs by logarithmic plotting; minimum, 42 cfs Jan. 4, 1954, result of freezeup.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 10		July 11 to Sept. 30	
1.9	51	1.8	46
2.5	80	2.5	80
3.0	125	3.0	125
5.0	420	4.0	270

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	61	a68	60	70	90	102	85	195	90	48	62
2	*66	61	a70	60	69	80	118	78	118	71	48	54
3	69	61	*a73	62	69	75	105	74	92	62	47	54
4	62	61	a76	63	*69	*73	94	71	80	64	47	86
5	60	61	92	64	66	68	112	68	72	77	*46	64
6	59	*64	133	64	66	66	258	*64	70	64	46	55
7	62	68	127	*65	65	64	201	62	64	57	46	53
8	63	68	107	64	63	62	*202	60	60	*249	46	52
9	60	66	92	62	63	60	135	60	58	381	54	*50
10	59	63	79	58	63	60	119	81	*56	243	58	49
11	59	62	70	58	61	66	137	91	56	129	52	49
12	60	66	65	60	62	142	131	88	60	107	49	54
13	60	66	65	58	62	165	116	86	75	100	49	58
14	60	64	63	62	62	182	108	86	87	86	57	53
15	60	a66	68	70	60	342	108	144	76	73	52	53
16	68	a75	70	62	62	201	112	127	66	66	51	54
17	69	a75	71	70	58	168	115	104	66	61	49	52
18	64	a72	64	66	60	149	121	117	64	58	49	51
19	61	a68	64	64	57	133	124	108	61	56	49	50
20	60	a65	66	60	57	118	140	101	58	53	48	54
21	61	a68	67	58	57	118	132	88	56	62	48	55
22	61	a74	71	140	57	133	113	234	53	96	47	55
23	61	a70	76	130	57	137	119	194	55	82	47	53
24	60	a68	82	110	57	140	133	153	54	66	53	53
25	59	a65	81	95	80	124	202	116	58	58	52	52
26	61	a65	77	90	120	109	234	127	74	56	49	51
27	64	a65	72	80	110	103	162	114	114	55	48	50
28	63	a65	68	78	100	100	125	99	112	53	48	51
29	61	a65	64	75	-	101	106	89	186	51	51	51
30	61	a65	60	73	--------	100	94	85	119	50	52	51
31	61	--------	60	71	--------	99	--------	100	--------	49	57	--------
Total	1,912	1,983	2,361	2,252	1,902	3,632	4,078	3,154	2,415	2,825	1,543	1,629
Mean	61.7	66.1	76.2	72.6	67.9	117	136	102	80.5	91.1	49.8	54.3
Cfsm	0.523	0.560	0.646	0.615	0.575	0.992	1.15	0.864	0.682	0.772	0.422	0.460
In.	0.60	0.62	0.74	0.71	0.60	1.14	1.28	1.00	0.76	0.89	0.49	0.51

Calendar year 1956: Max 922 Min 48 Mean 90.9 Cfsm 0.770 In. 10.47
Water year 1956-57: Max 381 Min 46 Mean 81.3 Cfsm 0.689 In. 9.34

Peak discharge (base, 300 cfs).--Mar. 15 (10 a.m.) 370 cfs (4.67 ft); July 9 (12:30 to 1 a.m.) 444 cfs (5.15 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.

Note.--Stage-discharge relation affected by ice Dec. 11-14, 19, Dec. 27 to Jan. 2, Jan. 8-27, Feb. 5, Feb. 9 to Mar. 11.

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 bridge on State Highway 37, 4½ miles northwest of Hoxeyville, 7 miles east of Wellston, and 9 miles upstream from mouth.

Drainage area.--251 sq mi.

Records available.--July 1952 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 775 ft (by barometer).

Average discharge.--5 years, 275 cfs.

Extremes.--Maximum discharge during year, 620 cfs July 9 (gage height, 3.90 ft); minimum, 191 cfs Aug. 5, 6.

1952-57: Maximum discharge, 2,440 cfs Aug. 6, 1956 (gage height, 6.82 ft), from rating curve extended above 1,100 cfs by logarithmic plotting; minimum, 168 cfs Jan. 9, 1956.

Remarks.--Records good except those for periods of ice effect, which are fair. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 17, Jan. 23)

Oct. 1-17, July 9 to Sept. 30		Oct. 18 to Jan. 23, Apr. 27 to July 8		Jan. 24 to Apr. 26	
2.5	182	2.4	198	2.5	232
3.0	294	3.0	313	3.5	468
4.0	660	4.0	660	4.0	660

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	208	238	243	223	244	b285	276	253	320	273	196	227
2	*214	238	243	223	242	b270	288	243	315	249	196	225
3	222	236	*243	226	242	268	296	238	271	238	196	218
4	218	236	249	225	*244	*250	280	236	251	238	196	234
5	212	236	255	223	238	b245	288	234	241	238	*193	254
6	210	*240	282	223	b235	b240	394	*230	238	241	193	225
7	216	245	304	*226	244	b240	427	226	234	232	193	216
8	216	247	282	225	242	b235	402	225	228	*267	195	214
9	216	243	261	225	242	b235	360	225	223	564	204	*212
10	214	240	249	225	246	b235	*312	234	*221	489	212	210
11	216	240	243	217	244	246	321	255	223	341	208	212
12	218	241	240	226	240	301	332	255	223	273	202	216
13	220	243	230	214	240	372	312	253	228	256	202	222
14	222	241	223	206	242	367	299	253	253	246	208	220
15	225	253	234	219	236	492	292	298	247	227	210	218
16	234	284	234	208	244	468	294	317	240	216	204	218
17	249	284	236	204	244	372	299	287	234	210	204	214
18	245	265	232	223	240	350	303	276	232	206	204	212
19	240	251	228	216	240	332	307	284	230	204	204	212
20	240	247	230	223	238	314	318	276	225	200	204	216
21	240	261	230	234	238	307	321	263	223	200	204	220
22	240	284	232	317	238	314	307	360	219	227	202	220
23	238	271	240	388	238	323	299	437	223	239	204	218
24	236	253	245	307	238	325	314	352	223	220	210	214
25	236	253	249	b280	258	314	362	306	226	206	212	214
26	240	247	241	b260	365	299	424	293	245	202	208	212
27	240	247	240	b250	b330	286	368	298	271	202	204	212
28	240	247	236	b245	b300	278	317	273	289	202	206	212
29	240	245	234	b240	-	278	284	261	360	200	210	212
30	238	243	230	248	--------	282	265	253	328	200	214	214
31	238	--------	223	244	--------	278	--------	253	--------	198	218	--------
Total	7,081	7,499	7,541	7,413	7,032	9,401	9,661	8,447	7,484	7,704	6,316	6,543
Mean	228	250	243	239	251	303	322	272	249	249	204	218
Cfsm	0.908	0.996	0.968	0.952	1.00	1.21	1.28	1.08	0.992	0.992	0.813	0.869
In.	1.05	1.11	1.12	1.10	1.04	1.40	1.43	1.24	1.11	1.14	0.94	0.97

	Max	Min	Mean	Cfsm	In.
Calendar year 1956:	1,830	193	278	1.11	15.09
Water year 1956-57:	564	193	252	1.00	13.65

Peak discharge (base, 650 cfs).--No peak above base.

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

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, approximately.

Records available.--November 1951 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 585 ft (from river-profile map).

Average discharge.--5 years (1952-57), 1,977 cfs.

Extremes.--Maximum discharge during year, 3,460 cfs Apr. 28 (gage height, 7.34 ft); maximum gage height, 7.96 ft Jan. 25 (backwater from ice); minimum daily discharge, 1,040 cfs Aug. 25, Sept. 22.

1951-57: Maximum discharge, 6,800 cfs Apr. 9, 1954 (gage height, 8.16 ft); maximum gage height, 9.15 ft Feb. 12, 1955 (ice jam); minimum daily discharge, that of Aug. 25, Sept. 22, 1957.

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

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 9-15)

Oct. 1 to Feb. 8		Feb. 9 to Sept. 30	
3.8	1,080	3.8	1,020
6.0	2,140	6.0	2,100
7.0	2,950	7.0	2,950
		7.5	3,840

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,480	1,690	1,610	1,800	2,300	2,100	1,750	2,380	2,110	1,760	1,630	1,200
2	2,000	1,690	1,730	1,890	1,800	1,870	2,000	2,040	1,730	2,100	1,530	1,160
3	*1,890	1,600	1,750	1,630	1,700	1,530	2,080	1,980	1,900	2,260	1,440	1,410
4	1,690	1,430	*1,650	1,640	1,700	1,650	2,060	2,100	2,030	2,270	1,100	1,640
5	1,790	1,450	2,020	1,670	1,800	1,710	2,100	1,640	2,000	1,990	1,190	1,630
6	1,840	1,910	2,120	1,470	*2,000	*1,740	2,250	1,520	1,920	1,970	1,470	1,700
7	1,430	*1,830	2,240	1,740	2,000	1,730	2,710	1,780	1,910	1,740	*1,440	1,480
8	1,230	1,710	2,030	1,930	2,100	1,660	2,540	*1,700	2,200	2,190	1,440	1,300
9	1,480	1,780	1,880	*1,810	2,370	1,670	2,820	1,900	1,190	2,720	1,710	1,340
10	1,660	1,400	1,860	1,760	1,640	1,370	*2,940	1,470	1,230	*3,010	1,640	*1,520
11	1,910	1,480	2,140	2,000	1,760	1,530	2,520	1,720	*1,610	2,930	1,070	1,460
12	1,890	1,390	1,950	1,500	1,880	1,740	2,410	1,600	1,860	3,130	1,180	1,510
13	1,430	1,890	2,150	1,200	1,730	1,810	2,260	1,700	1,440	*3,200	1,880	1,600
14	1,430	1,740	1,830	1,300	1,770	2,250	1,900	2,000	1,920	2,960	1,580	2,080
15	1,390	1,920	1,750	1,900	1,650	2,510	1,930	2,380	1,700	2,560	1,650	1,120
16	1,960	1,930	1,300	1,900	1,500	2,860	2,050	2,220	1,380	2,270	1,520	1,260
17	1,900	1,790	1,560	1,800	1,660	2,860	1,960	2,400	1,660	2,100	1,450	1,340
18	1,740	1,820	1,910	1,900	1,480	2,580	2,340	2,780	1,880	2,040	1,160	1,340
19	1,700	1,670	1,780	1,900	1,770	2,300	2,070	2,240	1,950	1,960	1,270	1,590
20	1,750	2,130	1,800	1,100	1.660	2,320	2,340	1,840	1,920	1,720	1,640	1,700
21	1,340	2,180	1,830	1,100	1,680	2,120	2,220	2,080	1,690	1,190	1,680	1,860
22	1,340	2,120	1,610	2,000	1,600	2,150	2,160	2,410	1,730	1,280	1,580	1,040
23	1,740	1,710	1,580	2,100	1,560	2,120	2,450	2,670	1,260	1,480	1,520	1,210
24	1,750	2,150	1,790	2,500	1,410	1,930	2,560	2,930	1,420	1,370	1,740	1,720
25	1,730	1,700	1,940	2,500	1,590	1,780	2,740	2,970	1,700	1,400	1,040	1,240
26	1,850	1,840	1,960	2,200	2,260	2,410	2,910	2,590	1,790	1,450	1,090	1,460
27	1,680	1,880	1,860	1,600	2,560	2,160	3,210	2,160	1,980	1,430	1,270	1,760
28	1,250	1,960	1,890	1,500	1,740	2,130	2,770	2,330	2,020	1,350	1,470	1,850
29	1,540	1,880	1,790	2,000	-	2,040	2,080	2,060	2,090	1,220	1,660	1,380
30	1,690	1,840	1,570	1,800	--------	2,020	2,500	2,200	1,660	1,690	1,690	1,340
31	1,690	--------	1,590	2,100	--------	1,640	--------	2,100	--------	1,620	1,610	--------
Total	51,190	53,510	56,470	55,240	50,670	62,290	70,630	65,890	52,880	62,360	45,340	44,240
Mean	1,651	1,784	1,822	1,782	1,810	2,009	2,354	2,125	1,763	2,012	1,463	1,475
Cfsm	0.928	1.00	1.02	1.00	1.02	1.13	1.32	1.19	0.990	1.13	0.822	0.829
In.	1.07	1.12	1.18	1.15	1.06	1.30	1.47	1.37	1.10	1.30	0.95	0.92

Calendar year 1956:	Max	5,000	Min	1,200	Mean	1,915	Cfsm	1.08	In.	14.66
Water year 1956-57:	Max	3,210	Min	1,040	Mean	1,838	Cfsm	1.03	In.	13.99

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 11 to Feb. 8.

Little Manistee River near Freesoil, Mich.

Location.--Lat 44°11'15", long 86°09'55", in NE¼ sec. 31, T. 21 N., R. 15 W., on right bank 25 ft upstream from highway bridge, 6 miles north of Freesoil, 8½ miles upstream from mouth, and 8½ miles southeast of Manistee.

Drainage area.--200 sq mi.

Records available.--October 1956 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 680 ft (by barometer).

Extremes.--Maximum discharge during year, 214 cfs May 23 (gage height, 2.22 ft); minimum, 97 cfs Dec. 14, result of freezeup.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Dec. 15, Feb. 27)

Oct. 1 to July 23		July 24 to Sept. 30	
1.5	85	1.6	90
2.3	230	1.9	150

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	125	125	143	125	130	140	143	160	145	160	114	138
2	130	125	143	120	135	145	145	154	140	145	116	132
3	130	125	143	115	135	147	147	152	140	145	112	126
4	*130	125	*143	110	135	125	149	151	140	140	112	130
5	125	125	151	110	135	130	160	149	130	140	112	124
6	125	127	156	115	*140	*138	183	149	130	135	110	120
7	125	*127	161	115	142	133	196	147	125	135	*106	116
8	125	127	156	120	136	129	*187	*145	125	145	104	114
9	125	125	151	*120	138	127	179	145	120	160	120	114
10	125	125	147	120	138	127	169	150	120	*170	124	*114
11	125	125	143	115	138	133	170	155	120	170	120	114
12	127	127	142	115	134	147	174	155	125	160	114	120
13	127	129	134	110	134	167	170	155	130	170	116	120
14	127	127	118	110	134	174	165	165	135	185	124	120
15	127	143	130	115	133	188	161	170	140	175	120	118
16	131	152	143	115	133	196	161	185	140	160	116	118
17	131	152	142	115	134	183	161	170	140	150	112	116
18	129	149	142	115	133	170	161	165	135	135	110	114
19	127	145	138	120	131	169	160	155	125	130	110	114
20	127	145	136	130	131	165	161	155	125	125	110	120
21	127	152	136	145	129	161	161	150	125	127	108	118
22	127	156	138	170	129	161	156	190	120	138	106	118
23	125	152	143	185	129	165	158	205	125	163	110	116
24	125	142	151	170	133	163	169	205	125	138	116	114
25	125	140	152	150	145	160	181	185	135	126	116	114
26	129	142	149	135	165	160	201	170	145	122	112	112
27	131	147	143	130	160	152	199	165	150	122	110	112
28	129	145	142	130	150	147	185	160	160	120	110	112
29	127	143	138	130	-	147	172	150	165	120	114	114
30	127	143	134	130		147	163	150	175	118	116	114
31	125		134	130		145		150		116	132	
Total	3,940	4,112	4,422	3,935	3,839	4,741	5,047	5,012	4,055	4,445	3,532	3,546
Mean	127	137	143	127	137	153	168	162	135	143	114	118
Cfsm	0.635	0.685	0.715	0.635	0.685	0.765	0.840	0.810	0.675	0.715	0.570	0.590
In.	0.73	0.76	0.82	0.73	0.71	0.88	0.94	0.93	0.75	0.82	0.66	0.66

Calendar year 1956: Max - Min - Mean - Cfsm - In. -
Water year 1956-57: Max 205 Min 104 Mean 139 Cfsm 0.695 In. 9.39

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 1-9, Jan. 1 to Feb. 6, May 9 to July 19; discharge estimated on basis of weather records and records for stations on nearby streams.

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 1952 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 760 ft (by barometer).

Average discharge.--5 years, 197 cfs.

Extremes.--Maximum discharge during year, 980 cfs July 8 (gage height, 6.23 ft); minimum daily, 114 cfs Jan. 12.

1952-57: Maximum discharge, that of July 8, 1957; minimum daily, that of Jan. 12, 1957.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Diurnal fluctuation caused by powerplant three-quarters of a mile upstream.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 9-30)

2.9	102
3.5	188
5.0	559
6.0	900

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	172	176	184	164	132	157	209	249	198	286	169	185
2	*168	a170	165	160	157	157	183	214	172	188	166	a250
3	154	a170	*201	170	174	154	180	209	188	214	166	a200
4	200	a140	173	169	*166	*156	221	191	190	188	175	a250
5	167	a130	167	128	150	157	219	183	188	223	*163	a220
6	172	*a150	206	145	154	157	333	*175	186	205	180	a190
7	168	168	185	182	154	157	254	185	154	193	171	a180
8	163	170	263	158	151	154	*280	191	182	*672	141	a140
9	158	180	177	171	157	154	273	191	177	565	247	*a150
10	144	164	172	172	144	135	202	193	*166	374	205	150
11	160	144	158	170	142	152	200	193	185	432	139	172
12	177	183	164	114	158	185	214	191	170	300	166	170
13	174	183	190	138	163	172	273	202	180	343	185	169
14	159	145	176	201	162	174	193	188	a200	218	186	138
15	151	163	188	152	162	288	174	318	a200	218	188	136
16	173	249	150	156	142	231	218	330	a190	188	188	194
17	168	249	180	*154	122	211	182	296	180	218	157	150
18	177	170	170	151	142	190	255	234	a210	182	135	148
19	163	170	170	148	141	209	256	212	a200	178	162	166
20	156	192	169	131	160	209	258	214	a200	198	177	177
21	154	228	170	166	152	210	256	219	a200	193	172	151
22	154	160	170	180	154	214	234	261	a200	196	172	135
23	154	201	158	169	151	202	261	268	a160	185	172	162
24	154	196	192	151	142	193	268	234	a170	182	160	170
25	154	151	172	166	164	202	343	258	188	175	148	157
26	207	166	172	181	198	207	436	200	180	177	168	156
27	166	214	169	144	177	202	361	214	191	198	185	156
28	169	199	169	150	168	234	316	214	200	180	175	156
29	154	159	169	156	-	212	240	216	256	168	149	156
30	142	169	150	156	--------	177	225	191	256	182	166	156
31	160	--------	157	150	--------	216	--------	218	--------	180	243	--------
Total	5,092	5,309	5,456	4,903	4,339	5,828	7,517	6,852	5,717	7,599	5,376	5,090
Mean	164	177	176	158	155	188	251	221	191	245	173	170
Cfsm	0.735	0.794	0.789	0.709	0.695	0.843	1.13	0.991	0.857	1.10	0.776	0.762
In.	0.85	0.89	0.91	0.82	0.72	0.97	1.26	1.14	0.96	1.27	0.89	0.85

Calendar year 1956 : Max 503 Min 120 Mean 188 Cfsm 0.843 In. 11.47
Water year 1956-57 : Max 672 Min 114 Mean 189 Cfsm 0.848 In. 11.53

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* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records, recorded range in stage, powerplant operation, and records for stations on nearby streams.

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 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Staff gage read once daily. Altitude of gage is 750 ft (by barometer). Prior to June 15, 1942, staff gage at site about a quarter of a mile upstream at different datum.

Average discharge.--15 years, 196 cfs.

Extremes.--Maximum daily discharge during year, 390 cfs Apr. 25; minimum daily, 120 cfs Jan. 10, 13, Jan. 29 to Feb. 5, Feb. 10-12, 15, 19.
1942-57: Maximum discharge, 919 cfs Apr. 1, 1943 (gage height, 5.45 ft); minimum, 118 cfs Aug. 22, 24, 1944.

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

Revisions (water years).--WSP 1307: 1944(M), 1948(M).

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.1	113
2.5	180
3.0	314
4.0	655

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	150	150	172	130	120	140	209	185	178	250	135	160
2	157	150	160	130	120	130	212	182	165	270	135	175
3	157	150	170	130	120	125	197	180	163	280	134	170
4	155	155	160	130	120	125	202	176	160	262	134	185
5	157	160	170	130	120	141	199	176	150	235	134	170
6	154	165	180	130	125	145	207	170	185	197	134	160
7	154	170	200	130	140	148	240	161	185	197	135	150
8	157	175	180	130	130	152	*222	161	176	192	140	145
9	155	175	176	125	125	154	202	167	165	174	150	145
10	154	170	174	120	120	157	199	176	*161	163	160	145
11	152	170	167	125	*120	*154	199	176	200	160	150	145
12	148	*170	160	125	120	152	192	172	256	180	140	150
13	148	159	155	120	130	154	192	180	300	210	140	165
14	150	159	150	*130	125	170	199	*235	352	163	150	155
15	157	161	155	140	120	180	194	300	273	*167	145	155
16	*157	180	170	130	125	170	200	270	217	161	140	*159
17	159	210	*167	140	130	161	215	246	246	157	140	154
18	157	210	160	135	130	172	230	233	243	154	136	145
19	155	200	145	130	120	182	245	220	214	152	136	150
20	155	194	150	125	130	187	260	202	185	152	136	165
21	152	205	150	135	130	194	250	250	180	152	*136	165
22	152	200	159	175	130	202	240	320	180	148	141	160
23	152	190	155	170	130	212	230	276	190	146	148	155
24	152	170	157	155	140	225	300	227	200	145	148	155
25	154	160	161	150	155	225	390	217	230	141	150	161
26	152	160	163	140	180	214	320	230	284	141	146	154
27	152	165	160	130	155	220	264	205	290	140	140	154
28	152	172	160	125	125	212	238	190	284	141	140	155
29	152	150	155	120	-	204	212	197	370	138	145	157
30	148	160	140	120	--------	202	192	197	340	136	145	157
31	148	--------	135	120	--------	197	--------	187	--------	136	145	--------
Total	4,754	5,165	5,016	4,125	3,635	5,406	6,851	6,464	6,722	5,440	4,388	4,721
Mean	153	172	162	133	130	174	228	209	224	175	142	157
Cfsm	0.933	1.05	0.988	0.811	0.793	1.06	1.39	1.27	1.37	1.07	0.866	0.957
In.	1.08	1.17	1.14	0.94	0.83	1.22	1.55	1.46	1.53	1.23	1.00	1.07

Calendar year 1956: Max 672 Min 135 Mean 179 Cfsm 1.09 In. 14.89
Water year 1956-57: Max 390 Min 120 Mean 172 Cfsm 1.05 In. 14.22

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 29, 30, Dec. 12-15, 18-21, Dec. 27 to Mar. 4 (no gage-height record Dec. 27 to Jan. 6, Jan. 16-19, Feb. 10, 12-16). No gage-height record Oct. 14, Nov. 1-11, 16-19, 21-27, Dec. 2-8, Apr. 7, 16-22, 24-26, May 15, 16, 21, 26, 27, June 4, 5, 11, 13, 21, 22, 24, 25, June 29 to July 3, July 11-13, Aug. 8-15, Aug. 27 to Sept. 7, Sept. 11-15, 19-24; discharge estimated on basis of weather records and records for stations on nearby streams.

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 1957. Monthly discharge only for some periods, published in WSP 1307.

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, 1942 (corrected), staff gage at site 100 ft downstream at same datum.

Average discharge.--15 years, 547 cfs.

Extremes.--Maximum discharge during year, 622 cfs May 27 (gage height, 4.39 ft); maximum daily gage height, 4.36 ft May 27; minimum daily discharge, 293 cfs Aug. 22; minimum daily gage height, 3.47 ft Aug. 22, 28.

1942-57: Maximum discharge, 1,080 cfs Apr. 25, 1943 (gage height, 5.65 ft); maximum daily gage height, 5.53 ft Apr. 25, 1943; minimum daily discharge, 249 cfs Sept. 9, 1955; minimum daily gage height, 3.41 ft Sept. 26, 1955.

Remarks.--Records fair.

Revisions (water years).--WSP 1437: 1942(M), 1945(M), 1947.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	375	381	440	472	446	477	491	581	608	569	398	343
2	383	383	443	465	450	477	493	576	592	554	390	353
3	379	383	447	465	450	475	490	574	583	558	386	365
4	387	383	440	463	448	475	495	559	578	558	378	392
5	376	384	440	461	449	473	503	550	576	559	365	385
6	378	384	449	461	446	476	520	543	576	545	353	387
7	380	390	457	461	450	476	523	533	580	538	349	394
8	380	399	460	459	449	475	*523	525	573	537	342	393
9	375	397	457	455	449	475	521	532	564	533	338	398
10	373	386	469	453	453	473	521	529	*564	520	335	403
11	369	386	472	450	*450	*473	526	529	568	511	330	414
12	370	*389	488	448	454	485	522	522	573	516	326	428
13	372	382	494	453	457	482	522	524	573	541	321	438
14	376	383	492	*450	458	482	522	*536	593	539	323	444
15	380	410	490	446	456	487	518	568	593	*531	318	453
16	*383	417	485	446	460	495	518	568	588	518	315	*466
17	386	425	*483	452	457	495	517	568	581	507	308	464
18	387	425	480	454	458	498	522	573	578	498	304	468
19	385	425	478	452	455	495	a530	571	572	491	300	473
20	386	428	476	450	459	497	a540	567	563	480	296	480
21	388	439	473	445	460	497	a520	564	554	476	*294	480
22	386	446	473	451	460	494	a520	584	538	478	293	478
23	390	439	467	456	463	496	a520	592	540	465	298	483
24	385	430	474	447	463	496	a520	592	536	452	311	474
25	377	440	472	450	469	499	a560	595	547	446	311	481
26	376	447	472	448	472	493	a580	605	540	437	314	478
27	377	443	474	446	476	493	583	612	551	431	314	471
28	376	443	474	447	477	493	583	602	551	427	316	463
29	380	443	474	447	-	489	586	600	581	418	320	455
30	380	438	467	451	--------	492	581	605	581	412	328	446
31	381	--------	470	449	--------	485	--------	603	--------	404	331	--------
Total	11,776	12,348	14,530	14,053	12,794	15,068	15,870	17,582	17,095	15,449	10,205	13,050
Mean	380	412	469	453	457	486	529	567	570	498	329	435
Cfsm	0.652	0.707	0.804	0.777	0.784	0.834	0.907	0.973	0.978	0.854	0.564	0.746
In.	0.75	0.79	0.93	0.90	0.82	0.96	1.01	1.12	1.09	0.98	0.65	0.83

Calendar year 1956:	Max	675	Min	369	Mean	467	Cfsm	0.801	In.	10.90
Water year 1956-57:	Max	612	Min	293	Mean	465	Cfsm	0.798	In.	10.83

* 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 1957.

Gage.--Water-stage recorder. Datum of gage is 886.24 ft above mean sea level, datum of 1929.

Average discharge.--7 years, 74.7 cfs.

Extremes.--Maximum discharge during year, 1,500 cfs May 15 (gage height, 6.80 ft, from floodmark), from rating curve extended above 500 cfs by logarithmic plotting, result of failure of Lansing Club Dam 4 miles upstream; minimum, 13 cfs Jan. 8.
1950-57: Maximum discharge, that of May 15, 1957; minimum, that of Jan. 8, 1957.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Prior to May 16, 1957, occasional regulation by Lansing Club Dam 4 miles upstream. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	24
2.0	57
3.8	225
4.4	345
5.0	580

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	56	a78	70	52	62	81	77	65	73	43	55
2	56	56	a72	70	49	65	85	74	59	63	43	65
3	59	58	70	70	49	64	79	69	59	63	43	69
4	57	58	73	70	49	64	75	62	60	75	46	73
5	55	58	75	68	50	64	75	65	58	65	44	63
6	55	59	80	64	58	62	106	64	61	57	43	55
7	57	66	92	56	56	59	103	62	65	55	43	51
8	59	67	91	24	52	58	*95	59	59	63	43	50
9	57	65	78	45	50	58	85	62	59	63	47	51
10	56	61	71	52	48	59	59	65	*57	56	51	50
11	55	59	70	60	*46	*60	53	70	59	54	45	55
12	60	*63	68	60	48	69	75	69	67	55	44	58
13	74	64	64	60	58	70	75	66	77	67	43	59
14	57	63	66	*60	52	73	71	*78	121	58	55	55
15	55	138	67	66	54	110	75	*a400	87	*53	47	53
16	60	172	67	70	57	100	79	218	71	51	48	*54
17	63	112	67	70	59	83	86	115	69	55	44	51
18	*61	83	64	70	59	75	101	95	79	51	42	51
19	60	77	*62	130	58	74	124	83	75	48	41	51
20	58	64	66	113	58	72	158	81	65	47	41	76
21	56	127	61	107	59	*65	177	73	60	47	*41	67
22	56	63	67	96	59	75	127	147	59	51	40	66
23	57	88	66	80	59	81	84	140	59	49	41	62
24	58	87	a68	78	59	88	103	104	56	47	51	63
25	55	79	a70	72	65	85	196	81	58	45	50	73
26	56	a82	a72	68	75	79	190	81	63	47	47	64
27	56	a88	a72	65	66	77	163	79	75	51	43	60
28	56	a80	a72	62	56	78	107	70	67	48	44	59
29	55	a72	a66	59	-	77	91	67	136	46	50	57
30	55	a78	a62	56		77	86	71	102	45	50	55
31	55		a64	54		77		67		43	48	
Total	1,784	2,343	2,181	2,145	1,560	2,260	3,064	2,914	2,107	1,691	1,401	1,771
Mean	57.5	78.1	70.4	69.2	55.7	72.9	102	94.0	70.2	54.5	45.2	59.0
Cfsm	0.913	1.24	1.12	1.10	0.884	1.16	1.62	1.49	1.11	0.865	0.717	0.937
In.	1.05	1.38	1.29	1.27	0.92	1.34	1.81	1.72	1.24	1.00	0.83	1.05

Calendar year 1956: Max 315 Min 44 Mean 71.3 Cfsm 1.13 In. 15.40
Water year 1956-57: Max 400 Min 24 Mean 69.1 Cfsm 1.10 In. 14.90

* 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 Dec. 12-14, 18, 19, Jan. 1-6, 9-19, 22, Jan. 24 to Feb. 16, Feb. 19, 20, Feb. 27 to Mar. 1, Mar. 3-5, 8-10.

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 bridge on State Highway 68, 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 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Staff gage read twice daily. Altitude of gage is 675 ft (by barometer). Prior to Sept. 13, 1943, staff gage at site 50 ft upstream at same datum.

Average discharge.--15 years, 132 cfs.

Extremes.--Maximum discharge during year, 804 cfs May 16 (gage height, 6.02 ft, from high-water mark), result of failure of dam; minimum, 63 cfs Aug. 8.

1942-57: 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, 50 cfs Oct. 10, 1955.

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

Revisions (water years).--WSP 1437: 1945-46, 1950.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

4.1	54
4.5	120
5.0	254
5.5	485
6.0	791

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	79	79	115	90	75	90	147	182	152	234	70	91
2	82	79	110	90	75	85	144	166	140	171	68	114
3	82	82	116	90	75	80	144	154	120	159	67	142
4	82	82	110	90	75	75	147	133	116	269	67	142
5	82	82	116	90	75	70	152	129	110	304	72	133
6	82	82	133	90	75	70	166	124	112	182	67	102
7	82	93	135	85	85	70	184	116	122	138	67	86
8	84	96	131	70	80	70	*182	114	112	138	64	84
9	82	95	122	65	75	70	171	124	100	133	70	84
10	82	89	122	80	75	70	161	133	*100	118	76	82
11	82	89	120	80	*75	*110	135	131	106	110	76	82
12	82	*89	104	85	75	120	129	131	192	166	70	86
13	82	95	96	80	85	130	140	129	212	234	70	89
14	82	96	100	*85	75	140	138	*161	416	184	76	80
15	82	104	105	95	70	185	138	356	342	*135	78	82
16	*82	154	110	90	75	175	138	*627	231	114	76	*82
17	84	238	*114	95	75	155	147	400	171	110	74	80
18	86	187	100	95	75	145	164	265	187	104	72	79
19	82	138	95	90	70	140	187	201	166	95	70	86
20	82	133	95	85	75	140	204	164	144	87	67	98
21	82	138	100	85	75	140	240	147	120	82	*72	102
22	82	135	100	125	75	149	300	231	108	87	67	104
23	82	125	100	120	75	154	198	291	108	82	72	102
24	82	120	108	110	85	164	206	291	110	78	87	106
25	82	110	108	105	95	166	258	204	118	80	87	133
26	82	115	114	100	130	166	400	215	156	78	80	127
27	82	125	110	90	110	164	469	198	174	79	70	116
28	82	120	105	85	85	140	329	171	174	78	66	106
29	82	105	100	80	-	138	295	144	390	76	74	96
30	82	110	95	75	--------	135	218	138	366	76	82	93
31	79	--------	86	75	--------	138	--------	147	--------	73	84	--------
Total	2,544	3,385	3,375	2,770	2,245	3,844	6,031	6,117	5,175	4,054	2,258	2,989
Mean	82.1	113	109	89.4	80.2	124	201	197	172	131	72.8	99.6
Cfsm	0.516	0.711	0.686	0.562	0.504	0.780	1.26	1.24	1.08	0.824	0.458	0.626
In.	0.59	0.79	0.79	0.65	0.52	0.90	1.41	1.43	1.20	0.95	0.53	0.70

Calendar year 1956: Max 600 Min 63 Mean 111 Cfsm 0.698 In. 9.51
Water year 1956-57: Max 627 Min 64 Mean 123 Cfsm 0.774 In. 10.46

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 22 to Dec. 2, Dec. 14-16, 19-22, 28, Jan. 1 to Mar. 21.

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.--October 1942 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

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.--15 years, 773 cfs.

Extremes.--Maximum daily discharge during year, 1,160 cfs July 17; maximum daily gage height, 2.54 ft July 13; minimum daily discharge, 290 cfs Aug. 11; minimum daily gage height, 1.46 ft Mar. 25.

1942-57: Maximum daily discharge, 1,590 cfs Apr. 16, 1943; maximum daily gage height, 3.13 ft Apr. 17, 1945, Apr. 11, 1948; minimum daily discharge, 100 cfs Nov. 3, 1949; minimum daily gage height, 1.12 ft Dec. 29, 1952.

Remarks.--Records fair except those for periods of ice effect or indefinite stage-discharge relation, which are poor. 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 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	704	e700	654	647	560	777	685	991	1,100	975	586	658
2	752	e700	625	580	540	751	475	936	1,020	986	587	822
3	754	e660	746	721	500	544	522	1,060	910	1,030	583	761
4	760	e580	770	726	560	719	554	1,060	936	1,080	454	915
5	887	794	716	760	570	700	674	1,070	830	1,050	609	819
6	623	774	776	600	580	696	792	1,090	740	1,070	575	781
7	548	874	706	680	605	724	e720	1,020	657	1,070	575	803
8	711	930	714	700	708	702	829	930	670	1,080	593	657
9	745	797	738	750	740	675	*850	930	526	1,100	590	774
10	618	610	668	750	540	490	e820	867	702	1,120	564	786
11	579	484	684	760	700	699	e780	858	*783	1,120	e290	795
12	750	877	678	780	*748	759	919	792	785	970	562	664
13	627	*930	586	660	775	*780	892	896	955	997	604	743
14	582	778	619	700	770	769	718	834	1,030	1,050	659	689
15	774	1,010	589	*700	776	845	659	*1,120	1,080	1,090	619	580
16	849	1,090	514	660	769	868	666	1,110	938	1,110	656	684
17	*815	892	600	660	640	884	667	1,070	e820	*1,160	575	882
18	810	876	*550	700	610	841	e720	1,050	1,020	1,130	e380	829
19	639	935	550	720	616	861	e720	1,090	1,000	1,070	535	818
20	607	1,020	509	680	573	846	757	1,050	783	871	572	822
21	529	1,120	520	775	590	825	590	1,050	930	e580	620	e860
22	705	999	654	815	650	842	864	1,080	1,050	691	*565	e900
23	842	1,040	580	792	678	828	887	1,110	1,050	773	643	730
24	671	1,080	787	801	627	812	919	1,090	1,040	627	656	772
25	687	1,040	793	795	739	843	905	1,100	864	749	e330	783
26	737	973	772	792	e870	737	856	1,110	921	755	416	639
27	703	961	787	733	735	761	1,020	1,060	1,020	739	463	726
28	607	973	738	705	755	768	1,030	1,060	1,010	e570	538	543
29	695	1,020	772	754	-	640	973	1,060	988	661	431	448
30	745	1,070	657	600	--------	665	963	1,070	1,020	618	477	697
31	719	--------	560	560	--------	568	--------	1,080	--------	583	465	--------
Total	21,774	26,587	20,712	22,056	18,524	23,219	23,426	31,694	27,178	28,475	16,772	22,380
Mean	702	886	668	711	662	749	781	1,022	906	919	541	746
Cfsm	0.812	1.02	0.772	0.822	0.765	0.866	0.903	1.18	1.05	1.06	0.625	0.862
In.	0.94	1.14	0.89	0.95	0.80	1.00	1.01	1.36	1.17	1.22	0.72	0.96

Calendar year 1956 :	Max	1,120	Min	300	Mean	699	Cfsm	0.808	In. 10.99
Water year 1956-57 :	Max	1,160	Min	290	Mean	775	Cfsm	0.896	In. 12.16

* Discharge measurement made on this day.

e Stage-discharge relation indefinite; discharge computed on basis of weather records and records of powerplant operation at Cheboygan and Alverno.

Note.--Stage-discharge relation affected by ice Dec. 17-19, 23, 31, Jan. 2, 6-20, Jan. 30 to Feb. 6, Feb. 10, 11, 17, 18.

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.--October 1942 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 658.00 ft above mean sea level (Stanley Engineering Co. benchmark). Prior to Aug. 1, 1949, water-stage recorder at site 1 mile upstream at different datum.

Average discharge.--15 years, 247 cfs.

Extremes.--Maximum discharge during year, 1,020 cfs May 22 (gage height, 4.99 ft); minimum, 15 cfs Nov. 10; minimum daily, 62 cfs Nov. 4.

1942-57: 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 except those for period of no gage-height record, which are fair. Flow regulated by powerplants at Tower and Kleber Dam.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

1.8	55
2.3	128
3.0	268
4.0	590
5.0	1,030

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	171	163	195	99	171	200	253	558	292	550	126	118
2	146	162	257	136	142	163	251	518	205	498	82	203
3	120	186	280	164	112	144	245	374	270	498	84	251
4	120	62	210	185	162	143	176	251	309	504	115	279
5	147	162	220	134	167	156	228	282	223	751	115	252
6	142	167	240	182	135	193	292	334	124	501	99	232
7	153	164	250	217	130	167	299	278	205	431	115	205
8	99	141	240	194	134	134	*371	263	205	352	114	146
9	157	139	230	184	151	133	363	251	206	286	145	166
10	168	92	220	176	151	171	274	263	206	320	128	158
11	210	106	220	147	164	178	280	199	196	249	112	207
12	90	142	200	156	108	*216	307	240	*224	266	125	167
13	93	*169	160	162	*154	198	264	293	267	392	127	130
14	115	168	140	166	158	242	279	310	304	415	101	164
15	182	213	170	149	144	319	251	456	349	316	128	164
16	*182	293	200	*181	116	334	265	*555	359	255	130	172
17	145	337	*250	75	123	274	241	759	383	*202	140	162
18	140	362	158	176	189	252	284	742	416	226	107	*151
19	89	341	119	178	161	236	296	633	442	192	106	154
20	91	241	171	145	126	231	424	412	422	142	123	198
21	197	286	197	168	179	204	440	388	326	184	120	111
22	182	256	211	169	182	216	501	468	248	181	118	165
23	105	260	200	172	169	238	492	501	238	172	*150	177
24	140	249	212	172	150	286	332	515	264	115	144	201
25	172	204	177	179	175	275	505	532	213	161	85	159
26	118	250	200	156	212	258	778	522	295	151	135	232
27	115	239	216	131	206	246	948	479	290	157	115	220
28	72	244	202	164	175	247	935	395	332	119	129	168
29	161	152	161	178	-	166	868	329	437	129	128	179
30	150	119	106	155	--------	222	735	285	562	157	120	177
31	98	--------	101	158	--------	247	--------	313	--------	155	136	--------
Total	4,270	6,069	6,113	5,008	4,346	6,689	12,177	12,698	8,812	9,027	3,702	5,468
Mean	138	202	197	162	155	216	406	410	294	291	119	182
Cfsm	0.441	0.645	0.629	0.518	0.495	0.690	1.30	1.31	0.939	0.930	0.380	0.581
In.	0.51	0.72	0.73	0.60	0.52	0.80	1.45	1.51	1.05	1.07	0.44	0.65

Calendar year 1956: Max 900 Min 61 Mean 207 Cfsm 0.661 In. 9.01
Water year 1956-57: Max 948 Min 62 Mean 231 Cfsm 0.738 In. 10.05

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 3-17; discharge estimated on basis of weather records, records for Thunder Bay River near Bolton, and powerplant operation at Kleber Dam.

Rainy River near Ocqueoc, Mich.

Location.--Lat 45°24'30", long 84°10'35", on line between secs. 15 and 22, T. 35 N., R. 2 E., on upstream side of highway bridge, 3¾ miles upstream from Black Lake and 4½ miles west of Ocqueoc.

Drainage area.--85 sq mi, approximately.

Records available.--October 1952 to September 1957.

Gage.--Wire-weight gage read once daily. Datum of gage is 674.85 ft above mean sea level, unadjusted.

Average discharge.--5 years, 30.9 cfs.

Extremes.--Maximum discharge during year, 600 cfs Apr. 28 (gage height, 5.00 ft, from graph based on gage readings); minimum, 1.5 cfs Oct. 29.
1952-57: Maximum discharge, that of Apr. 28, 1957; minimum, 0.4 cfs Sept. 7, 1955.

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

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	0.6	2.5	77
1.5	4.6	3.0	140
1.7	11	4.0	325
2.0	29	5.0	600

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.3	2.1	10	8.5	5.5	19	26	153	47	222	18	4.8
2	2.3	2.3	10	8.0	5.0	19	28	119	42	180	15	8.1
3	2.5	2.3	10	9.0	5.0	18	26	99	36	255	12	14
4	2.7	2.3	11	10	5.0	18	26	82	30	258	10	19
5	3.3	2.3	14	9.5	5.0	17	29	69	26	256	8.8	18
6	2.1	2.5	20	11	5.0	16	42	59	27	231	8.1	16
7	2.7	2.9	22	12	5.5	16	49	51	26	206	7.1	12
8	3.1	2.5	21	12	5.0	15	64	46	25	178	8.1	10
9	3.3	2.3	28	11	5.0	16	*59	42	21	150	7.1	8.1
10	3.5	2.5	20	10	4.5	18	61	39	*19	136	6.4	6.8
11	3.7	2.7	17	12	4.0	20	61	37	18	123	5.9	8.5
12	3.7	2.9	18	11	4.5	*22	59	36	22	112	5.1	9.2
13	3.5	*2.9	20	9.5	*4.5	22	56	42	27	125	5.1	8.5
14	3.7	3.7	22	8.5	4.5	25	52	69	31	188	6.4	8.1
15	2.9	12	19	9.5	4.0	31	51	110	26	183	6.2	7.8
16	*2.7	21	16	*8.5	4.5	36	52	*185	25	*142	6.2	7.8
17	2.9	21	14	9.5	4.5	45	53	172	27	110	4.8	7.4
18	2.9	17	19	9.5	4.5	54	58	151	55	93	4.6	*6.4
19	2.7	14	*15	9.5	4.0	27	63	126	59	78	5.1	7.1
20	2.9	14	13	10	4.5	20	66	106	68	66	4.3	8.1
21	2.9	22	11	12	4.5	26	74	98	75	58	4.1	7.8
22	3.1	24	9.6	13	4.5	38	79	148	63	49	4.5	8.5
23	3.3	20	9.9	11	4.5	58	81	154	43	44	*4.6	9.2
24	3.1	18	12	9.5	5.0	44	100	154	31	40	6.8	9.6
25	3.3	17	15	9.0	10	35	240	139	35	35	5.9	11
26	3.1	16	14	8.0	29	30	362	119	42	30	5.3	13
27	2.9	15	11	7.5	25	33	480	105	60	27	4.6	11
28	2.1	13	10	7.0	22	37	582	90	89	25	4.1	10
29	1.6	10	9.0	6.5	-	35	392	77	182	21	6.4	12
30	2.1	11	8.0	6.0	--------	35	193	69	238	21	5.6	12
31	2.1	--------	9.5	5.5	--------	34	--------	60	--------	21	4.6	--------
Total	90.0	301.2	458.0	293.5	198.5	879	3,564	3,006	1,515	3,663	210.8	299.8
Mean	2.90	10.0	14.8	9.47	7.09	28.4	119	97.0	50.5	118	6.80	9.99
Cfsm	0.034	0.118	0.174	0.111	0.083	0.334	1.40	1.14	0.594	1.39	0.080	0.118
In.	0.04	0.13	0.20	0.13	0.09	0.39	1.56	1.31	0.66	1.60	0.09	0.13

Calendar year 1956: Max 270 Min 1.2 Mean 18.0 Cfsm 0.212 In. 2.86
Water year 1956-57: Max 582 Min 1.6 Mean 39.7 Cfsm 0.467 In. 6.33

Peak discharge (base, 110 cfs).--Apr. 28 (12 m. to 1 p.m.) 600 cfs (5.00 ft); May 15 (10 p.m) 219 cfs (3.47 ft); May 24 (10 a.m.) 159 cfs (3.12 ft); July 3 (8 to 10 p.m.) 268 cfs (3.74 ft); July 14 (8 p.m.) 202 cfs (3.38 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23 to Dec. 4, Dec. 13-15, 18-21, Dec. 25 to Mar. 17.

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.--October 1942 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

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.--15 years, 416 cfs.

Extremes.--Maximum daily discharge during year, 1,900 cfs May 1; maximum daily gage height, 4.10 ft Apr. 30; minimum daily discharge, 20 cfs Aug. 11, Sept. 1; minimum daily gage height, 2.02 ft Mar. 9.

1942-57: Maximum daily discharge, 2,260 cfs Apr. 19, 1952; maximum daily gage height, 5.28 ft Apr. 7, 1943; minimum daily discharge, 11 cfs Aug. 14, 1949; minimum daily gage height, 1.60 ft Sept. 2, 1947.

Remarks.--Records fair except those for periods of indefinite stage-discharge relation or no gage-height record, which are poor. Flow affected during most of time by backwater from powerplant at Alverno Dam.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	102	e100	447	374	169	361	297	1,900	906	820	75	e20
2	106	132	117	e170	e130	396	166	1,810	662	876	81	46
3	75	a135	371	413	79	e100	242	1,730	621	842	118	98
4	e80	a100	434	425	177	383	e125	1,620	810	827	e25	315
5	80	a120	364	287	204	345	122	1,570	295	1,160	44	e240
6	e80	a170	568	114	185	226	e120	1,450	403	1,300	56	519
7	e40	a120	370	266	311	345	e50	1,370	456	1,300	63	475
8	e75	a150	418	289	179	508	269	1,010	432	1,270	56	e150
9	e75	a120	317	277	315	514	*381	884	e150	1,230	54	265
10	71	a150	447	278	82	e100	228	587	457	1,170	56	299
11	51	a60	412	320	306	184	197	554	*458	1,120	e20	299
12	82	a80	366	475	*360	*339	455	332	530	1,070	45	298
13	76	a90	434	e350	232	334	546	563	813	1,060	38	295
14	e30	e170	447	e400	333	287	579	508	852	1,040	50	276
15	83	186	243	448	337	284	726	*612	996	1,010	143	e70
16	84	278	115	*a300	325	428	714	832	887	*984	216	e300
17	*84	161	363	a400	e60	436	507	1,290	400	932	186	*612
18	e80	e50	*381	a650	333	406	460	1,480	570	807	e45	322
19	e80	151	e260	595	328	554	720	1,490	656	719	159	339
20	e75	201	333	469	219	607	514	1,440	373	531	152	342
21	e30	327	334	585	314	593	e70	1,460	734	e110	72	693
22	92	335	316	572	296	578	473	1,410	964	351	*151	915
23	134	406	115	507	309	588	712	1,400	988	323	92	335
24	161	670	388	e420	184	585	565	1,390	976	222	e50	154
25	46	630	381	a500	268	660	604	1,430	971	370	e75	210
26	95	449	388	a560	485	569	948	1,420	827	286	180	124
27	226	*428	393	432	272	357	1,350	1,190	734	65	170	88
28	e45	299	387	485	366	528	1,420	1,090	823	e30	79	479
29	217	608	385	291	-	465	1,460	1,010	822	57	145	e150
30	204	413	89	293	--------	105	1,890	1,010	782	91	114	143
31	190	--------	384	e120	--------	e50	--------	980	--------	62	34	--------
Total	2,949	7,289	10,767	12,065	7,158	12,215	16,910	36,822	20,348	22,035	2,844	8,871
Mean	951	243	347	389	256	394	564	1,188	678	711	917	296
Cfsm	0.159	0.407	0.581	0.652	0.429	0.660	0.945	1.99	1.14	1.19	0.154	0.496
In.	0.18	0.45	0.67	0.75	0.45	0.76	1.05	2.29	1.27	1.37	0.18	0.55

Calendar year 1956:	Max 1,240	Min 23	Mean 332	Cfsm 0.556	In. 7.56
Water year 1956-57:	Max 1,900	Min 20	Mean 439	Cfsm 0.735	In. 9.97

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* 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 and at Cheboygan.

e Stage-discharge relation indefinite; discharge estimated on basis of weather records and records of powerplant operation at Alverno Dam and at Cheboygan.

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 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Altitude of gage is 760 ft (by barometer).

Average discharge.--12 years, 208 cfs.

Extremes.--Maximum discharge during year, 1,250 cfs Apr. 25 (gage height, 8.69 ft); minimum daily, 110 cfs Feb. 11, 15, 19, Mar. 8.
1945-57: 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 poor. Prior to May 12, 1950, diurnal fluctuation below about 500 cfs by powerplant at Atlanta. Occasional regulation by dam at Atlanta thereafter.

Revisions (water years).--WSP 1307: 1946(M).

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-4, June 30 to July 1, July 4)

Oct. 1 to Mar. 10

4.0	110	5.0	189
4.5	139	6.0	337

Mar. 11 to Sept. 30

4.4	126	7.0	508
5.0	181	8.0	870
6.0	315	8.7	1,260

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*146	*153	185	150	120	150	*181	290	290	*383	142	149
2	153	154	170	150	120	145	186	*258	252	296	141	172
3	156	155	187	*150	120	135	181	237	*221	321	139	*184
4	153	156	*170	150	120	125	180	225	202	353	136	189
5	149	156	193	150	*120	120	192	213	192	328	*136	173
6	149	157	218	150	125	120	329	204	194	265	134	162
7	152	162	230	150	135	115	326	196	202	236	131	153
8	150	162	219	150	130	*110	314	188	190	247	132	148
9	149	161	205	145	120	115	271	183	174	251	138	145
10	149	157	197	130	115	160	248	196	171	221	152	147
11	149	157	193	135	110	170	234	210	171	202	145	156
12	150	161	183	140	120	203	234	205	193	196	140	167
13	150	162	180	130	130	166	220	214	204	287	139	173
14	150	161	170	145	120	172	209	251	317	262	152	162
15	152	a180	180	160	110	251	207	456	350	222	144	159
16	159	a220	185	150	120	225	212	520	325	202	146	156
17	159	a260	192	160	120	203	224	446	316	188	145	150
18	157	a230	180	155	120	188	240	383	583	177	141	147
19	156	a220	160	150	110	185	261	325	430	173	140	145
20	156	214	165	140	120	184	293	283	331	167	136	158
21	155	228	170	140	125	185	309	255	269	164	135	156
22	154	a220	175	220	125	197	287	503	227	180	131	160
23	154	a200	182	210	130	204	269	580	220	160	131	160
24	153	a190	192	200	135	205	346	503	198	155	146	162
25	153	a175	188	180	150	197	1,080	414	198	154	145	174
26	153	a190	184	170	200	190	817	368	205	156	144	168
27	153	199	187	155	170	185	589	321	300	156	140	162
28	153	180	188	150	140	183	472	279	272	152	140	158
29	152	165	180	140	-	181	400	251	622	148	147	156
30	153	175	165	135		179	334	247	523	146	147	154
31	153		150	125		177		241		145	146	
Total	4,730	5,460	5,723	4,765	3,580	5,325	9,645	9,445	8,342	6,693	4,361	4,805
Mean	153	182	185	154	128	172	322	305	278	216	141	160
Cfsm	0.659	0.784	0.797	0.664	0.552	0.741	1.39	1.31	1.20	0.931	0.608	0.690
In.	0.76	0.87	0.92	0.77	0.57	0.85	1.55	1.51	1.34	1.07	0.70	0.77

Calendar year 1956:	Max	895	Min	132	Mean	189	Cfsm	0.815	In. 11.08
Water year 1956-57:	Max	1,080	Min	110	Mean	200	Cfsm	0.862	In. 11.68

Peak discharge (base, 600 cfs).--Apr. 25 (1 to 2 p.m.) 1,250 cfs (8.69 ft); May 22 (10 p.m.) 687 cfs (7.58 ft); June 18 (9 a.m.) 641 cfs (7.45 ft); June 29 (4:30 p.m.) 776 cfs (7.80 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.

Note.--Stage-discharge relation affected by ice Nov. 28 to Dec. 2, Dec. 4, 13-16, 18-22, Dec. 29 to Mar. 11.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 671.96 ft above mean sea level, unadjusted. Prior to Aug. 12, 1945, staff gage at site 500 ft downstream at different datum.

Average discharge.--12 years, 438 cfs.

Extremes.--Maximum discharge during year, 2,240 cfs May 24 (gage height, 7.61 ft); minimum, 125 cfs Oct. 15.

1945-57: Maximum discharge, 3,410 cfs Apr. 12, 1947 (gage height, 9.00 ft); maximum gage height, 9.08 ft Mar. 21, 1948 (backwater from ice); minimum discharge, 92 cfs Sept. 28, 29, 1955.

Remarks.--Records good except those for periods of ice effect, which are poor. Diurnal fluctuation caused by powerplant at Hillman and regulation by Fletcher Pond on the Upper South Branch Thunder Bay River (usable capacity, 40,170 acre-ft).

Revisions (water years).--WSP 1437: 1946.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.1	203
4.0	415
5.0	805
8.0	2,500

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*397	*251	400	310	260	310	*344	672	528	*1,590	318	330
2	292	251	400	330	270	310	344	544	520	1,330	318	350
3	261	255	*400	350	280	280	337	*474	*482	1,240	318	*374
4	290	257	400	350	*290	250	325	406	496	1,330	308	388
5	243	257	410	350	290	250	327	385	478	1,300	*299	382
6	278	245	440	350	310	260	532	363	409	1,180	296	379
7	251	270	474	350	310	*260	814	397	354	1,000	296	365
8	209	265	478	320	300	260	818	382	340	895	292	327
9	231	261	457	310	290	260	752	340	320	846	290	301
10	276	257	436	280	270	270	660	337	303	736	301	325
11	237	255	400	310	250	290	600	354	325	624	310	340
12	227	257	350	300	290	426	556	365	332	556	301	332
13	267	259	350	280	320	426	510	374	365	588	296	330
14	221	261	350	310	300	412	468	400	422	644	301	337
15	221	301	350	340	250	496	440	728	568	624	313	318
16	267	443	370	300	270	544	422	1,080	588	548	306	310
17	255	548	400	330	280	478	422	1,240	560	499	308	303
18	261	478	360	320	280	394	440	1,120	648	454	310	296
19	255	409	310	310	260	352	471	926	970	432	303	294
20	255	371	330	330	280	330	510	752	1,160	412	322	292
21	255	368	350	*350	290	332	564	640	995	400	332	299
22	255	379	350	440	300	371	572	1,200	800	397	330	299
23	263	380	350	400	300	412	524	1,670	672	397	315	301
24	215	350	360	380	310	415	580	2,180	556	374	325	308
25	245	330	354	350	350	409	1,150	2,080	488	360	327	318
26	247	350	363	330	400	394	1,770	1,710	492	354	327	325
27	249	380	357	310	350	377	1,990	1,180	572	347	325	315
28	249	350	344	290	300	363	1,590	955	632	347	318	308
29	247	330	327	280	-	350	1,180	708	1,000	342	322	301
30	251	400	272	270		342	846	540	1,340	334	327	296
31	251		300	260		334		506		315	330	
Total	7,921	9,768	11,592	10,090	8,250	10,957	20,858	25,008	17,715	20,795	9,684	9,743
Mean	256	326	374	325	295	353	695	807	590	671	312	325
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 2,040 Min 205 Mean 372 Cfsm - In. -
Water year 1956-57: Max 2,180 Min 209 Mean 445 Cfsm - In. -

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23 to Dec. 6, Dec. 11-23, Dec. 31 to Mar. 10.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 675.52 ft above mean sea level, unadjusted. Prior to Aug. 16, 1945, staff gage at site half a mile upstream at different datum.

Average discharge.--12 years, 103 cfs.

Extremes.--Maximum discharge during year, 1,040 cfs Apr. 27 (gage height, 5.52 ft); minimum, 4.6 cfs Aug. 23.

1945-57: Maximum discharge, 2,330 cfs Apr. 13, 1947 (gage height, 7.00 ft), from rating curve extended above 1,650 cfs; maximum gage height, 7.98 ft Mar. 31, 1950 (ice jam); minimum discharge, 0.4 cfs Oct. 14, 1955.

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

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 24		Mar. 25 to Sept. 30			
2.7	7.0	2.6	4.4	3.8	160
2.9	16	2.7	7.0	4.4	375
3.2	49	2.9	16	5.4	955
3.5	100	3.0	24	6.0	1,435
4.0	232	3.3	60		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	12	65	43	22	50	123	380	146	*276	28	8.2
2	*22	*10	60	*38	21	46	*125	*302	121	388	22	12
3	24	9.6	*60	41	21	43	121	248	104	425	16	*16
4	20	10	76	43	*21	40	110	214	*92	510	14	46
5	14	10	72	40	21	38	108	181	81	703	11	78
6	14	10	64	45	22	37	155	141	74	790	*9.6	89
7	14	14	74	45	25	*37	181	127	63	685	9.6	83
8	14	11	94	45	23	38	238	112	56	490	8.7	57
9	14	11	100	42	21	40	310	100	53	302	9.6	41
10	14	12	95	39	20	40	314	96	52	205	12	39
11	14	14	85	43	19	50	298	89	50	184	9.6	38
12	10	16	85	40	21	65	266	80	49	172	7.5	39
13	10	14	80	37	23	75	238	78	46	190	7.5	35
14	7.0	15	75	30	21	90	214	74	59	141	10	31
15	7.8	25	67	35	20	110	193	184	94	132	11	30
16	9.6	48	64	30	22	140	175	334	118	134	12	31
17	14	79	61	31	22	180	146	715	98	116	10	31
18	20	104	60	32	22	170	143	709	100	98	9.6	30
19	20	108	56	32	20	150	163	526	141	87	7.8	28
20	14	98	54	36	24	140	169	380	199	74	6.7	26
21	11	90	49	41	24	130	190	262	217	63	5.8	25
22	9.6	90	49	45	24	115	202	420	217	54	5.3	25
23	10	89	50	42	24	130	211	455	190	47	5.1	24
24	14	85	49	38	24	160	238	558	129	45	7.0	24
25	15	80	52	35	30	180	402	592	102	40	11	32
26	16	75	55	33	54	175	703	490	98	36	10	34
27	15	75	55	31	45	187	1,020	370	108	a35	7.5	33
28	13	65	52	29	46	169	925	269	116	a32	7.8	33
29	12	60	48	27	-	146	703	208	230	a31	9.2	33
30	22	65	40	25		134	475	196	238	a30	8.7	32
31	14		45	24		125		163		a29	7.2	
Total	449.0	1,404.6	1,991	1,137	702	3,230	8,859	9,053	3,441	6,544	316.8	1,083.2
Mean	14.5	46.8	64.2	36.7	25.1	104	295	292	115	211	10.2	36.1
Cfsm	0.079	0.254	0.349	0.199	0.136	0.565	1.60	1.59	0.625	1.15	0.055	0.196
In.	0.09	0.28	0.40	0.23	0.14	0.65	1.78	1.83	0.70	1.33	0.06	0.22

Calendar year 1956: Max 1,690 Min 6.3 Mean 79.8 Cfsm 0.434 In. 5.90
Water year 1956-57: Max 1,020 Min 5.1 Mean 105 Cfsm 0.571 In. 7.71

Peak discharge (base, 500 cfs).--Apr. 27 (5 to 8 p.m.) 1,040 cfs (5.52 ft); May 17 (8 to 11 p.m.) 790 cfs (5.17 ft); May 25 (2 to 5 a.m.) 614 cfs (4.87 ft); July 6 (3 to 7 a.m.) 810 cfs (5.20 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Thunder Bay River near Hillman and Rainy River near Ocqueoc.

Note.--Stage-discharge relation affected by ice Nov. 24 to Dec. 1, Dec. 9-14, 18, 19, 25, Dec. 29 to Mar. 26 (no gage-height record Dec. 29 to Jan. 2, Feb. 4).

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.--October 1942 to September 1957. Prior to October 1954, published as Middle Branch Au Sable River at Grayling. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 1,123.49 ft above mean sea level, datum of 1929.

Average discharge.--15 years, 76.5 cfs.

Extremes.--Maximum discharge during year, 113 cfs July 9 (gage height, 1.78 ft); minimum, 45 cfs Aug. 23.

1942-57: 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, which are fair. Prior to Dec. 31, 1952, diurnal fluctuation caused by powerplant 2.5 miles upstream. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	44
2.0	138

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	69	56	65	57	57	65	69	*70	77	91	*50	58
2	73	55	65	*57	56	63	*70	68	72	79	49	77
3	69	56	65	61	b56	53	68	66	69	74	48	*69
4	*66	57	64	61	b56	49	66	65	66	76	48	81
5	63	*57	*65	60	56	*55	70	65	64	78	48	75
6	62	*59	68	59	56	59	83	64	*63	76	48	67
7	63	60	73	60	*57	58	85	61	63	73	48	62
8	63	60	72	59	56	53	83	60	62	*102	47	59
9	62	60	70	b56	58	52	80	61	60	112	55	58
10	61	59	67	b55	60	52	75	64	59	101	59	57
11	60	59	66	b52	55	59	75	66	60	87	57	58
12	60	60	61	b55	51	63	74	67	68	81	53	60
13	60	60	57	b54	56	63	73	67	72	82	52	63
14	60	60	57	b52	59	65	71	69	73	79	54	63
15	61	71	64	b53	52	75	70	80	75	75	54	61
16	61	83	65	b53	54	79	71	90	75	72	53	58
17	61	83	64	b54	b54	77	72	86	75	70	50	57
18	60	77	60	54	b54	74	75	79	76	66	49	56
19	59	72	55	55	54	73	81	73	74	64	48	55
20	59	70	62	56	53	72	86	70	70	63	48	57
21	59	72	63	58	b53	71	88	67	67	60	47	63
22	58	74	62	72	b54	71	86	77	62	63	46	63
23	58	68	61	70	55	73	84	90	62	63	47	61
24	58	64	62	63	56	75	81	90	62	60	50	60
25	58	b64	61	b58	61	74	86	84	65	58	50	58
26	58	b63	60	b58	66	72	96	80	71	57	50	57
27	58	b62	62	58	62	71	95	75	74	57	47	56
28	57	b62	62	58	55	70	86	73	79	57	47	55
29	57	b61	60	58	-	70	80	71	95	55	48	55
30	57	61	55	58	--------	69	75	72	98	53	48	54
31	57	--------	55	57	--------	68	--------	74	--------	52	49	--------
Total	1,887	1,925	1,948	1,791	1,572	2,043	2,354	2,244	2,108	2,236	1,547	1,833
Mean	60.9	64.2	62.8	57.8	56.1	65.9	78.5	72.4	70.3	72.1	49.9	61.1
Cfsm	0.554	0.584	0.571	0.525	0.510	0.599	0.714	0.658	0.639	0.655	0.454	0.555
In.	0.64	0.65	0.66	0.61	0.53	0.69	0.80	0.76	0.71	0.76	0.52	0.62

Calendar year 1956:	Max 145	Min 49	Mean 68.4	Cfsm 0.622	In. 8.48
Water year 1956-57:	Max 112	Min 46	Mean 64.4	Cfsm 0.585	In. 7.95

* Discharge measurement made on this day.

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 bridge on State Highway 33 at Mio, 10 miles downstream from Big Creek, and 80 miles upstream from mouth.

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

Records available.--July 1952 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 929.60 ft above mean sea level, datum of 1929.

Average discharge.--5 years, 926 cfs.

Extremes.--Maximum discharge during year, 2,870 cfs Aug. 9 (gage height, 5.06 ft); minimum, daily, 564 cfs Jan. 14.
1952-57: Maximum discharge, 2,980 cfs Aug. 5, 1952 (gage height, 5.16 ft); minimum daily, 526 cfs Sept. 5, 1955.

Remarks.--Records good. Flow regulated at all stages by powerplant 500 ft upstream. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 25		Apr. 26 to Sept. 30	
2.3	530	2.5	600
3.0	920	3.5	1,260
4.0	1,700	5.0	2,800

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	781	806	790	648	671	740	774	939	884	1,200	878	860
2	829	740	756	570	746	722	904	961	888	1,180	774	740
3	838	628	882	708	713	708	792	844	943	1,180	765	877
4	806	643	756	768	706	628	894	859	870	1,330	768	922
5	756	768	860	868	691	690	833	736	876	1,070	914	1,000
6	820	761	954	759	724	731	1,240	787	828	1,060	728	708
7	775	764	899	786	728	659	1,020	776	876	928	843	790
8	730	900	916	764	754	652	1,080	842	651	1,440	606	736
9	754	656	813	702	762	712	1,050	664	750	1,190	776	776
10	733	794	828	717	688	570	988	711	817	1,120	921	811
11	713	725	784	566	684	693	930	830	887	1,370	821	788
12	704	808	820	658	734	842	948	1,030	797	1,060	860	800
13	768	714	669	698	658	872	880	914	1,020	1,280	859	820
14	663	*728	671	564	758	858	976	778	966	1,310	812	792
15	794	922	920	583	*606	1,110	791	1,170	880	1,180	859	767
16	742	1,180	767	*682	735	982	874	1,290	948	1,180	778	778
17	725	1,060	850	624	643	884	*914	1,070	968	1,070	793	777
18	761	814	756	610	744	903	931	991	*1,010	1,000	662	730
19	780	918	*664	687	600	*863	1,050	920	868	1,180	888	863
20	630	818	832	714	692	870	998	921	868	936	746	710
21	690	974	776	852	794	814	1,210	902	830	1,020	743	828
22	808	917	786	1,110	578	798	1,130	*1,670	866	*1,130	730	744
23	736	886	742	862	646	914	1,030	1,620	832	870	768	880
24	*660	890	770	632	678	840	1,060	1,330	891	846	756	701
25	682	828	818	896	913	916	1,480	1,130	788	914	748	790
26	748	872	810	756	942	858	1,210	1,200	868	868	784	*751
27	744	827	700	700	796	866	1,210	1,060	1,110	884	*804	752
28	722	686	716	754	752	832	1,240	1,020	1,300	866	678	706
29	708	818	779	835	-	804	1,300	1,130	1,950	1,010	788	713
30	654	770	679	646		824	963	898	1,470	814	692	746
31	682		658	645		848		1,130		752	778	
Total	22,936	24,615	24,421	22,364	20,136	25,003	30,689	31,123	28,500	33,238	24,320	23,656
Mean	740	820	788	721	719	807	1,023	1,004	950	1,072	785	789
Cfsm	0.673	0.745	0.716	0.655	0.654	0.734	0.930	0.913	0.864	0.975	0.714	0.717
In.	0.78	0.83	0.83	0.76	0.68	0.85	1.04	1.05	0.96	1.12	0.82	0.80

Calendar year 1956: Max 2,460 Min 573 Mean 894 Cfsm 0.767 In. 10.45
Water year 1956-57: Max 1,950 Min 564 Mean 852 Cfsm 0.775 In. 10.52

* Discharge measurement made on this day.

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 1957.

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 at site 25 ft upstream at same datum.

Average discharge.--6 years (1951-57), 68.4 cfs.

Extremes.--Maximum discharge during year, 358 cfs Apr. 26 (gage height, 4.87 ft); maximum gage height, 6.09 ft Jan. 23 (ice jam); minimum discharge, 25 cfs Aug. 21.
1950-57: Maximum discharge, 865 cfs Apr. 14, 1952 (gage height, 7.67 ft); minimum, 16 cfs Dec. 4, 1952.

Remarks.--Records good except those for periods of ice effect, which are poor. Since 1953, periodic regulation by dam 2½ miles upstream. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 26, June 24 to Sept. 30		Feb. 27 to June 23	
1.5	29	1.6	37
2.5	89	2.5	95
4.0	248	4.0	249
		5.0	377

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	42	42	32	40	45	58	114	62	111	37	34
2	43	42	42	30	40	45	66	104	59	86	36	35
3	42	40	42	33	50	43	62	97	56	74	35	37
4	41	39	44	33	45	40	62	91	54	69	34	49
5	40	39	53	37	35	43	104	86	54	72	34	36
6	40	40	65	40	40	45	259	82	53	63	34	34
7	41	40	64	40	42	45	187	79	51	60	32	32
8	40	39	57	35	37	45	137	75	50	68	32	34
9	40	39	52	38	42	48	108	74	50	63	46	33
10	40	38	49	32	50	52	93	101	48	57	45	58
11	41	40	46	35	38	80	90	99	48	55	38	54
12	42	40	45	32	43	180	88	89	50	55	36	54
13	42	*40	41	32	40	109	80	84	53	60	34	60
14	42	40	45	32	35	85	74	88	65	54	37	45
15	43	48	41	*32	33	103	*71	148	54	50	34	42
16	46	62	35	32	36	80	71	132	51	48	34	40
17	45	49	30	31	36	70	72	109	80	48	33	38
18	44	46	*31	31	35	*63	75	99	128	45	33	38
19	43	45	35	33	32	62	78	91	96	45	32	36
20	42	45	39	35	35	59	84	84	76	42	32	48
21	43	57	42	45	38	62	84	78	*66	44	32	48
22	43	52	44	60	42	74	77	76	64	59	31	44
23	*43	49	45	150	35	83	76	*74	200	*48	*30	40
24	42	47	55	90	43	81	89	73	140	44	32	*40
25	42	50	49	60	55	74	233	70	104	42	32	38
26	42	45	47	50	130	68	331	72	95	42	31	37
27	42	47	47	45	70	63	242	68	99	42	30	36
28	42	40	46	45	*50	61	177	65	106	42	32	36
29	42	43	40	50	-	60	146	65	199	40	34	37
30	42	43	33	40	--------	58	126	65	160	40	34	36
31	42	--------	35	45	--------	56	--------	65	--------	38	34	--------
Total	1,304	1,326	1,381	1,355	1,247	2,082	3,500	2,697	2,471	1,706	1,060	1,229
Mean	42.1	44.2	44.5	43.7	44.5	67.2	117	87.0	82.4	55.0	34.2	41.0
Cfsm	0.501	0.526	0.530	0.520	0.530	0.800	1.39	1.04	0.981	0.655	0.407	0.488
In.	0.58	0.59	0.61	0.60	0.55	0.92	1.55	1.20	1.09	0.76	0.47	0.54

Calendar year 1956 : Max 527 Min 28 Mean 59.7 Cfsm 0.711 In. 9.69
Water year 1956-57 : Max 331 Min 30 Mean 58.5 Cfsm 0.696 In. 9.46

Peak discharge (base, 300 cfs).--Apr. 26 (10 a.m.) 358 cfs (4.87 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 23 to Dec. 2, Dec. 12-20, Dec. 29 to Mar. 12.

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 1957.

Gage.--Water-stage recorder. Altitude of gage is 710 ft (by barometer). Prior to Oct. 1, 1951, wire-weight gage at site 1.7 miles upstream at different datum.

Average discharge.--6 years (1951-57), 104 cfs.

Extremes.--Maximum discharge during year, 748 cfs Apr. 26 (gage height, 4.81 ft); maximum gage height, 8.37 ft Jan. 23 (ice jam); minimum discharge, 8.4 cfs Aug. 26.
1950-57: Maximum daily discharge, 1,600 cfs Apr. 14, 1952; maximum gage height, 10.5 ft Feb. 21, 1953 (ice jam); minimum discharge, that of Aug. 26, 1957.

Remarks.--Records good except those for periods of ice effect, which are poor. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 6, Aug. 23 to Sept. 30		Apr. 7 to Aug. 22	
0.9	9.0	0.8	8.0
1.5	86	1.2	56
3.0	330	3.0	336
5.0	800	5.0	800

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	31	60	45	75	105	89	228	78	175	20	16
2	61	35	61	50	85	100	121	198	73	150	19	17
3	64	37	65	50	95	100	113	178	69	127	18	18
4	59	37	72	50	85	100	103	164	66	121	17	37
5	57	33	83	50	70	100	156	152	66	140	16	24
6	57	33	131	55	80	105	655	142	62	112	15	15
7	58	33	117	55	80	105	565	133	62	98	15	14
8	57	32	97	45	75	105	363	124	59	133	14	14
9	52	31	86	50	85	100	271	121	57	144	40	13
10	64	28	80	43	95	100	226	178	57	108	56	49
11	62	29	70	48	80	150	211	193	56	97	34	53
12	45	32	65	45	85	550	214	182	59	100	24	48
13	33	*32	60	43	78	450	190	166	53	112	22	75
14	40	32	65	40	70	300	175	175	96	98	34	45
15	36	50	70	*37	65	200	*160	334	66	88	29	40
16	31	93	63	45	75	150	150	313	47	60	34	36
17	32	69	58	43	80	120	150	241	53	55	30	31
18	31	62	*52	40	80	*115	152	200	345	52	28	28
19	29	75	57	45	75	110	152	175	140	48	26	28
20	29	75	60	50	80	110	158	163	80	44	25	36
21	31	94	60	70	88	115	145	148	*60	44	30	49
22	32	90	62	140	95	150	133	142	59	90	31	41
23	*32	75	68	500	80	160	134	*128	500	*78	*23	36
24	29	70	75	200	95	150	182	122	228	63	24	*35
25	28	65	70	120	140	138	388	96	154	55	15	32
26	27	68	70	100	400	118	712	96	140	47	12	28
27	27	65	70	80	150	107	525	92	174	34	18	28
28	28	60	65	90	*110	103	396	86	211	29	17	26
29	27	54	55	95	-	96	313	80	490	26	20	26
30	28	58	45	75	--------	90	262	80	274	24	16	26
31	29	--------	50	85	--------	86	--------	80	--------	23	13	--------
Total	1,273	1,578	2,162	2,484	2,751	4,588	7,564	4,910	3,934	2,575	735	964
Mean	41.1	52.6	69.7	80.1	98.2	148	252	158	131	83.1	23.7	32.1
Cfsm	0.243	0.311	0.412	0.474	0.581	0.876	1.49	0.935	0.775	0.492	0.140	0.190
In.	0.28	0.35	0.48	0.55	0.60	1.01	1.66	1.08	0.86	0.57	0.16	0.21

Calendar year 1956: Max 920 Min 18 Mean 90.0 Cfsm 0.533 In. 7.27
Water year 1956-57: Max 712 Min 12 Mean 97.3 Cfsm 0.576 In. 7.81

Peak discharge (base, 600 cfs).--Jan. 23 (time unknown) about 650 cfs; Mar. 12 (time unknown) about 700 cfs; Apr. 6 (10 a.m.) 712 cfs (4.67 ft); Apr. 26 (2 to 3 p.m.) 748 cfs (4.81 ft); June 23 (8 a.m.) 655 cfs (4.44 ft); June 29 (12:30 a.m.) 608 cfs (4.25 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23 to Dec. 1, Dec 10 to Mar. 24.

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 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Altitude of gage is 860 ft (by barometer).

Average discharge.--7 years, 52.3 cfs.

Extremes.--Maximum discharge during year, 199 cfs Apr. 25 (gage height, 4.33 ft); minimum, 37 cfs Aug. 27, 28, Sept. 8, 9.

1950-57: Maximum discharge, 575 cfs Apr. 4 1956 (gage height, 6.31 ft); minimum, 28 cfs Feb. 1, 1953.

Remarks.--Records good except those for periods of ice effect, which are fair. Prior to June 25, 1955, some regulation at low flow from sawmill on Sandback Creek at Rose City. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 24-27)

Oct. 1 to Dec. 6		Dec. 7 to Sept. 30	
2.3	37	2.2	33
3.0	88	3.0	94
		5.0	281

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	44	40	b40	39	43	48	53	55	49	43	39
2	44	44	40	b40	39	b41	54	51	53	44	42	39
3	42	43	41	40	39	b39	47	50	52	43	42	38
4	42	43	42	39	39	b38	46	50	52	44	42	47
5	42	43	51	39	40	38	67	49	50	46	42	40
6	42	43	70	39	39	38	159	48	51	42	42	38
7	42	43	59	40	39	39	88	47	52	42	41	38
8	42	43	48	39	*39	39	*72	47	49	56	41	38
9	42	*42	45	39	41	39	56	50	49	49	59	38
10	42	42	42	b39	42	38	52	59	49	44	48	45
11	42	42	42	b39	40	42	55	59	50	44	42	44
12	42	43	42	38	39	135	55	55	52	47	41	47
13	42	42	41	b39	39	74	50	55	52	69	41	47
14	42	42	b41	*b39	39	62	49	62	53	48	45	44
15	*42	47	41	b39	40	*84	48	152	48	45	41	45
16	44	62	42	b39	39	53	50	95	47	45	41	44
17	44	46	*42	b39	39	47	51	67	49	45	40	42
18	44	43	42	b39	38	46	55	62	*51	44	40	42
19	44	42	40	b39	38	46	57	59	46	44	40	42
20	44	42	41	b40	38	45	62	57	45	44	40	44
21	44	51	42	b45	38	55	59	55	44	46	40	44
22	45	46	42	b130	38	66	54	96	45	*60	39	44
23	44	43	42	b75	38	62	56	*73	99	46	*38	45
24	44	41	46	b50	38	58	84	65	50	44	40	43
25	44	42	44	b45	68	49	181	59	47	44	40	42
26	45	42	42	b40	106	46	*143	63	48	45	38	*42
27	45	42	43	b40	55	45	85	58	54	45	38	42
28	46	41	43	b40	45	46	74	55	58	44	38	42
29	45	41	42	40	-	45	61	55	149	44	39	42
30	45	40	42	b40		45	56	55	68	44	39	42
31	45		40	40		44		59		43	39	
Total	1,345	1,310	1,360	1,369	1,211	1,587	2,074	1,920	1,667	1,439	1,281	1,269
Mean	43.4	43.7	43.9	44.2	43.2	51.2	69.1	61.9	55.6	46.4	41.3	42.3
Cfsm	1.61	1.62	1.63	1.64	1.60	1.90	2.56	2.29	2.06	1.72	1.53	1.57
In.	1.86	1.81	1.88	1.89	1.67	2.19	2.86	2.64	2.30	1.98	1.76	1.75

Calendar year 1956: Max 440 Min 35 Mean 49.4 Cfsm 1.83 In. 24.93
Water year 1956-57: Max 181 Min 38 Mean 48.9 Cfsm 1.81 In. 24.59

Peak discharge (base, 150 cfs).--Jan. 22 (time unknown) about 150 cfs; Mar. 12 (8 p.m.) 155 cfs (3.68 ft); Apr. 6 (7 to 8 a.m.) 186 cfs (4.02 ft); Apr. 25 (6 a.m.) 199 cfs (4.33 ft); May 15 (1 p.m.) 178 cfs (3.93 ft); June 29 (12 m. to 2 p.m.) 170 cfs (3.90 ft).

* 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 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder and wooden control. Altitude of gage is 850 ft (by barometer).

Average discharge.--7 years, 92.0 cfs.

Extremes.--Maximum discharge during year, 320 cfs Apr. 26 (gage height, 9.00 ft); minimum, 52 cfs June 5.

1950-57: Maximum discharge, 750 cfs Apr. 4, 1956 (gage height, 9.90 ft); minimum, 48 cfs Oct. 8, 1952.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Prior to June 25, 1955, some regulation at low flow from sawmill on Sandback Creek at Rose City. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 11 to Sept. 30)

Oct. 1 to Jan. 31, May 16 to Sept. 30		Feb. 1 to Mar. 12		Mar. 13 to May 15	
6.4	53	6.6	67	6.7	80
7.0	82	7.5	132	7.5	141
8.0	179	9.0	320	9.0	320
9.0	320				

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	75	72	b70	76	b80	97	114	74	100	71	70
2	74	74	73	b70	75	b77	108	104	70	87	71	71
3	73	73	74	68	75	b75	98	97	60	81	71	72
4	71	73	77	68	75	73	96	94	53	81	70	80
5	70	73	89	67	77	72	118	90	54	89	70	70
6	71	73	120	68	74	72	232	88	57	83	69	67
7	71	73	105	68	74	72	177	84	66	77	69	66
8	70	73	92	68	*74	72	*151	82	65	100	69	66
9	70	*74	83	68	78	71	128	84	64	95	96	64
10	70	72	75	b68	80	70	119	102	64	80	87	72
11	74	72	73	b68	76	75	118	104	66	77	72	77
12	72	72	72	67	73	192	117	100	72	80	69	79
13	55	72	72	b67	74	145	107	98	74	120	70	74
14	59	73	71	*b68	73	134	102	106	81	88	78	70
15	*64	79	72	b70	74	163	101	218	72	81	68	70
16	69	99	73	b69	73	128	100	170	71	78	68	69
17	71	86	*74	b70	72	110	103	131	75	77	67	66
18	71	78	74	b65	72	100	108	113	*83	75	65	65
19	70	77	71	b67	71	*98	112	99	72	75	66	65
20	70	75	72	b70	71	96	120	91	68	74	65	66
21	70	91	72	b77	70	106	122	83	66	77	66	66
22	71	88	74	b180	70	124	114	103	68	*101	64	67
23	71	78	74	b130	71	123	117	*111	153	80	*65	68
24	70	75	80	b90	71	120	145	103	91	76	69	66
25	68	75	78	b80	95	109	283	90	82	75	68	65
26	68	75	75	b72	143	97	*288	91	83	75	66	*64
27	69	74	76	b71	99	93	212	83	97	75	65	63
28	69	74	75	b70	84	94	180	79	103	73	66	63
29	87	72	72	71	-	94	148	77	243	72	68	63
30	81	71	b70	b70	---	92	127	77	137	73	68	63
31	77	---	70	74	---	90	---	81	---	72	68	---
Total	2,191	2,289	2,400	2,349	2,190	3,117	4,148	3,147	2,484	2,547	2,164	2,047
Mean	70.7	76.3	77.4	75.8	78.2	101	138	102	82.8	82.2	69.8	68.2
Cfsm	1.31	1.41	1.43	1.40	1.45	1.87	2.56	1.89	1.53	1.52	1.29	1.26
In.	1.51	1.57	1.65	1.61	1.51	2.16	2.86	2.18	1.71	1.75	1.49	1.41

	Max	Min	Mean	Cfsm	In.
Calendar year 1956:	590	55	88.9	1.65	22.40
Water year 1956-57:	288	53	85.1	1.58	21.41

Peak discharge (base, 250 cfs).--Apr. 6 (11 a.m. to 12 m.) 257 cfs (8.59 ft); Apr. 26 (4 to 6 a.m.) 320 cfs (9.00 ft); May 15 (4 p.m.) 257 cfs (8.59 ft); June 29 (1 to 4 p.m.) 266 cfs (8.66 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Oct. 31 to Nov. 14, Dec. 6, 7, 10-17; discharge estimated on basis of weather records and records for stations on nearby streams.

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 1957.

Gage.--Water-stage recorder. Altitude of gage is 840 ft (by barometer).

Average discharge.--7 years, 16.6 cfs.

Extremes.--Maximum discharge during year, 128 cfs Apr. 6 (gage height, 4.12 ft, from recorded range in stage), from rating curve extended above 110 cfs; maximum gage height, 5.05 ft Feb. 26 (ice jam); minimum discharge, 5.8 cfs Aug. 23.

1950-57: Maximum discharge, 186 cfs Mar. 22, 1955, Apr. 4, 1956, from rating curve extended above 110 cfs; maximum gage height, 5.23 ft Apr. 4, 1956 (backwater from logs); minimum discharge, 3.8 cfs Sept. 10, 1950.

Remarks.--Records good except those above 90 cfs and those for periods of ice effect or no gage-height record, which are poor. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 26		Feb. 27 to Sept. 30	
1.1	6.0	1.1	6.0
1.4	11	1.4	11
2.0	30	2.0	30
3.0	77	4.0	122

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	9.6	12	9	11	15	17	17	14	15	7.4	7.4
2	11	9.8	13	10	13	14	23	16	11	12	7.2	7.6
3	11	9.6	14	10	15	13	20	14	10	10	7.0	8.0
4	10	9.6	17	10	13	13	18	13	9.8	10	6.9	10
5	9.8	9.8	21	10	11	12	30	12	9.8	14	6.8	7.6
6	10	9.8	46	10	12	12	110	12	10	10	6.8	7.0
7	10	10	41	9	12	11	60	12	9.6	9.4	6.8	6.8
8	9.8	9.6	25	8	11	11	40	11	9.2	18	6.6	6.6
9	9.4	9.2	18	9	12	11	26	12	9.0	17	14	6.4
10	9.2	8.8	16	8	15	11	22	21	8.7	11	11	8.1
11	9.2	9.0	15	9	11	12	25	21	9.4	10	8.4	9.8
12	9.4	*9.4	13	8	12	60	25	18	17	10	7.4	11
13	9.4	9.0	12	7.5	11	40	20	17	16	30	7.0	13
14	9.4	9.0	12	*6.5	10	32	17	21	21	15	8.0	9.6
15	9.4	13	13	8	9.5	45	16	98	16	11	7.4	8.7
16	12	23	12	7.5	11	25	18	72	13	9.8	7.2	8.6
17	11	15	12	7	11	19	20	31	*12	9.0	6.6	8.0
18	10	13	*12	7	11	17	*22	24	10	8.6	6.4	7.5
19	9.8	12	14	8	10	*17	24	20	9.6	8.0	6.3	7.4
20	9.8	12	12	9	11	16	27	19	9.0	7.6	6.2	7.6
21	10	21	13	14	11	22	27	16	8.2	11	6.2	8.0
22	*10	20	13	45	*11	43	23	*31	10	40	*6.0	8.1
23	9.8	14	14	25	11	40	24	25	47	17	5.9	7.6
24	9.4	14	16	18	13	33	32	21	18	*9.8	6.6	7.4
25	9.4	13	15	15	20	22	66	17	14	8.6	6.6	*7.4
26	9.6	12	13	12	40	18	*79	20	16	8.4	6.3	7.0
27	9.8	13	13	12	20	17	47	16	25	8.0	6.0	7.0
28	9.6	11	13	15	17	18	36	14	26	7.5	6.2	7.0
29	9.6	11	10	13	-	17	25	13	72	7.0	7.0	7.2
30	9.6	13	8	11	--------	16	20	14	38	7.2	7.0	7.4
31	9.8	--------	10	13	--------	15	--------	17	--------	7.6	7.0	--------
Total	308.2	362.2	488	363.5	375.5	667	959	685	508.3	377.5	222.2	240.8
Mean	9.94	12.1	15.7	11.7	13.4	21.5	32.0	22.1	16.9	12.2	7.17	8.03
Cfsm	0.523	0.637	0.826	0.616	0.705	1.13	1.68	1.16	0.889	0.642	0.377	0.423
In.	0.60	0.71	0.95	0.71	0.73	1.30	1.87	1.34	0.99	0.74	0.43	0.47

Calendar year 1956:	Max	168	Min	5.0	Mean	16.2	Cfsm	0.853	In.	11.61
Water year 1956-57:	Max	110	Min	5.9	Mean	15.2	Cfsm	0.800	In.	10.84

Peak discharge (base, 100 cfs).--Apr. 6 (time unknown) 128 cfs (4.12 ft); May 15 (2 p.m.) 125 cfs (4.06 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 24 to Dec. 1, Dec. 13-17, Dec. 24 to Mar. 18. No gage-height record Dec. 13-17, Jan. 16-24, Feb. 25, 26, Mar. 31 to Apr. 8; discharge estimated on basis of weather records and records for stations on nearby streams.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 828.47 ft above mean sea level, datum of 1929.

Average discharge.--7 years, 146 cfs.

Extremes.--Maximum discharge during year, 512 cfs Apr. 6 (gage height, 3.03 ft); maximum gage height, 4.23 ft Jan. 22 (backwater from ice); minimum discharge, 62 cfs Oct. 13.
1950-57: Maximum discharge, 1,680 cfs Apr. 4, 1956 (gage height, 4.94 ft), from rating curve extended above 1,020 cfs by logarithmic plotting; minimum, that of Oct. 13, 1956.

Remarks.--Records good except those for periods of ice effect, which are fair. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 15-28)

Oct. 1 to Jan. 23, June 30 to Sept. 30		Jan. 24 to June 29	
1.5	55	1.6	79
2.0	162	2.0	172
2.5	310	3.0	500

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	110	97	110	100	100	*131	145	186	131	165	78	87
2	108	112	112	110	105	126	178	169	121	134	78	91
3	106	102	117	110	120	120	153	153	112	122	76	91
4	102	97	126	110	105	110	143	148	93	117	74	106
5	97	95	141	100	90	105	198	140	93	136	74	91
6	99	97	214	105	100	99	462	135	95	119	74	85
7	102	99	205	108	100	99	381	131	103	108	72	83
8	99	97	165	105	100	97	281	123	106	149	72	82
9	95	95	141	104	110	99	218	123	103	146	108	80
10	95	93	129	100	115	99	198	169	101	117	119	91
11	95	93	126	110	100	103	195	178	103	106	91	108
12	106	*97	120	100	110	318	195	164	133	108	83	106
13	64	95	120	95	105	297	172	158	126	176	82	112
14	67	93	120	90	106	239	161	169	153	129	97	95
15	69	114	117	95	105	304	153	416	131	110	87	97
16	83	170	119	100	101	216	*156	398	119	102	87	95
17	83	136	122	100	100	172	158	260	121	97	83	91
18	80	124	110	90	101	150	172	221	*126	93	82	89
19	78	119	*100	90	100	143	175	198	112	89	82	87
20	78	117	110	95	100	138	192	178	103	85	80	93
21	80	152	112	*100	100	150	192	161	97	95	82	97
22	*80	149	114	250	99	*210	175	*207	101	170	78	99
23	80	120	119	220	99	207	175	204	245	117	78	98
24	78	120	134	150	99	198	207	192	167	*99	83	94
25	76	117	129	120	145	172	409	164	140	91	83	*90
26	78	117	124	110	290	150	*496	172	145	91	*82	89
27	80	117	124	110	*192	138	384	156	178	89	78	89
28	80	117	122	125	161	140	318	143	175	85	80	91
29	93	115	120	110	-	143	254	135	360	83	83	91
30	99	115	110	100		140	210	135	280	83	87	91
31	87		120	105		135		145		82	83	
Total	2,727	3,381	3,952	3,517	3,258	4,948	6,906	5,631	4,173	3,493	2,576	2,789
Mean	88.0	113	127	113	116	160	230	182	139	113	83.1	93.0
Cfsm	0.800	1.03	1.15	1.03	1.05	1.45	2.09	1.65	1.26	1.03	0.755	0.845
In.	0.92	1.15	1.33	1.19	1.09	1.67	2.33	1.90	1.41	1.19	0.87	0.94

Calendar year 1956: Max 1,520 Min 64 Mean 143 Cfsm 1.30 In. 17.70
Water year 1956-57: Max 496 Min 64 Mean 130 Cfsm 1.18 In. 15.99

Peak discharge (base, 500 cfs).--Apr. 6 (8 p.m.) 512 cfs (3.03 ft); Apr. 26 (1 to 3 p.m.) 508 cfs (3.02 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23, 24, 29, 30, Dec. 12-14, 18, 19, Dec. 29 to Jan. 6, Jan. 8, Jan. 10 to Feb. 13, Feb. 15, 17, 19-21, Mar. 3-5.

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 town of West Branch.

Drainage area.--52 sq mi, approximately.

Records available.--February 1952 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 796 ft (by barometer).

Average discharge.--5 years, 58.7 cfs.

Extremes.--Maximum discharge during year, 388 cfs Apr. 6 (gage height, 5.81 ft); minimum, 26 cfs Aug. 5.

1952-57: Maximum discharge, 1,160 cfs Apr. 4, 1956 (gage height, 8.80 ft), from rating curve extended above 660 cfs by logarithmic plotting; minimum, 19 cfs Aug. 3, 1953.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Records of water temperatures for the water year 1957 are given in WSP 1520.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 18 to Apr. 7)

Oct. 1 to July 8		July 9 to Sept. 30	
2.6	31	2.6	25
3.0	60	3.0	52
4.0	162	4.0	149
5.0	285		
6.0	450		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44	40	47	35	47	65	59	67	53	63	29	33
2	46	40	46	37	52	60	73	62	51	54	29	38
3	43	42	46	37	60	55	65	59	46	48	29	40
4	42	39	52	37	52	53	61	56	4	48	28	45
5	39	40	62	38	43	51	127	58	45	58	27	40
6	37	43	99	40	50	50	a330	51	45	50	29	36
7	39	44	94	40	50	50	192	53	45	45	28	33
8	39	43	72	35	45	50	139	51	44	158	27	31
9	40	44	58	38	52	50	96	52	43	133	35	30
10	37	41	56	34	60	50	79	68	39	61	46	35
11	40	39	50	36	45	70	83	84	42	48	37	35
12	39	39	47	34	50	a120	87	82	44	43	34	42
13	42	*44	45	33	46	a250	78	72	46	81	33	50
14	40	41	45	31	43	a150	66	77	54	58	34	43
15	39	47	47	34	40	a120	64	277	54	46	33	38
16	40	79	45	*33	43	a90	*63	200	51	38	32	37
17	42	62	45	32	44	a75	66	116	*44	37	31	38
18	42	52	*42	32	44	*a68	68	92	43	35	30	34
19	42	49	43	35	40	62	72	80	42	32	29	32
20	39	48	43	40	43	62	80	72	42	32	30	32
21	39	60	44	60	47	75	77	66	39	32	29	35
22	41	62	45	200	50	96	71	*75	57	54	*29	36
23	42	55	48	100	45	93	75	77	119	50	29	35
24	*38	52	54	75	50	85	91	71	67	*40	29	35
25	38	48	52	60	70	75	182	62	55	35	29	*35
26	39	45	50	52	150	65	222	66	58	35	29	33
27	40	47	48	54	*85	61	144	58	75	35	29	32
28	41	43	50	60	70	61	118	56	86	32	29	32
29	37	45	45	56	-	59	94	54	186	32	30	32
30	39	46	35	47	--------	58	74	53	96	33	32	32
31	39	--------	40	53	--------	57	--------	54	--------	31	32	--------
Total	1,244	1,419	1,595	1,528	1,516	2,386	3,096	2,421	1,759	1,577	956	1,079
Mean	40.1	47.3	51.5	49.3	54.1	77.0	103	78.1	58.6	50.9	30.8	36.0
Cfsm	0.771	0.910	0.990	0.948	1.04	1.48	1.98	1.50	1.13	0.979	0.592	0.692
In.	0.89	1.02	1.14	1.09	1.08	1.71	2.21	1.73	1.26	1.13	0.68	0.77

Calendar year 1956:	Max 939	Min 28	Mean	60.4	Cfsm	1.16	In.	15.80
Water year 1956-57:	Max 330	Min 27	Mean	56.4	Cfsm	1.08	In.	14.71

Peak discharge (base, 300 cfs).--Jan. 22 (time unknown) about 330 cfs; Mar. 13 (time unknown) about 310 cfs; Apr. 6 (4 a.m.) 388 cfs (5.81 ft); May 15 (11:30 a.m. to 2 p.m.) 339 cfs (5.36 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Rifle River at Selkirk.

Note.--Stage-discharge relation affected by ice Nov. 23-30, Dec. 12-20, 22, Dec. 29 to Mar. 11.

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, approximately.

Records available.--October 1936 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Altitude of gage is 641 ft (by barometer). Jan. 13, 1937, to June 7, 1938, chain gage and June 8, 1938, to Jan. 10, 1939, wire-weight gage, at same site and datum.

Average discharge.--21 years, 308 cfs.

Extremes.--Maximum discharge during year, 1,470 cfs Apr. 26 (gage height, 6.00 ft); maximum gage height, 6.24 ft Mar. 15 (ice jam); minimum discharge, 120 cfs Dec. 30 (result of freezeup).

1936-57: Maximum discharge, 5,340 cfs Mar. 28, 1950 (gage height, 13.74 ft), from rating curve extended above 2,900 cfs; minimum, 87 cfs Dec. 2, 1946.

Remarks.--Records good except those for periods of ice effect, which are fair. Diurnal fluctuation during low flow caused by powerplant above station.

Revisions (water years).--WSP 1437: 1937(M), 1938, 1939-40(M).

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 11 to May 26)

Oct. 1 to Mar. 14		Mar. 15 to Aug. 10		Aug. 11 to Sept. 30	
1.6	138	1.4	146	1.4	134
2.5	320	2.5	350	2.5	332
4.0	715	6.0	1,410	3.0	452
5.0	1,040				

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	208	189	210	150	220	310	312	490	294	380	170	155
2	206	206	208	160	230	290	380	428	268	298	168	170
3	202	202	202	165	280	270	365	385	246	262	164	172
4	191	195	224	165	245	260	336	355	222	252	160	212
5	183	189	252	170	200	250	460	338	214	292	158	184
6	180	193	378	180	225	235	1,200	316	210	266	158	160
7	191	195	410	180	225	230	1,100	306	210	232	157	154
8	180	195	335	160	210	230	818	294	214	604	156	151
9	180	193	284	170	250	230	626	292	210	873	181	146
10	176	189	250	150	270	235	533	418	202	435	266	170
11	176	187	230	160	210	300	509	506	202	312	189	189
12	189	189	220	155	230	640	533	470	242	278	166	210
13	180	*193	200	150	210	900	478	425	236	422	158	250
14	159	195	200	140	200	760	438	435	300	344	172	201
15	174	214	220	*150	180	630	*402	909	274	270	168	182
16	181	315	210	150	200	506	400	1,030	238	232	160	176
17	193	289	180	140	200	395	402	722	242	212	157	170
18	185	243	*170	140	200	*342	420	572	270	196	151	164
19	183	224	180	150	190	330	432	500	234	187	148	160
20	181	220	190	170	200	314	470	452	210	180	144	174
21	183	262	195	250	220	328	482	408	*192	200	144	181
22	183	303	198	350	230	455	445	*412	196	368	142	179
23	*191	240	210	740	200	472	432	462	640	*322	*140	172
24	183	230	243	450	230	468	566	415	480	248	146	*170
25	178	220	246	340	300	405	1,020	358	334	212	151	166
26	181	210	230	250	640	355	1,380	372	304	200	144	161
27	183	210	222	240	450	322	1,100	348	392	196	139	158
28	185	210	224	250	*350	322	899	318	360	187	140	157
29	180	210	210	270	-	318	716	302	688	178	146	157
30	204	210	150	220	--------	312	581	300	648	180	150	157
31	195	--------	160	240	--------	304	--------	306	--------	178	154	--------
Total	5,744	6,520	7,041	6,755	6,995	11,718	18,235	13,644	8,972	8,996	4,947	5,208
Mean	185	217	227	218	250	378	608	440	299	290	160	174
Cfsm	0.578	0.678	0.709	0.681	0.781	1.18	1.90	1.38	0.934	0.906	0.500	0.544
In.	0.67	0.76	0.82	0.79	0.81	1.36	2.12	1.59	1.04	1.04	0.58	0.61

Calendar year 1956: Max 2,660 Min 140 Mean 296 Cfsm 0.925 In. 12.61
Water year 1956-57: Max 1,380 Min 139 Mean 287 Cfsm 0.897 In. 12.19

Peak discharge (base, 1,600 cfs).--No peak above base.
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 23 to Dec. 1, Dec. 10-20, Dec. 30 to Mar. 15.

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, 1¾ miles northwest of Kawkawlin, and 2½ miles upstream from mouth.

Drainage area.--101 sq mi.

Records available.--March 1951 to September 1957.

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.

Average discharge.--6 years, 57.8 cfs.

Extremes.--Maximum discharge during year, 415 cfs Apr. 8; maximum gage height, 5.28 ft July 13 (backwater from vegetal growth); no flow at times.
1951-57: Maximum discharge, 1,100 cfs Mar. 13, 1955; maximum gage height, 7.67 ft June 22, 1954; no flow for long periods each year.

Remarks.--Records good except those for periods of ice effect or no gage-height record, and those below 10 cfs, which are poor.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 6 to Aug. 18)

0.5	0	1.7	15
.6	.1	2.0	27
.7	.4	2.5	56
.8	.9	3.0	95
.9	1.5	4.0	210
1.1	3.3	5.0	385
1.3	6.0	6.0	665

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.1	0.3	3.5	3.5	70	65	152	57	45	3.1	0
2	.3	.1	.3	3.5	4	60	67	121	45	48	2.6	0
3	.3	.1	.4	3.5	4.5	50	62	95	36	51	2.1	0
4	.3	.1	.4	4	4	45	60	74	28	51	1.7	0
5	.2	.1	.6	4.5	3.5	35	107	57	24	49	1.4	0
6	.2	.1	.7	4	4.5	35	154	46	20	41	1.1	0
7	.2	.1	.8	4	5	30	228	36	16	32	.8	0
8	.2	*0	.8	4	6.5	25	410	28	14	185	.6	0
9	.1	0	.7	*4	45	25	349	25	12	98	.4	0
10	**.1	0	.5	3.5	35	25	260	25	11	94	.3	0
11	.1	0	.4	3	45	25	206	26	10	276	.3	.1
12	.1	0	*.4	3	40	25	162	26	9.8	331	.2	.2
13	.1	0	.4	3	35	25	132	25	8.0	319	.2	.8
14	.1	0	.4	2.5	*30	30	113	33	7.2	244	.2	.6
15	.1	0	.4	2.5	25	50	103	59	6.2	178	.1	.6
16	.1	.1	.4	2.5	20	75	91	71	5.2	128	.1	*1.6
17	.1	.1	.6	2.5	20	100	*80	*80	4.3	96	.1	1.6
18	.1	.1	.5	2.5	15	90	70	154	3.7	73	.1	1.6
19	.1	.1	.5	2	15	80	60	187	*3.0	*57	0	1.8
20	.1	.1	.5	2	15	69	54	180	2.5	43	0	6
21	.1	.4	.5	2	15	84	49	175	2.1	30	*0	8
22	.1	.3	1.5	4.5	15	76	45	192	1.9	22	0	6.5
23	.1	.4	3.5	7	15	69	43	196	2.8	17	0	5.5
24	.1	.4	4.5	4	15	81	45	178	3.0	13	0	4.6
25	.1	.4	5.5	3.5	135	112	51	143	3.1	11	0	3.8
26	.1	.4	5	3	120	123	56	148	3.2	9.0	0	3.0
27	.1	.4	5	3	90	*116	128	121	5.0	7.8	0	2.4
28	.1	.4	4.5	3.5	80	103	227	97	110	6.4	0	2.2
29	.1	.4	4	3.5	-	87	225	81	56	5.4	0	2.6
30	.1	.3	4	4	--------	76	190	75	37	4.5	0	2.9
31	.1	--------	4	3.5	--------	68	--------	68	--------	3.8	0	--------
Total	4.2	5.0	52.0	105.5	860.5	1,964	3,892	2,974	547.0	2,568.9	15.4	56.4
Mean	0.14	0.17	1.68	3.40	30.7	63.4	130	95.9	18.2	82.9	0.50	1.88
Cfsm	0.0014	0.0017	0.017	0.034	0.304	0.628	1.29	0.950	0.180	0.821	0.0050	0.019
In.	0.002	0.002	0.02	0.04	0.32	0.72	1.43	1.10	0.20	0.95	0.006	0.02

Calendar year 1956: Max 800 Min 0 Mean 52.5 Cfsm 0.520 In. 7.06
Water year 1956-57: Max 410 Min 0 Mean 35.7 Cfsm 0.353 In. 4.81

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Dec. 8 to Mar. 18 (no gage-height record Feb. 27 to Mar. 11). No gage-height record Sept. 17-23; discharge estimated on basis of weather records and records for stations on nearby streams.

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 milldam which is just upstream from South Branch Shiawassee River.

Drainage area.--368 sq mi.

Records available.--October 1947 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Wire-weight gage and crest-stage indicator; gage read twice daily. Datum of gage is 811.54 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--10 years, 299 cfs.

Extremes.--Maximum discharge during year, 1,410 cfs July 15; maximum gage height, 10.21 ft July 14, 15; minimum discharge observed, 29 cfs Aug. 12; minimum gage height observed, 4.01 ft June 22.

1947-57: Maximum discharge, 2,860 cfs May 13, 1948; maximum gage height, 12.58 ft May 15, 1956; minimum discharge observed, 25 cfs Sept. 4, 1956; minimum gage height, 3.90 ft Sept. 26, 1955.

Remarks.--Records good except those for periods of ice effect, which are fair. Low flow slightly regulated at times by mills above station.

Revisions.--WSP 1144: Drainage area.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 10, June 13 to Sept. 25)

3.7	25	5.0	205
3.8	32	7.0	584
4.0	52	9.0	1,150
4.5	121	10.0	1,530

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	98	139	120	180	345	226	571	276	123	278	86
2	74	89	140	110	180	317	260	504	287	123	231	89
3	77	89	142	110	170	308	289	463	278	110	207	82
4	84	83	147	100	170	290	289	429	251	96	152	98
5	84	82	151	100	170	267	345	355	222	113	123	93
6	*84	87	151	90	170	254	448	265	202	144	113	84
7	82	90	134	85	170	244	518	249	180	231	108	87
8	71	96	127	85	198	233	556	240	166	276	93	86
9	75	92	124	80	262	233	518	231	168	534	93	76
10	87	*89	131	*80	308	240	459	280	144	793	82	93
11	80	87	127	80	326	258	412	325	149	832	65	92
12	83	84	134	85	347	319	387	357	146	922	31	92
13	77	79	134	85	357	379	*370	334	147	1,160	35	90
14	77	82	124	85	343	391	349	312	198	1,390	57	93
15	75	87	*123	90	272	353	326	341	210	1,390	76	84
16	84	98	134	90	256	372	319	341	181	1,250	72	77
17	77	86	144	90	240	400	301	310	154	1,070	86	90
18	79	83	131	90	230	395	254	*349	154	907	75	99
19	84	83	131	90	220	414	229	602	116	708	71	*96
20	84	92	137	100	*183	440	212	802	70	546	70	84
21	75	99	157	110	171	421	195	1,130	43	459	66	92
22	76	115	181	120	174	402	168	1,160	41	431	69	93
23	77	151	195	140	191	*385	188	1,040	116	457	65	83
24	86	127	178	160	205	343	236	895	126	444	84	87
25	83	137	178	170	231	280	349	763	*132	425	90	86
26	94	134	174	180	425	251	546	700	129	389	*76	89
27	87	118	198	190	406	258	710	645	123	287	84	86
28	79	131	170	190	395	251	814	550	132	247	84	89
29	76	140	150	190	-	247	826	419	156	*256	100	89
30	89	147	140	180	--------	247	725	296	166	303	99	75
31	90	--------	130	180	--------	247	--------	296	--------	305	89	--------
Total	2,500	3,055	4,556	3,655	6,950	9,784	11,824	15,554	4,863	16,721	3,024	2,640
Mean	80.6	102	147	118	248	316	394	502	162	539	97.5	88.0
Cfsm	0.219	0.277	0.399	0.321	0.674	0.859	1.07	1.36	0.440	1.46	0.265	0.239
In.	0.25	0.31	0.46	0.37	0.70	0.99	1.19	1.57	0.49	1.69	0.31	0.27

Calendar year 1956: Max 2,780 Min 26 Mean 337 Cfsm 0.916 In. 12.49
Water year 1956-57: Max 1,390 Min 31 Mean 233 Cfsm 0.633 In. 8.60

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 28 to Feb. 7, Feb. 17-19.

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 north of Owosso.

Drainage area.--538 sq mi.

Records available.--March 1931 to September 1957. Monthly discharge only for some periods, published in WSP 1307. Gage-height records for flood seasons collected in this vicinity 1910-28 are contained in reports of U. S. 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 5.46 ft higher.

Average discharge.--26 years, 331 cfs.

Extremes.--Maximum discharge during year, 2,550 cfs July 12 (gage height, 6.82 ft); minimum, 46 cfs Dec. 11 (gage height, 1.81 ft).

1931-57: 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 or no gage-height record, which are fair. Flow regulated below about 800 cfs by powerplant at Shiawasseetown prior to February 1953.

Revisions (water years).--WSP 1337: 1932, 1934, 1936-38, 1944.

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 17 to Sept. 30)

Oct. 1-25		Oct. 26 to Sept. 30			
2.0	70	1.9	61	4.0	810
2.2	115	2.0	81	6.0	2,000
		2.5	220	7.0	2,850
		3.0	385		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	98	100	169	140	260	604	340	940	360	190	340	97
2	102	110	178	140	260	508	378	696	382	*172	312	122
3	98	110	175	140	250	428	410	616	350	166	265	208
4	92	105	157	140	250	399	440	564	315	157	244	77
5	95	100	163	140	250	*392	616	512	280	148	211	79
6	*95	100	172	140	250	388	*930	425	256	145	175	90
7	95	100	169	130	250	343	880	322	217	217	160	102
8	92	105	*163	130	300	318	835	312	202	720	140	104
9	88	110	163	120	400	298	765	284	208	1,120	130	107
10	86	110	157	120	600	280	678	536	196	835	120	112
11	84	105	138	120	500	262	600	1,020	172	1,400	120	109
12	84	100	134	*120	450	448	544	1,040	178	2,520	120	117
13	88	100	136	120	420	564	500	820	187	2,290	110	122
14	92	100	130	120	420	580	476	660	208	1,880	110	122
15	90	*109	169	120	*420	564	452	900	230	1,720	110	130
16	88	104	190	120	380	548	420	785	230	1,580	105	122
17	84	102	172	130	360	512	406	600	220	1,440	105	112
18	82	99	137	130	350	516	392	*592	210	1,240	100	104
19	84	102	172	140	320	532	343	1,200	200	955	100	*109
20	90	95	166	150	300	588	304	2,240	190	840	90	114
21	90	104	169	160	280	678	287	1,610	180	608	90	114
22	92	112	178	170	262	660	259	1,520	180	600	90	114
23	92	142	190	190	265	584	274	1,450	180	1,000	90	117
24	84	166	190	230	259	528	315	1,320	180	700	107	109
25	80	155	200	240	419	452	589	1,010	180	520	102	104
26	83	175	210	250	725	378	966	976	180	450	*102	104
27	86	166	210	260	795	360	1,170	835	180	400	102	102
28	90	166	170	270	688	357	1,520	740	180	350	110	102
29	90	184	150	270	-	343	1,260	604	190	*304	120	102
30	90	175	140	270	--------	329	1,120	480	200	304	114	102
31	95	--------	140	270	--------	336	--------	382	--------	340	95	--------
Total	2,779	3,611	5,157	5,190	10,683	14,077	18,469	25,991	6,621	25,311	4,289	3,329
Mean	90.3	120	166	167	382	454	616	838	221	816	138	111
Cfsm	0.168	0.223	0.309	0.310	0.710	0.844	1.14	1.56	0.411	1.52	0.257	0.206
In.	0.19	0.25	0.36	0.36	0.74	0.97	1.28	1.80	0.46	1.75	0.30	0.23

Calendar year 1956: Max 3,800 Min 80 Mean 459 Cfsm 0.853 In. 11.60
Water year 1956-57: Max 2,520 Min 77 Mean 344 Cfsm 0.639 In. 8.69

Peak discharge (base, 1,500 cfs).--Apr. 27 (9 to 10 p.m.) 1,610 cfs (5.44 ft); May 20 (7 a.m.) 2,490 cfs (6.71 ft); July 12 (7 to 11 a.m.) 2,550 cfs (6.82 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 12 to Feb. 21. No gage-height record Oct. 20, 21, Oct. 31 to Nov. 14, Dec. 23 to Jan. 11, Feb. 12-14, June 15 to July 1, July 22-28, Aug. 7-21; discharge estimated on basis of recorded range in stage, weather records, and records for stations at Byron and near Fergus.

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.--October 1939 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Wire-weight gage read twice daily. Datum of gage is 587.80 ft above mean sea level, datum of 1929.

Average discharge.--18 years, 448 cfs.

Extremes.--Maximum discharge during year, 5,250 cfs July 12 (gage height, 12.1 ft); minimum, 86 cfs Oct. 13, 14, 15; minimum gage height, 4.09 ft Sept. 5.

1939-57: Maximum discharge, 7,500 cfs Apr. 6, 1947 (includes overflow bypassing gage); maximum gage height, 13.3 ft May 9 or 10, 1956, from graph based on gage readings; minimum discharge observed, 29 cfs Aug. 31, 1946 (gage height, 3.10 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Some regulation at low stages by powerplant above Owosso prior to February 1953.

Revisions (water years).--WSP 1337: 1940(M), 1941-42, 1943(M), 1944, 1945(M), 1946, 1947(M), 1948, 1950.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 7 to Nov. 2)

Oct. 1 to Feb. 23				Feb. 24 to Sept. 30			
4.2	80	6.0	310	4.1	95	9.0	1,320
4.5	104	7.0	520	5.0	187	11.0	2,980
5.0	159	8.0	830	6.0	368	11.5	3,650
				8.0	890	12.0	4,900

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	115	105	189	160	329	800	486	1,050	537	253	377	a110
2	112	111	186	159	321	716	627	875	522	193	364	a110
3	107	109	192	160	318	622	637	693	503	a190	333	a150
4	101	121	193	160	308	554	624	672	474	a180	286	a220
5	100	127	203	160	314	587	767	627	431	a180	246	95
6	97	136	203	160	301	564	1,310	557	390	a180	213	96
7	98	*132	203	150	303	510	1,620	441	350	184	187	101
8	98	a130	*197	150	297	458	944	402	325	1,970	174	108
9	a95	a130	201	140	560	446	908	381	309	2,020	159	115
10	a92	127	190	140	800	436	839	866	278	958	151	120
11	91	136	172	140	600	450	758	1,620	256	2,330	147	127
12	89	151	154	140	510	627	685	1,810	235	4,250	144	125
13	86	139	154	140	444	688	640	1,140	235	3,150	134	133
14	86	134	166	140	450	688	622	938	290	2,420	128	129
15	86	127	201	150	450	a685	597	*1,050	282	1,920	127	126
16	88	118	218	150	450	*685	557	1,060	327	1,770	126	135
17	88	125	230	150	420	600	527	764	305	1,500	124	*127
18	88	135	222	160	400	570	515	650	315	1,230	120	119
19	a92	141	203	160	386	642	498	740	290	1,050	115	117
20	96	134	217	160	348	702	460	2,880	278	794	117	125
21	a92	175	211	170	327	776	418	2,580	265	622	111	138
22	*89	159	220	200	330	905	372	1,870	247	710	*104	137
23	93	150	228	250	340	836	381	1,780	a245	1,530	101	129
24	96	138	225	280	400	722	*607	1,660	*244	954	100	126
25	89	194	234	*300	500	607	812	1,710	a245	*722	115	121
26	87	194	243	310	800	562	982	1,090	a240	607	117	117
27	92	206	249	320	1,030	537	1,180	1,010	a240	532	118	115
28	101	152	192	320	902	522	2,000	926	a240	477	116	113
29	104	168	169	330	-	498	1,480	794	a250	404	115	116
30	107	183	160	340	--------	489	1,200	652	a260	355	a130	113
31	105	--------	160	337	--------	472	--------	602	--------	364	a120	--------
Total	2,960	4,287	6,185	6,186	12,938	18,956	24,053	33,890	9,408	33,999	5,019	3,713
Mean	95.5	143	200	200	462	611	802	1,093	314	1,097	162	124
Cfsm	0.150	0.224	0.314	0.314	0.725	0.959	1.26	1.72	0.493	1.72	0.254	0.195
In.	0.17	0.25	0.36	0.36	0.76	1.11	1.40	1.98	0.55	1.98	0.29	0.22

Calendar year 1956: Max 4,850 Min 86 Mean 573 Cfsm 0.900 In. 12.25
Water year 1956-57: Max 4,250 Min 86 Mean 443 Cfsm 0.695 In. 9.43

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* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of 1 discharge measurement and records for stations at Owosso and at Byron.

Note.--Stage-discharge relation affected by ice Dec. 30 to Jan. 1, Jan. 3-29, Feb. 10, 11, 14-18, 22-26.

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 South Fork.

Drainage area.--89 sq mi, approximately.

Records available.--December 1948 to September 1957.

Gage.--Wire-weight gage and crest-stage indicator; gage read twice daily. Datum of gage is 591.21 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--8 years (1949-57), 68.0 cfs.

Extremes.--Maximum discharge during year, 1,390 cfs July 9 (gage height, 13.3 ft, from graph based on gage readings); maximum gage height, 13.5 ft Feb. 26 (ice jam); no flow at times.

1948-57: Maximum discharge, 2,900 cfs May 6, 1956 (gage height, 15.18 ft), from rating curve extended above 1,400 cfs by logarithmic plotting; no flow at times.

Remarks.--Records fair except those for periods of ice effect or no gage-height record and those below 5 cfs, which are poor.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 23, Apr. 7-26, July 9 to Sept. 30)

5.9	0	9.0	93
6.0	.2	9.5	144
6.1	.8	10.0	194
6.3	2.7	11.0	370
6.5	5.5	12.0	710
7.0	17	13.0	1,250
8.0	48	14.0	1,950

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.7	2.5	2.5	4	120	43	48	95	276	3.1	0.5
2	.4	.7	2.5	2	4	60	62	33	72	84	2.3	.7
3	.4	.8	2.5	2	3.5	40	72	24	37	58	1.8	.7
4	.3	.8	3	2	3.5	30	80	17	16	41	1.6	.6
5	.2	.8	3	1.5	3.5	22	154	14	14	23	1.4	.5
6	.1	.8	3	1.5	3.5	17	435	13	12	12	1.0	.4
7	.1	*.9	3	1.5	3.5	14	489	9.9	11	2.4	.7	.3
8	.1	.7	*3	1.5	4	13	324	7.9	9.4	810	.6	.1
9	.1	.8	3	1.5	30	12	184	7.1	8.6	1,260	.5	.1
10	*0	.7	3	1.5	60	11	142	12	7.5	766	.5	.3
11	0	.6	2.5	1.5	120	11	92	37	7.5	912	a.4	.4
12	0	.6	2.5	1.5	80	32	84	76	7.3	750	a.4	.7
13	0	.6	2.5	1.5	*60	74	63	89	6.6	606	a.3	1.2
14	0	.6	2.5	1.5	35	61	50	77	6.0	358	a.4	1.2
15	0	.7	2.5	1.5	25	51	44	70	5.9	227	a.3	1.7
16	0	.7	3	1.5	20	*54	39	*59	6.0	129	.2	2.1
17	0	.7	3	1.5	17	53	35	38	5.7	69	.1	*1.5
18	0	.7	3	1.5	15	42	32	38	11	41	.1	1.2
19	0	.8	2.5	1.5	12	37	28	102	11	32	.1	1.1
20	0	.9	2.5	1.5	10	36	26	203	9.4	19	.1	2.0
21	.1	1.3	3	2.5	9	41	24	150	8.1	15	0	4.5
22	.1	1.2	3.5	6	8	66	22	138	6.9	30	0	5.3
23	.1	1.2	4	8	7	78	20	164	8.8	89	*0	7.1
24	.1	2	4.5	8	5.5	66	*20	133	*6.6	55	0	7.1
25	.2	2	4.5	7	40	50	28	108	6.2	*36	0	3.9
26	.3	2	4.5	6	500	40	42	110	7.3	22	0	2.3
27	.4	2	4.5	6	450	35	134	86	9.4	13	0	1.4
28	.4	2.5	4.5	5	250	43	112	57	56	8.8	0	.9
29	.5	2.5	4	5	-	62	88	41	282	6.6	.1	.7
30	.5	2.5	3.5	4.5	--------	64	70	30	390	5.0	.1	.9
31	.6	--------	3	4.5	--------	55	--------	30	--------	3.8	.3	--------
Total	5.2	33.8	98.5	95.0	1,783.0	1,390	3,038	2,021.9	1,140.2	6,759.6	16.4	51.4
Mean	0.17	1.13	3.18	3.06	63.7	44.8	101	65.2	38.0	218	0.53	1.71
Cfsm	0.0019	0.013	0.036	0.034	0.716	0.503	1.13	0.733	0.427	2.45	0.0060	0.019
In.	0.002	0.01	0.04	0.04	0.75	0.58	1.27	0.84	0.48	2.82	0.007	0.02

Calendar year 1956: Max 1,800 Min 0 Mean 85.3 Cfsm 0.958 In. 13.02
Water year 1956-57: Max 1,260 Min 0 Mean 45.0 Cfsm 0.506 In. 6.86

Peak discharge (base, 700 cfs).--July 9 (7 a.m.) 1,390 cfs (13.3 ft).

* Discharge measurement or observation of no flow made on this day.

a No gage-height record; discharge estimated on basis of weather records and adjacent record.

Note.--Stage-discharge relation affected by ice Nov. 24 to Mar. 7 (no gage-height record Dec. 25-30, Jan. 5, 6).

Farmers Creek near Lapeer, Mich.

Location.--Lat 43°02', long 83°20', in sec. 6, T. 7 N., R. 10 E., 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.--October 1932 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder and concrete control. Datum of gage is 805.79 ft above mean sea level, datum of 1929. Prior to May 25, 1954, staff gage at same site and datum.

Average discharge.--25 years, 30.6 cfs.

Extremes.--Maximum discharge during year, 198 cfs May 21 (gage height, 16.72 ft); minimum, 0.3 cfs Mar. 10 (gage height, 14.87 ft), result of freezeup.

1932-57: 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. Prior to 1941, occasional regulation by dam above station.

Revisions (water years).--WSP 924: 1940. WSP 1084: 1942(M), 1943. WSP 1337: 1934-38, 1940(M), 1944(M), 1945, 1946(M), 1948-52(M).

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

15.0	1.8	15.6	30
15.1	3.8	16.0	74
15.2	6.8	16.5	158
15.4	16	17.0	260

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.2	8.8	12	17	20	69	33	75	37	16	14	14
2	8.4	9.2	12	14	17	54	34	60	39	14	12	14
3	9.2	9.6	13	13	16	44	34	50	39	11	11	12
4	8.8	9.2	14	10	16	33	38	40	35	9.6	10	10
5	8.4	*9.2	15	9.6	16	29	46	35	32	8.8	9.2	8.8
6	8.8	9.2	17	9.6	15	27	66	30	27	8.4	8.0	7.2
7	8.8	9.6	20	9.6	14	24	101	27	24	7.6	7.2	6.4
8	*8.8	9.6	24	10	14	23	101	25	22	12	6.4	5.8
9	8.4	9.2	24	10	24	19	80	23	20	19	5.8	5.5
10	8.0	8.8	22	*9.2	28	21	65	50	18	30	5.8	6.8
11	7.2	8.4	20	9.2	*46	22	57	96	18	35	5.2	9.6
12	7.2	8.8	*18	9.6	62	35	50	128	18	35	4.6	11
13	7.2	9.2	13	b10	50	53	46	130	18	42	4.3	11
14	6.8	9.2	12	b10	40	62	42	106	20	64	3.8	11
15	6.8	10	14	b10	35	61	39	94	22	106	4.0	10
16	6.8	12	16	b9	30	54	35	88	22	98	4.0	9.2
17	6.8	13	17	b9	27	51	34	83	21	65	3.8	9.2
18	6.8	14	16	8.0	25	46	33	68	22	46	3.6	8.0
19	6.8	14	12	7.6	b23	40	32	70	20	*34	3.6	*6.8
20	6.8	13	15	b8	b20	38	32	116	17	25	3.4	6.8
21	7.2	15	14	b9	b19	39	31	187	14	20	3.4	6.8
22	7.6	17	18	b16	18	42	30	174	12	37	3.2	6.8
23	8.0	16	22	24	18	*43	28	125	12	62	*3.2	7.2
24	8.0	16	27	31	18	43	*29	96	*12	92	3.8	6.8
25	8.0	14	28	38	28	40	40	86	12	94	5.2	6.4
26	8.0	14	27	39	59	39	54	73	11	62	6.1	5.8
27	8.0	13	26	38	91	37	70	61	10	44	6.1	5.5
28	8.4	13	24	34	96	36	80	54	12	33	6.1	5.2
29	8.4	12	20	30	-	36	90	47	14	25	7.6	5.2
30	8.8	12	18	24	--------	36	90	40	17	20	9.6	5.2
31	8.8	--------	19	21	--------	34	--------	35	--------	17	12	--------
Total	243.2	346.0	569	506.4	885	1,230	1,540	2,372	617	1,192.4	196.0	244.0
Mean	7.85	11.5	18.4	16.3	31.6	39.7	51.3	76.5	20.6	38.5	6.32	8.13
Cfsm	0.138	0.202	0.323	0.286	0.554	0.696	0.900	1.34	0.361	0.675	0.111	0.143
In.	0.16	0.23	0.37	0.33	0.58	0.80	1.00	1.55	0.40	0.78	0.13	0.16

Calendar year 1956:	Max 475	Min 5.5	Mean 39.1	Cfsm 0.686	In. 9.35
Water year 1956-57:	Max 187	Min 3.2	Mean 27.2	Cfsm 0.477	In. 6.49

Peak discharge (base, 160 cfs).--May 21 (1 to 7 p.m.) 198 cfs (16.72 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Dec. 1-11, Mar. 24, Apr. 27 to May 10; discharge estimated on basis of recorded range in stage and records for Flint River near Flint and Mill Creek near Abbottsford.

Holloway Reservoir near Otisville, Mich.

Location.--Lat 43°07'15", long 83°29'45", in NW¼ sec. 11, T. 8 N., R. 8 E., in gatehouse on left side of Holloway Dam on Flint River, 3½ miles southeast of Otisville.

Drainage area.--543 sq mi.

Records available.--March 1954 to September 1957.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929 (levels by city of Flint).

Extremes.--Maximum contents during year, 824,000,000 cu ft June 21 (elevation, 755.6 ft); minimum, 169,000,000 cu ft Oct. 24 (elevation, 744.5 ft).

1954-57: Maximum contents, 996,000,000 cu ft Mar. 8, 1956 (elevation, 757.4 ft); minimum, reservoir empty at times during October, November 1954, January, February 1955.

Remarks.--Records fair. Reservoir is formed by an earth-fill dam with concrete spillway completed in 1953. Capacity of reservoir, 1,256,000,000 cu ft at elevation 760.00 ft. The spillway section includes two 90-foot drum gates with minimum crest elevation of 751 ft, maximum of 755 ft, three 20-foot radial gates with sill elevation of 745 ft, and two sluices (each 4 by 6 ft), one on each side with valve controls. Entrance elevation of sluiceways is 724 ft. Reservoir is used to regulate flow for water supply and sewage dilution for city of Flint.

Cooperation.--Reservoir elevations furnished by city of Flint.

Month-end elevation and contents, water year October 1956 to September 1957

Date	Elevation (feet)†	Contents (millions of cubic feet)	Change in contents	
			Millions of cubic feet	Equivalent, cubic feet per second
Sept. 30	750.7	455	-	-
Oct. 31	744.7	175	-280	-105
Nov. 30	746.4	238	+63	+24.3
Dec. 31	750.6	449	+211	+78.8
Calendar year 1956	-	-	+24	+.8
Jan. 31	751.4	497	+48	+17.9
Feb. 28	751.9	530	+33	+13.6
Mar. 31	751.6	509	-21	-7.8
Apr. 30	755.4	806	+297	+115
May 31	755.2	788	-18	-6.7
June 30	755.1	779	-9	-3.5
July 31	755.0	770	-9	-3.4
Aug. 31	753.2	623	-147	-54.9
Sept. 30	752.0	537	-86	-33.2
Water year 1956-57	-	-	+82	+2.6

† Elevation at 12 p.m.

Flint River near Otisville, Mich.

Location.--Lat 43°06'40", long 83°31'10", in SE$\frac{1}{4}$ sec. 9, T. 8 N., R. 8 E., on left bank 20 ft downstream from bridge on State Highway 15, 1$\frac{1}{2}$ miles downstream from Holloway Reservoir, 3$\frac{1}{2}$ miles upstream from Powers-Cullen drain, and 3$\frac{3}{4}$ miles south of Otisville.

Drainage area.--547 sq mi.

Records available.--October 1952 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 721.39 ft above mean sea level, datum of 1929.

Average discharge.--5 years, 297 cfs (adjusted for storage since 1954).

Extremes.--Maximum discharge during year, 1,320 cfs May 23 (gage height, 8.68 ft); minimum, 24 cfs Nov. 13 (gage height, 2.38 ft).
1952-57: Maximum discharge, 4,500 cfs May 13, 1956 (gage height, 13.78 ft); minimum, 7.6 cfs Apr. 14, 1955 (gage height, 2.03 ft).

Remarks.--Records good. Flow regulated by Holloway Reservoir 1$\frac{1}{2}$ miles above station (see preceding page).

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-25, July 9-29)

2.5	37
3.0	116
9.0	1,400

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	120	60	81	60	169	621	358	941	272	234	84	127
2	137	60	81	60	158	653	386	895	396	220	86	127
3	160	62	81	60	152	577	413	732	442	190	86	129
4	202	62	81	60	146	474	476	631	402	179	100	129
5	232	*60	81	62	141	407	545	503	354	162	98	126
6	258	62	83	65	137	350	763	346	296	141	90	126
7	256	62	79	79	133	300	956	262	254	111	118	126
8	*254	62	71	90	133	256	1,040	234	209	165	133	126
9	266	62	71	*96	181	228	1,060	148	190	203	133	126
10	290	62	71	102	274	209	a950	404	154	211	133	126
11	288	64	73	100	*337	222	a900	903	144	230	133	126
12	288	65	73	100	365	306	a800	1,000	162	242	135	126
13	286	62	73	102	369	398	a700	1,100	194	254	141	124
14	282	71	73	98	350	472	a600	1,190	294	260	141	124
15	280	88	*73	96	304	524	a550	1,210	342	280	141	124
16	238	91	73	93	270	549	a480	1,190	369	284	139	124
17	141	91	73	90	236	535	a430	1,130	358	286	139	124
18	213	91	67	88	215	497	a390	1,060	379	250	139	124
19	274	91	56	81	198	478	a350	1,040	535	*217	137	*116
20	272	91	58	79	184	436	a330	1,110	666	164	135	112
21	268	95	58	70	173	426	a320	1,210	732	129	135	112
22	*264	95	59	90	164	421	a310	*1,260	690	162	133	112
23	260	95	59	158	158	438	290	1,310	612	258	*133	112
24	148	95	60	207	154	453	150	1,170	*501	373	133	116
25	40	95	60	248	198	459	120	807	373	396	131	118
26	58	96	60	260	358	423	135	780	320	365	131	118
27	76	96	60	252	518	388	*131	738	250	302	131	118
28	78	96	60	236	577	367	218	692	228	244	129	118
29	78	91	60	222	-	*375	520	522	215	205	129	116
30	71	81	60	200	--------	381	904	390	234	*177	127	116
31	59	--------	60	182	--------	371	--------	298	--------	137	129	--------
Total	6,137	2,354	2,128	3,786	6,752	12,994	15,575	25,206	10,567	7,031	3,882	3,648
Mean	198	78.5	68.6	122	241	419	519	813	352	227	125	122
(†)	-105	+24.3	+78.8	+17.9	+13.6	-7.8	+115	-6.7	-3.5	-3.4	-54.9	-33.2

Adjusted for change in contents in Holloway Reservoir

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean	93.0	103	147	140	255	411	634	806	348	224	70.1	88.8
Cfsm	0.170	0.188	0.269	0.256	0.466	0.751	1.16	1.47	0.636	0.410	0.128	0.162
In.	0.20	0.21	0.31	0.30	0.49	0.87	1.29	1.70	0.71	0.47	0.15	0.18

	Observed			Adjusted		
Calendar year 1956:	Max 4,380	Min 32	Mean 381	Mean 382	Cfsm 0.698	In. 9.51
Water year 1956-57:	Max 1,310	Min 40	Mean 274	Mean 277	Cfsm 0.506	In. 6.88

* Discharge measurement made on this day.

† Change in contents, equivalent in cubic feet per second, in Holloway Reservoir; furnished by city of Flint.

a No gage-height record; discharge estimated on basis of recorded range in stage and records for stations near Flint and near Fosters.

Swartz Creek near Holly, Mich.

Location.--Lat 42°49'40", long 83°37'40", in SW¼ sec. 15, T. 5 N., R. 7 E., on right bank 25 ft downstream from bridge on Elliott Road and 2½ miles north of Holly.

Drainage area.--11.9 sq mi.

Records available.--January 1956 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 905 ft (from topographic map).

Extremes.--Maximum discharge during year, 54 cfs July 13 (gage height, 3.02 ft); minimum, 1.1 cfs Sept. 30; minimum gage height, 1.57 ft Aug. 22.
1956-57: Maximum discharge, 77 cfs May 13, 1956 (gage height, 3.40 ft); minimum, that of Sept. 30, 1957; minimum gage height, 1.56 ft Jan. 30, 1956, result of freezeup.

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

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 11-15, Nov. 1-5)

1.55	1.2	2.0	9.0
1.6	1.8	2.5	30
1.8	4.7	3.0	55

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.7	3.3	4.2	5	5.6	12	9.6	23	8.4	3.7	3.9	2.8
2	2.0	3.4	4.3	4.5	4.8	11	12	19	8.4	3.3	3.6	2.7
3	2.3	3.3	4.3	4	4.8	11	12	15	7.6	3.0	3.3	2.4
4	2.3	3.3	4.5	4	4.5	9.0	12	13	6.8	2.8	3.0	2.3
5	2.3	*3.1	5.0	3.5	4.5	7.6	19	11	6.1	3.7	2.7	2.0
6	2.1	3.1	6.1	3.5	4.5	6.8	25	9.0	5.7	3.3	2.4	1.9
7	2.1	3.1	6.3	3.5	4.3	6.3	24	8.1	5.7	3.0	2.3	1.8
8	1.9	3.0	6.3	3.5	4.5	6.8	22	7.4	5.6	32	2.1	1.7
9	1.9	2.8	6.1	*3.5	12	6.1	19	7.0	5.2	38	2.1	1.5
10	1.7	2.8	5.7	4	14	6.1	17	13	4.8	34	2.1	1.8
11	1.5	2.8	5.6	4	11	7.1	16	21	4.8	35	2.0	2.0
12	1.5	2.8	*5.2	4	10	16	15	23	4.7	*39	1.9	2.0
13	1.5	2.8	5.0	4	8.4	17	13	21	4.7	53	1.8	*2.1
14	1.5	2.5	5.4	4	7.9	17	11	19	5.6	48	1.7	2.1
15	*1.6	3.1	4.8	4	7.5	17	10	a18	5.4	39	1.7	2.1
16	1.8	3.7	5.4	4	7.0	17	9.6	a16	5.2	30	1.7	2.1
17	1.9	3.9	5.4	4	6.5	15	9.0	a16	5.2	22	1.5	2.0
18	1.9	3.7	5.6	4	6	13	9.0	a17	4.8	17	1.5	1.9
19	2.0	3.7	5.7	4	6	14	8.7	a18	4.5	14	1.5	1.9
20	2.1	3.7	4.7	5	*6	15	8.7	a35	4.2	10	1.4	2.0
21	2.1	5.2	5.0	6	5.5	15	8.4	a48	3.7	8.7	1.4	2.0
22	2.3	5.6	7.0	8	5.2	14	7.9	a45	3.3	11	1.3	2.1
23	2.0	5.2	10	11	5.0	*13	8.4	a35	3.6	15	1.5	2.0
24	2.0	4.8	11	11	5.2	11	*14	a25	3.3	12	2.0	2.0
25	2.1	4.5	10	10	11	9.9	24	a22	3.3	9.0	2.4	1.9
26	2.4	4.7	9.3	9	18	9.3	28	a19	*3.1	7.4	*2.3	1.5
27	2.5	4.5	8.4	8	19	9.3	30	a17	3.0	6.5	2.0	1.5
28	2.7	4.3	7.9	7	15	9.0	34	a14	3.6	5.7	2.1	1.4
29	2.7	4.3	7.2	6.5	-	9.0	32	*12	4.5	5.2	2.7	1.3
30	2.7	4.2	6.5	6.1	-------	9.6	26	10	4.0	4.7	3.1	1.2
31	2.7	-------	5.6	5.9	-------	9.9	-------	9.0	-------	4.3	3.1	-------
Total	63.8	111.2	193.5	168.5	223.7	349.8	494.3	585.5	148.8	523.3	68.1	58.0
Mean	2.06	3.71	6.24	5.44	7.99	11.3	16.5	18.9	4.96	16.9	2.20	1.93
Cfsm	0.173	0.312	0.524	0.457	0.671	0.950	1.39	1.59	0.417	1.42	0.185	0.162
In.	0.20	0.35	0.60	0.53	0.70	1.09	1.54	1.83	0.47	1.64	0.21	0.18

Calendar year 1956:	Max 74	Min 1.5	Mean 10.4	Cfsm 0.874	In. 11.86
Water year 1956-57:	Max 53	Min 1.2	Mean 8.19	Cfsm 0.688	In. 9.34

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* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for Farmers Creek near Lapeer and Shiawassee River at Byron.
Note.--Stage-discharge relation affected by ice Jan. 1-29, Feb. 5, 6, 15, 17-21.

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.--September 1903 to March 1904 (gage heights only), August 1932 to September 1957. Gage-height records for flood seasons collected in this vicinity 1911-28, are contained in reports of U. S. 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.--25 years, 569 cfs (adjusted for storage since 1954).

Extremes.--Maximum discharge during year, 3,960 cfs May 20 (gage height, 8.53 ft); minimum, 79 cfs Oct. 28 (gage height, 2.49 ft).

1932-57: 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).--WSP 954: 1941. WSP 1337: 1933-34(M), 1935-37.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.5	81	5.0	1,070
3.0	185	7.0	2,580
3.5	338	9.0	4,430
4.0	530		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	148	121	145	140	302	1,070	630	1,710	767	356	210	195
2	238	127	145	143	279	1,050	808	1,410	780	324	174	188
3	221	117	156	150	269	950	736	1,080	758	286	165	195
4	238	125	154	143	260	770	902	950	726	269	163	188
5	272	*125	165	137	238	606	1,290	830	616	260	170	178
6	306	121	163	127	247	562	1,870	602	588	218	143	178
7	320	127	165	135	247	510	1,810	544	502	181	135	181
8	*316	115	159	b140	250	458	1,780	482	426	2,810	150	178
9	313	119	154	b140	1,110	422	1,650	396	378	2,230	165	176
10	334	117	148	b140	1,200	385	1,580	1,080	349	1,080	163	209
11	349	121	150	b140	819	455	1,510	2,020	289	2,140	165	183
12	345	129	145	*b140	710	792	1,390	2,570	276	3,440	167	176
13	345	119	139	b150	764	819	1,080	2,040	349	2,470	163	*185
14	342	111	135	b150	670	950	1,030	1,900	646	1,740	174	172
15	345	128	*165	b150	593	1,080	885	2,450	562	1,300	165	180
16	327	163	167	b150	544	1,150	780	2,130	534	1,190	167	192
17	243	143	163	b140	478	1,050	720	1,890	530	1,020	163	170
18	195	141	154	137	430	890	645	*1,740	566	700	163	167
19	293	148	129	133	381	848	570	2,350	640	620	163	167
20	316	141	152	133	*345	902	534	3,710	748	478	156	168
21	324	242	152	143	320	920	534	2,760	808	381	156	190
22	316	176	205	195	302	902	522	2,480	868	1,430	152	176
23	316	178	195	b300	292	890	548	2,330	1,010	1,580	*141	170
24	320	167	198	381	295	860	637	2,220	700	1,000	299	161
25	175	170	200	410	594	*824	944	1,660	*580	802	190	165
26	121	174	210	*446	1,050	797	1,160	1,390	392	742	172	163
27	93	161	247	442	1,150	604	1,290	1,250	410	650	163	161
28	101	163	216	430	1,080	665	1,720	1,140	445	575	200	159
29	127	161	227	403	-	665	1,540	1,010	434	401	214	156
30	125	152	120	381	--------	670	1,760	770	381	*327	181	159
31	125	--------	140	385	--------	655	--------	670	--------	286	188	--------
Total	7,949	4,302	5,163	6,734	15,219	24,171	32,855	49,564	17,058	31,286	5,340	5,286
Mean	256	143	167	217	544	780	1,095	1,599	569	1,009	172	176
(†)	-105	+24.3	+78.8	+17.9	+13.6	-7.8	+115	-6.7	-3.5	-3.4	-54.9	-33.2

Adjusted for change in contents in Holloway Reservoir

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean	151	167	246	235	558	772	1,210	1,592	566	1,003	117	143
Cfsm	0.163	0.180	0.265	0.254	0.602	0.833	1.31	1.72	0.611	1.09	0.126	0.154
In.	0.19	0.20	0.31	0.29	0.63	0.96	1.46	1.98	0.68	1.25	0.15	0.17

	Observed			Adjusted		
Calendar year 1956:	Max 7,830	Min 85	Mean 737	Mean 738	Cfsm 0.796	In. 10.84
Water year 1956-57:	Max 3,710	Min 93	Mean 561	Mean 564	Cfsm 0.608	In. 8.27

* Discharge measurement made on this day.

† Change in contents, equivalent in cubic feet per second, in Holloway Reservoir; furnished by city of Flint.

b Stage-discharge relation affected by ice.

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 side of bridge on Sheridan Road, 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.--October 1939 to September 1957. Monthly discharge only for some periods, published in WSP 1307. Gage-height records for flood seasons collected in this vicinity 1910-20, 1922-27, are contained in reports of U. S. Weather Bureau.

Gage.--Wire-weight gage read twice daily. Datum of gage is 582.22 ft above mean sea level, unadjusted (levels by U. S. Weather Bureau). Prior to August 1943, chain gage at same site and datum.

Average discharge.--18 years, 754 cfs.

Extremes.--Maximum discharge during year, 5,400 cfs July 9 (gage height, 17.0 ft); minimum, 120 cfs Oct. 29 (gage height, 4.15 ft).

1939-57: Maximum discharge, 19,000 cfs Apr. 7, 1947 (including flow bypassing gage); maximum gage height, 18.2 ft Mar. 7, 1956, from graph based on gage readings; 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, doubtful, or no gage-height record, which are fair. Some regulation by reservoirs above Flint.

Revisions (water years).--WSP 954: 1941. WSP 1337: 1940, 1942, 1943-44(M), 1945, 1946-47(M), 1948-50.

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 30 to Nov. 15)

Oct. 1 to Feb. 26		Feb. 27 to Sept. 30			
4.0	113	4.3	173	9.0	1,340
6.0	470	5.0	294	15.0	4,000
8.0	990	6.0	490	17.0	5,400
10.0	1,700				

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	208	139	197	170	400	1,140	713	1,880	a900	464	344	240
2	200	137	204	180	350	1,110	955	1,720	961	408	285	233
3	152	142	195	180	320	1,030	1,020	1,200	820	370	236	222
4	209	135	199	180	310	915	967	1,050	811	338	217	222
5	278	141	199	170	300	713	1,730	895	733	338	220	215
6	307	141	222	160	300	626	2,660	808	639	a300	212	208
7	322	*138	217	*150	300	587	2,720	738	600	a250	203	202
8	338	142	199	160	350	527	2,140	530	530	3,020	194	199
9	342	134	191	170	600	488	1,990	492	454	5,180	183	205
10	*342	134	*186	170	1,500	456	1,790	462	424	3,350	a200	220
11	353	130	190	170	1,200	444	1,710	1,700	396	2,000	a200	251
12	355	132	181	170	900	898	1,640	3,970	352	4,710	a200	240
13	355	134	188	170	*840	918	1,200	3,370	a400	4,210	a200	220
14	353	a130	199	170	800	1,010	1,060	2,450	a800	3,260	a200	207
15	357	a140	267	170	700	1,160	1,050	*2,640	a700	2,140	a210	205
16	342	a160	233	170	650	*1,290	862	3,070	a640	1,580	a200	220
17	338	a150	235	170	600	1,200	828	2,340	a640	1,260	a200	*212
18	267	a150	206	170	540	1,070	766	1,970	727	1,020	202	214
19	253	157	166	160	500	906	688	2,260	1,230	750	192	202
20	328	179	157	160	420	949	613	4,240	834	a600	194	205
21	332	181	173	180	380	1,160	585	4,140	817	a450	189	208
22	334	191	191	250	360	1,160	572	3,060	a1,050	a1,700	*187	219
23	322	182	231	350	350	1,060	568	2,900	a1,300	a1,800	179	224
24	317	160	242	450	350	967	699	2,710	*909	a1,300	215	212
25	315	152	256	500	450	*887	699	2,130	694	*1,040	382	203
26	272	213	256	520	900	867	a1,000	1,620	603	a900	247	202
27	138	254	265	540	1,400	884	*1,180	1,490	466	a800	208	197
28	125	227	274	520	1,300	853	a1,500	1,220	521	644	197	183
29	123	195	249	500	-	831	1,900	1,190	1,040	568	247	183
30	139	193	135	470		786	1,810	a1,000	657	426	254	191
31	141		170	420		741		a850		390	244	
Total	8,557	4,793	6,473	8,070	17,370	27,633	37,615	60,095	21,648	45,566	6,841	6,364
Mean	276	160	209	260	620	891	1,254	1,939	722	1,470	221	212
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956:	Max 9,100	Min 100	Mean 863	Cfsm -	In. -
Water year 1956-57:	Max 5,180	Min 123	Mean 688	Cfsm -	In. -

* Discharge measurement made on this day.

a Doubtful or no gage-height record; discharge estimated on basis of records for stations near Flint and near Otisville.

Note.--Stage-discharge relation affected by ice Dec. 31 to Feb. 28.

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 1957 (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, 11.78 ft July 13; minimum, 1.55 ft Nov. 16. 1948-57: 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.

Mean gage height, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.86	2.84	2.34	2.67	2.85	7.04	3.98	6.21	3.84	4.27	3.13	2.38
2	2.69	2.76	2.34	2.48	2.67	6.38	5.09	5.78	4.03	3.75	2.90	2.36
3	2.96	2.72	2.17	2.24	2.52	5.66	5.59	5.07	3.91	3.23	2.89	1.98
4	2.88	2.88	2.90	2.13	2.51	4.88	4.98	4.49	3.62	3.09	3.28	2.78
5	3.34	2.69	2.42	2.44	2.49	4.46	7.04	3.97	3.50	2.64	3.27	2.76
6	2.48	2.46	2.30	2.14	2.36	4.04	8.32	3.63	3.26	2.97	2.94	2.67
7	2.85	2.20	2.66	2.06	2.32	3.81	8.54	3.15	3.32	2.80	2.71	2.58
8	2.58	2.32	2.64	2.30	2.74	3.56	7.96	2.84	3.11	6.25	2.56	2.55
9	3.22	2.67	2.48	2.30	3.44	3.26	7.29	2.84	2.91	10.30	2.79	2.50
10	2.98	2.96	2.15	2.68	7.72	3.17	6.59	4.15	2.70	10.58	2.79	2.52
11	2.72	2.00	1.88	2.06	7.88	3.11	5.99	8.42	2.52	10.37	2.71	2.34
12	2.58	2.53	2.28	2.03	6.22	4.58	5.60	9.47	2.69	11.37	3.26	2.40
13	3.03	2.37	2.69	2.30	5.38	5.71	5.18	9.20	2.55	11.75	2.66	2.29
14	2.62	2.27	2.44	2.20	5.15	5.07	4.59	8.32	2.64	11.40	2.56	2.47
15	2.80	2.18	2.21	2.10	4.62	5.05	4.38	7.88	3.00	10.62	2.88	2.27
16	2.83	1.67	2.22	2.02	4.31	5.30	3.97	8.22	3.07	9.70	2.88	2.33
17	2.76	2.58	2.28	1.97	4.02	4.93	3.75	7.39	2.94	8.66	2.72	2.59
18	3.58	2.47	2.61	1.92	3.77	4.49	3.61	6.56	3.89	7.59	2.68	2.44
19	3.12	2.25	2.02	1.97	3.53	4.30	3.45	6.97	6.34	6.42	2.55	2.25
20	2.82	2.68	2.38	1.95	3.33	4.30	3.12	9.50	4.69	5.45	2.66	2.68
21	2.80	2.17	2.22	2.08	3.34	4.94	3.17	9.79	3.72	4.52	3.01	2.47
22	2.82	2.48	2.64	2.33	3.11	5.88	3.10	9.22	3.39	4.10	f2.56	2.48
23	2.84	2.79	2.45	3.09	3.05	5.56	2.93	8.54	3.76	7.90	(a)	2.47
24	3.87	2.16	2.48	3.67	2.99	4.96	3.68	8.00	4.41	8.26	(a)	2.45
25	2.60	2.44	2.66	3.55	4.35	4.70	4.47	7.38	3.51	6.33	(a)	2.35
26	2.09	3.05	2.46	3.38	8.38	4.46	5.94	6.34	3.10	4.95	f2.34	2.39
27	2.48	2.51	2.38	3.20	8.86	4.15	6.18	5.70	2.89	4.18	3.12	2.65
28	2.56	2.06	2.73	3.10	7.89	4.30	7.54	5.22	3.02	3.72	2.51	2.30
29	2.46	2.56	2.65	3.05	-	4.44	7.71	4.77	5.46	3.51	2.43	2.25
30	2.42	2.18	2.50	2.95	-------	4.24	6.66	4.31	5.27	3.22	2.57	2.00
31	2.62	-------	2.30	2.83	-------	4.12	-------	3.91	-------	3.27	2.42	-------

a No gage-height record.
f Fragmentary gage-height record.

East Branch Cass River near Cass City, Mich.

Location.--Lat 43°34'10", long 83°06'30", in NW¼ sec. 7, T. 13 W., R. 12 E., on left bank 1¾ miles downstream from bridge on State Highway 53, 3 miles upstream from confluence with North Branch, and 4 miles southeast of Cass City.

Drainage area.--251 sq mi.

Records available.--October 1948 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Altitude of gage is 715 ft (from river-profile map). Prior to Nov. 8, 1952, wire-weight gage at site 1¾ miles upstream at different datum.

Average discharge.--9 years, 147 cfs.

Extremes.--Maximum discharge during year, 1,330 cfs Apr. 7 (gage height, 6.75 ft); minimum, 0.8 cfs Aug. 23 (gage height, 1.76 ft).

1948-57: Maximum discharge, 4,940 cfs Mar. 28, 1950 (gage height, 23.07 ft, from graph based on gage readings, site and datum then in use); minimum, 0.2 cfs Sept. 20-23, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record and those below 5 cfs, which are poor.

Revisions (water years).--WSP 1337: 1949-50.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.7	6.9	7.8	11	14	250	73	266	53	73	6.0	2.2
2	3.8	6.9	7.5	10	14	150	104	126	54	39	5.7	3.6
3	4.2	6.9	7.5	9.5	13	120	158	90	48	22	5.4	3.9
4	4.2	6.9	7.5	9	12	80	118	74	40	17	4.8	3.3
5	4.6	6.9	8	9	12	65	504	62	35	56	4.5	2.5
6	4.8	*6.9	9	9	12	55	1,140	53	29	53	3.9	2.2
7	4.6	6.9	11	9	11	45	1,110	45	26	24	3.6	1.9
8	4.4	6.6	12	9	11	45	731	39	22	63	3.3	1.6
9	*4.2	6.6	12	8.5	20	40	339	34	18	316	3.3	1.5
10	4.4	6.6	11	*7	60	35	182	58	15	216	3.6	2.8
11	4.6	6.6	*10	7	110	32	149	406	14	117	3.3	3.9
12	4.4	6.9	9.5	7	*90	100	168	719	14	73	2.8	4.5
13	4.6	6.6	9	7	80	200	126	543	13	62	2.5	5.1
14	4.6	6.6	8.5	7	55	130	104	302	15	73	2.5	4.2
15	4.8	6.6	8	7	40	140	90	210	49	56	2.5	3.6
16	4.8	7.2	8.5	7	30	130	80	250	48	37	2.5	4.2
17	5.0	7.2	10	7	26	110	*73	190	29	26	2.5	3.9
18	5.0	7.2	10	7	22	90	66	130	23	18	1.9	*3.3
19	4.8	7.2	9.5	7	20	80	63	150	190	14	1.6	2.5
20	4.8	6.9	9	7	17	75	57	550	471	12	1.5	2.5
21	5.0	7.8	9	7.5	15	85	55	480	333	10	*1.0	3.6
22	5.6	9.5	9.5	10	14	150	49	350	128	12	.9	5.7
23	6.3	14	11	55	13	260	46	250	74	25	.9	8.0
24	6.3	10	13	45	14	200	157	208	77	30	1.2	7.2
25	6.3	8.4	11	22	70	150	914	164	*54	25	1.5	5.4
26	6.0	8.4	13	20	590	120	1,050	123	35	20	1.6	4.2
27	6.3	7.8	14	19	500	130	948	109	25	16	2.8	3.3
28	6.9	7.8	13	18	350	*135	1,040	89	32	15	1.9	3.0
29	6.9	7.8	11	17	-	135	895	72	86	13	1.9	2.8
30	6.9	7.8	10	16	--------	109	711	62	120	10	1.9	2.5
31	6.9	--------	12	15	--------	85	--------	54	--------	*7	1.9	--------
Total	159.7	226.4	311.8	405.5	2,235	3,531	11,300	6,258	2,170	1,550	85.2	108.9
Mean	5.15	7.55	10.1	13.1	79.8	114	377	202	72.3	50.0	2.75	3.63
Cfsm	0.021	0.030	0.040	0.052	0.318	0.454	1.50	0.805	0.288	0.199	0.011	0.014
In.	0.02	0.03	0.05	0.06	0.33	0.52	1.67	0.93	0.32	0.23	0.01	0.02

Calendar year 1956: Max 2,300 Min 3.0 Mean 149 Cfsm 0.594 In. 8.08
Water year 1956-57: Max 1,140 Min 0.9 Mean 77.6 Cfsm 0.309 In. 4.19

Peak discharge (base, 800 cfs).--Feb. 25 or 26 (time unknown) about 800 cfs; Apr. 7 (1:30 a.m.) 1,330 cfs (6.75 ft); Apr. 28 (7:30 a.m.) 1,080 cfs (6.12 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 4-11, Mar. 1-28, May 15-23, July 25-31; discharge estimated on basis of recorded range in stage, weather records, and records for Cass River at Cass City and Cass River at Vassar. Stage-discharge relation affected by ice Dec. 12 to Feb. 28 (no gage-height record Feb. 7-12, 26-28).

Cass River at Cass City, Mich.

Location.--Lat 43°35'10", long 83°10'35", in NE¼ sec. 4, T. 13 N., R. 11 E., on left bank 500 ft downstream from highway bridge, half a mile downstream from confluence of North Branch and East Branch, and 1 mile south of Cass City.

Drainage area.--370 sq mi, approximately.

Records available.--October 1947 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 697.92 ft above mean sea level, datum of 1929. Prior to Nov. 14, 1952, wire-weight gage at site 500 ft upstream at same datum.

Average discharge.--10 years, 231 cfs.

Extremes.--Maximum discharge during year, 1,710 cfs Apr. 7 (gage height, 8.60 ft); maximum gage height, 9.87 ft Feb. 26 (backwater from ice); minimum discharge, 2.3 cfs Aug. 23 (gage height, 4.49 ft).

1947-57: 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.

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

Revisions (water years).--WSP 1337: 1949-50.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

4.4	0.7	5.2	83
4.5	4.0	5.5	150
4.6	9.0	6.0	290
4.7	16	7.0	700
5.0	48	9.0	1,990

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	17	26	25	35	500	162	448	79	192	10	6.0
2	13	17	26	22	33	350	188	236	75	132	9.0	7.5
3	13	18	27	22	31	250	254	170	70	77	8.5	8.0
4	13	18	27	24	30	180	245	135	59	54	7.5	7.5
5	13	18	29	20	29	140	566	112	51	72	7.0	6.5
6	13	*18	32	21	28	120	1,370	93	44	89	6.5	5.5
7	13	18	37	21	26	100	1,590	79	42	62	6.0	4.5
8	12	18	42	21	26	100	1,230	68	38	115	6.0	4.0
9	*12	17	43	21	35	90	732	59	33	399	6.0	3.0
10	11	16	40	*17	120	80	427	87	31	346	6.5	6.5
11	10	17	*38	16	180	70	325	412	29	257	6.5	8.0
12	11	18	37	16	*170	232	332	730	28	178	6.5	9.0
13	11	18	37	16	130	350	278	632	25	135	6.0	12
14	11	18	35	16	95	284	254	407	27	130	6.5	10
15	11	19	32	16	80	297	206	431	42	103	6.5	10
16	11	20	33	16	70	294	172	520	56	77	7.0	11
17	11	20	35	16	60	260	*155	336	40	45	6.5	11
18	12	20	36	16	52	212	138	230	35	32	6.5	*10
19	10	20	34	16	47	185	128	275	126	25	6.5	8.5
20	12	19	33	17	41	165	118	962	427	22	5.5	9.0
21	12	25	33	18	35	168	110	992	346	20	*4.5	15
22	13	30	35	35	33	308	97	730	155	30	3.5	20
23	14	38	36	100	33	475	93	415	91	45	3.0	27
24	14	34	40	55	33	423	139	332	89	50	3.5	26
25	14	32	35	45	100	346	932	269	*72	40	4.0	22
26	15	32	38	50	1,000	281	1,200	212	53	31	4.5	18
27	15	27	42	50	900	227	1,350	188	45	28	5.0	14
28	15	26	37	45	800	*245	1,410	150	75	25	5.5	12
29	16	26	31	40	-	248	1,140	118	192	20	5.5	10
30	17	27	25	38	--------	236	908	97	245	15	5.5	9.0
31	17	--------	28	36	--------	190	--------	83	--------	*12	5.5	--------
Total	396	661	1,059	887	4,252	7,406	16,249	10,008	2,720	2,858	187.0	330.5
Mean	12.8	22.0	34.2	28.6	152	239	542	323	90.7	92.2	6.03	11.0
Cfsm	0.035	0.059	0.092	0.077	0.411	0.646	1.46	0.873	0.245	0.249	0.016	0.030
In.	0.04	0.07	0.11	0.09	0.43	0.74	1.63	1.01	0.27	0.29	0.02	0.03

Calendar year 1956: Max 3,230 Min 6.5 Mean 229 Cfsm 0.619 In. 8.43
Water year 1956-57: Max 1,590 Min 3.0 Mean 129 Cfsm 0.349 In. 4.73

Peak discharge (base, 1,000 cfs).--Feb. 26 (time unknown) about 1,400 cfs; Apr. 7 (4:30 to 6:30 a.m.) 1,710 cfs (8.60 ft); Apr. 28 (8 to 9 a.m.) 1,500 cfs (8.30 ft); May 20 (5 p.m.) 1,180 cfs (7.84 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 29 to Mar. 11. No gage-height record July 17-31; discharge estimated on basis of weather records and records for Cass River at Vassar and East Branch Cass River near Cass City.

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.--October 1948 to September 1957. Monthly discharge only for some periods, published in WSP 1307. Gage-height records for flood seasons collected in this vicinity 1910-28 are contained in reports of U. S. Weather Bureau.

Gage.--Wire-weight gage and crest-stage indicator above concrete dam; gage read twice daily. Datum of gage is 612.376 ft above mean sea level, datum of 1929 (levels by U. S. Weather Bureau).

Average discharge.--9 years, 448 cfs.

Extremes.--Maximum discharge during year, 2,560 cfs Apr. 8 (gage height, 8.40 ft); minimum, 27 cfs Aug. 8 (gage height, 3.17 ft).

1948-57: Maximum discharge, 11,300 cfs Mar. 28, 1950 (gage height, 16.60 ft); minimum observed, 15 cfs Oct. 10, 1955 (gage height, 3.14 ft).

A stage of 20.8 ft occurred on Mar. 20, 1948, from U. S. Weather Bureau records (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 or no gage-height record, which are fair. Some regulation by dam at Michigan Sugar Co. 10 miles upstream.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 7				Apr. 8 to Sept. 30			
3.2	20	5.0	560	3.1	20	4.0	194
3.4	47	8.0	2,280	3.4	56	5.0	560
3.7	102	9.0	2,980	3.7	114	8.0	2,280
4.0	177						

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	44	62	83	125	1,410	316	862	146	436	*79	40
2	44	49	64	72	120	1,080	420	520	151	326	77	38
3	41	53	68	72	115	472	412	283	164	246	70	42
4	41	55	72	74	105	544	512	197	131	227	48	38
5	41	55	76	70	100	324	1,070	203	138	126	38	38
6	41	*55	89	70	95	230	1,820	203	148	294	36	38
7	38	58	109	72	90	240	2,420	206	194	176	31	38
8	36	58	114	70	90	216	2,020	209	121	206	28	40
9	*35	61	138	70	90	194	1,480	203	103	644	29	38
10	35	61	110	*57	160	142	996	273	105	655	30	a42
11	38	67	*96	52	*420	128	705	1,070	107	532	31	45
12	40	63	89	52	340	480	660	1,020	a105	294	30	45
13	40	63	52	52	240	268	650	1,030	103	650	30	46
14	40	61	70	52	190	304	565	1,060	112	194	34	46
15	40	63	76	52	160	464	436	680	114	75	38	52
16	41	65	85	54	170	665	472	840	112	243	38	55
17	42	63	98	54	150	368	a370	765	a102	82	37	55
18	46	63	98	54	140	456	*333	690	200	151	36	*55
19	42	63	102	54	120	452	a340	a660	750	156	36	a53
20	40	63	111	56	110	412	420	925	504	143	35	53
21	40	74	100	60	110	272	182	1,700	625	77	36	73
22	40	85	98	70	110	340	227	*1,200	512	77	*32	92
23	38	74	109	85	110	810	250	1,010	348	86	32	90
24	32	58	125	115	110	785	253	820	*250	148	36	86
25	31	67	a135	200	200	650	524	750	a210	88	38	82
26	32	77	118	175	1,700	528	1,490	650	200	88	36	75
27	40	61	128	165	2,110	*428	1,700	528	197	88	34	66
28	40	61	128	160	1,680	300	1,960	392	337	86	35	61
29	38	63	109	150	-	508	1,710	330	1,020	82	36	64
30	40	60	87	140	--------	472	1,340	400	615	79	37	59
31	42	--------	92	135	--------	320	--------	290	--------	79	38	--------
Total	1,216	1,863	3,008	2,697	9,260	14,262	26,053	19,969	7,924	6,834	1,201	1,645
Mean	39.2	62.1	97.0	87.0	331	460	868	644	264	220	38.7	54.8
Cfsm	0.056	0.089	0.139	0.124	0.473	0.657	1.24	0.920	0.377	0.314	0.055	0.078
In.	0.06	0.10	0.16	0.14	0.49	0.76	1.38	1.06	0.42	0.36	0.06	0.09

Calendar year 1956 :	Max	6,280	Min	31	Mean	439	Cfsm	0.627	In. 8.53
Water year 1956-57 :	Max	2,420	Min	28	Mean	263	Cfsm	0.376	In. 5.08

Peak discharge (base, 3,000 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for stations at Frankenmuth and at Cass City.

Note.--Stage-discharge relation affected by ice Nov. 30 to Dec. 2, Dec. 10, 14, 15, 31, Jan. 12 to Feb. 26 (no gage-height record Jan. 23, Jan. 25 to Feb. 5, Feb. 19).

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 1957. Monthly discharge only for some periods, published in WSP 1307.

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 18 to Sept. 11, 1935, wire-weight gage and Sept. 12, 1935, to Sept. 30, 1936, and June 20, 1939, to Sept. 30, 1949, water-stage recorder, at site half a mile downstream at datum 0.04 ft higher than present datum.

Average discharge.--19 years (1935-36, 1939-57), 493 cfs.

Extremes.--Maximum discharge during year, 3,400 cfs Feb. 27 (gage height, 13.34 ft); maximum gage height, 13.68 ft Feb. 26 (ice jam); minimum discharge, 35 cfs Oct. 26 (gage height, 3.21 ft).

1908-9, 1935-36, 1939-57: Maximum discharge, 17,700 cfs Mar. 18, 1942 (gage height, 20.88 ft); maximum gage height, 22.44 ft Feb. 17, 1954 (ice jam); minimum daily discharge, about 1.5 cfs Aug. 6, 1944.

Remarks.--Records good except those for periods of ice effect, which are fair. Occasional diurnal fluctuation at low and medium flows caused by mill above station. Prior to 1950, regulation at low and medium flows by mill above station.

Revisions (water years).--WSP 1307: 1936(M), 1940(M).

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 26				Feb. 27 to Sept 30			
3.2	34	5.0	310	3.2	40	6.0	555
3.5	62	7.0	810	3.8	104	10.0	1,800
4.0	127			4.5	216	14.0	3,800

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	51	47	70	90	145	1,770	336	1,240	214	661	100	52
2	51	48	73	82	140	1,490	570	650	392	452	96	51
3	51	52	74	80	135	822	578	704	245	330	90	53
4	48	53	78	80	130	587	572	256	166	300	77	52
5	47	55	81	76	120	528	1,140	314	175	205	57	50
6	45	*54	94	75	115	395	2,020	247	184	334	53	49
7	44	55	112	75	115	321	2,880	245	225	219	56	48
8	40	58	122	75	110	306	2,430	238	200	234	48	48
9	*41	60	121	75	150	290	1,710	229	130	692	47	48
10	40	61	*106	*70	450	221	1,240	392	127	745	47	58
11	41	62	103	64	550	191	922	1,170	130	703	47	67
12	44	63	112	62	450	650	853	1,880	140	450	46	67
13	44	62	80	66	380	606	802	1,760	144	612	42	68
14	45	61	95	66	280	558	715	1,380	182	286	41	64
15	45	63	100	66	220	683	412	1,030	162	169	44	66
16	45	64	110	66	250	1,040	558	1,100	144	322	48	69
17	46	67	116	68	210	470	448	*1,060	117	158	48	69
18	46	63	127	70	190	545	402	880	402	162	47	*68
19	44	62	83	70	170	558	418	835	1,380	191	45	67
20	43	62	133	73	150	535	485	1,450	850	175	43	67
21	43	73	120	78	140	442	241	2,150	748	122	43	79
22	43	83	120	85	140	490	272	1,730	601	124	*42	88
23	43	83	137	100	130	943	294	1,270	703	178	42	103
24	41	75	161	140	130	952	300	1,040	452	184	47	96
25	38	74	173	250	170	802	442	793	*325	144	51	88
26	36	84	162	210	800	655	1,550	775	294	127	50	85
27	38	71	148	200	3,290	548	1,720	365	292	116	47	78
28	40	70	169	190	2,420	382	2,060	482	501	109	43	70
29	41	70	143	170	-	*604	2,010	400	1,460	103	48	73
30	43	70	81	160	--------	580	1,470	428	1,150	102	49	64
31	44	--------	95	155	--------	486	--------	327	--------	*103	52	--------
Total	1,351	1,925	3,499	3,187	11,680	19,450	29,850	26,820	12,235	8,812	1,636	2,005
Mean	43.6	64.2	113	103	417	627	995	865	408	284	52.8	66.8
Cfsm	0.051	0.076	0.133	0.121	0.492	0.739	1.17	1.02	0.481	0.335	0.062	0.079
In.	0.06	0.08	0.15	0.14	0.51	0.85	1.30	1.18	0.54	0.39	0.07	0.09

Calendar year 1956: Max 7,250 Min 36 Mean 545 Cfsm 0.643 In. 8.74
Water year 1956-57: Max 3,290 Min 36 Mean 335 Cfsm 0.395 In. 5.36

Peak discharge (base, 3,500 cfs).--No peak above base.
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 28 to Dec. 1, Dec. 14, 15, Dec. 31 to Feb. 26.

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 at Beaverton, and 2 miles upstream from Venison Creek.

Drainage area.--487 sq mi.

Records available.--July 1948 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 683.27 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--9 years, 375 cfs.

Extremes.--Maximum discharge during year, 7,680 cfs July 9 (gage height, 12.95 ft); minimum, 7.4 cfs Dec. 19 (gage height, 0.78 ft); minimum daily, 81 cfs Sept. 28.
1948-57: Maximum discharge, that of July 9, 1957; minimum, 6.5 cfs Jan. 13, 1949 (gage height, 0.78 ft); minimum daily, 25 cfs Aug. 12, 1951.

Remarks.--Records good except those for periods of ice effect, which are fair. Regulation at all stages by powerplant 1 mile upstream.

Revisions (water years).--WSP 1307: 1948(M).

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.8	80	6.0	1,600
2.5	210	8.0	2,900
3.0	335	13.0	7,730
4.0	680		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	180	217	304	225	281	436	322	409	237	714	233	228
2	267	206	198	141	206	283	350	356	286	391	243	216
3	171	227	288	188	258	217	374	358	230	263	225	263
4	228	189	225	204	237	324	432	356	184	389	200	202
5	187	179	298	221	b200	170	708	330	247	311	190	*191
6	172	290	378	226	220	158	1,010	328	212	435	169	218
7	190	206	455	214	303	200	1,070	277	178	226	262	197
8	224	209	316	*b200	278	164	787	175	197	3,610	188	188
9	163	*222	277	b175	327	345	655	199	159	6,660	92	173
10	239	231	210	b190	465	367	580	375	223	2,610	283	192
11	*182	164	235	b190	385	288	456	251	185	1,960	221	203
12	176	249	235	187	249	368	463	439	156	2,690	150	277
13	158	180	*217	b190	*276	734	421	460	212	2,540	216	286
14	188	227	181	b190	230	678	347	400	334	1,580	259	194
15	173	300	264	b190	b200	508	*315	532	561	880	205	286
16	227	390	243	b190	b200	436	349	736	465	741	183	176
17	190	568	273	b190	208	490	286	*684	*266	*513	160	203
18	246	374	212	b210	243	366	419	580	199	494	208	242
19	184	273	184	b200	234	376	426	491	198	314	207	213
20	193	209	227	b220	220	507	397	645	233	358	*209	294
21	151	221	269	b140	b200	199	349	645	193	361	178	216
22	184	231	245	b340	188	162	404	457	125	653	149	283
23	205	219	221	743	181	535	440	382	641	662	158	198
24	227	222	273	567	274	630	466	419	711	484	160	300
25	182	223	282	236	526	425	506	316	402	397	206	162
26	195	225	249	205	962	413	858	367	427	271	180	206
27	191	219	275	300	875	*272	946	509	488	357	169	214
28	203	217	235	b230	597	318	763	443	700	279	174	81
29	180	224	235	198	-	284	583	225	1,520	242	167	335
30	183	248	185	b225	--------	324	386	288	1,190	257	204	87
31	228	--------	227	b220	--------	268	--------	295	--------	231	248	--------
Total	6,067	7,359	7,916	7,345	9,023	11,245	15,868	12,727	11,359	31,873	6,096	6,524
Mean	196	245	255	237	322	363	529	411	379	1,028	197	217
Cfsm	0.402	0.503	0.524	0.487	0.661	0.745	1.09	0.844	0.778	2.11	0.405	0.446
In.	0.46	0.56	0.60	0.56	0.69	0.86	1.22	0.97	0.87	2.43	0.47	0.50

Calendar year 1956 : Max 3,960 Min 126 Mean 390 Cfsm 0.801 In. 10.89
Water year 1956-57 : Max 6,660 Min 81 Mean 365 Cfsm 0.749 In. 10.19

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

Salt River near North Bradley, Mich.

Location.--Lat 43°42'10", long 84°28'15", in SE¼ sec. 7, T. 15 N., R. 1 W., on right bank 200 ft upstream from bridge on U. S. Highway 10, 0.5 mile upstream from Bluff Creek, and 1.1 miles southeast of North Bradley.

Drainage area.--138 sq mi.

Records available.--June 1934 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 618.01 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). June 4, 1934, to Mar. 26, 1942, staff gage at site 100 ft downstream and Mar. 27, 1942, to July 7, 1954, wire-weight gage at bridge 200 ft downstream, at same datum.

Average discharge.--23 years, 77.0 cfs.

Extremes.--Maximum discharge during year, 6,160 cfs July 9 (gage height, 13.84 ft); minimum, 8.8 cfs Oct. 6, 9, 11, Sept. 19; minimum gage height, 0.21 ft Dec. 12 (result of freezeup).

1934-57: 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 good except those for periods of ice effect, which are poor.

Revisions (water years).--WSP 1337: 1936-39, 1940(M), 1943(M), 1949-50.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-21, Aug. 24 to Sept. 30)

0.2	8.8	7.0	940
.4	13	9.0	1,490
.7	28	11.0	2,360
1.0	49	12.0	3,260
2.0	152	13.0	4,620
4.0	435		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.5	13	15	15	19	150	43	58	55	94	23	12
2	9.9	13	16	14	21	100	51	47	51	53	23	12
3	9.9	13	17	11	23	80	52	41	39	41	22	11
4	9.7	13	18	15	20	60	46	35	33	40	20	11
5	9.2	13	21	17	19	50	106	32	31	36	18	*10
6	9.0	13	26	16	24	45	524	29	28	29	18	9.9
7	9.0	14	28	15	28	41	336	27	26	24	16	9.7
8	9.0	*13	24	*15	36	38	179	26	24	1,830	16	9.5
9	9.0	13	20	15	55	36	124	31	23	4,320	16	9.2
10	9.2	13	15	14	200	34	94	33	22	1,040	17	9.9
11	*9.0	13	15	14	160	38	88	64	21	1,250	16	10
12	9.5	13	13	14	80	48	96	117	22	2,730	14	12
13	10	13	*12	14	*55	60	75	121	22	1,550	13	15
14	11	13	12	14	45	75	63	93	22	808	15	13
15	11	15	14	13	40	90	*56	274	23	450	14	11
16	11	18	16	14	36	84	51	277	23	250	13	11
17	11	20	18	14	33	58	49	*141	27	*140	12	9.9
18	11	16	16	13	33	49	48	109	*19	104	12	9.9
19	11	15	15	13	30	45	46	137	16	77	12	11
20	11	15	16	14	30	42	48	274	15	68	*12	34
21	11	16	17	18	30	46	48	186	13	56	11	39
22	12	18	16	28	31	77	41	120	13	55	11	24
23	12	17	18	130	35	104	43	92	68	64	11	20
24	12	16	20	80	40	90	58	75	100	53	11	15
25	12	16	22	50	70	70	108	61	46	42	11	13
26	12	16	21	37	500	*55	294	73	35	40	11	12
27	12	14	20	30	400	50	179	103	43	35	11	11
28	12	17	19	26	230	51	150	64	78	32	11	11
29	13	14	17	23	-	52	108	49	316	29	11	11
30	13	14	16	21		51	75	43	194	27	11	11
31	13		17	20		46		43		25	12	
Total	332.9	440	550	747	2,323	1,915	3,279	2,875	1,448	15,392	444	408.0
Mean	10.7	14.7	17.7	24.1	83.0	61.8	109	92.7	48.3	497	14.3	13.6
Cfsm	0.078	0.107	0.128	0.175	0.601	0.448	0.790	0.672	0.350	3.60	0.104	0.099
In.	0.09	0.12	0.15	0.20	0.63	0.52	0.88	0.77	0.39	4.15	0.12	0.11

Calendar year 1956 :	Max	2,000	Min	8.4	Mean	73.3	Cfsm	0.531	In. 7.24
Water year 1956-57 :	Max	4,320	Min	9.0	Mean	82.6	Cfsm	0.599	In. 8.13

Peak discharge (base, 800 cfs).--Feb. 26 or 27 (time and discharge unknown); July 9 (4 a.m.) 6,160 cfs (13.84 ft); July 12 (7 a.m.) 3,340 cfs (12.07 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23, 30, Dec. 9-11, Dec. 13 to Mar. 14 (no gage-height record Mar. 2-6).

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 September 1931, October 1932 to September 1957. Monthly discharge only for some periods, published in WSP 1307. Gage-height records for flood seasons collected in this vicinity 1910-27, are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 710.38 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to Oct. 21, 1938, chain and wire-weight gage at site 30 ft upstream at same datum.

Average discharge.--26 years, 289 cfs.

Extremes.--Maximum discharge during year, 2,480 cfs July 9 (gage height, 9.92 ft); minimum, 95 cfs Nov. 30 (gage height, 2.96 ft); minimum daily, 130 cfs Oct. 9, 11.

1930-31, 1932-57: 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 fair. Diurnal fluctuation below 750 cfs caused by powerplant at Mount Pleasant.

Revisions (water years).--WSP 744: Drainage area. WSP 1337: 1931, 1933-40, 1945, 1948-49.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 20 to Sept. 30)

3.0	107	6.0	1,050
4.0	417	8.0	1,760
5.0	727	10.0	2,680

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	150	150	222	190	170	377	250	426	268	694	237	191
2	160	154	203	170	170	318	259	383	281	575	234	194
3	170	154	222	180	190	250	265	336	237	488	216	197
4	180	169	209	209	180	240	256	302	212	451	212	181
5	160	154	237	212	170	230	321	281	178	423	200	*172
6	160	150	253	191	180	220	697	268	184	420	194	166
7	170	200	278	194	200	212	705	265	191	405	197	157
8	150	200	293	*180	240	203	628	256	178	881	188	163
9	130	*200	262	180	250	194	560	228	172	2,280	188	154
10	140	175	243	180	300	188	470	268	163	1,920	181	154
11	130	175	231	180	450	209	432	333	166	1,600	188	160
12	*155	181	210	180	360	369	423	414	181	1,560	191	184
13	138	163	*190	180	260	457	398	370	169	1,400	178	203
14	163	166	170	175	*255	405	367	327	172	1,160	181	212
15	141	203	222	170	220	429	*336	458	203	940	175	200
16	157	228	256	180	200	439	318	550	203	*759	188	191
17	169	256	243	180	200	414	299	*451	*228	562	178	160
18	181	250	210	170	195	370	302	402	222	501	175	175
19	175	237	190	170	185	340	305	408	315	436	172	169
20	172	222	210	180	185	315	327	467	346	392	*163	259
21	150	225	225	220	185	321	336	426	287	370	178	265
22	166	246	206	280	185	324	315	355	271	355	163	259
23	141	250	225	500	181	340	321	355	528	386	150	231
24	157	219	243	350	178	343	333	398	575	383	150	216
25	157	231	256	240	449	330	436	408	479	343	150	203
26	154	229	256	220	967	*312	637	398	426	324	147	197
27	154	200	250	200	610	284	588	414	516	305	141	181
28	154	225	246	195	435	278	622	349	584	281	144	188
29	154	216	220	190	-	262	578	308	1,010	278	160	184
30	157	203	190	180	--------	259	494	274	861	262	169	169
31	157	--------	200	175	--------	253	--------	250	--------	246	181	--------
Total	4,852	6,031	7,071	6,401	7,750	9,485	12,578	11,128	9,806	21,380	5,569	5,735
Mean	157	201	228	206	277	306	419	359	327	690	180	191
Cfsm	0.377	0.483	0.548	0.495	0.666	0.736	1.01	0.863	0.786	1.66	0.433	0.459
In.	0.43	0.54	0.63	0.57	0.69	0.85	1.13	0.99	0.88	1.91	0.50	0.51

Calendar year 1956: Max	2,620	Min	130	Mean	325	Cfsm	0.781	In. 10.63
Water year 1956-57: Max	2,280	Min	130	Mean	295	Cfsm	0.709	In. 9.63

Peak discharge (base, 850 cfs).--Feb. 26 (10 to 11 a.m.) 1,160 cfs (6.32 ft); June 29 (4 to 6 p.m.) 1,090 cfs (6.41 ft); July 9 (8 to 9 a.m.) 2,480 cfs (9.92 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 12-14, 18-20, Dec. 29 to Jan. 3, Jan. 8 to Feb. 22, Mar. 3-6. No gage-height record Oct. 1-12, Jan. 15-21, Jan. 26 to Feb. 14; discharge estimated on basis of weather records and records for stations on nearby streams.

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., on 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.--October 1947 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

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).

Average discharge.--10 years, 446 cfs.

Extremes.--Maximum discharge during year, 4,700 cfs July 9 (gage height, 6.89 ft, from graph based on gage readings); minimum, 125 cfs Oct. 24 (gage height, 2.28 ft).
1947-57: Maximum discharge, 8,510 cfs Mar. 20, 1948, 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 fair except those for periods of ice effect or no gage-height record, which are poor. Diurnal fluctuation below 750 cfs caused by powerplant at Mount Pleasant.

Revisions (water years).--WSP 1337: 1950.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	174	184	230	210	210	880	368	670	570	1,260	225	218
2	174	157	210	200	220	650	400	550	730	928	a230	225
3	196	a160	208	200	250	500	432	467	503	741	a220	225
4	208	a170	208	220	220	370	424	384	353	620	a220	212
5	184	174	226	250	210	330	891	a350	266	521	a210	196
6	179	152	250	220	250	300	1,510	323	232	485	a200	190
7	190	*179	292	230	280	280	1,600	308	225	467	a200	190
8	174	202	a320	*220	310	260	1,260	301	212	1,560	a190	162
9	152	214	299	210	340	240	961	272	190	4,280	a180	190
10	162	208	257	210	540	240	807	308	179	4,050	a170	179
11	*146	196	250	210	580	250	720	485	179	3,810	173	179
12	174	184	244	210	490	316	700	730	190	4,110	179	207
13	190	184	220	210	360	650	640	785	196	3,150	173	252
14	174	152	152	210	*310	560	570	680	190	2,310	162	266
15	179	174	230	200	280	600	512	*720	218	1,730	179	252
16	157	257	290	210	260	640	449	1,020	245	1,420	179	*245
17	174	257	270	210	260	600	416	752	259	983	173	212
18	202	264	250	200	250	540	392	720	279	*660	168	201
19	208	250	230	200	240	a500	384	a760	a286	521	179	207
20	179	226	240	210	240	432	416	972	360	408	*162	252
21	a165	244	300	250	240	467	416	972	368	392	162	400
22	157	a260	290	350	240	512	416	763	345	384	184	353
23	179	a260	264	450	240	560	384	a690	416	400	153	308
24	146	a230	278	600	300	494	476	640	851	308	157	259
25	168	a240	a290	600	520	503	741	630	774	360	162	245
26	174	240	306	450	980	*440	1,180	690	610	330	157	232
27	157	210	292	350	1,500	424	1,160	818	640	316	153	225
28	a160	230	a280	300	1,180	416	1,120	660	862	293	148	207
29	168	220	264	270	-	392	*972	530	1,480	266	162	207
30	157	210	230	250	--------	384	807	449	1,820	259	179	207
31	174	--------	250	220	--------	376	--------	416	--------	238	196	--------
Total	5,381	6,288	7,920	8,330	11,300	14,115	21,524	18,815	14,028	37,660	5,585	6,903
Mean	174	210	255	269	404	455	717	607	468	1,215	180	230
Cfsm	0.291	0.352	0.427	0.451	0.677	0.762	1.20	1.02	0.784	2.04	0.302	0.385
In.	0.34	0.39	0.49	0.52	0.70	0.88	1.34	1.18	0.87	2.35	0.35	0.43

	Max	Min	Mean	Cfsm	In.
Calendar year 1956:	3,730	120	455	0.762	10.36
Water year 1956-57:	4,280	146	432	0.724	9.84

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of 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. 26 to Dec. 2, Dec. 15-22, Dec. 30 to Mar. 11 (no gage-height record Jan. 6, 20, 27, Feb. 7, 17).

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 1957. Monthly discharge only for some periods, published in WSP 1307. Gage-height records for flood seasons collected in this vicinity 1910-28 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 718.37 ft above mean sea level, datum of 1929. Prior to Dec. 10, 1930, tape gage at Superior Street Bridge at different datum. Dec. 10, 1930, to June 15, 1938, staff gage at site 70 ft downstream from bridge and June 16 to Oct. 25, 1938, wire-weight gage at Superior Street Bridge, at present datum.

Average discharge.--27 years, 196 cfs.

Extremes.--Maximum discharge during year, 675 cfs July 12 (gage height, 4.88 ft); minimum, 30 cfs Aug. 15 (gage height, 0.85 ft); minimum daily, 40 cfs Aug. 8, 15.

1930-57: Maximum discharge, 4,400 cfs Mar. 19, 1948 (gage height, 10.81 ft); minimum daily, 2 cfs July 23, 1938.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Occasional regulation by dam half a mile above station.

Revisions (water years).--WSP 744: Drainage area. WSP 1337: 1931, 1932-34(M), 1936, 1939, 1945, 1949.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	108	101	80	85	360	290	358	181	374	95	94
2	86	105	121	70	90	320	279	290	175	420	94	106
3	86	110	123	75	95	290	272	242	181	376	90	103
4	87	107	118	85	100	250	291	299	181	239	91	97
5	90	107	95	95	*95	220	356	282	135	185	89	*89
6	84	111	90	90	100	200	*559	140	129	161	88	73
7	79	108	95	90	100	180	563	98	115	138	71	98
8	76	106	100	95	95	170	579	144	110	362	40	101
9	61	*107	100	85	120	160	568	141	102	546	54	97
10	67	111	110	95	250	150	502	167	83	458	71	103
11	74	105	110	85	210	161	437	224	66	494	69	105
12	*80	102	110	80	180	210	381	335	89	655	82	118
13	83	78	*85	90	160	272	353	380	98	618	118	129
14	82	62	80	90	140	326	329	398	108	543	78	148
15	86	86	90	85	120	362	299	*390	144	500	40	158
16	79	117	130	80	110	*345	272	353	170	*458	69	141
17	80	167	130	80	110	344	259	326	*167	407	75	125
18	84	152	120	80	110	324	247	311	165	353	72	116
19	84	117	110	*80	100	297	242	331	146	268	*72	105
20	88	122	100	80	100	260	242	432	141	206	71	130
21	88	134	120	90	90	256	234	437	162	162	69	200
22	92	141	120	110	90	272	230	414	132	152	68	218
23	92	161	120	150	95	299	240	356	135	172	62	180
24	129	126	110	190	90	304	270	297	125	185	66	144
25	146	112	120	230	220	293	335	245	153	172	76	126
26	116	130	130	200	550	279	399	249	161	130	76	106
27	111	80	130	130	500	216	447	272	167	115	69	105
28	114	100	120	120	420	217	502	291	272	114	72	96
29	112	134	110	110	-	264	492	261	342	105	76	96
30	85	75	100	100	--------	270	432	216	340	100	80	95
31	108	--------	90	90	--------	249	--------	189	--------	95	90	--------
Total	2,814	3,381	3,388	3,210	4,525	8,130	10,901	8,868	4,675	9,263	2,333	3,602
Mean	90.8	113	109	104	162	262	363	286	156	299	75.3	120
Cfsm	0.315	0.392	0.378	0.361	0.562	0.910	1.26	0.993	0.542	1.04	0.261	0.417
In.	0.36	0.44	0.44	0.42	0.59	1.05	1.41	1.14	0.60	1.20	0.30	0.47

Calendar year 1956:	Max 1,360	Min 61	Mean 224	Cfsm 0.778	In. 10.60
Water year 1956-57:	Max 655	Min 40	Mean 178	Cfsm 0.618	In. 8.42

Peak discharge (base, 700 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 5 to Mar. 10 (no gage-height record Jan. 24 to Feb. 5, Mar. 1-10; discharge estimated on basis of weather records and records for Pine River near Midland and Chippewa River near Mount Pleasant).

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., on left bank at downstream side of bridge on State Highway 30, 7 miles southwest of Midland and 8 miles upstream from mouth.

Drainage area.--390 sq mi, approximately.

Records available.--May 1934 to September 1938, February 1948 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 623.87 ft above mean sea level (Michigan State Highway Department bench mark). May 31, 1934, to Sept. 30, 1938, tape, staff, or wire-weight gage at same site at datum 5.48 ft lower. Feb. 3, 1948, to Dec. 13, 1951, wire-weight gage, water-stage recorder, or staff gage at present site and datum.

Average discharge.--13 years, 283 cfs.

Extremes.--Maximum discharge during year, 2,160 cfs July 11 (gage height, 6.70 ft); maximum gage height, 6.73 ft Feb. 26 (ice affected); minimum discharge, 13 cfs Aug. 11 (gage height, 2.42 ft).

1934-38, 1948-57: Maximum discharge, 6,360 cfs Mar. 20, 1948 (gage height, 10.00 ft, from graph based on gage readings); minimum not determined.

Remarks.--Records fair except those for periods of ice effect and those below 100 cfs, which are poor. Regulation at low and medium stages by powerplant at St. Louis.

Revisions (water years).--WSP 1337: 1935(M), 1936-38, 1948-49.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	93	79	175	150	140	600	262	427	231	507	144	107
2	95	126	160	140	140	500	335	331	207	458	136	109
3	98	119	150	140	150	380	290	287	217	534	136	121
4	100	129	145	160	160	300	315	245	153	489	124	112
5	93	126	147	190	140	260	452	224	224	355	109	121
6	82	104	149	170	140	230	796	201	152	273	119	100
7	102	*134	163	150	150	210	726	144	155	276	107	109
8	89	129	177	140	170	200	630	147	144	1,200	104	35
9	104	134	207	130	210	180	640	131	131	1,580	63	58
10	136	107	204	145	600	172	580	217	136	972	25	78
11	*80	134	169	130	450	183	520	280	109	1,470	15	87
12	74	129	160	150	350	217	435	411	89	1,400	91	93
13	87	124	150	150	*280	262	387	484	87	1,140	74	109
14	107	195	140	150	230	312	355	502	146	924	121	109
15	121	134	170	140	200	363	325	*566	109	810	121	126
16	93	59	210	150	190	355	310	525	98	605	70	*139
17	126	158	200	150	190	327	301	435	144	548	25	124
18	87	183	180	140	180	323	284	427	*170	*448	52	109
19	91	169	170	140	170	315	273	453	189	399	78	102
20	112	131	180	140	170	298	270	605	180	287	*63	144
21	104	152	190	140	170	276	256	595	177	273	69	260
22	82	160	180	140	170	304	238	561	242	231	69	245
23	104	155	180	150	175	350	256	494	234	238	63	245
24	121	140	183	180	200	310	280	407	224	242	80	198
25	124	150	192	240	450	310	387	339	231	245	67	169
26	163	160	214	330	1,400	*290	489	335	231	234	52	155
27	126	190	210	250	1,100	273	502	347	312	204	84	119
28	91	230	201	190	800	210	534	319	350	180	84	131
29	116	170	180	170	-	273	*548	301	710	183	72	116
30	150	200	160	160	--------	287	512	273	543	158	72	114
31	124	--------	170	150	--------	284	--------	231	--------	147	93	--------
Total	3,275	4,310	5,466	5,055	8,875	9,154	12,488	11,244	6,325	17,010	2,582	3,844
Mean	106	144	176	163	317	295	416	363	211	549	83.3	128
Cfsm	0.272	0.369	0.451	0.418	0.813	0.756	1.07	0.931	0.541	1.41	0.214	0.328
In.	0.31	0.41	0.52	0.48	0.85	0.87	1.19	1.07	0.60	1.63	0.25	0.37

Calendar year 1956: Max 2,600 Min 59 Mean 302 Cfsm 0.774 In. 10.57
Water year 1956-57: Max 1,580 Min 15 Mean 246 Cfsm 0.631 In. 8.55

Peak discharge (base, 950 cfs).--Feb. 26 (time unknown) about 1,800 cfs; July 9 (12:30 a.m.) 2,080 cfs (6.65 ft); July 11 (5 p.m.) 2,160 cfs (6.70 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23 to Dec. 4, Dec. 12-23; Dec. 29 to Mar. 9.

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 1957. Gage-height records for flood seasons collected in this vicinity 1910-26, 1928, and since 1946 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 580.28 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1955, at datum 10.00 ft higher.

Average discharge.--21 years, 1,554 cfs (adjusted for diversion).

Extremes.--Maximum discharge during year, 22,000 cfs July 10 (gage height, 26.34 ft); minimum, 114 cfs Jan. 20 (gage height, 9.13 ft); minimum daily, 199 cfs Jan. 20.

1936-57: Maximum discharge, 34,000 cfs Mar. 21, 1948 (gage height, 19.50 ft, datum then in use); minimum, 39 cfs Oct. 12, 1942; minimum daily, 111 cfs Aug. 21, 1949; minimum gage height, -0.96 ft Aug. 19, 1954, datum then in use.

Remarks.--Records good except those for periods of no gage-height record and those below 400 cfs, 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. Extremes and daily discharge not adjusted for diversion. Discharge below 4,000 cfs regulated by powerplants above station.

Revisions (water years).--WSP 1054: 1945. WSP 1144: 1948.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 28 to Sept. 19)

9.3	165	14.0	2,970
10.0	440	23.0	13,200
12.0	1,450	26.0	20,900

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	350	366	574	528	a400	2,670	1,070	2,440	1,120	3,330	624	262
2	426	680	410	726	258	2,320	1,080	1,440	1,580	2,910	596	276
3	519	456	696	494	706	1,910	1,160	1,310	1,200	1,670	672	276
4	480	480	740	536	477	1,490	1,510	949	967	890	474	*272
5	600	546	953	638	429	902	2,060	958	1,010	780	490	422
6	598	890	819	498	714	823	5,120	950	956	808	460	438
7	472	591	950	579	659	700	5,630	934	876	838	506	474
8	408	*586	1,040	772	444	597	4,470	829	680	6,730	421	416
9	424	390	835	*729	816	498	3,890	684	439	18,400	585	381
10	388	400	1,040	584	2,100	1,120	3,540	946	516	19,300	320	556
11	368	386	866	618	2,120	1,360	3,330	1,440	564	12,900	292	548
12	*446	415	*652	433	1,120	1,420	2,360	1,680	540	13,800	417	551
13	366	587	602	272	919	2,370	2,100	2,310	622	13,500	444	659
14	344	544	518	a600	*900	2,230	1,910	2,710	698	10,700	423	609
15	426	714	679	a540	848	2,220	1,720	2,730	465	7,000	510	613
16	544	778	870	a350	552	2,260	*1,430	*4,120	816	4,990	518	537
17	548	852	740	a300	450	1,670	1,370	3,380	946	3,970	398	568
18	458	812	690	a360	864	1,380	1,300	3,190	*840	*2,020	302	473
19	558	578	704	a300	754	1,750	1,510	3,480	600	1,450	286	477
20	403	962	717	199	632	1,860	1,600	4,070	792	1,230	416	869
21	354	904	780	a500	570	1,880	1,180	3,140	809	1,140	*431	1,210
22	432	584	617	1,030	632	1,730	1,540	2,420	518	1,330	416	1,160
23	544	554	708	1,890	415	1,480	1,570	2,150	1,040	2,170	282	842
24	497	611	865	a960	650	1,920	1,820	1,840	1,850	1,230	286	746
25	599	414	952	a860	1,740	1,980	2,700	1,450	1,390	1,050	302	528
26	489	721	948	a540	4,940	1,720	4,220	1,470	942	1,110	364	512
27	485	680	1,010	a700	5,140	*1,920	4,240	1,730	980	900	384	462
28	490	1,020	1,080	664	2,850	1,530	4,000	1,700	1,710	768	376	442
29	462	554	680	460	-	1,060	3,760	1,640	3,730	714	385	654
30	462	606	462	a510	--------	1,540	3,350	1,080	4,310	836	1,060	498
31	454	--------	959	650	--------	1,230	--------	1,230	--------	780	907	--------
Total	14,394	18,761	24,156	18,820	33,099	49,540	76,540	60,400	33,506	139,244	14,347	16,731
Mean	464	625	779	607	1,182	1,598	2,551	1,948	1,117	4,492	463	558
(†)	121	110	110	105	104	101	104	107	108	111	116	122

Adjusted for diversion by Dow Chemical Co.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean	585	735	889	712	1,286	1,699	2,655	2,055	1,225	4,603	579	680
Cfsm	0.244	0.306	0.370	0.297	0.536	0.708	1.11	0.856	0.510	1.92	0.241	0.283
In.	0.28	0.34	0.43	0.34	0.56	0.82	1.24	0.99	0.57	2.21	0.28	0.32

	Observed			Adjusted		
Calendar year 1956:	Max 15,200	Min 271	Mean 1,619	Mean 1,725	Cfsm 0.719	In. 9.77
Water year 1956-57:	Max 19,300	Min 199	Mean 1,369	Mean 1,478	Cfsm 0.616	In. 8.38

Peak discharge (base, 5,800 cfs).--Apr. 7 (2 to 5 a.m.) 6,090 cfs (17.00 ft); July 10 (2 a.m.) 22,000 cfs (26.34 ft).

* Discharge measurement made on this day.

† Diversion, in cubic feet per second, for industrial use; furnished by Dow Chemical Co.

a No gage-height record; discharge estimated on basis of weather records, 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, 1908-9, 1912-13, 1916, 1918-19, 1929-30, and 1942 (flood discharge for certain periods only) in WSP 1084; December 1942 to September 1957 (high-water periods only; no high water 1944, 1949, 1953, 1955). Gage-height records for flood seasons collected in this vicinity 1910-20, and for entire years since 1921 are contained in reports of U. S. Weather Bureau.

Gage.--Staff gage read at least once daily. Datum of gage is 566.85 ft, U. S. Lake Survey datum, levels by U. S. Weather Bureau. Auxiliary water-stage recorder on right bank at Essexville 15 miles downstream.

Extremes.--Maximum discharge during year, 27,800 cfs July 13 (gage height, 17.15 ft, from graph based on gage readings).

1904-57: Maximum discharge, 68,000 cfs Mar. 29, 1904 (gage height, 24.9 ft).

Remarks.--Records fair. Considerable diversion through metropolitan area of Saginaw.

Cooperation.--Gage readings at base gage furnished by city of Saginaw and U. S. Weather Bureau. Auxiliary gage-height record furnished by Corps of Engineers.

Discharge, in cubic feet per second, water year October 1956 to September 1957

July 9	16,100	July 12	25,800	July 15	24,800
10	23,800	13	27,800	16	20,700
11	*25,200	14	27,100	17	17,500

Pigeon River near Owendale, Mich.

Location.--Lat 43°45'35", long 83°14'45", in SE¼ sec. 36, T. 16 N., R. 10 E., on left bank 600 ft downstream from bridge on county road, 2 miles downstream from confluence of East and West Branches, and 2½ miles northeast of Owendale.

Drainage area.--55 sq mi, approximately.

Records available.--October 1952 to September 1957.

Gage.--Water-stage recorder. Prior to June 10, 1954, wire-weight gage at site 600 ft upstream at same datum.

Average discharge.--5 years, 33.7 cfs.

Extremes.--Maximum discharge during year, 468 cfs June 29 (gage height, 5.12 ft); minimum, 1.1 cfs Oct. 6.

1952-57: Maximum discharge, 2,550 cfs Mar. 25, 1954 (gage height, 10.75 ft), from rating curve extended above 1,200 cfs; minimum observed, 0.5 cfs Oct. 11, 1952 (gage height, 1.00 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record and those below 5 cfs, which are poor.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.5	3.4	5	5	6.5	50	16	18	20	42	4.5	2.9
2	1.6	3.4	5	4.5	6.5	40	21	14	10	24	4.5	3.4
3	2.1	3.4	5	4	6	30	25	12	7.4	18	4.5	3.6
4	1.6	3.4	5	4	5.5	25	30	11	6.6	21	4.5	2.9
5	1.3	3.1	5.5	3.5	5.5	21	60	9.5	5.9	47	4.5	2.5
6	1.3	*3.4	7	3.5	5	19	110	8.4	5.6	26	4.3	2.2
7	1.3	3.1	6.5	3.5	5	17	150	8.1	5.2	14	3.8	2.3
8	1.8	3.1	5.5	3.5	5	15	120	7.4	5.0	136	3.8	2.3
9	*2.3	3.1	5	*3	7	14	90	7.0	4.7	198	4.5	2.2
10	2.5	3.1	5	3	60	14	50	11	4.5	52	4.5	2.9
11	2.6	3.4	*5	3	45	14	35	18	4.3	27	3.8	5.0
12	2.6	3.8	3.4	3	*25	50	35	23	4.7	20	3.4	4.5
13	2.6	3.6	4.5	3	18	34	30	21	5.6	31	2.9	5.0
14	2.6	3.4	4.5	3	15	22	25	18	6.6	30	3.6	3.6
15	2.5	3.8	5	3	13	27	21	22	6.3	18	3.6	3.1
16	2.6	4.0	5.5	3	11	26	19	18	5.2	13	3.6	3.8
17	2.8	3.8	6.5	3	10	20	*17	13	5.0	10	2.9	3.6
18	2.8	3.8	6	3	9	18	16	16	6.5	8.4	2.5	*3.0
19	2.6	3.8	6	3	8	16	15	23	*11	7.7	2.5	3.4
20	2.8	4.3	5.5	3	7.5	15	13	56	7.4	7.0	2.5	7.0
21	3.1	6.6	5.5	4	6.5	18	11	40	5.9	6.6	*2.3	36
22	3.1	7.5	6	8	6	25	9.5	28	5.2	8.8	2.3	36
23	3.1	6.5	7	25	6	60	11	*27	50	8.1	2.1	18
24	3.1	5	7.5	19	6	45	109	32	22	7.0	2.5	8.4
25	3.4	5	6.5	12	60	35	120	22	11	6.3	3.1	6.6
26	3.4	5	6	10	150	30	142	19	9.5	5.9	2.8	6.3
27	3.6	5	6.5	9	100	25	55	19	14	5.6	2.5	5.6
28	3.6	5	6	8	70	*28	48	13	174	5.2	2.5	5.0
29	3.6	5	5.5	7.5	-	28	33	10	379	5.6	2.8	5.0
30	3.6	5	5	7	--------	25	23	9.5	123	4.7	2.9	5.0
31	3.4	--------	5.5	7	--------	20	--------	10	--------	*4.5	3.1	--------
Total	80.8	125.8	173.4	184.0	678.0	826	1,459.5	563.9	931.1	818.4	103.6	201.1
Mean	2.61	4.19	5.59	5.94	24.2	26.6	48.6	18.2	31.0	26.4	3.34	6.70
Cfsm	0.047	0.076	0.102	0.108	0.440	0.484	0.884	0.331	0.564	0.480	0.061	0.122
In.	0.05	0.08	0.12	0.12	0.46	0.56	0.99	0.38	0.63	0.55	0.07	0.14

Calendar year 1956: Max 681 Min 1.3 Mean 41.7 Cfsm 0.758 In. 10.30
Water year 1956-57: Max 379 Min 1.3 Mean 16.8 Cfsm 0.305 In. 4.15

Peak discharge (base, 500 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 22 to Dec. 11, Dec. 13 to Mar. 12. No gage-height record Mar. 21 to Apr. 17; discharge estimated on basis of weather records and records for East Branch Cass River near Cass City, Cass River at Cass City, and Salt River near North Bradley.

Black River near Fargo, Mich.

Location.--Lat 43°06', long 82°37', in NW¼ sec. 32, T. 8 N., R. 16 E., on left bank 20 ft downstream from bridge on Norman Road, 2½ 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 1957.

Gage.--Water-stage recorder. Datum of gage is 613.75 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to July 9, 1954, wire-weight gage at same site and datum.

Average discharge.--13 years, 322 cfs.

Extremes.--Maximum discharge during year, 4,020 cfs Apr. 28 (gage height, 9.34 ft); maximum gage height, 10.68 ft Feb. 27 (ice jam); minimum discharge, 3.2 cfs Dec. 11 (gage height, 1.56 ft).

1944-57: 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 periods of ice effect or no gage-height record, which are poor.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	9.0	4.0	465
1.8	16	5.0	650
2.0	35	7.0	2,000
2.2	58	9.0	3,680
2.5	101	10.0	4,680
3.0	195		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	15	18	35	45	1,000	180	308	90	58	24	19
2	*16	15	20	30	40	700	250	220	90	52	23	20
3	19	16	20	30	40	500	350	173	84	44	22	21
4	18	15	20	30	35	350	1,000	144	78	38	22	19
5	17	17	23	30	35	220	2,500	123	72	34	20	21
6	16	*16	28	30	35	150	3,000	110	67	35	20	22
7	12	16	33	30	35	100	2,000	95	63	42	20	19
8	14	16	39	30	35	75	1,000	85	59	47	24	17
9	12	15	42	30	150	65	700	79	56	457	32	15
10	13	15	35	*27	450	60	550	104	52	471	27	18
11	14	19	26	25	450	77	450	384	52	191	21	19
12	12	18	26	25	550	268	350	975	50	118	20	11
13	12	16	*26	25	350	444	280	635	52	87	19	12
14	12	16	26	25	200	278	230	348	68	72	21	22
15	12	17	26	25	130	265	180	686	90	67	20	25
16	12	20	27	25	100	342	150	804	93	58	18	21
17	12	20	28	25	80	240	130	345	68	50	19	18
18	12	21	30	25	60	177	*125	225	57	*44	19	17
19	12	21	31	25	50	165	122	479	128	38	18	*16
20	10	20	32	25	45	225	120	2,440	221	35	17	16
21	11	24	32	25	*45	232	113	1,760	116	32	17	16
22	13	22	40	25	45	423	103	577	74	33	16	19
23	13	21	59	30	45	535	93	360	58	37	15	18
24	14	20	68	40	45	453	144	315	48	62	*18	21
25	15	20	78	150	100	310	1,280	285	*48	58	20	21
26	14	18	74	250	1,000	199	2,780	213	45	44	19	20
27	13	17	53	150	2,000	167	1,750	185	43	36	19	18
28	14	17	50	100	1,500	*334	3,760	153	45	32	20	17
29	15	17	45	80	-	426	1,970	127	53	29	22	15
30	15	17	40	65	--------	298	548	108	58	28	20	15
31	15	--------	35	55	--------	205	--------	96	--------	26	20	--------
Total	424	537	1,130	1,522	7,695	9,283	26,208	12,941	2,178	2,455	632	548
Mean	13.7	17.9	36.5	49.1	275	299	874	417	72.6	79.2	20.4	18.3
Cfsm	0.029	0.038	0.077	0.103	0.579	0.629	1.84	0.878	0.153	0.167	0.043	0.039
In.	0.03	0.04	0.09	0.12	0.60	0.73	2.05	1.01	0.17	0.19	0.05	0.04

Calendar year 1956: Max 6,300 Min 6.5 Mean 283 Cfsm 0.596 In. 8.11
Water year 1956-57: Max 3,760 Min 10 Mean 180 Cfsm 0.379 In. 5.12

Peak discharge (base, 3,500 cfs).--Apr. 6 (time unknown) about 3,500 cfs; Apr. 28 (10 to 11 a.m.) 4,020 cfs (9.34 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23-30, Dec. 13-19, Dec. 28 to Mar. 10. No gage-height record Apr. 1-17; discharge estimated on basis of records for Flint River near Flint, Cass River at Cass City, and Mill Creek near Abbottsford.

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 1957.

Gage.--Wire-weight gage and crest-stage indicator; gage read twice daily. Datum of gage is 609.80 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to Mar. 7, 1950, staff gage at same site and datum.

Average discharge.--10 years, 117 cfs.

Extremes.--Maximum discharge during year, 1,120 cfs May 20 (gage height, 6.2 ft); minimum, 4.8 cfs Aug. 20, 23, 24 (gage height, 2.42 ft).

1947-57: 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, 2.7 cfs Sept. 22, 1955; minimum gage height, 2.28 ft Aug. 11, 1949.

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

Revisions (water years).--WSP 1437: 1950.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 21 to May 29)

2.4	4.2	3.2	64
2.5	7.0	3.5	120
2.6	11	4.0	250
2.7	16	5.0	610
2.9	31	6.0	1,080

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.0	12	14	23	45	300	97	372	70	22	9.0	8.6
2	*9.4	12	14	21	45	200	204	241	64	25	8.6	8.2
3	9.8	13	15	20	40	150	256	149	77	21	7.8	9.4
4	10	12	16	19	40	120	268	105	63	17	7.4	7.8
5	9.4	12	18	18	35	90	586	78	56	16	6.7	7.0
6	9.4	*12	25	18	35	60	862	63	48	15	6.4	7.0
7	12	12	25	18	35	50	740	53	44	14	6.2	7.0
8	10	12	28	18	35	50	632	45	38	22	6.4	7.0
9	9.4	12	25	18	80	50	518	41	35	20	6.7	6.4
10	9.0	11	22	*18	300	50	404	57	33	17	6.7	7.8
11	9.8	11	22	17	250	49	296	218	32	15	7.0	8.6
12	9.8	12	*20	16	250	185	230	468	29	20	6.4	9.4
13	9.4	11	19	16	250	213	182	453	31	25	5.9	11
14	9.0	11	17	16	200	190	144	411	39	20	6.4	11
15	9.0	12	20	16	150	196	112	562	33	17	6.4	12
16	9.0	14	20	15	100	210	95	534	42	17	6.4	14
17	9.4	14	20	15	70	159	82	472	37	17	6.4	9.8
18	9.4	13	23	15	60	118	*91	400	38	*16	6.4	9.0
19	8.6	12	22	16	55	131	90	542	57	14	5.9	*8.6
20	9.0	12	25	16	50	159	78	985	74	13	4.8	8.6
21	9.0	20	21	16	*47	174	67	754	50	12	5.0	9.0
22	9.4	18	48	60	45	230	59	660	39	14	5.3	9.0
23	9.4	15	48	100	45	213	54	*586	29	16	4.8	9.4
24	9.4	14	58	120	45	159	58	510	24	14	*6.2	8.6
25	9.4	14	62	150	60	122	280	394	*22	12	7.8	7.8
26	10	17	54	130	450	93	327	303	22	12	7.4	7.0
27	11	13	43	110	400	101	383	233	23	14	6.4	7.0
28	11	12	41	90	500	*140	691	174	23	12	5.9	7.0
29	11	19	33	70	-	169	542	135	24	10	8.2	7.4
30	11	14	29	60	--------	154	475	103	22	9.4	8.6	7.8
31	11	--------	25	55	--------	122	--------	82	--------	9.4	8.6	--------
Total	301.4	398	872	1,310	3,717	4,407	8,903	10,183	1,218	497.8	208.1	258.2
Mean	9.72	13.3	28.1	42.3	133	142	297	328	40.6	16.1	6.71	8.61
Cfsm	0.070	0.096	0.204	0.307	0.964	1.03	2.15	2.38	0.294	0.117	0.049	0.062
In.	0.08	0.11	0.23	0.35	1.00	1.19	2.40	2.74	0.33	0.13	0.06	0.07

Calendar year 1956: Max 1,840 Min 7.8 Mean 124 Cfsm 0.899 In. 12.26
Water year 1956-57: Max 985 Min 4.8 Mean 88.4 Cfsm 0.641 In. 8.69

Peak discharge (base, 900 cfs).--May 20 (4 a.m.) 1,120 cfs (6.2 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 31 to Mar. 10.

Clinton River at Auburn Heights, Mich.

Location.--Lat 42°38'00", long 83°13'28", in NW¼ sec. 36, T. 3 N., R. 10 E., on right bank 30 ft upstream from bridge on State Highway 59 at Auburn Heights and 2.8 miles upstream from Galloway Creek.

Drainage area.--123 sq mi. Area at site used prior to Oct. 1, 1940, revised from 123 to 119 sq mi.

Records available.--May 1935 to June 1939 and February to September 1940 (published as "at Pontiac"), October 1956 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Altitude of gage is 860 ft (from topographic map). Prior to October 1940, staff gage at site 3.3 miles upstream at datum 876.01 ft above mean sea level.

Extremes.--Maximum discharge during year, 503 cfs July 8 (gage height, 3.24 ft), from rating curve extended above 390 cfs by logarithmic plotting; minimum, 11 cfs Dec. 10; minimum gage height, 1.16 ft Nov. 25, Dec. 10.

1935-40, 1956-57: Maximum discharge observed, 716 cfs Feb. 12, 1938 (gage height, 5.10 ft, site and datum then in use), from rating curve extended above 150 cfs; minimum observed, 4.8 cfs Sept. 4, 1936, site then in use.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Some regulation by many lakes above station. Flow includes waste from city of Pontiac water supply, most of which is pumped from ground-water sources.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

1.1	11	2.0	151
1.4	45	2.5	275
1.7	92	3.1	457

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	49	62	22	80	84	120	110	124	149	110	140	48
2	53	55	16	90	80	110	128	126	140	100	136	52
3	55	46	25	89	75	99	122	128	138	100	132	69
4	55	41	29	89	80	108	145	124	140	100	122	55
5	55	*44	50	84	82	110	169	118	134	110	118	61
6	52	51	43	77	84	110	165	120	132	100	112	67
7	48	51	38	78	84	116	134	122	132	100	106	64
8	51	49	32	*80	85	118	128	116	124	430	105	55
9	52	48	30	85	144	112	126	112	116	250	92	58
10	53	44	30	77	97	103	130	151	120	149	82	92
11	55	39	72	85	92	121	130	151	130	216	80	78
12	55	43	78	80	92	158	122	130	122	240	75	*77
13	52	45	94	70	96	126	122	122	134	250	75	78
14	45	45	*106	70	99	120	120	134	214	230	75	67
15	48	56	110	72	96	128	120	151	130	220	75	78
16	*51	48	101	72	96	124	122	136	124	210	75	82
17	51	34	96	67	82	116	122	128	126	*200	75	70
18	48	34	92	65	99	118	124	140	134	193	75	67
19	52	40	89	64	94	145	120	247	145	170	75	70
20	51	45	90	65	97	136	114	228	124	160	80	72
21	48	84	103	84	96	134	108	169	118	150	75	70
22	49	38	124	172	*92	130	108	160	112	150	72	67
23	52	24	101	101	89	124	89	158	110	150	69	72
24	51	23	92	89	85	116	*82	162	100	150	78	70
25	52	18	84	89	105	120	116	153	100	150	46	64
26	52	25	78	84	135	*124	*108	151	*96	150	38	61
27	51	28	90	75	134	122	128	151	100	150	44	59
28	44	26	94	80	116	122	112	*153	100	150	52	56
29	45	28	103	85	-	120	112	151	120	150	*72	53
30	46	26	103	85	--------	116	120	143	130	150	62	53
31	46	--------	101	84	--------	106	--------	138	--------	140	56	--------
Total	1,567	1,240	2,316	2,567	2,690	3,732	3,656	4,497	3,794	5,278	2,569	1,985
Mean	50.5	41.3	74.7	82.8	96.1	120	122	145	126	170	82.9	66.2
Cfsm	0.411	0.336	0.607	0.673	0.781	0.976	0.992	1.18	1.02	1.38	0.674	0.538
In.	0.47	0.37	0.70	0.78	0.81	1.13	1.11	1.36	1.15	1.60	0.78	0.60

Calendar year 1956:	Max	-	Min	-	Mean	-	Cfsm	-	In.	-
Water year 1956-57:	Max	430	Min	16	Mean	98.3	Cfsm	0.799	In.	10.86

Peak discharge (base, 300 cfs).--May 19 (8 p.m.) 326 cfs (2.68 ft); June 14 (3 a.m.) 323 cfs (2.67 ft); July 8 (time unknown) 503 cfs (3.24 ft).

* Discharge measurement made on this day.

Note.--No gage-height record June 23-25, June 27 to July 9, July 12-16, 19-31, Aug. 11-21; discharge estimated on basis of recorded range in stage, weather records, and records for nearby streams.

Paint Creek near Lake Orion, Mich.

Location.--Lat 42°46'03", long 83°13'12", in NE¼ sec. 13, T. 4 N., R. 10 E., on left bank 100 ft upstream from railroad bridge, 1.6 miles southeast of Lake Orion, and 2.8 miles upstream from Trout Creek.

Drainage area.--38.1 sq mi.

Records available.--September 1955 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 940 ft (from topographic map).

Extremes.--Maximum discharge during year, 130 cfs May 22 (gage height, 2.75 ft); maximum gage height, 2.92 ft Jan. 15 (backwater from ice); minimum discharge, 3.5 cfs June 26, 27, Aug. 23, 24 (gage height, 1.50 ft).

1955-57: Maximum discharge, 340 cfs Mar. 6, 1956 (gage height, 3.60 ft), from rating curve extended above 190 cfs by logarithmic plotting; minimum recorded, 2.6 cfs Nov. 7-12, 1955.

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

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 15		Jan. 16 to Sept. 30			
1.6	5.0	1.5	3.5	2.4	68
1.8	15	1.7	12	2.7	119
2.0	28	2.0	30		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	13	14	b20	22	30	26	47	22	15	12	16
2	20	14	14	b19	21	31	26	45	22	15	14	15
3	19	14	14	b17	21	30	26	42	26	15	14	16
4	17	14	15	17	20	29	29	39	23	15	14	14
5	16	*14	16	16	19	28	32	36	11	17	13	14
6	14	13	17	16	19	26	36	32	13	15	13	14
7	13	13	17	16	18	26	38	32	16	14	12	12
8	12	13	18	*b16	18	24	44	33	18	48	12	9.8
9	10	12	19	16	22	24	49	29	18	57	12	8.4
10	9.5	12	19	b16	22	22	48	33	19	66	12	12
11	8.6	12	18	b16	23	24	46	36	21	73	11	12
12	8.6	12	*17	16	24	26	43	36	22	*78	11	12
13	8.6	12	17	b15	26	26	40	37	26	86	9.3	12
14	8.2	12	17	b14	26	29	36	39	47	80	9.8	12
15	*7.7	13	17	b13	26	31	35	40	55	77	11	13
16	7.7	14	18	14	26	31	32	38	39	71	12	14
17	7.2	13	18	14	29	31	32	36	32	61	a10	14
18	7.2	11	18	13	28	30	31	36	30	52	a8	14
19	8.2	10	17	12	27	32	32	46	29	47	a7	12
20	8.6	10	17	9.8	*26	34	29	58	26	34	a6	12
21	7.7	15	17	12	24	35	28	80	26	17	a5	12
22	6.8	15	20	19	22	34	27	113	28	22	a3.9	12
23	7.2	15	21	b21	21	*32	30	88	24	27	3.9	11
24	7.2	14	22	b23	21	36	*32	76	16	34	5.1	*9.3
25	7.2	14	23	24	22	34	36	66	10	32	7.5	8.8
26	8.2	15	23	24	24	32	36	59	*3.9	30	9.3	8.0
27	9.5	15	24	24	26	31	42	52	5.5	29	11	7.1
28	10	15	24	24	29	29	43	*46	13	26	12	6.7
29	11	14	24	24	-	29	44	42	16	24	*17	6.7
30	11	14	b23	24	--------	28	46	34	16	24	17	7.1
31	12	--------	22	23	--------	27	--------	28	--------	18	17	--------
Total	330.9	397	580	547.8	652	911	1,074	1,454	673.4	1,219	331.8	346.9
Mean	10.7	13.2	18.7	17.7	23.3	29.4	35.8	46.9	22.4	39.3	10.7	11.6
Cfsm	0.281	0.346	0.491	0.465	0.612	0.772	0.940	1.23	0.588	1.03	0.281	0.304
In.	0.32	0.39	0.57	0.53	0.64	0.89	1.05	1.42	0.66	1.19	0.32	0.34

Calendar year 1956: Max 220 Min 6.8 Mean 34.0 Cfsm 0.892 In. 12.15
Water year 1956-57: Max 113 Min 3.9 Mean 23.3 Cfsm 0.612 In. 8.32

Peak discharge (base, 90 cfs).--May 22 (12:30 a.m.) 130 cfs (2.75 ft); July 13 (8 a.m.) 91 cfs (2.56 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage and records for nearby streams.

b Stage-discharge relation affected by ice.

Bear Creek at Warren, Mich.

Location.--Lat 42°31'23", long 83°01'25", in SW¼ sec. 3, T. 1 N., R. 12 E., on upstream side of bridge on Chicago Road, 0.4 mile upstream from Red Run and 1.3 miles east of Warren.

Drainage area.--17.3 sq mi.

Records available.--January 1954 to September 1957 (discontinued).

Gage.--Wire-weight gage and crest-stage indicator; gage read twice daily. Datum of gage is 594.24 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 649 cfs July 8 (gage height, 10.1 ft); minimum observed, 2.8 cfs Oct. 8, Nov. 12, 19 (gage height, 1.21 ft).
1954-57: Maximum discharge, that of July 8, 1957; minimum observed, 1.0 cfs Jan. 17, 1954; minimum gage height, 1.11 ft May 22, 1955.

Remarks.--Records good except those above 50 cfs, which are poor. Some regulation by industrial plants above station.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 19-25, Aug. 1 to Sept. 30)

1.2	2.6	2.5	72
1.3	4.3	3.0	126
1.6	12	6.0	377
2.0	32	8.0	517

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.8	28	4.1	3.6	7.7	18	10	14	7.1	7.4	17	6.4
2	6.6	9.3	3.6	4.8	6.6	14	25	10	5.7	7.1	20	5.2
3	*5.7	5.2	6.1	5.4	5.4	9.8	12	8.8	6.1	8.2	17	5.9
4	6.1	4.3	11	5.2	8.0	8.8	65	7.7	8.0	59	15	7.7
5	5.9	4.8	10	4.5	7.7	9.3	177	6.1	8.8	36	11	7.4
6	4.8	6.4	6.9	3.8	7.1	9.3	116	8.5	8.8	7.7	11	9.3
7	4.3	*5.7	12	4.8	9.6	9.3	28	9.3	8.8	7.7	12	5.9
8	4.8	6.1	7.1	*5.7	21	8.2	22	8.2	5.7	510	12	5.2
9	5.0	6.1	8.8	5.7	126	6.6	16	7.7	4.3	229	11	4.1
10	5.2	4.5	6.6	5.4	31	4.8	13	9.3	6.4	44	10	11
11	6.9	3.8	6.9	6.1	18	8.2	11	7.7	72	231	8.2	6.9
12	5.7	4.8	7.1	5.4	13	37	9.3	8.2	9.3	85	9.0	30
13	4.3	5.2	6.4	4.0	13	18	7.4	8.0	26	*128	10	18
14	3.4	5.7	*6.1	6.1	15	14	5.7	12	81	47	11	4.8
15	6.6	6.1	12	5.7	11	16	6.6	12	12	34	10	6.1
16	6.6	7.1	7.1	5.0	9.6	9.0	6.4	7.1	7.7	28	8.5	17
17	5.7	4.0	7.1	5.7	7.7	7.7	8.0	6.6	47	24	7.7	8.8
18	6.6	3.6	6.9	5.4	9.6	8.2	11	33	25	22	6.9	5.9
19	5.7	4.8	8.0	4.8	9.3	47	9.0	168	18	25	7.7	6.1
20	4.1	14	6.1	4.8	7.1	31	8.0	177	10	22	8.0	6.6
21	4.8	57	7.7	17	7.7	20	5.4	38	9.6	19	8.8	8.0
22	4.8	6.1	99	102	*10	16	5.4	26	11	22	7.4	5.9
23	5.9	5.4	17	22	11	10	5.9	27	6.6	21	8.8	6.1
24	5.7	4.0	11	13	9.3	8.0	31	*22	7.4	19	40	5.7
25	5.2	3.6	9.0	11	54	8.5	*210	11	6.9	20	5.2	5.4
26	7.1	6.6	8.2	9.8	90	11	100	11	*7.1	19	5.9	*7.8
27	4.3	5.2	11	7.7	52	*11	151	9.3	11	18	*8.2	7.4
28	3.6	5.7	11	8.5	15	9.0	54	10	16	13	8.5	4.8
29	5.2	5.7	6.9	8.8	-	10	29	8.8	11	16	10	5.2
30	5.9	5.7	4.3	8.2	--------	16	18	6.1	5.9	17	11	6.6
31	11	--------	4.0	7.7	--------	8.8	--------	6.1	--------	18	8.8	--------
Total	172.3	244.5	339.0	317.6	592.4	422.5	1,176.1	704.5	470.2	1,764.1	345.6	241.2
Mean	5.56	8.15	10.9	10.2	21.2	13.6	39.2	22.7	15.7	56.9	11.1	8.04
Cfsm	0.321	0.471	0.630	0.590	1.23	0.786	2.27	1.31	0.908	3.29	0.642	0.465
In.	0.37	0.53	0.73	0.68	1.27	0.91	2.53	1.51	1.01	3.79	0.74	0.52

Calendar year 1956:	Max 412	Min 3.4	Mean 18.8	Cfsm 1.09	In. 14.81
Water year 1956-57:	Max 510	Min 3.4	Mean 18.6	Cfsm 1.08	In. 14.59

* Discharge measurement made on this day.

Big Beaver Creek at Warren, Mich.

Location.--Lat 42°31'57", long 83°01'45", in NW¼ sec. 3, T. 1 N., R. 12 E., on downstream side of center pier of bridge on State Highway 53, 0.6 mile upstream from Red Run and 1.0 mile east of Warren.

Drainage area.--25.2 sq mi.

Records available.--January 1954 to September 1957.

Gage.--Staff gage and crest-stage indicator; gage read twice daily. Altitude of gage is 610 ft (from topographic map).

Extremes.--Maximum discharge during year, 701 cfs July 8 (gage height, 12.50 ft); minimum not determined; minimum daily, 0.1 cfs Oct. 1-5.
1954-57: Maximum discharge, 1,060 cfs Apr. 29, 1956 (gage height, 13.9 ft); no flow at times.

Remarks.--Records poor.

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 27 to Nov. 30)

Oct. 1 to July 8

6.4	0	7.1	9.5
6.5	.2	7.4	22
6.6	.5	7.7	40
6.7	1.2	8.0	65
6.8	2.3	10.0	276
6.9	4.1	11.0	412

July 9 to Sept. 30

7.7	40
10.0	310

Note.--Same as preceding table below 7.7 ft.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.4	0.6	3.2	1	92	15	13	13	0.4	1.2	1.2
2	.1	.3	.5	3.2	1	56	31	11	6.6	.4	1.2	1.1
3	*.1	.3	.3	3.0	.2	17	17	9.5	6.6	.4	1.2	1.1
4	.1	.5	.3	2.7	.4	13	26	8.9	4.1	.4	.9	.8
5	.1	.5	.4	2.5	1.2	6.6	220	8.3	4.1	15	.7	.5
6	.4	.2	2.8	2.2	1.8	5.6	198	8.3	4.1	12	.5	.5
7	.4	*.5	3.0	1.4	2.7	5.6	94	7.2	4.1	5.6	.4	.5
8	.2	1.1	3.0	*.9	3.6	5.6	41	6.6	4.1	288	.4	.4
9	.2	1.1	1.8	.7	79	5.6	26	6.6	4.1	256	.4	.4
10	.2	1.1	1.3	.5	65	5.6	18	8.0	4.1	40	.2	1.2
11	.2	1.1	1.4	.5	38	5.6	15	17	4.1	166	.2	8.0
12	.2	1.1	1.4	.5	21	109	14	13	4.1	262	.2	15
13	.5	.6	1.5	.5	20	39	11	13	4.1	*260	.2	6.6
14	.5	1.9	*3.6	.5	19	26	10	13	26	94	.2	3.7
15	.5	2.8	5.6	.5	18	22	9.5	22	11	44	.2	5.4
16	.5	2.8	3.6	.5	15	18	9.5	22	5.8	20	.5	21
17	.5	3.0	2.8	.5	13	15	9.5	74	4.8	6.6	.5	8.0
18	.5	3.0	1.9	.5	9.5	13	9.5	154	3.7	2.7	.5	2.3
19	.5	2.8	1.6	.5	9.5	33	9.5	226	3.6	1.2	.5	.2
20	.5	3.0	1.2	1	9.2	72	9.5	209	3.4	.5	.5	.5
21	.8	6.9	1.6	2	6.6	32	8.9	117	4.1	.5	.5	4.1
22	.6	2.5	1.6	30	*5.4	27	8.0	65	3.4	.5	.5	1.2
23	.3	3.6	3.6	25	13	21	7.5	33	1.9	.4	.5	3.4
24	.3	.6	15	18	15	16	7.2	*33	1.2	2.3	2.3	2.3
25	.3	.4	5.6	12	20	12	*198	33	1.2	1.2	1.2	2.1
26	.2	.4	5.1	9	36	12	381	22	*1.2	1.2	.5	*1.8
27	.5	.5	6.9	6	139	*13	218	13	2.5	1.2	*.5	.9
28	.4	.5	5.4	4	176	12	109	13	2.3	1.2	.8	.6
29	.4	.5	5.4	3	-	12	50	13	1.9	1.2	2.3	.5
30	.4	.5	3.2	2	--------	12	26	13	1.9	1.2	2.7	1.4
31	.4	--------	3.2	2	--------	12	--------	13	--------	1.2	2.7	--------
Total	10.9	44.5	95.2	138.8	739.1	746.2	1,806.6	1,218.4	147.1	1,487.3	25.1	96.7
Mean	0.35	1.48	3.07	4.48	26.4	24.1	60.2	39.3	4.90	48.0	0.81	3.22
Cfsm	0.014	0.059	0.122	0.178	1.05	0.956	2.39	1.56	0.194	1.90	0.032	0.128
In.	0.02	0.07	0.14	0.20	1.09	1.10	2.67	1.80	0.22	2.19	0.04	0.14

Calendar year 1956: Max 724 Min 0 Mean 22.9 Cfsm 0.909 In. 12.37
Water year 1956-57: Max 381 Min 0.1 Mean 18.0 Cfsm 0.714 In. 9.68

Peak discharge (base, 170 cfs).--Feb. 27 (10 p.m.) 300 cfs (10.2 ft); Apr. 5 (10 p.m.) 362 cfs (10.67 ft); Apr. 25 (12 p.m.) 676 cfs (12.39 ft); May 19 (11 p.m.) 652 cfs (12.28 ft); July 8 (7 p.m.) 701 cfs (12.50 ft); July 12 (time and dishcarge unknown).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 9 to Feb. 2.

Plum Brook near Utica, Mich.

Location.--Lat 42°35'01", long 83°01'49", in SW¼ sec. 15, T. 2 N., R. 12 E., on right bank at downstream side of bridge on State Highway 53, 3.0 miles south of Utica and 3.4 miles upstream from mouth.

Drainage area.--22.5 sq mi.

Records available.--January 1954 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 610 ft (from topographic map).

Extremes.--Maximum discharge during year, 708 cfs Apr. 25 (gage height, 8.18 ft); no flow for part of Aug. 23.
1954-57: Maximum discharge, 980 cfs Apr. 29, 1956 (gage height, 8.60 ft); no flow at times.

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

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 23 to Nov. 21)

Oct. 1 to July 12				July 13 to Sept. 30			
1.0	1.1	5.0	140	0.8	0	2.5	23
1.5	5.4	6.0	210	.9	.7	3.0	37
2.0	11	7.0	311	1.0	1.5	4.0	79
2.4	22	7.5	394	1.5	6.2	6.0	210
4.0	87			2.0	13		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.5	2.3	2.5	2.5	3.5	15	9.3	14	5.0	2.2	1.7	1.8
2	*1.5	2.5	3	2.5	3.5	12	20	9.4	5.4	1.6	1.3	1.7
3	1.5	2.4	3.5	2.5	3.5	10	13	7.9	4.1	1.1	1.0	1.4
4	1.3	2.5	4	2	3.5	8	44	7.3	3.8	1.3	1.0	1.3
5	1.7	*2.0	5.5	2	3.5	8	156	6.4	3.3	5.3	1.0	1.0
6	1.7	*2.1	7	2.5	3.5	7	139	5.7	3.8	2.2	.8	.8
7	2.0	2.1	6.5	2.5	5	7	60	5.0	4.2	1.4	.6	.8
8	2.0	1.9	5	2.5	8	7	43	4.4	4.0	199	.6	.8
9	1.9	1.7	4.5	2.5	60	7	32	4.0	3.1	140	.5	.7
10	2.2	1.7	3.5	2.5	50	7	25	18	2.9	28	.6	4.4
11	2.7	1.7	3.5	2.5	30	17	21	28	3.1	118	.6	5.2
12	3.0	1.8	3.5	2.5	18	68	16	31	3.7	140	.4	6.5
13	3.1	1.9	3	2.5	15	42	13	18	3.8	*141	.3	11
14	3.0	1.7	*3	2	12	33	11	17	14	49	.8	5.4
15	2.8	2.1	3.5	2	10	38	10	15	6.7	24	1.5	7.8
16	3.0	4.1	3.5	2	9	26	9.8	9.1	4.1	15	.9	15
17	3.1	3.9	3.5	2	8	18	9.8	7.2	4.4	10	.6	7.3
18	3.7	3.3	3	2	7	15	11	9.6	4.1	7.2	.6	4.5
19	3.6	3.2	3	2	7	54	13	195	12	5.3	.7	3.4
20	3.5	3.4	3	2	6.5	60	11	391	6.0	4.2	.4	3.8
21	3.6	11	3.5	5	6	37	9.4	76	3.7	3.5	.2	3.7
22	3.3	9.9	10	20	*6	26	7.8	53	2.5	3.2	.3	7.1
23	3.3	5	10	10	6	20	7.3	41	2.3	4.7	.1	5.9
24	3.1	3.5	7.5	8	7	13	30	*32	2.1	3.4	1.1	4.7
25	2.3	3	6.5	7	15	11	*263	19	2.1	2.5	2.0	3.5
26	2.0	3	5	6	80	11	174	19	*1.9	2.3	1.2	*2.7
27	2.2	3	5	5	70	*12	101	11	1.9	2.2	*.9	2.1
28	2.2	3	5	4.5	35	10	63	9.1	3.8	2.1	.9	2.1
29	2.2	2.5	4	4	-	10	38	7.3	5.6	1.7	2.2	2.6
30	2.2	2.5	3.5	4	--------	11	22	6.3	3.3	1.6	2.2	2.1
31	2.2	--------	3	3.5	--------	9.2	--------	5.8	--------	1.6	2.0	--------
Total	77.4	94.7	140.5	122.5	491.5	629.2	1,382.4	1,082.5	130.7	924.6	29.0	121.1
Mean	2.50	3.16	4.53	3.95	17.6	20.3	46.1	34.9	4.36	29.8	0.94	4.04
Cfsm	0.111	0.140	0.201	0.176	0.782	0.902	2.05	1.55	0.194	1.32	0.042	0.180
In.	0.13	0.16	0.23	0.20	0.81	1.04	2.28	1.79	0.22	1.53	0.05	0.20

Calendar year 1956:	Max	634	Min	0.6	Mean	20.7	Cfsm	0.920	In. 12.53
Water year 1956-57:	Max	391	Min	0.1	Mean	14.3	Cfsm	0.636	In. 8.64

Peak discharge (base, 150 cfs).--Apr. 5 (12 p.m.) 241 cfs (6.36 ft); Apr. 25 (9 p.m.) 708 cfs (8.18 ft); May 20 (4:30 a.m.) 678 cfs (8.13 ft); July 8 (9 p.m.) 337 cfs (7.19 ft); July 11 (12 p.m.) 270 cfs (6.65 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23 to Mar. 10 (no gage-height record Jan. 16 to Feb. 5; discharge estimated on basis of records for River Rouge at Birmingham, North Branch Clinton River near Mount Clemens and Big Beaver Creek at Warren).

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 1957.

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.--10 years, 357 cfs.

Extremes.--Maximum discharge during year, 3,870 cfs July 8 (gage height, 15.39 ft); minimum, 88 cfs Oct. 15; minimum gage height, 4.85 ft Aug. 28.

1947-57: 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, 47 cfs Sept. 6, 1955; minimum gage height, 4.29 ft Sept. 7, 1954.

Flood of Apr. 5 or 6, 1947, reached a stage of 20 ft, from floodmarks (discharge, 9,000 cfs, from rating curve extended above 4,000 cfs).

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

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-16)

4.8	88	12.0	1,560
6.0	232	14.0	2,560
8.0	581	15.0	3,440

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	222	116	200	230	467	298	514	335	186	233	153
2	*116	163	104	190	220	404	445	461	358	185	218	123
3	118	126	110	180	210	311	376	414	327	180	212	157
4	117	117	139	170	200	298	609	383	316	177	227	149
5	111	111	152	160	200	298	1,410	346	297	618	203	133
6	111	116	205	160	201	278	1,580	327	287	210	184	137
7	136	*121	218	150	205	264	958	327	276	161	175	137
8	103	123	170	150	223	255	696	311	270	1,710	168	121
9	102	120	166	150	729	252	583	294	243	2,950	165	110
10	102	112	153	150	871	236	514	345	231	1,320	156	290
11	106	109	142	140	436	266	474	592	333	1,110	135	255
12	107	107	180	140	348	773	438	577	335	1,810	125	*276
13	105	105	*168	140	308	602	390	476	383	1,720	131	460
14	100	117	192	140	233	484	361	469	853	1,430	132	193
15	95	118	211	140	284	496	345	496	616	912	143	292
16	100	198	242	140	278	454	338	470	480	671	142	522
17	99	138	210	140	256	375	334	392	722	564	132	218
18	114	111	200	140	246	332	a330	443	420	*478	119	174
19	108	105	167	140	261	594	a360	1,220	457	420	120	163
20	109	118	193	140	232	766	a330	2,840	345	383	121	167
21	106	394	220	261	*232	554	a300	1,820	287	335	118	188
22	99	276	375	902	235	463	a250	1,140	270	308	117	223
23	108	161	411	*583	248	411	a250	935	260	416	114	156
24	110	119	346	350	218	363	a600	*836	220	368	201	*161
25	111	125	297	310	374	334	a1,100	676	232	329	189	142
26	114	114	238	290	790	*334	2,150	617	*209	308	*112	135
27	131	130	245	260	1,320	340	1,500	536	224	298	109	129
28	115	129	266	250	622	326	1,290	469	298	276	109	123
29	106	116	235	240	-	346	790	432	322	255	232	117
30	109	117	220	240		400	608	387	227	249	186	114
31	119		200	230		318		346		248	176	
Total	3,403	4,238	6,491	6,976	10,210	12,394	20,007	19,891	10,433	20,585	4,904	5,718
Mean	110	141	209	225	365	400	667	642	348	664	158	191
Cfsm	0.242	0.311	0.460	0.496	0.804	0.881	1.47	1.41	0.767	1.46	0.348	0.421
In.	0.28	0.35	0.53	0.57	0.84	1.02	1.64	1.63	0.85	1.69	0.40	0.47

Calendar year 1956: Max 3,770	Min 90	Mean 403	Cfsm 0.888	In. 12.07
Water year 1956-57: Max 2,950	Min 95	Mean 343	Cfsm 0.756	In. 10.27

Peak discharge (base, 1,100 cfs).--Jan. 22 (4 p.m.) 1,250 cfs (10.89 ft); Feb. 27 (4 to 5 a.m.) 1,570 cfs (12.02 ft); Apr. 6 (1 a.m.) 1,820 cfs (12.63 ft); Apr. 25 (time unknown) about 2,800 cfs; May 20 (10 to 11 a.m.) 3,110 cfs (14.68 ft); June 17 (1 a.m.) 1,180 cfs (10.61 ft); July 8 (12 p.m.) 3,870 cfs (15.39 ft); July 12 (5 to 6 a.m.) 1,980 cfs (12.97 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Clinton River at Mount Clemens.

Note.--Stage-discharge relation affected by ice Dec. 30 to Jan. 20, Jan. 24 to Feb. 5.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 576.38 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to Nov. 15, 1949, wire-weight gage at same site and datum.

Average discharge.--10 years, 133 cfs.

Extremes.--Maximum discharge during year, 3,220 cfs May 20 (gage height, 14.65 ft); minimum, 1.7 cfs Aug. 9; minimum gage height, 3.33 ft Oct. 4.

1947-57: Maximum daily discharge, 4,500 cfs Apr. 4, 1950; maximum gage height, 17.5 ft Apr. 4 or 5, 1950, from high-water mark in gage well (backwater from Clinton River); minimum discharge, 0.2 cfs Sept. 13, 14, 1954 (gage height, 3.12 ft).

Flood of Apr. 5 or 6, 1947, reached a stage of 20.0 ft, from floodmark.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Some regulation at times from mill above station.

Revisions (water years).--WSP 1437: 1948.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*11	17	22	70	50	450	115	158	71	31	24	31
2	15	16	22	45	45	250	164	131	69	26	19	34
3	14	14	22	32	45	170	239	115	76	22	17	37
4	6.1	13	24	30	45	100	171	102	68	19	14	30
5	12	10	26	30	45	80	528	90	61	12	11	25
6	12	*17	34	30	45	60	1,460	80	55	18	11	23
7	11	15	50	29	45	60	1,180	73	50	14	4.9	17
8	9.4	16	55	29	70	60	575	68	47	34	4.9	15
9	8.2	16	52	28	150	60	a400	64	43	226	2.0	4.6
10	8.8	17	42	28	400	60	a300	70	40	75	3.0	16
11	7.0	15	65	28	550	60	a220	117	39	50	4.3	34
12	6.7	15	37	28	350	309	a180	220	37	44	4.9	57
13	6.4	19	*39	28	200	376	a140	216	38	121	4.6	50
14	6.1	22	26	28	150	267	116	159	72	286	4.3	35
15	5.8	21	29	28	110	262	114	162	98	121	3.8	36
16	5.8	22	27	28	90	325	106	173	72	92	4.6	43
17	6.7	26	32	28	70	197	99	132	54	73	4.9	33
18	6.1	30	34	28	60	139	95	115	45	*54	4.9	27
19	6.1	27	31	28	50	175	94	303	72	42	4.6	19
20	5.2	28	31	28	50	435	94	2,250	61	34	3.6	17
21	4.9	30	27	40	*50	457	92	2,080	44	30	3.6	16
22	5.8	40	37	90	50	292	85	912	34	27	3.4	17
23	13	52	163	350	50	222	81	329	29	70	3.4	14
24	17	51	161	320	70	158	a250	*256	23	250	4.9	*21
25	18	35	135	210	110	131	747	217	*22	161	8.2	18
26	17	30	110	150	400	*118	1,440	160	18	90	*11	14
27	17	30	87	100	700	117	891	143	16	67	14	9.4
28	19	24	79	90	750	124	593	125	21	53	12	7.0
29	22	25	71	70		129	488	108	30	42	14	5.5
30	21	21	80	60	--------	136	252	98	36	34	19	3.6
31	20	--------	75	55	--------	130	--------	84	--------	29	30	--------
Total	344.1	714	1,725	2,166	4,800	5,909	11,309	9,310	1,441	2,247	278.8	709.1
Mean	11.1	23.8	55.6	69.9	171	191	377	300	48.0	72.5	8.99	23.6
Cfsm	0.060	0.129	0.301	0.378	0.924	1.03	2.04	1.62	0.259	0.392	0.049	0.128
In.	0.07	0.14	0.35	0.44	0.96	1.19	2.27	1.87	0.29	0.45	0.06	0.14

	Max	Min	Mean	Cfsm	In.
Calendar year 1956:	4,150	4.9	170	0.919	12.54
Water year 1956-57:	2,250	2.0	112	0.605	8.23

Peak discharge (base, 650 cfs).--Feb. 27 (time unknown) about 900 cfs; Apr. 6 (5 p.m.) 1,670 cfs (12.67 ft); Apr. 26 (12 m.) 1,580 cfs (12.44 ft); May 20 (5 to 6 p.m.) 3,220 cfs (14.65 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records from Mill Creek near Abbottsford, Clinton River near Fraser, and River Rouge at Birmingham.

Note.--Stage-discharge relation affected by ice Jan. 1 to Mar. 11.

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 1957. Monthly discharge only for some periods, published in WSP 1307.

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, at same datum. Mar. 15, 1938, to Jan. 3, 1952, auxiliary wire-weight gage 1¼ miles downstream from base gage.

Average discharge.--23 years, 498 cfs.

Extremes.--Maximum discharge during year, 6,570 cfs May 20 (gage height, 13.27 ft); minimum not determined, occurred during period of indefinite stage-discharge relation; minimum gage height, 4.05 ft Jan. 14.

1934-57: 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 ice effect or indefinite stage-discharge relation, which are fair.

Revisions (water years).--WSP 1084: 1943, 1945-46. WSP 1437: 1935, 1936(M), 1937-39, 1949(M), 1950.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*140	250	150	350	320	1,090	431	751	460	250	300	220
2	160	200	140	270	310	740	659	680	490	240	270	180
3	160	160	149	250	310	528	706	600	460	230	260	220
4	140	150	178	230	290	585	818	550	430	230	270	200
5	140	140	205	220	330	448	2,410	510	400	720	250	180
6	140	140	254	220	280	383	3,490	460	390	256	220	180
7	170	*140	277	200	280	351	2,580	460	370	210	210	180
8	130	150	243	200	330	318	1,660	440	360	1,650	200	160
9	130	150	228	200	1,000	312	1,050	410	320	3,670	190	140
10	130	150	215	200	1,400	297	830	460	310	1,900	170	340
11	130	140	207	190	1,200	313	739	632	420	1,250	160	340
12	130	140	227	190	800	1,220	660	908	420	2,320	150	370
13	130	140	*203	190	560	1,170	581	786	470	2,440	150	620
14	120	160	252	190	490	910	517	688	1,070	2,260	150	275
15	110	160	252	180	460	891	475	714	838	1,290	160	268
16	120	226	296	180	430	905	468	710	559	853	170	761
17	120	178	270	180	370	668	450	555	887	698	160	333
18	140	153	249	180	360	523	457	551	511	*583	150	244
19	130	152	227	180	350	868	500	1,860	664	502	140	214
20	130	160	245	180	320	1,540	457	5,500	494	457	140	219
21	130	405	254	200	320	1,240	405	4,500	375	406	140	217
22	120	370	410	1,100	*280	910	352	2,380	316	354	140	293
23	140	234	722	*1,000	295	748	349	1,470	324	506	140	213
24	140	190	636	800	274	591	760	*1,150	250	657	230	*210
25	150	180	549	600	473	512	2,460	1,000	*266	551	220	190
26	150	170	444	500	1,410	*476	4,350	900	233	444	*140	170
27	160	180	398	400	2,450	497	3,040	780	233	399	140	160
28	150	170	406	380	1,420	483	2,460	680	330	364	140	150
29	150	160	346	360	-	497	1,620	610	372	350	280	140
30	150	160	340	340	--------	595	1,030	550	278	330	230	140
31	160	--------	310	320	--------	493	--------	500	--------	310	230	--------
Total	4,300	5,458	9,282	10,180	17,112	21,102	36,764	32,745	13,300	26,680	5,900	7,527
Mean	139	182	299	328	611	681	1,225	1,056	443	861	190	251
Cfsm	0.190	0.248	0.408	0.447	0.834	0.929	1.67	1.44	0.604	1.17	0.259	0.342
In.	0.22	0.28	0.47	0.52	0.87	1.07	1.87	1.66	0.67	1.35	0.30	0.38

	Max		Min		Mean		Cfsm		In.	
Calendar year 1956:	Max	10,500	Min	103	Mean	673	Cfsm	0.918	In.	12.49
Water year 1956-57:	Max	5,500	Min	110	Mean	522	Cfsm	0.712	In.	9.66

Peak discharge (base, 3,000 cfs).--Apr. 6 (12 m. to 2 p.m.) 3,670 cfs (10.00 ft); Apr. 26 (7 to 8 a.m.) 4,800 cfs (11.34 ft); May 20 (5:30 p.m.) 6,570 cfs (13.27 ft); July 9 (4:30 a.m.) 4,290 cfs (10.77 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 24 to Dec. 2, Dec. 30 to Feb. 21 (no gage-height record Jan. 15-21). Stage-discharge relation indefinite Oct. 1 to Nov. 15, Nov. 20, May 2-10, May 25 to June 13, July 1-7, Aug. 1 to Sept. 12, Sept. 24-30; discharge computed on basis of 4 discharge measurements and sum of records for Clinton River near Fraser and 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 in Birmingham, 25 ft downstream from mouth of Quarton Lake Outlet and 100 ft upstream from bridge on West Maple Road.

Drainage area.--33 sq mi, approximately.

Records available.--June 1950 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Altitude of gage is 720 ft (by barometer).

Average discharge.--7 years, 17.4 cfs.

Extremes.--Maximum discharge during year, 488 cfs July 8 (gage height, 4.67 ft), from rating curve extended as explained below; minimum, 1.3 cfs Oct. 7 (gage height, 1.40 ft).

1950-57: Maximum discharge, 700 cfs Apr. 29, 1956 (gage height, 5.38 ft), from rating curve extended above 340 cfs by logarithmic plotting; minimum, 0.4 cfs Sept. 1, 3, 4, 6-8, 1954; minimum gage height, 1.27 ft Sept. 16, 1955.

Remarks.--Records good except those for period of no gage-height record and those below 5 cfs, which are fair. Occasional regulation by Quarton Lake above station.

Revisions (water years).--WSP 1387: 1951-52(M).

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

1.4	1.3	2.4	53
1.5	3.6	3.0	121
1.6	6.7	4.0	290
2.0	26	5.0	565

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*3.8	11	6.3	5.6	8.6	23	a19	20	17	6.0	5.3	6.0
2	3.0	8.2	6.3	5.3	7.8	19	a30	18	17	5.3	5.0	5.3
3	3.6	6.3	7.4	5.0	7.8	15	a22	16	15	5.0	5.3	6.0
4	3.6	5.3	8.2	5.0	7.8	13	a35	16	14	12	5.3	5.0
5	3.6	*6.0	12	5.0	7.4	12	a75	14	14	18	5.0	4.1
6	3.8	5.0	16	5.0	7.4	11	a70	13	12	8.2	4.7	3.8
7	3.1	5.0	15	*5.6	7.8	11	a50	13	12	6.3	4.4	3.8
8	4.3	4.4	12	5.6	9.0	12	a40	12	12	297	4.4	3.3
9	4.4	4.1	10	6.3	44	12	a35	12	10	149	4.4	3.3
10	7.0	4.1	8.2	6.0	33	11	a28	25	9.4	64	4.1	24
11	7.4	4.1	7.8	6.0	20	21	a23	28	11	102	4.1	12
12	8.2	4.4	7.8	5.6	15	43	*20	29	10	*113	3.8	16
13	8.2	3.8	7.4	5.6	16	31	20	24	19	134	3.6	14
14	9.0	4.1	*6.6	5.0	14	27	21	23	22	75	5.3	7.4
15	11	7.6	7.4	5.0	12	29	20	22	16	47	6.0	21
16	11	9.8	8.6	5.0	13	24	17	18	16	34	4.7	19
17	12	7.8	8.2	4.7	9.8	21	16	16	16	27	3.8	9.8
18	12	6.3	7.0	4.7	10	19	17	22	16	24	3.8	7.8
19	14	6.0	6.3	4.7	8.6	33	17	132	18	21	3.8	7.0
20	13	6.6	6.6	4.7	8.6	36	16	200	12	20	3.3	7.0
21	14	25	8.2	9.3	8.2	29	15	95	8.2	18	3.3	8.2
22	15	16	22	50	*9.8	26	14	65	7.0	17	3.0	9.8
23	14	9.4	23	26	9.8	22	17	54	7.0	18	3.0	7.8
24	14	7.4	18	21	9.4	20	16	45	6.0	13	12	6.3
25	13	6.6	16	16	22	18	47	36	5.6	11	7.4	6.0
26	8.2	7.0	12	12	53	18	43	33	*5.2	8.6	5.0	*5.3
27	8.2	6.3	12	12	57	*18	51	27	6.4	7.8	*4.1	5.0
28	6.0	6.3	12	12	29	18	36	*23	13	7.8	4.6	5.0
29	5.6	6.3	9.0	10	-	18	28	20	12	7.4	10	5.0
30	6.6	6.0	7.4	9.4	--------	a22	23	18	7.8	6.6	6.3	5.3
31	6.3	--------	7.4	9.0	--------	a19	--------	18	--------	6.3	7.4	--------
Total	256.9	216.2	322.1	292.1	465.8	651	881	1,107	366.6	1,289.3	156.2	249.3
Mean	8.29	7.21	10.4	9.42	16.6	21.0	29.4	35.7	12.2	41.6	5.04	8.31
Cfsm	0.251	0.218	0.315	0.285	0.503	0.636	0.891	1.08	0.370	1.26	0.153	0.252
In.	0.29	0.24	0.36	0.33	0.52	0.73	0.99	1.25	0.41	1.45	0.18	0.28

Calendar year 1956: Max 365 Min 2.5 Mean 23.9 Cfsm 0.724 In. 9.84
Water year 1956-57: Max 297 Min 3.0 Mean 17.1 Cfsm 0.518 In. 7.03

Peak discharge (base, 110 cfs).--Apr. 5 (time and discharge unknown); Apr. 25 (1 p.m.) 149 cfs (3.20 ft); May 19 (12 p.m.) 308 cfs (4.08 ft); July 8 (11 a.m.) 488 cfs (4.67 ft); July 11 (12 p.m.) 164 cfs (3.21 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for River Rouge at Detroit, Clinton River near Fraser, and Plum Brook near Utica.

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 bridge on Plymouth Road in Detroit and 4 miles upstream from Middle River Rouge.

Drainage area.--193 sq mi.

Records available.--October 1930 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

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 4.6 ft lower.

Average discharge.--27 years, 111 cfs.

Extremes.--Maximum discharge during year, 4,030 cfs July 9 (gage height, 16.07 ft); minimum, 11 cfs Aug. 23 (gage height, 3.02 ft).

1930-57: 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 period of ice effect, which are poor.

Revisions (water years).--WSP 1034: 1933(M). WSP 1054: 1939, 1943, 1945(M). WSP 1437: 1931-32, 1934, 1936(M), 1937-38, 1944(M), 1945.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 12, Aug. 6 to Sept. 30)

2.9	12	8.0	667
3.1	21	12.0	1,610
4.0	83	14.0	2,450
5.0	185	16.0	3,970

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	64	45	45	50	208	129	144	80	45	32	50
2	18	67	42	40	50	165	243	121	80	38	30	33
3	*17	37	45	35	45	115	179	105	76	35	29	32
4	17	30	56	35	45	114	348	92	67	65	31	29
5	16	28	59	35	45	99	1,080	86	67	229	31	23
6	18	28	103	30	45	94	1,030	79	73	75	26	18
7	20	29	99	*30	45	86	437	71	61	48	21	17
8	20	*28	81	30	55	77	302	66	59	1,680	20	16
9	18	27	72	30	450	78	233	64	52	3,220	20	16
10	20	27	66	25	700	75	185	73	50	836	20	71
11	20	28	58	25	280	94	159	103	120	644	22	73
12	22	32	62	25	200	398	*144	134	92	*1,810	18	72
13	21	31	56	25	160	246	127	110	80	873	17	164
14	23	36	56	25	140	195	117	107	186	522	16	57
15	25	38	52	25	120	194	110	112	87	310	22	56
16	26	66	69	25	110	166	103	99	63	206	22	169
17	27	60	65	25	100	128	102	76	58	154	18	66
18	28	49	58	25	95	114	118	144	56	129	15	40
19	31	45	*47	25	90	190	92	650	65	109	16	32
20	32	52	49	25	85	317	116	1,680	*59	98	16	35
21	35	179	65	70	80	209	105	976	49	86	14	55
22	35	132	132	450	80	159	92	437	42	134	12	47
23	37	67	189	550	*90	131	91	*350	52	133	12	38
24	38	59	134	230	110	114	166	334	45	86	41	33
25	35	63	114	170	200	101	527	226	44	68	64	29
26	36	52	89	130	500	99	1,050	197	40	61	31	28
27	44	54	83	100	879	111	737	158	46	55	21	*26
28	45	51	70	80	308	*103	600	126	79	52	*18	25
29	41	47	65	65	-	124	275	109	94	47	49	23
30	40	42	55	60		247	186	96	59	41	50	25
31	41		50	55		156		87		38	66	
Total	864	1,548	2,286	2,545	5,157	4,707	9,183	7,212	2,081	11,927	820	1,398
Mean	27.9	51.6	73.7	82.1	184	152	306	233	69.4	385	26.5	46.6
Cfsm	0.145	0.267	0.382	0.425	0.953	0.788	1.59	1.21	0.360	1.99	0.137	0.241
In.	0.17	0.30	0.44	0.49	0.99	0.91	1.77	1.39	0.40	2.30	0.16	0.27

Calendar year 1956: Max 2,890 Min 14 Mean 163 Cfsm 0.845 In. 11.47
Water year 1956-57: Max 3,220 Min 12 Mean 136 Cfsm 0.705 In. 9.59

Peak discharge (base, 800 cfs).--Jan. 23 (time unknown) about 830 cfs; Feb. 10 (time unknown) about 900 cfs; Feb. 27 (8 a.m.) 1,100 cfs (10.04 ft); Apr. 6 (8 a.m.) 1,220 cfs (10.54 ft); Apr. 26 (6 to 7 a.m.) 1,340 cfs (11.02 ft); May 20 (4 to 5 p.m.) 1,850 cfs (12.71 ft); July 9 (4 a.m.) 4,030 cfs (16.07 ft); July 12 (9 to 10 a.m.) 2,110 cfs (13.35 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 28 to Feb. 26.

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 bridge on Inkster Road, 1¼ miles northeast of Garden City, and 6¼ miles upstream from mouth.

Drainage area.--93 sq mi, approximately.

Records available.--June 1947 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 600.95 ft above mean sea level, datum of 1929. Prior to Oct. 18, 1948, wire-weight gage at site 200 ft upstream at same datum.

Average discharge.--10 years, 80.4 cfs.

Extremes.--Maximum discharge during year, 1,210 cfs July 8 (gage height, 9.01 ft); maximum gage height, 9.13 ft July 12; minimum discharge, 2.6 cfs Oct. 30 (gage height, 1.06 ft).

1947-57: Maximum discharge, 2,150 cfs May 10, 1948 (gage height, 10.50 ft, from floodmark); minimum, 0.9 cfs Aug. 16, 1956.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Occasional regulation by reservoirs above station since 1956.

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 9 to Sept. 30)

Oct. 1 to Feb. 9				Feb. 10 to Sept. 30			
1.1	3.0	2.0	29	1.6	11	7.0	530
1.3	6.0	3.0	103	1.9	21	8.0	730
1.5	10	5.0	296	2.4	50	8.5	920
1.6	12			4.0	176	9.0	1,240
				6.0	394		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	13	6.8	a30	28	154	89	99	45	26	25	36
2	13	8.0	7.2	a28	26	119	138	79	44	22	24	29
3	*13	5.6	13	a25	25	87	136	68	42	20	32	27
4	12	4.6	23	25	24	71	247	59	39	30	50	22
5	12	4.2	34	22	24	59	540	53	36	59	29	28
6	16	4.4	48	21	24	54	655	50	35	44	24	21
7	16	4.6	69	*20	24	52	342	46	33	28	22	17
8	14	*4.0	43	19	25	49	207	42	31	739	19	23
9	13	4.2	45	17	276	46	158	42	29	627	19	17
10	12	4.0	42	16	304	43	130	48	28	298	19	40
11	12	3.6	42	15	164	57	114	52	71	583	17	29
12	12	3.4	34	14	107	132	*98	71	54	*1,040	16	40
13	13	3.6	29	14	82	156	85	59	90	638	16	56
14	13	3.2	24	14	80	162	77	67	125	341	16	33
15	14	5.8	29	14	76	110	73	62	51	192	17	39
16	14	22	35	14	62	90	69	56	39	133	17	47
17	14	18	30	14	63	71	71	47	33	98	16	45
18	15	15	28	14	56	63	90	65	34	77	15	42
19	14	14	*26	14	56	122	89	228	48	60	15	38
20	16	20	a28	14	55	128	82	548	*31	51	14	50
21	19	101	a35	80	49	114	71	379	26	43	14	51
22	17	62	a110	280	41	92	61	221	22	54	14	36
23	18	40	a120	260	*50	78	59	*173	26	66	13	33
24	16	147	a90	150	63	66	78	157	22	52	17	76
25	14	55	a85	80	132	58	263	117	24	41	30	63
26	42	9.0	a65	65	330	57	356	103	22	35	20	55
27	165	9.4	a60	50	493	59	445	86	39	32	16	*16
28	144	12	a45	40	244	*58	330	71	56	30	*16	19
29	13	7.8	a35	35	-	76	170	61	55	28	40	20
30	5.8	6.6	a32	32	--------	106	124	53	36	28	32	21
31	6.0	--------	a30	30	--------	99	--------	46	--------	27	61	--------
Total	729.8	615.0	1,343.0	1,466	2,983	2,688	5,447	3,308	1,266	5,542	695	1,069
Mean	23.5	20.5	43.3	47.3	107	86.7	182	107	42.2	179	22.4	35.6
Cfsm	0.253	0.220	0.466	0.509	1.15	0.932	1.96	1.15	0.454	1.92	0.241	0.383
In.	0.29	0.25	0.54	0.59	1.19	1.07	2.18	1.32	0.51	2.22	0.28	0.43

Calendar year 1956: Max 1,280 Min 3.2 Mean 84.9 Cfsm 0.913 In. 12.42
Water year 1956-57: Max 1,040 Min 3.2 Mean 74.4 Cfsm 0.800 In. 10.87

Peak discharge (base, 500 cfs).--Feb. 27 (8 to 9 a.m.) 577 cfs (7.31 ft); Apr. 6 (9:30 a.m.) 757 cfs (8.09 ft); Apr. 27 (5 p.m.) 581 cfs (7.33 ft); May 20 (12 m.) 585 cfs (7.35 ft); July 8 (2 p.m.) 1,210 cfs (9.01 ft); July 12 (3 a.m.) 1,170 cfs (9.13 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for River Rouge at Detroit, River Rouge at Birmingham, and Lower River Rouge at Inkster.

Note.--Stage-discharge relation affected by ice Jan. 4 to Feb. 8.

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 bridge on John Daly Road, 0.6 mile northeast of Inkster, and 4¾ miles upstream from mouth.

Drainage area.--90 sq mi, approximately.

Records available.--June 1947 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 593.14 ft above mean sea level, datum of 1929. Prior to Oct. 20, 1948, wire-weight gage at same site and datum.

Average discharge.--10 years, 56.3 cfs.

Extremes.--Maximum discharge during year, 964 cfs Apr. 6 (gage height, 9.18 ft); minimum, 0.6 cfs Oct. 8 (gage height, 2.82 ft).
1947-57: Maximum discharge, 3,120 cfs Apr. 4, 1950 (gage height, 12.42 ft); minimum, 0.2 cfs Sept. 13, 1955.

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

Revisions (water years).--WSP 1174: 1948(M). WSP 1437: 1949.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-9)

Oct. 1 to Jan. 22			
2.7	0.4	3.6	27
2.8	1.3	4.0	56
2.9	2.6	5.0	150
3.1	6.7		

Jan. 23 to Sept. 30			
2.8	0	3.9	52
2.9	1.9	5.0	150
3.0	4.0	6.0	285
3.2	10	8.0	665
3.4	19	9.0	915

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.1	18	4.7	9	15	116	30	66	14	6.7	4.0	7.0
2	1.3	6.5	4.5	8	14	92	75	47	14	4.5	3.8	6.5
3	*1.7	5.8	6.0	7	13	54	67	35	11	3.4	16	9.7
4	2.1	4.9	8.0	6	12	43	173	30	9.7	6.5	7.4	3.8
5	2.8	3.9	12	6	12	36	762	25	8.7	12	3.0	3.4
6	2.8	4.3	16	5	12	32	828	22	7.7	5.4	2.5	2.5
7	2.3	4.9	21	*5	12	31	228	19	6.7	4.3	3.0	2.3
8	1.7	*4.5	20	5	15	26	150	17	6.2	318	3.2	2.5
9	3.7	4.7	21	4	180	26	104	16	5.4	165	2.5	1.3
10	3.8	4.3	14	4	419	25	82	19	5.1	42	3.0	11
11	1.7	4.3	14	4	128	34	*69	19	21	440	2.5	4.0
12	2.5	3.7	15	4	78	99	56	38	18	*703	2.1	13
13	3.0	3.7	14	4	69	86	46	28	40	259	2.5	10
14	2.5	4.1	12	3	58	68	39	34	91	126	3.2	8.0
15	3.0	7.7	15	3	58	69	35	30	33	86	3.2	22
16	6.3	8.4	18	3	48	53	33	21	18	50	2.5	12
17	2.8	5.6	18	3	39	38	36	16	12	32	2.5	5.6
18	3.6	5.4	15	3	36	33	63	36	9.7	22	2.1	4.3
19	4.7	4.5	*10	3	33	82	70	204	8.4	16	1.9	3.6
20	3.2	9.9	11	3	27	118	55	648	*9.0	12	1.9	59
21	6.3	46	16	10	25	82	43	257	5.6	10	2.1	52
22	3.7	20	51	140	25	62	34	128	5.1	32	1.9	36
23	3.0	11	60	174	*35	50	31	*98	4.0	25	1.7	13
24	4.1	8.4	46	69	58	39	80	95	3.6	13	14	9.0
25	3.0	7.0	43	50	146	32	257	62	4.3	8.4	5.6	7.4
26	3.4	6.7	33	35	437	30	457	52	3.6	6.7	2.3	5.9
27	4.7	7.0	29	30	749	32	660	39	7.0	5.9	1.9	*4.5
28	3.7	6.7	22	25	204	*31	391	29	15	4.8	*3.4	3.8
29	3.4	6.0	17	20	-	33	156	23	17	4.5	15	3.4
30	3.9	4.9	12	18	--------	40	91	18	12	4.5	7.7	3.4
31	3.9	--------	10	16	--------	34	--------	16	--------	4.0	12	--------
Total	99.7	242.8	608.2	679	2,957	1,626	5,201	2,187	425.8	2,432.6	140.4	329.9
Mean	3.22	8.09	19.6	21.9	106	52.5	173	70.5	14.2	78.5	4.53	11.0
Cfsm	0.036	0.090	0.218	0.243	1.18	0.583	1.92	0.783	0.158	0.872	0.050	0.122
In.	0.04	0.10	0.25	0.28	1.22	0.67	2.15	0.90	0.18	1.01	0.06	0.14

Calendar year 1956: Max 1,530 Min 1.1 Mean 53.0 Cfsm 0.589 In. 8.00
Water year 1956-57: Max 828 Min 1.1 Mean 46.4 Cfsm 0.516 In. 7.00

Peak discharge (base, 600 cfs).--Feb. 27 (2 to 4 p.m.) 862 cfs (8.75 ft); Apr. 6 (2 p.m.) 964 cfs (9.18 ft); Apr. 27 (1:30 p.m.) 805 cfs (8.56 ft); May 20 (4 to 5 p.m.) 725 cfs (8.24 ft); July 8 (12 m.) 692 cfs (8.11 ft); July 11 (11 p.m.) 932 cfs (9.07 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 28 to Jan. 22, Jan. 25 to Feb. 9.

Huron River at Commerce, Mich.

Location.--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 1957.

Gage.--Staff gage read twice daily. Datum of gage is 910.00 ft above mean sea level, datum of 1929.

Average discharge.--11 years, 44.6 cfs.

Extremes.--Maximum discharge during year, 102 cfs July 14, 18, 20 (gage height, 1.96 ft); minimum, 14 cfs Oct. 16, 17, Aug. 23; minimum gage height, 1.02 ft Aug. 23.

1946-57: 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; minimum gage height, 0.66 ft Sept. 10, 1953.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Some regulation by dams operated for lake level control at outlets of Pontiac, Oxbow, and Union Lakes.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 5 to Apr. 4, May 9 to June 25, July 1-24)

1.0	11	2.0	95
1.1	16	3.0	201
1.5	48		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	20	20	34	35	51	41	55	70	30	48	25
2	17	20	21	33	35	52	38	55	68	31	44	24
3	16	19	21	31	35	52	37	55	63	23	39	25
4	17	20	20	30	35	50	40	55	61	22	36	24
5	17	20	22	28	a35	52	48	55	56	29	35	22
6	17	20	23	a27	a35	*52	56	54	50	26	33	21
7	16	20	22	26	a30	52	58	a50	43	a25	29	22
8	16	20	25	28	a30	51	60	a50	39	89	27	21
9	19	20	26	*26	a35	51	62	53	40	78	26	21
10	18	19	25	25	35	51	65	59	40	72	25	25
11	16	17	24	25	33	53	68	62	39	80	24	*27
12	16	18	23	25	32	58	70	62	39	88	22	28
13	16	18	23	25	35	56	*68	59	39	100	22	26
14	15	*17	22	25	36	55	65	61	48	101	22	25
15	15	19	22	25	36	55	62	58	47	100	22	26
16	*14	20	23	25	33	54	60	55	49	98	22	27
17	14	20	*24	25	33	52	57	a55	46	*97	22	26
18	16	19	22	25	32	50	52	62	49	101	21	25
19	16	18	22	25	28	55	50	91	47	100	20	24
20	16	17	21	25	25	58	47	88	43	101	19	26
21	16	29	25	30	25	57	45	92	39	95	17	27
22	17	26	33	45	25	56	42	94	38	93	16	26
23	16	24	38	45	24	56	44	96	34	90	15	26
24	15	23	40	45	25	54	48	96	33	81	18	28
25	15	22	42	45	34	52	50	*91	33	74	20	25
26	16	21	43	45	45	51	52	91	*29	71	17	25
27	17	21	44	40	49	51	54	86	31	67	16	22
28	16	21	44	40	51	48	53	81	32	62	17	22
29	17	20	43	40	-	46	54	76	33	58	*20	22
30	16	20	41	40	--------	44	55	73	31	52	20	22
31	16	--------	39	40	--------	44	--------	71	--------	50	23	--------
Total	502	608	883	993	941	1,619	1,601	2,141	1,309	2,184	757	735
Mean	16.2	20.3	28.5	32.0	33.6	52.2	53.4	69.1	43.6	70.5	24.4	24.5
Cfsm	0.318	0.398	0.559	0.627	0.659	1.02	1.05	1.35	0.855	1.38	0.478	0.480
In.	0.37	0.44	0.64	0.72	0.69	1.18	1.17	1.56	0.95	1.59	0.55	0.54

Calendar year 1956: Max 196 Min 11 Mean 44.2 Cfsm 0.867 In. 11.80
Water year 1956-57: Max 101 Min 14 Mean 39.1 Cfsm 0.767 In. 10.40

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* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Huron River at Milford and Clinton River at Auburn Heights.

Note.--Stage-discharge relation affected by ice Jan. 10 to Feb. 4.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 880.00 ft above mean sea level, datum of 1929.

Average discharge.--9 years, 111 cfs.

Extremes.--Maximum discharge during year, 438 cfs July 13 (gage height, 8.23 ft); minimum, 8.6 cfs Feb. 24 (gage height, 4.11 ft); minimum daily, 16 cfs Oct. 7.
1948-57: Maximum discharge, 645 cfs Apr. 5, 1950 (gage height, 8.25 ft); minimum daily, 8.3 cfs Sept. 17, 1949.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow below about 300 cfs regulated by powerplant 1½ miles above station prior to May 20, 1957.

Revisions (water years).--WSP 1337: 1952(m).

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 5, June 1 to Sept. 30)

4.2	14	6.0	194
4.5	34	7.5	428
5.0	77		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	71	60	26	55	90	113	121	112	a150	85	120	90
2	58	77	47	111	66	75	135	112	a150	70	121	76
3	57	42	85	79	71	83	130	104	a140	67	104	84
4	56	39	66	73	88	122	120	78	133	78	106	84
5	57	82	67	69	88	97	138	81	122	111	104	81
6	64	66	77	35	82	*89	155	119	110	83	98	76
7	16	72	89	95	79	93	155	102	104	82	87	71
8	60	66	54	77	70	92	168	97	100	203	79	68
9	60	61	56	*65	95	73	147	75	95	251	80	59
10	58	35	94	69	95	81	131	106	88	284	78	62
11	54	42	76	67	103	121	128	89	88	338	75	*70
12	52	79	77	66	86	162	139	110	83	*374	72	a75
13	57	64	74	55	89	140	*92	136	91	423	69	a75
14	26	*62	77	55	85	134	123	132	113	409	69	a80
15	60	58	49	66	78	138	135	122	124	362	72	a80
16	*58	71	60	65	79	121	130	117	119	313	72	a80
17	*56	26	*102	62	54	99	129	106	112	274	60	a80
18	55	42	*76	64	98	135	127	90	116	244	61	a75
19	55	76	75	56	75	131	128	170	120	223	62	a75
20	52	60	75	36	76	136	92	242	110	216	61	a80
21	20	101	75	81	73	132	105	228	*104	202	59	a75
22	52	53	86	111	73	121	124	224	99	186	57	a75
23	53	100	85	106	53	92	114	214	90	199	56	a70
24	59	36	86	104	42	105	101	204	82	193	62	a70
25	54	40	88	83	103	139	123	*197	90	182	70	a70
26	53	91	110	75	131	114	148	188	86	162	65	59
27	54	70	99	81	143	113	122	180	84	158	60	56
28	22	67	98	104	119	115	128	171	96	154	58	53
29	67	63	77	90	-	122	145	149	99	149	*66	a50
30	57	78	74	97	--------	95	128	147	91	142	69	a50
31	58	--------	79	88	--------	103	--------	a140	--------	132	76	--------
Total	1,631	1,879	2,359	2,340	2,384	3,486	3,861	4,342	3,189	6,349	2,348	2,149
Mean	52.6	62.6	76.1	75.5	85.1	112	129	140	106	205	75.7	71.6
Cfsm	0.421	0.501	0.609	0.604	0.681	0.896	1.03	1.12	0.848	1.64	0.606	0.573
In.	0.49	0.56	0.70	0.70	0.71	1.04	1.15	1.29	0.95	1.89	0.70	0.64

Calendar year 1956 :	Max 525	Min 16	Mean 115	Cfsm 0.920	In. 12.49
Water year 1956-57 :	Max 423	Min 16	Mean 99.5	Cfsm 0.796	In. 10.82

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage and records for stations at Commerce and near New Hudson.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 868.00 ft above mean sea level, datum of 1929.

Average discharge.--9 years, 126 cfs.

Extremes.--Maximum discharge during year, 488 cfs July 14 (gage height, 4.08 ft); minimum, 9.4 cfs Apr. 12 (gage height, 0.76 ft).

1948-57: Maximum discharge, 1,080 cfs Dec. 29, 1950 (gage height, 5.05 ft), from rating curve extended above 600 cfs by logarithmic plotting; minimum, 3.4 cfs July 18, 1952; minimum gage height, 0.63 ft Mar. 16, 17, 1953.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Occasional regulation by Kent Lake.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-28, June 24 to Sept. 30)

1.0	25	3.0	328
1.5	86	4.0	560
2.0	161		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	71	170	92	104	150	72	130	180	75	136	a100
2	54	75	169	92	102	139	115	120	185	66	127	a90
3	55	73	130	97	93	124	128	110	177	55	120	a95
4	57	67	116	93	96	126	71	102	174	60	112	a95
5	57	63	180	90	97	132	40	87	167	82	103	a90
6	54	68	195	80	99	*124	89	90	155	76	96	a85
7	49	71	153	*80	99	122	138	94	144	67	90	a80
8	37	72	130	90	96	121	96	93	133	130	83	a75
9	46	71	103	89	108	115	68	96	126	201	79	a70
10	52	67	96	93	122	109	100	112	124	231	79	a75
11	52	57	97	89	120	126	116	118	124	323	78	*80
12	53	102	103	86	121	169	56	112	122	401	76	87
13	54	136	96	83	116	177	*36	121	122	450	63	97
14	53	*106	93	75	120	174	a60	130	98	475	73	94
15	48	92	93	72	110	164	a100	138	108	*455	80	89
16	55	112	85	a75	108	161	a130	132	136	395	75	94
17	*57	183	*89	a75	97	155	a140	118	136	348	69	94
18	62	115	94	a75	97	151	a140	122	136	314	64	92
19	59	92	92	a70	104	158	a130	163	148	280	59	85
20	55	150	92	71	100	163	a120	219	134	256	58	92
21	52	172	96	67	99	161	a120	239	*120	235	59	86
22	54	153	103	102	96	156	a120	239	110	217	54	86
23	53	118	109	127	90	145	a120	243	104	215	49	85
24	58	114	108	124	80	138	a130	238	94	207	71	80
25	57	180	108	118	89	98	a140	*227	92	198	82	80
26	57	134	109	108	130	30	150	217	83	187	75	80
27	59	164	115	100	163	63	148	209	89	174	73	71
28	54	203	118	102	161	90	139	198	93	166	67	67
29	54	144	110	112	-	114	134	190	87	158	*79	67
30	59	121	100	109	--------	66	138	182	83	156	a85	64
31	63	--------	97	108	--------	39	--------	174	--------	150	a90	--------
Total	1,675	3,346	3,549	2,844	3,017	3,960	3,284	4,763	3,784	6,803	2,504	2,525
Mean	54.0	112	114	91.7	108	128	109	154	126	219	80.8	84.2
Cfsm	0.378	0.783	0.797	0.641	0.755	0.895	0.762	1.08	0.881	1.53	0.565	0.589
In.	0.44	0.87	0.92	0.74	0.78	1.03	0.85	1.24	0.98	1.77	0.65	0.66

Calendar year 1956: Max 575 Min 35 Mean 132 Cfsm 0.923 In. 12.57
Water year 1956-57: Max 475 Min 30 Mean 115 Cfsm 0.804 In. 10.93

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* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for stations at Milford and near Hamburg.

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.--March 1951 to September 1957.

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).

Average discharge.--6 years, 25.9 cfs.

Extremes.--Maximum discharge observed during year, 88 cfs July 17 (gage height, 16.3 ft); minimum observed, 8.6 cfs Oct. 20; minimum gage height observed, 14.29 ft Sept. 29, 30.

1951-57: Maximum discharge observed, 193 cfs May 13, 1956 (gage height, 16.50 ft); minimum, 1.5 cfs July 16, 1952; minimum gage height, 13.82 ft Oct. 4, 1955.

Remarks.--Records poor. Occasional regulation by lakes above station.

Revisions (water years).--WSP 1437: 1951(M).

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	11	14	20	20	33	27	33	40	30	42	14
2	11	11	14	20	20	33	29	31	39	29	43	14
3	11	11	14	19	19	23	33	29	36	23	44	15
4	11	12	14	19	19	23	41	27	33	28	33	15
5	10	12	14	18	19	22	51	28	33	31	34	15
6	11	11	14	16	18	21	54	29	34	33	28	12
7	11	12	14	15	18	19	48	30	34	31	29	13
8	13	12	14	15	18	24	49	31	34	56	33	13
9	16	11	14	*14	18	22	33	31	22	54	36	13
10	16	12	15	14	21	22	34	30	19	64	40	13
11	16	12	14	14	23	22	36	33	22	68	11	15
12	15	11	14	14	24	23	45	30	18	78	12	16
13	15	*11	14	14	25	25	46	27	19	83	39	*15
14	14	11	14	14	25	34	45	24	22	73	33	15
15	13	11	14	14	25	36	44	25	23	*82	16	14
16	13	9.4	15	14	24	37	44	25	22	82	18	13
17	*9.4	10	16	14	24	33	42	25	29	88	11	13
18	11	11	*19	14	*24	35	44	28	25	83	14	14
19	9.9	13	17	14	23	33	42	31	27	78	15	15
20	8.6	14	18	14	21	36	42	32	30	78	16	13
21	9.4	16	19	14	20	35	50	33	*32	79	15	15
22	9.9	19	19	17	19	36	44	34	28	74	14	19
23	10	18	21	20	18	34	43	39	23	68	12	21
24	10	16	21	22	20	33	42	34	25	64	11	19
25	9.9	16	22	23	20	32	41	31	23	66	11	18
26	9.9	15	22	23	21	34	40	35	24	70	11	11
27	9.9	14	23	22	22	*33	*40	37	24	72	12	11
28	9.9	14	22	21	36	37	30	38	31	41	11	11
29	11	14	21	21	-	44	29	*46	28	42	11	11
30	11	14	21	21	--------	32	31	44	25	42	*13	11
31	12	--------	20	20	--------	30	--------	42	--------	41	14	--------
Total	357.8	384.4	527	534	604	936	1,219	992	824	1,831	682	427
Mean	11.5	12.8	17.0	17.2	21.6	30.2	40.6	32.0	27.5	59.1	22.0	14.2
Cfsm	0.371	0.413	0.548	0.555	0.697	0.974	1.31	1.03	0.887	1.91	0.710	0.458
In.	0.43	0.46	0.63	0.64	0.72	1.12	1.46	1.19	0.99	2.20	0.82	0.51

Calendar year 1956: Max 193 Min 8.6 Mean 29.9 Cfsm 0.965 In. 13.15
Water year 1956-57: Max 88 Min 8.6 Mean 25.5 Cfsm 0.823 In. 11.17

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 1-8, Jan. 10 to Feb. 17, Feb. 19-21, Mar. 31, May 15, June 19, 20, 22, Sept. 7; discharge estimated on basis of records for Huron River near Hamburg and at Commerce.

Huron River near Hamburg, Mich.

Location.--Lat 42°27'55", long 83°48'00", in sec. 24, T. 1 N., R. 5 E., on right bank at downstream side of bridge on Hamburg Road, 1.1 miles north of Hamburg and 3 miles upstream from Strawberry Lake.

Drainage area.--299 sq mi.

Records available.--October 1951 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 850.00 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to Aug. 12, 1953, staff gage at same site and datum.

Average discharge.--6 years, 230 cfs.

Extremes.--Maximum discharge during year, 884 cfs July 16 (gage height, 7.42 ft); minimum not determined; minimum daily, 100 cfs Oct. 5-16.

1951-57: Maximum discharge, 1,560 cfs May 15, 1956 (gage height, 8.35 ft); minimum, 50 cfs Sept. 14, 1955; minimum gage height, 3.43 ft May 22, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Occasional regulation by Kent Lake 11 miles above station.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 1, May 19 to Sept. 30)

3.4	90
4.0	185
5.0	376
7.0	921

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	110	124	203	198	190	321	172	292	292	246	327	165
2	110	134	217	189	190	319	203	279	284	230	313	169
3	110	139	228	185	180	300	230	262	275	214	298	171
4	110	139	207	178	180	275	257	243	262	208	284	169
5	100	136	192	167	180	261	257	225	250	234	268	165
6	100	136	225	155	170	250	281	207	232	257	252	162
7	100	139	261	144	170	234	317	194	216	261	239	158
8	100	140	248	142	169	223	363	187	203	283	228	155
9	100	140	221	*145	169	214	356	176	189	346	216	150
10	100	137	189	140	198	201	327	183	181	410	208	148
11	100	134	172	140	214	203	321	201	181	498	203	148
12	100	128	171	140	230	255	307	212	183	602	194	153
13	100	*152	171	140	230	296	255	210	187	727	183	*169
14	100	178	172	140	240	317	226	212	207	825	180	174
15	100	174	169	130	220	327	223	223	210	874	187	174
16	100	169	167	130	210	323	230	225	223	*878	187	174
17	*108	194	164	130	200	311	239	221	232	840	181	172
18	110	225	167	130	*185	294	248	221	239	780	172	167
19	112	196	167	120	180	290	253	270	257	710	164	160
20	112	174	167	120	187	296	255	352	266	648	155	160
21	110	221	172	130	174	294	250	427	*261	591	147	158
22	108	262	187	150	172	286	239	500	243	554	142	158
23	106	255	205	200	167	279	235	541	237	520	134	155
24	107	221	212	210	162	266	230	541	228	485	136	152
25	108	226	217	220	167	250	234	523	225	458	150	148
26	108	244	212	220	216	210	261	492	219	436	153	145
27	112	221	205	210	283	*174	*290	451	221	415	147	139
28	113	225	205	200	311	180	307	410	243	390	139	132
29	113	252	199	200	-	196	307	*376	261	365	139	128
30	113	228	194	200	--------	219	300	344	259	348	*144	125
31	116	--------	185	190	--------	185	--------	311	--------	337	157	--------
Total	3,296	5,443	6,071	5,093	5,544	8,049	7,973	9,511	6,966	14,970	6,027	4,703
Mean	106	181	196	164	198	260	266	307	232	483	194	157
Cfsm	0.355	0.605	0.656	0.548	0.662	0.870	0.890	1.03	0.776	1.62	0.649	0.525
In.	0.41	0.68	0.76	0.63	0.69	1.00	0.99	1.18	0.87	1.86	0.75	0.58

Calendar year 1956 : Max 1,560 Min 97 Mean 278 Cfsm 0.930 In. 12.67
Water year 1956-57 : Max 878 Min 100 Mean 229 Cfsm 0.766 In. 10.40

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 10 to Feb. 7. No gage-height record Oct. 1-16, Jan. 15-21, Jan. 24 to Feb. 3, Feb. 12-17; discharge estimated on basis of records for stations near New Hudson and near Dexter.

Portage Creek near Pinckney, Mich.

Location.--Lat 42°25'40", long 83°57'35", in SW¼ sec. 34, T. 1 N., R. 4 E., on right upstream abutment of bridge on Tiplady Road, 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 1957. Monthly discharge only for some periods, published in WSP 1307.

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.--13 years, 55.8 cfs.

Extremes.--Maximum discharge during year, 100 cfs Apr. 7 (gage height, 3.3 ft, from graph based on gage readings); minimum observed, 4.2 cfs Aug. 23 (gage height, 1.00 ft).

1944-57: Maximum discharge, 529 cfs Apr. 9, 10, 1947 (gage height, 5.72 ft); minimum, 0.6 cfs Oct. 5, 1946 (gage height, 0.56 ft).

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Regulation by Hiland Lake 2½ miles above station.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 15 to Jan. 14)

1.0	4.2	2.5	45
1.4	12	3.0	75
2.0	27	3.3	100

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.9	11	16	a40	a41	64	68	71	75	21	22	a14
2	9.9	11	a17	a35	41	65	72	68	a75	20	21	14
3	9.5	a10	19	a35	a38	a70	69	65	75	20	20	14
4	9.5	a10	19	a35	37	74	72	61	69	a22	a18	13
5	9.1	a10	20	a33	b40	72	75	a59	64	24	16	12
6	9.1	a10	a21	a32	b38	65	88	57	59	24	16	12
7	a9	a10	a22	30	32	62	a90	54	55	a28	15	12
8	9.1	a10	23	30	32	64	87	53	51	32	14	a11
9	8.3	a10	a25	28	39	74	88	53	a50	30	14	11
10	7.9	a10	26	28	a40	a65	87	52	47	28	13	12
11	7.1	a10	26	a28	43	64	87	51	42	34	a13	12
12	7.1	a10	26	a28	47	75	87	a49	41	46	12	*13
13	7.1	*10	26	a28	49	72	a85	47	40	44	10	14
14	a7	a10	26	a28	b55	72	a85	48	44	a44	8.3	a14
15	*7.0	a10	26	*b28	b55	81	82	45	a40	44	8.3	a14
16	6.8	a11	a26	a28	b55	79	81	42	a35	*45	7.1	a14
17	6.8	11	27	a27	a56	a80	79	41	a30	55	6.4	a14
18	7.5	a11	*27	a27	*b57	75	78	46	a25	53	a6	a14
19	7.5	11	27	a26	b55	79	75	a60	a22	37	5.4	a14
20	a9	11	27	a26	b50	81	75	71	a20	38	5.4	a14
21	a9	18	28	a26	b48	81	a73	71	*17	a36	4.8	a14
22	a9	a18	29	a35	a45	79	71	75	a17	35	4.8	a14
23	a9	19	a35	a40	42	78	68	85	a17	40	4.2	14
24	a9	19	41	a42	a42	a76	67	81	18	36	6.4	14
25	a9	a18	a42	a43	43	75	75	82	19	32	a6	13
26	a9	18	43	a45	46	74	74	a83	18	30	5.7	12
27	a9	18	45	a45	56	*74	*75	84	21	29	5.7	12
28	a9	18	45	a45	60	72	a74	81	25	a26	6.4	11
29	9.1	15	a45	a44	-	72	74	79	27	24	6.4	a10
30	9.5	15	a45	a43		72	74	a75	a24	24	*8.1	9.9
31	9.5		a45	a42		a70		72		24	13	
Total	264.3	383	915	1,050	1,282	2,256	2,335	1,961	1,162	1,025	322.4	385.9
Mean	8.53	12.8	29.5	33.9	45.8	72.8	77.8	63.3	38.7	33.1	10.4	12.9
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 310 Min 6.6 Mean 55.1 Cfsm - In. -
Water year 1956-57: Max 90 Min 4.2 Mean 36.6 Cfsm - In. -

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* Discharge measurement made on this day.

a No gage-height record; discharge interpolated or estimated on basis of weather records and records for Huron River near Dexter and Ore Creek near Brighton.

b Stage-discharge relation affected by ice.

Huron River near Dexter, Mich.

Location.--Lat 42°23'10", long 83°54'40", in S½ sec. 13, T. 1 S., R. 4 E., on right bank 20 ft downstream from 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 1957. Published as "at Dover" 1904. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 837.11 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). August to December 1904 chain gage at site 1 mile upstream at different datum. Mar. 5, 1946, to July 30, 1953, wire-weight gage at present site and datum.

Average discharge.--11 years, 422 cfs.

Extremes.--Maximum discharge during year, 880 cfs July 17, 18 (gage height, 4.97 ft); minimum, 130 cfs Oct. 15 (gage height, 3.20 ft).

1946-57: 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, 2.92 ft Sept. 12, 13, 1954.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Occasional regulation by lake level control operations above station.

Rating tables, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Stage-dicharge relation affected by ice Jan. 10, 14, 15, 17, 18; shifting-control method used Nov. 10-25)

Oct. 1 to May 25		May 26 to Sept. 30	
3.2	130	3.3	140
3.5	222	3.5	197
4.0	438	4.0	396
5.0	920	5.0	896

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	150	161	294	316	321	493	410	512	522	282	344	190
2	150	164	282	286	316	516	420	498	489	270	323	200
3	147	170	282	264	308	521	430	484	461	259	294	200
4	147	173	375	260	312	512	440	456	437	243	270	200
5	144	176	398	256	308	498	460	429	396	247	255	190
6	144	176	352	252	294	479	500	411	298	247	240	190
7	147	179	344	249	290	461	540	393	282	236	232	180
8	144	173	348	233	277	438	560	366	282	270	225	180
9	141	170	357	233	294	420	600	348	270	323	214	170
10	138	167	348	230	321	406	600	348	262	356	208	170
11	136	164	321	230	352	402	580	348	259	428	197	170
12	136	161	308	222	370	438	540	352	259	531	191	*185
13	138	155	290	226	384	470	500	357	259	604	178	191
14	138	*155	277	220	402	498	470	366	266	688	182	191
15	141	170	273	*220	393	530	450	375	278	767	182	197
16	144	188	277	219	393	544	430	370	282	*831	175	200
17	147	191	273	210	384	544	420	370	286	869	175	200
18	*150	205	*277	210	*370	539	420	384	290	874	169	197
19	152	219	273	208	357	520	430	438	314	853	166	194
20	152	226	273	198	339	500	450	525	*310	799	163	197
21	158	249	277	202	321	490	440	585	310	746	158	200
22	161	273	299	237	316	470	430	642	302	699	156	200
23	161	290	316	321	312	460	430	691	302	668	153	197
24	158	299	339	334	303	450	420	725	290	604	156	194
25	152	294	366	334	308	440	440	745	278	555	161	188
26	152	303	375	352	348	420	460	735	262	512	156	185
27	155	303	380	357	411	420	480	719	270	480	160	175
28	158	290	380	352	456	410	490	*683	290	447	160	169
29	155	290	370	348	-	410	500	638	294	419	160	166
30	158	299	352	339	-------	410	*507	594	290	387	*169	161
31	158	--------	339	326	-------	410	--------	555	--------	365	180	--------
Total	4,612	6,433	10,015	8,244	9,560	14,519	14,247	15,442	9,390	15,859	6,152	5,627
Mean	149	214	323	266	341	468	475	498	313	512	198	188
Cfsm	0.294	0.423	0.638	0.526	0.674	0.925	0.939	0.984	0.619	1.01	0.391	0.372
In.	0.34	0.47	0.74	0.61	0.70	1.07	1.05	1.13	0.69	1.17	0.45	0.41

	Max		Min		Mean		Cfsm		In.	
Calendar year 1956:	Max	2,250	Min	136	Mean	435	Cfsm	0.860	In.	11.68
Water year 1956-57:	Max	874	Min	136	Mean	329	Cfsm	0.650	In.	8.83

* Discharge measurement made on this day.

Note.--No gage-height record Mar. 19 to Apr. 29, Aug. 27-29, Aug. 31 to Sept. 11; discharge estimated on basis of recorded range in stage and records for stations near Hamburg and at Ann Arbor.

Mill Creek near Dexter, Mich.

Location.--Lat 42°18'00", long 83°53'55", on line between sec. 13, T. 2 S., R 4 E., and sec. 18, T. 2 S., R. 5 E., on downstream side of highway bridge, 2½ miles south of Dexter, and 4 miles upstream from mouth.

Drainage area.--134 sq mi.

Records available.--February 1952 to September 1957.

Gage.--Wire-weight gage read twice daily. Altitude of gage is 850 ft (from topographic map).

Average discharge.--5 years, 70.1 cfs.

Extremes.--Maximum discharge during year, 368 cfs Apr. 6 (gage height, 7.95 ft); minimum observed, 12 cfs Aug. 22 (gage height, 5.14 ft).

1952-57: Maximum discharge, 1,300 cfs Apr. 29, 1956 (gage height, 12.2 ft, from graph based on gage readings), from rating curve extended above 870 cfs by logarithmic plotting; minimum observed, 12 cfs Sept. 7-10, 1955, Jan. 30, 1956, Aug. 22, 1957; minimum gage height, 5.07 ft Jan. 30, 1956.

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

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

5.1	11	6.0	85
5.3	18	8.0	375
5.6	39		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	24	19	35	35	210	55	75	46	48	15	28
2	19	23	22	35	35	150	154	60	46	37	14	24
3	19	22	26	40	35	110	237	51	39	33	15	22
4	19	22	35	40	35	90	165	49	37	28	19	19
5	19	21	38	35	35	80	188	43	32	32	16	17
6	19	20	41	30	35	80	303	43	30	28	15	16
7	19	20	43	30	35	70	276	39	30	26	14	16
8	19	19	46	30	40	70	226	36	29	45	14	16
9	19	19	41	30	70	60	160	33	28	72	14	16
10	19	19	43	30	120	60	137	36	28	45	14	16
11	19	19	34	30	160	60	119	37	29	62	14	16
12	18	18	34	30	120	70	104	37	33	82	13	*17
13	20	18	34	30	100	75	90	34	30	67	13	26
14	19	18	30	30	85	75	84	37	99	53	13	21
15	19	*23	31	28	80	75	77	37	60	43	*14	22
16	19	28	35	*27	70	75	70	33	38	*36	15	23
17	*19	24	35	25	65	70	73	28	30	31	14	23
18	19	22	40	25	*60	70	101	41	32	27	14	23
19	19	22	40	25	55	70	98	123	31	25	13	20
20	19	21	42	30	50	80	89	292	*28	24	13	28
21	22	25	*43	40	50	80	77	212	23	21	13	31
22	22	44	45	60	45	80	67	196	23	22	12	38
23	22	33	45	75	45	75	68	154	32	35	13	34
24	22	25	45	75	45	70	62	146	24	28	16	28
25	22	24	45	70	55	65	120	105	28	24	20	25
26	22	30	45	60	80	65	165	108	25	22	17	22
27	22	38	45	50	180	*60	155	89	27	22	17	20
28	22	33	45	45	250	60	151	72	86	20	18	20
29	22	23	35	45	-	55	122	61	95	19	20	20
30	22	21	30	40		55	*90	53	73	18	25	19
31	22		30	40		52		47		16	32	
Total	622	718	1,162	1,215	2,070	2,417	3,883	2,407	1,191	1,091	489	666
Mean	20.1	23.9	37.5	39.2	73.9	78.0	129	77.6	39.7	35.2	15.8	22.2
Cfsm	0.150	0.178	0.280	0.293	0.551	0.582	0.963	0.579	0.296	0.263	0.118	0.166
In.	0.17	0.20	0.32	0.34	0.57	0.67	1.08	0.67	0.33	0.30	0.14	0.18

Calendar year 1956:	Max 1,020	Min 18	Mean 80.5	Cfsm 0.601	In. 8.18
Water year 1956-57:	Max 303	Min 12	Mean 49.1	Cfsm 0.366	In. 4.97

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 16 to Apr. 1, Aug. 27-30, Sept. 10, 11; discharge estimated on basis of 4 discharge measurements and records for River Raisin near Adrain and Grand River near Eaton Rapids.

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 bridge on Wall Street 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 1957. Monthly discharge only for some periods, published in WSP 1307. 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 1947, at Barton Dam, 3 miles upstream; flow computed from records of operation of powerplants and records of depth of flow over dam and/or flow through undersluices.

Average discharge.--53 years, 448 cfs (adjusted for diversion since 1955).

Extremes.--Maximum discharge during year, 1,120 cfs Apr. 25; maximum gage height, 14.27 ft July 16; minimum discharge, 15 cfs Aug. 7; minimum gage height, 11.46 ft Nov. 16; minimum daily discharge, 146 cfs Aug. 21, 23.

1914-57: Maximum daily discharge, 5,840 cfs Mar. 14, 1918; minimum daily, 4 cfs Aug. 2, Sept. 11, 1931 (plant leakage), but may be doubtful due to change in leakage.

Remarks.--Records good. Diversion above station for Ann Arbor municipal supply had negligible effect on natural flow prior to 1955; figures of runoff adjusted since. Flow regulated by powerplants and by occasional lake level control operations above station.

Revisions (water years).--WSP 874: 1938.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 5 to Sept. 30)

11.9	118	13.0	600
12.0	147	14.0	1,360
12.5	340		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	195	204	372	260	406	612	510	602	593	470	350	305
2	192	162	349	309	345	620	465	562	567	338	287	212
3	167	208	326	322	358	576	511	550	526	358	295	260
4	168	192	336	322	372	580	592	517	494	354	291	238
5	185	208	470	326	349	570	734	490	452	340	224	212
6	187	214	405	257	322	503	1,030	496	428	344	236	214
7	171	194	390	318	326	491	962	412	279	270	228	246
8	182	204	372	234	349	476	811	468	390	552	247	211
9	169	198	380	322	454	448	788	428	322	388	182	230
10	157	165	380	228	590	470	720	420	308	394	200	220
11	164	202	372	231	465	420	734	440	321	607	206	*230
12	166	183	358	260	449	630	720	396	304	640	183	*214
13	164	206	349	322	454	584	639	429	442	648	170	247
14	159	202	340	226	465	600	642	430	300	627	180	234
15	172	*199	272	248	465	622	598	412	473	846	182	282
16	155	225	326	*248	465	634	544	376	252	*842	173	268
17	*175	228	326	238	426	608	552	390	322	857	165	252
18	*159	228	*331	228	*424	614	551	442	340	880	180	253
19	155	226	358	270	388	634	563	668	408	892	159	251
20	174	264	269	226	408	652	547	838	*382	857	184	273
21	171	367	336	252	380	637	536	836	358	845	146	267
22	170	336	344	482	359	624	534	850	392	664	152	242
23	180	274	395	374	380	603	504	836	449	734	146	277
24	167	367	376	250	362	561	540	878	426	613	212	238
25	167	367	440	421	367	558	632	887	354	558	200	237
26	169	322	390	425	678	530	658	839	372	508	156	230
27	178	331	435	344	688	*522	654	900	398	444	178	217
28	164	372	435	403	726	490	642	*816	498	450	184	206
29	177	349	372	402	-	454	650	720	474	456	215	202
30	170	265	380	358	--------	498	*630	720	398	360	*214	204
31	164	--------	390	332	--------	460	--------	678	--------	404	226	--------
Total	5,293	7,462	11,374	9,438	12,220	17,281	19,193	18,726	12,022	17,540	6,351	7,172
Mean	171	249	367	304	436	557	640	604	401	566	205	239
(†)	9.5	8.9	8.2	8.2	8.7	8.8	8.8	8.6	7.8	7.7	9.5	6.2
Adjusted for diversion												
Mean	180	258	375	312	445	566	649	613	409	574	214	245
Cfsm	0.253	0.363	0.527	0.439	0.626	0.796	0.913	0.862	0.575	0.807	0.301	0.345
In.	0.29	0.40	0.61	0.51	0.65	0.92	1.02	0.99	0.64	0.93	0.35	0.38

	Observed						Adjusted					
Calendar year 1956:	Max	2,690	Min	120	Mean	552	Mean	560	Cfsm	0.788	In.	10.70
Water year 1956-57:	Max	1,030	Min	146	Mean	395	Mean	403	Cfsm	0.567	In.	7.69

* Discharge measurement made on this day.
† Average monthly diversion, equivalent in cubic feet per second; furnished by city of Ann Arbor.

River Raisin near Adrian, Mich.

Location.--Lat 41°54'15", long 83°58'50", in NW¼ sec. 5, T. 7 S., R. 4 E., on right bank 10 ft downstream from bridge on Academy Road, 1.7 miles east of Adrian, and 2.6 miles downstream from South Branch River Raisin.

Drainage area.--455 sq mi.

Records available.--October 1953 to September 1957. Records for October 1930 to August 1931, October 1932 to April 1938, published as "Raisin River" in WSP 714, 744, 759, 784, 804, 824, and 854, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 693.2 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 2,230 cfs Apr. 28 (gage height, 11.42 ft); minimum, 42 cfs Aug. 23 (gage height, 1.98 ft); minimum daily, 59 cfs Oct. 15, Aug. 21.

1953-57: Maximum discharge, 5,580 cfs Apr. 30, 1956 (gage height, 14.87 ft), from rating curve extended above 2,700 cfs by logarithmic plotting; minimum, 24 cfs Sept. 19, 1955 (gage height, 1.71 ft); minimum daily, 28 cfs Sept. 19, 1955.

Remarks.--Records good except those for periods of ice effect, which are fair. Diurnal fluctuation caused by powerplant at Tecumseh 11 miles above station.

Revisions.--See Records available.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.3	58	8.0	955
2.5	75	10.0	1,540
3.0	130	12.0	2,610
6.0	565		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	102	138	141	170	928	248	648	208	180	78	174
2	95	99	212	202	160	586	258	524	238	140	81	162
3	77	94	110	203	150	484	264	447	200	224	93	173
4	*79	103	180	210	150	395	336	382	217	153	116	154
5	79	100	180	188	150	373	650	343	178	141	104	142
6	85	107	197	148	150	342	1,160	314	184	109	146	148
7	73	112	222	99	160	312	1,330	308	160	144	121	136
8	63	142	209	128	174	298	998	292	143	176	114	132
9	61	133	228	138	302	276	766	261	158	310	96	164
10	72	139	196	148	592	264	*712	246	123	138	87	148
11	92	84	174	130	735	254	776	243	170	*162	84	*82
12	88	70	194	120	581	300	864	211	172	192	80	104
13	100	92	182	120	440	345	685	227	152	165	80	126
14	80	124	202	110	387	347	522	283	224	155	80	107
15	59	*145	203	110	350	343	446	245	154	100	*79	106
16	84	100	195	100	313	338	408	228	171	122	80	104
17	73	89	146	90	283	318	402	218	189	150	77	120
18	71	123	224	85	264	308	423	218	205	111	74	108
19	81	91	174	85	*256	324	450	252	*190	90	74	102
20	113	111	200	130	230	354	429	376	164	80	65	162
21	142	215	*199	170	216	377	498	531	135	90	59	145
22	137	216	199	250	210	357	490	474	136	94	77	135
23	107	172	184	350	200	336	422	405	101	117	75	136
24	80	218	226	350	200	315	399	391	95	100	69	123
25	71	214	224	300	232	296	740	363	122	94	82	119
26	84	191	222	270	337	284	1,060	332	150	88	78	114
27	64	124	238	230	832	268	1,680	300	109	88	86	95
28	75	99	219	210	1,110	*266	2,130	294	168	83	89	100
29	82	162	100	200	-	254	1,400	269	189	82	100	91
30	85	279	126	190	--------	252	906	226	189	82	118	96
31	96	--------	160	180	--------	234	--------	214	--------	82	173	--------
Total	2,615	4,050	5,863	5,385	9,334	10,728	21,852	10,065	4,994	4,042	2,815	3,808
Mean	84.4	135	189	174	333	346	728	325	166	130	90.8	127
Cfsm	0.185	0.297	0.415	0.382	0.732	0.760	1.60	0.714	0.365	0.286	0.200	0.279
In.	0.21	0.33	0.48	0.44	0.76	0.88	1.79	0.82	0.41	0.33	0.23	0.31

Calendar year 1956: Max 4,830 Min 55 Mean 366 Cfsm 0.804 In. 10.95
Water year 1956-57: Max 2,130 Min 59 Mean 234 Cfsm 0.514 In. 6.99

Peak discharge (base, 1,000 cfs).--Feb. 28 (8 to 10 p.m.) 1,170 cfs (8.8 ft); Apr. 7 (12 m. to 2 p.m.) 1,370 cfs (9.47 ft); Apr. 28 (6 to 9 a.m.) 2,230 cfs (11.42 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 11 to Feb. 7, Feb. 20, 22, 23.

River Raisin near Monroe, Mich.

Location.--Lat 41°57'40", long 83°31'55", on left bank 0.8 mile downstream from bridge on Ida Maybee Road, 5.0 miles downstream from Saline River, and 7.5 miles west of Monroe, Monroe County.

Drainage area.--1,034 sq mi.

Records available.--September 1937 to September 1957. Published as "Raisin River at Monroe" 1937-52 and as "River Raisin at Monroe" 1952-53.

Gage.--Water-stage recorder. Datum of gage is 616.26 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1953, at site 9 miles downstream at datum 46.26 ft lower.

Average discharge.--20 years, 717 cfs.

Extremes.--Maximum discharge during year, 4,390 cfs Apr. 27 (gage height, 6.86 ft); minimum recorded, 55 cfs Oct. 13; minimum gage height, 1.96 ft Aug. 24; minimum daily, 76 cfs Oct. 13.

1937-57: Maximum discharge, 12,900 cfs May 19, 1945, Mar. 29, 1950; maximum gage height, 10.7 ft Feb. 1, 1949 (ice jam), site and datum then in use; minimum discharge, about 2 cfs Sept. 4, 1938, Sept. 19, 20, 1941, site then in use.

Remarks.--Records good except those for periods of ice effect or indefinite stage-discharge relation, which are fair. Prior to Feb. 14, 1954, diurnal fluctuation caused by powerplant at Dundee 11 miles above station. Occasional slight diurnal fluctuation by powerplants further upstream.

Revisions (water years).--WSP 954: 1938-40(m), 1941. WSP 1337: Drainage area. WSP 1437: 1939, 1948.

Rating tables, water year 1956-57, except period of ice effect and indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 2-14, July 11, 12)

Oct. 1 to Dec. 17		Dec. 18 to Sept. 30			
2.1	76	2.0	69	4.0	1,040
2.5	162	2.5	187	6.0	3,160
3.0	335	3.0	365	6.4	3,700
		3.5	640		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	111	98	165	182	300	2,110	374	2,710	334	406	106	179
2	81	104	255	216	280	1,930	374	1,900	365	316	90	222
3	88	111	201	232	270	1,450	388	1,230	392	244	97	210
4	*102	113	192	182	270	1,020	536	916	374	222	117	193
5	90	111	170	193	260	762	1,890	740	324	250	163	187
6	78	111	204	216	230	647	3,010	614	316	202	160	171
7	88	111	224	225	230	588	2,850	527	293	174	144	157
8	104	106	252	222	250	515	2,870	476	264	190	150	160
9	86	*115	274	179	400	471	2,780	440	247	250	150	157
10	80	115	259	210	1,200	440	2,530	415	241	309	137	155
11	78	139	278	210	1,400	420	*2,670	392	241	*383	117	*172
12	90	137	244	210	1,400	466	2,440	370	210	244	120	204
13	76	111	217	210	1,300	575	2,440	352	258	244	108	199
14	109	96	241	210	1,100	557	2,330	352	278	241	108	165
15	106	98	248	190	900	594	1,840	365	275	222	*99	179
16	111	117	255	180	700	563	1,360	383	309	187	101	193
17	92	132	274	160	600	527	1,100	338	261	144	92	160
18	90	124	261	160	550	488	1,150	320	258	193	92	152
19	94	115	228	150	*450	498	1,260	324	*282	163	97	147
20	86	124	*254	140	400	627	1,290	504	329	134	88	277
21	106	150	254	140	370	696	1,360	435	301	117	92	e450
22	137	148	268	*250	350	710	1,180	*849	238	127	88	e550
23	139	214	282	450	350	661	1,060	865	213	122	92	e600
24	157	208	309	550	350	588	986	740	190	106	83	e550
25	135	198	293	650	400	533	1,330	640	174	142	101	e450
26	109	204	312	600	709	493	1,610	588	152	132	117	272
27	96	220	320	550	2,090	460	3,460	527	187	120	101	222
28	102	192	309	450	2,190	*435	3,660	460	225	115	106	187
29	98	184	301	400	-	415	3,190	420	238	120	107	163
30	86	135	272	350	--------	401	3,020	378	356	106	120	155
31	84	--------	222	320	--------	383	--------	352	--------	99	132	--------
Total	3,089	4,141	7,838	8,587	19,299	21,023	56,338	19,922	8,125	6,024	3,475	7,238
Mean	99.6	138	253	277	689	678	1,878	643	271	194	112	241
Cfsm	0.096	0.133	0.245	0.268	0.666	0.656	1.82	0.622	0.262	0.188	0.108	0.233
In.	0.11	0.15	0.28	0.31	0.69	0.76	2.03	0.72	0.29	0.22	0.12	0.26

Calendar year 1956:	Max 8,470	Min 75	Mean	779	Cfsm	0.753	In.	10.24
Water year 1956-57:	Max 3,660	Min 76	Mean	452	Cfsm	0.437	In.	5.94

Peak discharge (base, 2,200 cfs).--Feb. 27 (4 to 5 p.m.) 2,410 cfs (5.37 ft); Apr. 6 (12 m.) 3,160 cfs (6.00 ft); Apr. 27 (10 to 11 p.m.) 4,390 cfs (6.86 ft).

* Discharge measurement made on this day.

e Stage-discharge relation indefinite; discharge computed on basis of unpublished records for former station at Monroe.

Note.--Stage-discharge relation affected by ice Jan. 11 to Feb. 25.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 795.40 ft above mean sea level, datum of 1929. Prior to Oct. 22, 1947, wire-weight gage at same site and datum.

Average discharge.--11 years, 548 cfs.

Extremes.--Maximum discharge during year, 2,700 cfs Apr. 12 (gage height, 11.49 ft); minimum, 25 cfs Oct. 7; minimum gage height, 1.65 ft Aug. 23, 24.

1946-57: Maximum discharge, 9,710 cfs Apr. 6, 1950 (gage height, 17.05 ft); minimum, 16 cfs Sept. 30, 1953 (gage height, 1.45 ft).

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

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method Oct. 1-23)

1.5	21	6.0	714
2.0	54	8.0	1,190
2.5	99	10.0	1,880
3.0	159	12.0	3,020
4.0	308		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	46	79	102	214	1,560	244	*1,840	260	520	54	41
2	27	46	70	95	214	1,560	420	1,340	308	*380	53	44
3	*27	48	70	90	193	1,280	520	868	380	276	50	51
4	29	49	*66	*105	193	880	1,130	648	342	228	47	46
5	29	49	70	94	186	610	2,060	520	276	244	45	*39
6	27	48	70	89	186	470	2,520	440	228	244	44	38
7	26	48	79	84	186	361	*2,640	380	200	186	44	38
8	27	46	89	79	193	325	2,640	342	186	166	42	36
9	29	46	99	b74	414	292	2,460	308	166	361	40	34
10	29	48	104	79	1,060	276	2,340	292	*159	626	39	34
11	30	48	99	84	1,220	244	2,580	276	159	540	39	34
12	32	46	89	79	1,220	260	2,700	260	152	325	38	35
13	33	47	99	b70	1,140	325	2,640	244	159	244	38	44
14	34	46	94	b62	915	380	2,640	260	214	200	36	45
15	34	50	99	b54	670	361	2,400	292	361	172	35	42
16	36	54	99	b53	520	325	1,880	292	420	152	34	40
17	36	53	99	b53	420	308	1,250	260	342	128	35	36
18	36	53	104	b57	361	276	1,140	244	260	110	39	36
19	34	58	98	b61	308	276	1,340	325	260	99	38	38
20	35	58	98	b70	276	342	1,370	714	308	94	34	54
21	36	70	123	84	260	440	1,250	846	244	110	33	109
22	38	74	135	229	244	420	990	824	186	104	33	276
23	38	104	149	582	214	361	868	648	152	89	31	140
24	53	116	158	692	214	325	780	540	128	79	34	99
25	54	89	158	692	244	276	1,020	480	172	89	36	79
26	49	94	158	582	325	260	1,190	420	172	84	35	62
27	47	79	147	460	1,090	*244	1,630	380	152	70	44	54
28	46	74	138	361	*1,490	292	1,840	342	200	66	45	48
29	45	79	130	308	-	308	1,920	276	380	62	41	46
30	48	70	117	276	--------	276	1,970	244	520	*58	39	44
31	*50	--------	107	244	--------	244	--------	244	--------	58	39	--------
Total	1,122	1,836	3,294	6,044	14,170	14,157	50,372	15,389	7,446	6,164	1,234	1,762
Mean	36.2	61.2	106	195	506	457	1,679	496	248	199	39.8	58.7
Cfsm	0.059	0.100	0.173	0.318	0.824	0.744	2.73	0.808	0.404	0.324	0.065	0.096
In.	0.07	0.11	0.20	0.37	0.86	0.86	3.05	0.93	0.45	0.37	0.07	0.11

Calendar year 1956:	Max	9,190	Min	26	Mean	552	Cfsm	0.899	In.	12.23
Water year 1956-57:	Max	2,700	Min	26	Mean	337	Cfsm	0.549	In.	7.45

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Dec. 19 to Jan. 4, Mar. 4-6; discharge estimated on basis of weather records and by hydrographic comparison with stations on nearby streams.

St. Joseph River at Cedarville, Ind.

Location.--Lat 41°12', long 85°01', in SE¼ sec. 28, T. 32 N., R. 13 E., on left bank 500 ft upstream from highway bridge, 2,700 ft downstream from Cedarville Dam, 0.4 mile south of Cedarville, and 0.5 mile upstream from mouth of Cedar Creek.

Drainage area.--783 sq mi.

Records available.--January 1931 to May 1932, October 1955 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 757.94 ft above mean sea level, datum of 1929. Jan. 1, 1931, to May 31, 1932, tape gage on downstream side of highway bridge 500 ft downstream from present site at datum approximately 20 ft lower.

Extremes.--Maximum discharge during year, 3,950 cfs Apr. 5; maximum gage height, 12.70 ft Apr. 5; minimum daily, 17 cfs Oct. 7.

1931-32, 1955-57: Maximum discharge, 10,100 cfs May 1, 1956 (gage height, 18.07 ft, from floodmarks); minimum daily, 9.2 cfs Aug. 9, 1956.

Remarks.--Records fair. Flow regulated by reservoir above station.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*29	*70	85	142	172	1,550	332	1,820	379	*620	91	61
2	54	88	99	*126	172	1,680	470	1,820	412	540	88	59
3	54	77	*98	85	172	1,450	654	1,140	*412	412	82	120
4	51	46	94	90	172	1,110	2,330	780	461	363	76	*208
5	49	55	91	128	172	840	3,590	660	379	379	76	54
6	44	62	91	132	172	630	3,320	560	132	273	78	51
7	17	65	98	124	172	480	*3,280	461	317	302	80	51
8	51	66	104	119	183	363	3,120	461	288	273	76	51
9	54	68	132	119	390	348	3,060	428	126	259	61	37
10	49	83	132	113	858	273	*3,190	395	142	428	51	29
11	46	80	124	103	1,200	259	3,660	340	259	580	51	29
12	17	77	132	91	1,090	302	3,420	317	194	540	51	30
13	18	71	122	80	1,020	332	2,980	332	206	317	51	30
14	27	51	53	b72	974	363	2,750	348	317	232	51	31
15	40	79	62	b68	820	412	2,880	363	395	232	51	54
16	62	106	183	b66	650	395	2,480	348	430	162	51	61
17	34	96	194	b66	520	363	1,660	348	461	151	51	61
18	40	85	84	b70	428	332	1,870	317	461	151	51	61
19	66	244	104	b74	348	317	1,700	332	461	151	51	62
20	82	132	183	83	259	332	1,560	760	302	142	51	61
21	18	111	180	99	273	395	1,590	829	332	122	51	64
22	33	142	111	392	348	470	866	750	302	117	51	262
23	66	103	130	760	259	470	1,320	660	183	151	51	317
24	66	49	142	680	219	332	866	600	194	142	51	164
25	71	29	206	640	245	317	792	650	151	104	54	122
26	70	51	206	570	428	302	1,380	530	232	88	52	119
27	88	172	206	510	814	288	1,880	460	206	88	58	106
28	78	119	194	428	*1,520	348	1,780	412	680	90	58	74
29	74	65	183	332	-	*412	2,030	348	660	90	58	61
30	68	72	183	*317		395	*2,050	348	580	*90	59	61
31	68		142	273		363		332		91	61	
Total	1,584	2,614	4,148	6,952	14,050	16,223	62,860	18,249	10,054	7,680	1,873	2,551
Mean	51.0	87.1	134	224	502	523	2,095	589	335	248	60.4	85.0
Cfsm	0.065	0.111	0.171	0.286	0.641	0.668	2.68	0.752	0.428	0.317	0.077	0.109
In.	0.07	0.12	0.20	0.33	0.67	0.77	2.99	0.87	0.48	0.37	0.09	0.12

Calendar year 1956: Max 9,780 Min 9.2 Mean 729 Cfsm 0.931 In. 12.66
Water year 1956-57: Max 3,660 Min 17 Mean 408 Cfsm 0.521 In. 7.08

* 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 1957.

Gage.--Water-stage recorder. Datum of gage is 847.14 ft above mean sea level (city of Auburn bench mark). Prior to Aug. 28, 1946, staff gage and Aug. 28, 1946, to Sept. 30, 1953, wire-weight gage, at same site and datum.

Average discharge.--14 years, 73.0 cfs.

Extremes.--Maximum discharge during year, 651 cfs Apr. 6 (gage height, 6.89 ft); minimum, 1.8 cfs Oct. 8; minimum gage height, 0.95 ft Oct. 7, 8.
1943-57: Maximum discharge, 1,520 cfs Apr. 5, 1950 (gage height, 9.90 ft); minimum, 0.5 cfs Nov. 12, 1953; minimum gage height, 0.81 ft Feb. 9, 1954.

Remarks.--Records fair.

Revisions (water years).--WSP 1337: 1944-45(M), 1947-49, 1950(M).

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Jan. 16, 20-22; stage-discharge relation indefinite July 31 to Sept. 30; stage-discharge relation affected by ice Jan. 17-19)

0.8	2.2	2.3	96
.9	4.8	3.0	165
1.2	16	5.0	400
1.7	47	7.0	665

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.2	*4.8	5.2	12	28	165	50	*110	46	66	7.7	3.4
2	4.2	5.2	5.2	11	25	120	140	87	44	*47	7.3	6.2
3	*3.7	4.0	5.5	10	23	87	130	74	39	37	7.3	7.7
4	3.7	3.7	5.5	*11	21	74	376	66	34	36	6.9	5.2
5	3.7	4.5	*6.1	9.5	20	62	582	62	30	34	6.3	*5.2
6	3.4	4.8	7.0	9.1	*20	54	623	58	28	29	5.2	4.8
7	2.6	4.8	7.7	9.8	23	47	426	50	28	26	3.4	4.5
8	3.4	5.5	7.7	9.5	27	44	340	50	28	27	3.4	4.2
9	2.9	5.2	8.8	9.5	144	41	304	45	26	36	4.0	3.4
10	3.7	4.2	8.8	9.1	244	37	376	47	*25	30	5.5	5.2
11	3.4	4.0	9.5	8.0	165	39	543	45	26	26	5.5	6.2
12	3.7	4.2	11	7.7	115	47	465	47	25	23	5.2	5.9
13	2.9	4.8	11	7.3	87	47	316	50	35	22	5.9	5.5
14	4.3	5.2	9.6	7.0	82	44	232	66	87	21	6.2	4.2
15	2.9	7.7	8.8	6.2	70	41	187	62	105	20	6.6	3.7
16	3.4	6.2	11	5.9	62	37	165	50	78	18	8.0	7.0
17	3.4	5.2	15	5.6	50	34	150	44	58	17	5.9	7.0
18	4.0	4.2	15	5.3	46	34	220	46	54	16	3.4	7.0
19	3.4	4.5	13	5.1	42	46	256	106	100	16	4.0	8.8
20	3.4	7.0	13	4.8	36	54	198	232	62	14	5.2	18
21	3.7	13	15	10	33	50	155	176	45	16	5.5	26
22	4.5	12	20	136	32	46	130	125	34	15	5.2	13
23	4.5	11	26	198	30	41	120	96	35	16	4.0	5.5
24	4.2	8.4	28	125	31	35	130	78	31	14	7.3	4.2
25	4.8	8.0	27	87	39	33	244	70	27	12	4.0	5.2
26	5.5	7.0	25	70	93	34	232	62	23	11	3.7	4.8
27	4.2	6.6	23	54	*376	*36	316	54	28	10	3.7	5.2
28	3.4	6.2	22	46	244	58	232	46	102	9.5	3.7	5.5
29	4.2	6.2	20	41	-	62	176	40	155	9.5	4.0	4.8
30	4.8	5.5	16	34	--------	54	135	35	100	*9.1	4.2	5.3
31	5.2	--------	15	31	--------	45	--------	38	--------	8.8	3.7	--------
Total	119.3	183.6	421.4	995.4	2,208	1,648	7,949	2,217	1,538	691.9	161.9	202.6
Mean	3.85	6.12	13.6	32.1	78.9	53.2	265	71.5	51.3	22.3	5.22	6.75
Cfsm	0.041	0.066	0.146	0.345	0.848	0.572	2.85	0.769	0.552	0.240	0.056	0.073
In.	0.05	0.07	0.17	0.40	0.88	0.66	3.18	0.89	0.62	0.28	0.06	0.08

Calendar year 1956: Max 1,050 Min 2.6 Mean 66.3 Cfsm 0.713 In. 9.70
Water year 1956-57: Max 623 Min 2.6 Mean 50.2 Cfsm 0.540 In. 7.34

Peak discharge (base, 700 cfs).--No peak above base.
* Discharge measurement made on this day.

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, 2¾ miles northwest of Cedarville and 4 miles upstream from mouth.

Drainage area.--279 sq mi.

Records available.--October 1946 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 780.09 ft above mean sea level, datum of 1929. Prior to Nov. 4, 1947, wire-weight gage at same site and datum.

Average discharge.--11 years, 261 cfs.

Extremes.--Maximum discharge during year, 2,480 cfs Apr. 6 (gage height, 7.79 ft); minimum, 25 cfs Oct. 7, 8, 9; minimum gage height, 1.35 ft Aug. 24, Sept. 1, 2.
1946-57: Maximum discharge, 4,870 cfs Apr. 5, 1950 (gage height, 11.67 ft); minimum, 12 cfs Oct. 3, 1949; minimum gage height, 1.30 ft Sept. 3, Oct. 1, 1953.

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

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 28 to Nov. 22)

1.3	21	3.0	469
1.5	44	5.0	1,260
2.0	138	8.0	2,580

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*26	*32	32	49	78	450	138	378	154	263	39	27
2	28	34	31	*50	b70	329	450	312	148	*180	36	28
3	27	32	*31	b45	65	246	488	263	*125	136	36	39
4	28	31	32	b39	b63	187	1,100	223	112	118	34	*28
5	28	31	32	b35	b63	159	2,160	200	104	190	31	27
6	28	32	35	b34	65	141	2,430	177	102	125	31	28
7	26	34	43	b35	74	127	1,800	161	100	102	31	28
8	25	32	43	b35	87	116	1,220	148	100	100	31	26
9	27	32	44	36	361	110	1,060	141	96	141	31	25
10	28	32	41	41	660	100	1,220	138	94	108	34	26
11	29	31	40	55	432	100	1,940	136	96	87	32	28
12	30	32	44	39	312	118	1,660	136	102	74	31	30
13	28	34	43	32	230	118	1,060	138	104	73	30	43
14	26	35	41	b30	220	112	780	171	296	67	30	30
15	28	38	40	b29	190	108	580	164	296	64	31	29
16	28	46	40	b28	161	100	506	136	246	58	31	28
17	29	39	44	b28	131	94	469	123	164	55	30	29
18	29	34	47	b29	120	91	780	120	138	54	29	27
19	27	31	44	b30	112	112	1,020	160	395	52	28	28
20	29	36	47	31	100	143	700	543	246	50	28	49
21	30	57	52	32	94	136	543	469	154	50	29	87
22	30	57	55	80	91	127	432	346	116	49	28	109
23	30	46	62	620	85	116	432	280	100	62	27	60
24	30	40	64	a640	83	106	432	230	94	54	34	43
25	30	38	64	a520	92	100	900	190	87	47	38	38
26	34	36	60	a320	134	102	940	177	78	46	30	34
27	38	35	58	a210	940	106	1,180	156	83	46	30	31
28	31	35	58	a160	*740	174	940	134	306	41	30	31
29	31	34	57	a130	-	*190	620	123	660	41	31	29
30	31	32	50	*a110	--------	161	*469	116	432	43	31	28
31	32	--------	49	100	--------	138	--------	156	--------	*41	30	--------
Total	901	1,088	1,423	3,652	5,853	4,517	28,449	6,345	5,328	2,617	972	1,093
Mean	29.1	36.3	45.9	118	209	146	948	205	178	84.4	31.4	36.4
Cfsm	0.104	0.130	0.165	0.423	0.749	0.523	3.40	0.735	0.638	0.303	0.113	0.130
In.	0.12	0.14	0.19	0.49	0.78	0.60	3.79	0.85	0.71	0.35	0.13	0.14

Calendar year 1956:	Max	4,380	Min	25	Mean	224	Cfsm	0.803	In.	10.90
Water year 1956-57:	Max	2,430	Min	25	Mean	171	Cfsm	0.613	In.	8.29

Peak discharge (base, 2,000 cfs).--Apr. 6 (1:30 p.m.) 2,480 cfs (7.79 ft); Apr. 11 (4:30 p.m.) 2,120 cfs (6.96 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and by hydrographic comparison with Cedar Creek at Auburn and nearby stations.

b Stage-discharge relation affected by ice.

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 1957. Gage-height records collected at this site December 1954 to August 1957 and at site half a mile upstream January 1932 to November 1954, and since September 1957 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 760.44 ft above mean sea level, datum of 1929. Prior to July 27, 1948, wire-weight gage at same site and datum.

Average discharge.--11 years, 535 cfs.

Extremes.--Maximum discharge during year, 7,700 cfs Apr. 8 (gage height, 21.49 ft); minimum, 12 cfs Sept. 7, 8; minimum gage height, 1.84 ft Sept. 7.

1946-57: Maximum discharge, 12,500 cfs Feb. 15, 1950 (gage height, 23.60 ft); minimum, 3.6 cfs Aug. 5, 6, 1955; minimum gage height, 1.73 ft Sept. 12, 1955.

Remarks.--Records good except those for periods of ice effect, which are fair. Flow regulated by Grand Lake Reservoir. Slight diversion from or into Wabash River and into Miami and Erie Canal.

Revisions (water years).--WSP 1114: 1948. WSP 1337: 1947.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 2-20, Feb. 27 to Mar. 3, Sept. 22-30)

1.8	11	7.0	630
2.1	24	12.0	1,830
2.5	47	17.0	3,450
3.5	118	20.0	5,400
4.5	224	22.0	8,600

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	24	26	b80	211	*1,640	176	1,010	384	3,750	97	24
2	*28	*26	24	b74	155	1,910	1,310	871	452	3,700	118	22
3	28	26	22	*b87	145	1,770	1,380	690	292	*3,250	93	*22
4	26	23	*21	b81	145	1,180	3,290	554	*199	2,360	65	18
5	24	24	20	b74	306	750	5,540	452	145	2,600	53	16
6	24	24	20	68	292	486	6,900	352	127	2,780	44	14
7	24	33	32	65	418	292	7,540	292	109	2,450	39	13
8	24	31	53	62	486	211	*7,540	264	109	2,050	37	12
9	26	26	76	62	877	176	*6,580	250	118	1,770	34	14
10	24	24	97	72	1,560	155	5,820	292	109	1,150	37	16
11	24	24	118	59	1,080	145	4,900	2,140	145	750	36	18
12	24	26	199	53	850	145	4,200	2,360	155	537	33	20
13	24	26	176	50	810	136	3,570	1,830	340	401	28	18
14	24	26	145	b47	770	127	2,810	2,750	1,300	320	31	18
15	25	28	136	44	650	127	1,910	2,750	1,010	264	47	22
16	24	25	127	41	469	118	1,220	1,860	1,300	237	56	29
17	21	22	101	39	336	105	1,050	1,180	1,030	224	30	24
18	18	20	82	36	264	101	2,540	892	670	211	26	19
19	16	16	68	36	224	109	4,260	1,080	520	199	24	21
20	14	24	72	36	165	118	4,320	1,130	320	187	24	217
21	20	47	140	62	145	109	4,440	982	199	176	24	871
22	27	44	187	1,300	145	105	3,900	871	145	176	23	537
23	25	36	187	2,310	127	105	3,250	1,150	127	651	21	384
24	22	27	199	1,510	118	97	2,600	1,750	101	710	24	384
25	22	29	165	914	127	90	2,360	1,510	82	435	24	384
26	26	31	136	958	440	90	2,310	1,220	68	368	26	320
27	24	30	118	1,200	2,280	136	2,140	982	62	306	24	211
28	26	23	114	1,280	2,050	*176	1,860	730	1,120	224	25	127
29	24	28	109	892	-	176	*1,400	503	3,090	*165	24	90
30	22	22	101	537	--------	165	1,150	320	3,570	176	24	*90
31	22	--------	b90	320	--------	145	--------	264	--------	127	25	--------
Total	730	815	3,161	12,449	15,645	11,195	102,266	33,281	17,398	32,704	1,216	3,975
Mean	23.5	27.2	102	402	559	361	3,409	1,074	580	1,055	39.2	132
Cfsm	0.038	0.044	0.166	0.654	0.909	0.587	5.54	1.75	0.943	1.72	0.064	0.215
In.	0.04	0.05	0.19	0.75	0.95	0.68	6.18	2.02	1.05	1.98	0.07	0.24

Calendar year 1956:	Max	2,980	Min	14	Mean	333	Cfsm	0.541	In.	7.37
Water year 1956-57:	Max	7,540	Min	12	Mean	643	Cfsm	1.05	In.	14.20

Peak discharge (base, 2,900 cfs).--Apr. 8 (7 a.m.) 7,700 cfs (21.49 ft); Apr. 21 (4:30 a.m.) 4,500 cfs (19.02 ft); May 14 (11 p.m.) 3,010 cfs (15.87 ft); July 1 (4 p.m.) 3,800 cfs (17.76 ft).

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

St. Marys River near Fort Wayne, Ind.

Location.--Lat 41°00', long 85°07', in NE¼ sec. 12, T. 29 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 1957 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. Datum of gage is 748.61 ft above mean sea level, unadjusted. Prior to Apr. 13, 1939, chain gage on highway bridge at same datum.

Average discharge.--25 years (1931-33, 1934-57), 581 cfs.

Extremes.--Maximum discharge during year, 8,990 cfs Apr. 8 (gage height, 16.57 ft); minimum, 11 cfs Sept. 9, 10 (gage height, 0.60 ft).

1930-57: 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 except those for periods of ice effect, which are fair. Flow regulated by Grand Lake Reservoir. Slight diversion from or into Wabash River basin and into Miami and Erie Canal.

Revisions (water years).--WSP 824: Drainage area. WSP 974: 1942. WSP 1337: 1933, 1947.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 31 to Nov. 21)

0.6	11	5.0	910
.7	20	8.0	2,140
1.4	90	12.0	4,450
2.0	172	15.0	6,870
3.0	360	17.0	9,710

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	25	28	102	260	*1,820	222	1,120	554	*3,900	141	29
2	*31	*24	27	*83	190	1,900	1,450	980	554	4,020	108	28
3	29	26	*27	78	175	1,950	1,900	815	452	3,900	114	*24
4	29	30	25	86	175	1,560	4,150	637	*297	3,360	102	23
5	28	28	24	83	380	1,020	5,930	502	223	2,820	76	21
6	25	26	24	77	360	665	*7,200	428	180	3,120	62	17
7	24	27	29	70	528	428	7,790	360	148	2,940	53	16
8	25	33	38	68	581	297	8,830	318	141	2,440	47	14
9	26	35	58	71	851	232	8,670	278	141	2,190	44	11
10	28	31	84	78	1,770	205	8,070	342	141	1,520	102	11
11	28	28	102	84	1,440	188	6,980	2,270	278	980	57	15
12	28	26	134	71	1,050	196	5,770	3,000	339	665	45	20
13	26	27	205	68	910	188	4,660	2,290	590	502	40	29
14	27	28	172	64	875	164	3,780	3,120	1,360	405	35	23
15	27	30	148	59	815	156	2,590	3,420	1,440	339	41	20
16	28	32	141	55	609	148	1,560	2,590	1,440	297	90	26
17	28	30	120	52	452	134	1,280	1,520	1,520	259	90	41
18	26	27	102	48	360	127	2,610	1,080	1,020	241	49	30
19	25	24	84	45	297	134	4,320	1,160	1,050	232	34	24
20	24	24	71	45	241	164	4,800	1,280	581	214	29	129
21	18	35	74	71	196	156	4,940	1,200	339	205	27	813
22	16	53	156	866	172	141	4,940	1,020	232	196	27	875
23	25	47	188	3,120	164	134	4,380	1,080	188	371	24	477
24	34	41	196	2,390	148	127	3,480	1,680	148	875	26	428
25	33	34	196	1,240	141	120	2,760	1,720	120	554	26	405
26	30	33	172	1,080	327	114	2,590	1,440	102	428	31	382
27	30	34	134	1,430	2,290	141	2,640	1,160	132	360	27	297
28	31	36	120	1,520	2,540	278	2,290	875	1,210	297	28	180
29	30	29	114	980	-	*278	1,680	637	3,120	232	29	114
30	30	31	108	640	--------	241	*1,320	452	3,660	164	27	90
31	27	--------	102	*380	--------	205	--------	360	--------	*214	27	--------
Total	848	934	3,203	15,104	18,297	13,611	123,582	39,134	21,700	38,240	1,658	4,612
Mean	27.4	31.1	103	487	653	439	4,119	1,262	723	1,234	53.5	154
Cfsm	0.036	0.041	0.137	0.647	0.867	0.583	5.47	1.68	0.960	1.64	0.071	0.205
In.	0.04	0.05	0.16	0.75	0.90	0.67	6.10	1.94	1.07	1.89	0.08	0.23

Calendar year 1956:	Max 4,410	Min 16	Mean 443	Cfsm 0.588	In. 8.01
Water year 1956-57:	Max 8,830	Min 11	Mean 770	Cfsm 1.02	In. 13.88

Peak discharge (base, 3,200 cfs).--Jan. 23 (3:30 p.m.) 4,020 cfs (11.31 ft); Apr. 8 (2 p.m.) 8,990 cfs (16.57 ft); Apr. 21 (11:30 p.m.) 5,010 cfs (12.75 ft); May 15 (6:30 a.m.) 3,480 cfs (10.43 ft); July 2 (11:30 a.m.) 4,020 cfs (11.33 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 1-8, 14-20, Jan. 27 to Feb. 6.

Maumee River at New Haven, Ind.

Location.--Lat 41°05', long 85°01', in SW¼ sec. 1, T. 30 N., R. 13 E., in center of span on downstream side of county road 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 1957. High-water records only prior to Sept. 7, 1956.

Gage.--Water-stage recorder. Datum of gage is 724.51 ft above mean sea level, datum of 1929. Prior to Sept. 7, 1956, wire-weight gage at same site and datum.

Extremes.--Maximum discharge during year, 15,000 cfs Apr. 11 (gage height, 19.16 ft); minimum daily, 95 cfs Oct. 7, 10-12, 14.

1946-57: Maximum discharge, 19,100 cfs Feb. 16, 1950 (gage height, 21.4 ft). Minimum daily since Sept. 7, 1956, that of Oct. 7, 10-12, 14, 1956.

Remarks.--Records good except those for periods of doubtful or no gage-height record, which are fair. Flow regulated at low stage by powerplant above station. Flow slightly regulated by upstream reservoirs.

Revisions.--WSP 1337: Drainage area.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

2.2	90	9.0	4,060
2.5	165	14.0	8,430
3.1	345	19.0	14,700
4.0	720		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	115	171	171	270	720	*4,420	1,250	3,780	1,120	5,060	300	122
2	120	*162	186	285	510	4,060	1,920	3,570	1,240	5,060	255	125
3	*115	174	195	*255	490	4,060	3,780	2,870	1,120	*4,820	255	158
4	110	145	*186	255	470	3,430	5,700	2,100	*940	4,580	255	*195
5	120	130	189	255	530	2,240	11,300	1,560	830	4,270	225	240
6	110	138	189	270	620	1,690	*14,200	1,430	620	3,920	158	122
7	95	142	315	270	830	1,300	14,400	1,120	490	3,780	145	122
8	128	145	285	255	940	940	14,400	1,060	670	3,500	160	110
9	110	152	330	255	1,800	775	14,100	940	490	3,360	195	110
10	95	165	510	240	3,570	720	14,400	940	362	2,520	510	112
11	95	174	330	210	3,710	670	14,500	2,350	720	2,030	240	112
12	95	152	345	210	3,010	720	12,800	3,780	885	1,500	177	115
13	108	160	380	195	2,520	720	10,200	3,430	1,000	1,300	158	120
14	95	160	380	171	2,450	720	8,330	3,640	1,890	830	148	102
15	105	168	300	162	2,100	775	6,900	4,270	2,380	720	160	98
16	125	240	345	151	1,690	720	5,380	3,850	2,380	670	225	102
17	122	210	398	150	1,360	670	4,340	2,590	2,590	470	225	108
18	142	192	345	151	1,060	620	4,660	1,820	1,960	490	192	105
19	122	186	240	157	885	720	8,130	1,820	2,100	490	140	110
20	150	362	300	160	670	720	7,930	2,660	1,430	450	135	270
21	128	475	380	240	570	775	7,830	3,220	940	432	128	679
22	102	285	315	1,560	570	830	7,130	2,520	775	415	128	1,300
23	108	255	398	3,640	620	830	6,400	2,520	620	530	125	1,000
24	132	195	415	2,820	510	720	5,380	2,660	490	1,060	165	775
25	142	152	450	2,200	510	620	5,140	2,870	450	885	195	570
26	162	135	470	2,130	940	620	6,120	2,520	362	620	145	530
27	171	183	432	2,100	4,130	620	6,600	2,030	686	570	125	490
28	171	270	415	2,100	5,460	*940	6,250	1,690	3,780	470	132	330
29	158	195	398	1,800	-	940	*5,060	1,300	4,980	*415	148	255
30	145	150	380	1,280	--------	885	4,130	1,060	4,980	380	128	195
31	155	--------	315	*940	--------	770	--------	1,060	--------	345	132	--------
Total	3,851	5,823	10,287	25,137	43,245	39,240	238,660	73,030	43,280	55,942	5,809	8,782
Mean	124	194	332	811	1,544	1,266	7,955	2,356	1,443	1,805	187	293
Cfsm	0.064	0.100	0.171	0.418	0.796	0.653	4.10	1.21	0.744	0.930	0.096	0.151
In.	0.07	0.11	0.20	0.48	0.83	0.75	4.57	1.40	0.83	1.07	0.11	0.17

Calendar year 1956:	Max -	Min -	Mean -	Cfsm -	In. -
Water year 1956-57:	Max 14,500	Min 95	Mean 1,515	Cfsm 0.781	In. 10.59

Peak discharge (base, 9,500 cfs).--Apr. 11 (2 a.m.) 15,000 cfs (19.16 ft).

* Discharge measurement made on this day.

Note.--Doubtful or no gage-height record Jan. 16-20, 24-30, Mar. 28 to Apr. 6, Apr. 10-27; discharge estimated on basis of weather records, appearance of recorder chart, and by hydrographic comparison with stations on St. Joseph and St. Marys Rivers and next station downstream on Maumee River at Antwerp.

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, Paulding County, 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 1957.

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.--32 years, 1,686 cfs.

Extremes.--Maximum discharge during year, 16,800 cfs Apr. 11 (gage height, 17.36 ft); minimum, 74 cfs Oct. 9 (gage height, 0.71 ft).

1921-35, 1939-57: 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).

Flood of Mar. 27, 1913, was estimated as 40,000 cfs.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Low flow slightly regulated by powerplant at Fort Wayne, Ind.

Revisions (water years).--WSP 759: Drainage area. WSP 1174: 1927, 1933, 1940. WSP 1387: 1922-23, 1925-27, 1934.

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 10				Apr. 11 to Sept. 30			
0.7	72	6.0	2,700	0.8	89	6.0	2,520
1.1	154	10.0	6,240	1.1	152	10.0	6,060
1.5	272	15.0	12,800	1.5	250	14.0	11,200
2.0	441	17.0	16,100	2.0	384	17.2	16,400
3.0	852			3.0	780		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	98	132	149	335	900	4,920	950	3,800	1,100	5,010	329	129
2	89	154	142	292	700	4,110	2,260	3,320	1,240	a5,000	284	123
3	97	154	164	280	600	4,110	3,950	2,940	1,150	a4,900	250	114
4	95	157	180	260	550	3,710	7,520	2,250	1,000	a4,800	240	140
5	89	154	177	250	550	2,850	13,100	1,690	875	a4,600	250	178
6	91	119	175	260	650	2,020	15,400	1,400	780	a4,300	210	230
7	91	123	203	270	900	1,490	15,900	1,240	561	a4,000	*171	134
8	84	121	335	270	1,100	1,250	15,700	1,020	502	a3,700	136	123
9	86	126	305	270	1,500	926	15,600	950	624	a3,300	152	110
10	98	130	348	260	3,080	828	15,700	925	447	2,730	218	108
11	86	137	514	250	3,870	758	16,400	1,260	370	2,060	430	114
12	79	154	345	230	3,310	804	16,100	3,170	850	1,690	242	114
13	80	144	369	210	2,700	804	14,400	3,400	825	1,340	174	118
14	84	137	403	200	2,490	804	11,100	3,240	1,370	1,050	157	125
15	86	*152	386	180	2,420	804	8,200	3,880	2,120	758	150	112
16	77	149	308	170	1,950	804	*6,280	3,880	2,250	*668	154	106
17	91	221	369	160	1,640	828	4,710	2,870	2,520	603	208	98
18	100	203	410	150	1,280	736	5,510	1,990	*2,180	465	212	*106
19	102	177	341	150	1,000	758	8,460	1,630	2,120	447	193	104
20	108	177	240	160	*876	852	8,460	2,250	1,930	447	138	127
21	108	441	305	170	714	901	7,940	2,940	1,240	414	131	260
22	130	477	403	800	652	901	7,810	2,660	900	384	125	829
23	98	288	335	2,000	652	926	7,210	2,320	690	414	123	1,180
24	89	240	413	3,800	652	901	6,610	2,320	561	521	134	875
25	91	197	441	2,500	572	781	5,210	2,520	465	1,000	169	690
26	126	152	477	2,400	652	714	5,010	2,590	414	780	202	521
27	135	128	496	2,300	3,000	736	6,500	2,060	356	561	152	502
28	170	152	452	2,200	5,320	926	6,500	1,750	2,660	521	129	430
29	154	256	438	2,000	-	1,100	5,310	1,400	5,840	447	129	324
30	152	194	420	1,600	--------	1,160	4,330	1,120	5,410	399	147	263
31	135	--------	386	1,200	--------	1,020	--------	975	--------	356	131	--------
Total	3,199	5,546	10,429	25,577	44,280	44,232	268,130	69,760	43,350	57,665	5,870	8,387
Mean	103	185	336	825	1,581	1,427	8,938	2,250	1,445	1,860	189	280
Cfsm	0.050	0.090	0.164	0.403	0.772	0.696	4.36	1.10	0.705	0.908	0.092	0.137
In.	0.06	0.10	0.19	0.46	0.80	0.80	4.86	1.27	0.79	1.05	0.11	0.15

Calendar year 1956 : Max 12,800 Min 77 Mean 1,586 Cfsm 0.774 In. 10.52
Water year 1956-57 : Max 16,400 Min 77 Mean 1,607 Cfsm 0.784 In. 10.64

Peak discharge (base, 8,000 cfs).--Apr. 11 (11 a.m. to 9 p.m.) 16,800 cfs (17.36 ft); Apr. 19 (2 p.m.) 8,590 cfs (12.11 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 Maumee River near Defiance, Ohio, and Maumee River at New Haven, Ind.

Note.--Stage-discharge relation affected by ice Jan. 3 to Feb. 9.

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, Fulton County, and 2¼ miles upstream from Iron Creek.

Drainage area.--238 sq mi.

Records available.--October 1940 to September 1957.

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.--17 years, 167 cfs.

Extremes.--Maximum discharge during year, 1,320 cfs Apr. 27 (gage height, 8.44 ft); minimum, 8.0 cfs Aug. 23, 24 (gage height, 0.25 ft).

1940-57: Maximum discharge, 4,250 cfs Apr. 29, 1956 (gage height, 13.82 ft); minimum, 5.9 cfs Sept. 1-3, 1953.

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

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 9				Feb. 10 to Sept. 30			
0.3	7.2	1.0	54	0.2	5.0	2.0	160
.5	15	2.0	158	.3	11	4.0	450
.7	27	4.0	450	.6	34	8.0	1,220
				1.0	66		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	16	18	25	65	351	78	298	66	78	15	25
2	11	17	19	30	60	261	*96	240	68	61	14	32
3	10	17	19	39	55	194	114	194	67	56	14	28
4	11	17	20	32	*50	171	252	160	60	51	15	23
5	10	17	22	30	50	144	609	144	61	42	61	20
6	12	17	24	30	55	119	645	129	58	38	*64	18
7	11	17	32	29	65	108	450	121	58	36	45	16
8	11	17	32	27	110	101	399	107	60	43	34	15
9	11	16	34	*30	250	95	375	99	56	72	27	14
10	11	16	32	30	550	88	359	94	52	88	23	14
11	11	16	27	25	375	81	737	92	48	71	20	15
12	11	16	30	25	240	109	718	89	*54	59	18	17
13	12	16	31	20	182	139	433	83	52	56	16	20
14	12	16	29	20	154	128	320	101	84	52	14	17
15	12	17	32	19	127	122	268	105	108	43	13	17
16	13	18	31	18	122	119	226	88	88	36	14	17
17	13	18	36	18	105	109	207	76	71	32	14	17
18	13	18	35	18	97	107	298	72	61	29	13	17
19	13	18	31	18	80	120	282	90	63	27	13	18
20	13	19	31	19	75	154	240	220	52	24	12	72
21	14	30	33	55	70	144	214	207	50	24	11	63
22	18	41	38	130	70	129	194	166	45	22	9.8	51
23	19	37	45	310	68	118	176	144	39	28	8.6	38
24	17	27	50	240	77	105	160	139	44	36	11	32
25	16	25	50	180	90	94	602	123	49	27	16	28
26	16	20	48	140	164	96	609	114	47	23	18	24
27	16	18	46	120	718	90	1,120	107	49	21	16	21
28	16	16	44	95	555	87	775	95	54	19	14	20
29	17	18	42	85	-	84	501	87	85	18	15	19
30	17	16	38	75	--------	82	375	76	107	17	16	19
31	*17	--------	34	70	--------	81	--------	70	--------	16	17	--------
Total	415	587	1,033	2,002	4,679	3,930	11,832	3,930	1,856	1,245	611.4	747
Mean	13.4	19.6	33.3	64.6	167	127	394	127	61.9	40.2	19.7	24.9
Cfsm	0.056	0.082	0.140	0.271	0.702	0.534	1.66	0.534	0.260	0.169	0.083	0.105
In.	0.06	0.09	0.16	0.31	0.73	0.62	1.85	0.62	0.29	0.19	0.10	0.12

Calendar year 1956: Max 3,260	Min 10	Mean 157	Cfsm 0.660	In. 8.97
Water year 1956-57: Max 1,120	Min 8.6	Mean 90.0	Cfsm 0.378	In. 5.14

Peak discharge (base, 1,200 cfs).--Apr. 27 (4:30 p.m.) 1,320 cfs (8.44 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 25 to Dec. 1, Jan. 1, 2, Jan. 10 to Feb. 10, Feb. 19-22.

Tiffin River at Stryker, Ohio

Location.--Lat 41°30'15", long 84°25'50", in SW¼ sec. 5, T. 6 N., R. 4 E., on right bank at downstream side of bridge on State Highway 191 at west edge of Stryker, Williams County, 0.6 mile upstream from New York Central Railroad bridge and 1½ miles downstream from Leatherwood Creek.

Drainage area.--441 sq mi.

Records available.--September 1921 to September 1928 (published as "near Stryker"), October 1940 to September 1957.

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 3½ miles downstream at different datum. Oct. 13, 1940, to Jan. 17, 1941, staff gage and Jan. 18, 1941, to Sept. 30, 1953, water-stage recorder, at site half a mile downstream at same datum.

Average discharge.--24 years, 319 cfs.

Extremes.--Maximum discharge during year, 1,670 cfs Apr. 13 (gage height, 11.48 ft); minimum, 11 cfs Aug. 24 (gage height, 1.16 ft).

1921-28, 1940-57: Maximum discharge, 6,640 cfs Apr. 25, 1950; maximum gage height, 16.16 ft May 1, 1956; minimum discharge, 3.6 cfs Aug. 30, 31, 1953.

Flood in March 1913 reached a stage of 16.0 ft, from floodmarks (discharge, 7,600 cfs). Flood in 1937 reached a stage of 15.0 ft, from information by local resident (discharge, 6,000 cfs).

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

Revisions (water years).--WSP 564: Drainage area. WSP 1144: 1922-28. WSP 1387: 1925.

Rating table, water year 1956-57, except periods of ice effect or shifting control (gage height, in feet, and discharge, in cubic feet per second)

1.1	8.0	5.0	348
1.2	13	8.0	686
1.4	28	10.0	1,100
1.7	56	11.0	1,440
2.0	84	12.0	1,950

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	27	b20	43	b100	840	134	840	302	172	19	22
2	15	28	26	30	b95	715	172	503	284	118	17	27
3	14	28	26	45	b90	459	221	348	212	89	16	41
4	14	27	24	47	b90	311	533	284	154	92	16	38
5	14	28	27	43	b90	257	1,050	239	126	230	17	28
6	14	28	29	38	b90	221	1,290	216	110	118	58	26
7	15	28	42	37	b100	194	1,360	194	99	74	*67	22
8	15	28	53	37	b110	172	1,360	176	95	242	44	20
9	15	27	55	*35	279	162	1,190	154	90	596	33	18
10	16	26	51	32	608	150	1,100	146	84	378	27	18
11	16	25	45	27	700	142	1,320	142	82	208	25	19
12	16	24	49	b25	715	167	1,400	134	85	138	22	20
13	16	25	44	b25	560	216	1,570	134	87	110	19	28
14	16	*26	36	b25	418	230	1,570	172	94	95	16	35
15	16	26	56	b20	320	216	1,190	212	172	78	18	28
16	16	27	52	b20	275	203	*730	180	185	62	19	29
17	20	32	52	b20	230	190	492	142	134	53	16	24
18	16	31	55	b20	180	172	514	130	*102	43	15	*22
19	16	28	42	b20	b150	185	633	150	122	39	14	22
20	19	29	48	b20	*b120	257	646	378	110	35	14	29
21	22	41	50	b35	b110	284	525	503	77	32	13	110
22	22	53	60	190	b110	257	408	428	67	29	12	176
23	26	46	74	408	b110	226	378	329	58	29	12	114
24	32	30	81	418	b120	198	358	275	48	32	15	67
25	27	28	86	338	142	176	348	239	55	39	22	48
26	26	b25	85	275	212	158	514	216	59	30	22	37
27	25	b25	82	b210	596	158	925	194	58	27	22	31
28	26	b19	80	b160	760	154	1,050	167	111	24	22	26
29	24	b20	72	b140	-	150	1,190	142	221	22	22	24
30	25	b19	58	b130	--------	142	1,160	130	208	21	22	23
31	26	--------	65	b120	--------	134	--------	167	--------	20	22	--------
Total	594	854	1,625	3,033	7,480	7,496	25,331	7,664	3,691	3,275	698	1,172
Mean	19.2	28.5	52.4	97.8	267	242	844	247	123	106	22.5	39.1
Cfsm	0.044	0.065	0.119	0.222	0.605	0.549	1.91	0.560	0.279	0.240	0.051	0.089
In.	0.05	0.07	0.14	0.26	0.63	0.63	2.13	0.65	0.31	0.28	0.06	0.10

Calendar year 1956: Max 5,440 Min 14 Mean 320 Cfsm 0.726 In. 9.88
Water year 1956-57: Max 1,570 Min 12 Mean 172 Cfsm 0.390 In. 5.31

Peak discharge (base, 1,800 cfs).--No peak above base.
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--Shifting-control method used Oct. 1 to Jan. 22.

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 200 ft upstream from bridge on U. S. Highway 224, 3½ miles northeast of Fort Jennings, Putnam County, and 6 miles upstream from Ottawa River.

Drainage area.--333 sq mi.

Records available.--August 1921 to December 1935, October 1940 to September 1957.

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.--31 years, 290 cfs.

Extremes.--Maximum discharge during year, 7,000 cfs Apr. 6 (gage height, 15.92 ft); minimum, 4.5 cfs Oct. 7 (gage height, 1.28 ft).

1921-35, 1940-57: Maximum discharge, 9,550 cfs Feb. 15, 1950 (gage height, 17.8 ft, from high-water mark); minimum, that of Oct. 7, 1956; minimum gage height, 0.75 ft Aug. 28, 1932

Remarks.--Records good except those for period of ice effect, which are fair. Some diversion from Grand Lake by Miami & Erie Canal into Jennings Creek, tributary to Auglaize River above station.

Revisions (water years).--WSP 744: 1932. WSP 974: 1930(M).

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 8)

1.1	3.7	3.0	163
1.2	5.7	4.0	331
1.3	8.3	6.0	804
1.4	12	9.0	1,780
1.6	20	12.0	3,140
1.9	40	14.0	4,740
2.2	68	16.0	7,130
2.5	101		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.3	16	15	60	112	1,200	86	322	132	4,280	77	24
2	7.0	12	15	56	94	526	302	238	136	1,170	58	25
3	6.2	12	15	51	90	341	888	183	135	467	48	27
4	6.2	15	17	47	90	238	2,060	149	130	434	46	24
5	6.0	15	27	44	*176	183	5,540	129	102	1,150	39	22
6	5.3	12	28	39	274	155	6,380	113	87	1,270	39	22
7	4.9	12	34	39	247	137	4,440	101	78	550	40	22
8	5.7	12	34	38	274	125	3,140	90	78	331	40	22
9	5.7	12	43	39	374	114	3,200	84	79	478	36	21
10	5.7	10	76	38	1,030	106	3,260	95	88	726	36	23
11	5.7	8.6	108	b35	832	97	3,080	879	89	331	33	24
12	6.5	8.3	94	b30	456	99	2,140	1,440	80	205	33	24
13	7.3	8.3	89	b30	293	90	1,120	700	80	151	33	25
14	6.7	8.3	89	b25	221	90	726	*1,150	103	126	89	25
15	6.7	10	72	b25	205	82	514	1,510	255	107	106	26
16	7.0	*12	62	b25	198	78	402	1,150	302	*94	39	29
17	12	13	50	b20	170	72	361	478	456	79	32	*28
18	13	11	*47	b20	145	68	940	312	502	68	29	25
19	11	10	46	b20	125	77	3,030	610	284	58	28	24
20	8.6	12	45	b19	107	84	3,320	1,060	176	53	27	58
21	7.8	18	50	b35	93	*81	1,540	2,020	136	49	27	552
22	6.7	21	70	541	88	79	1,300	1,460	105	45	26	1,370
23	6.2	17	109	2,100	79	73	1,510	1,090	82	295	*25	661
24	*5.1	15	98	2,460	78	68	2,190	1,300	71	1,340	26	361
25	6.2	19	80	1,120	78	66	1,060	832	64	570	29	221
26	8.3	18	74	456	183	70	610	456	58	256	29	146
27	12	17	70	293	1,940	92	860	322	52	162	28	105
28	12	16	68	221	2,730	101	1,120	230	861	114	27	78
29	12	16	68	190	-	103	648	176	3,860	87	26	62
30	12	16	62	154	--------	91	467	145	6,380	74	26	53
31	13	--------	68	138	--------	88	--------	135	--------	66	24	--------
Total	245.8	402.5	1,823	8,408	10,782	4,874	56,234	18,959	15,041	15,186	1,201	4,129
Mean	7.93	13.4	58.8	271	385	157	1,874	612	501	490	38.7	138
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956:	Max	3,320	Min	4.9	Mean	225	Cfsm	-	In. -
Water year 1956-57:	Max	6,380	Min	4.9	Mean	376	Cfsm	-	In. -

Peak discharge (base, 2,700 cfs).--Feb. 28 (10 a.m.) 2,880 cfs (11.51 ft); Apr. 6 (12:30 a.m.) 7,000 cfs (15.92 ft); Apr. 20 (4 a.m.) 3,820 cfs (12.98 ft); June 30 (12 m.) 6,620 cfs (15.63 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

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 1957.

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.--26 years, 124 cfs.

Extremes.--Maximum discharge during year, 5,300 cfs June 29 (gage height, 9.45 ft); minimum, 8.3 cfs Oct. 11, 12; minimum gage height, 2.28 ft Oct. 11, 12, Nov. 1, 5, Aug. 17.

1923-35, 1943-57: Maximum discharge, that of June 29, 1957; minimum, 1.4 cfs June 28, 29, 1933.

Flood of Mar. 15, 1939, reached a stage of 10.1 ft and flood in May 1943, a stage of about 10 ft (discharge not determined).

Remarks.--Records good except those for period of ice effect, 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).--WSP 1004: 1924. WSP 1144: 1944(M). WSP 1207: 1927. WSP 1387: 1924(M), 1927-28(M), 1929, 1930(M), 1935(M).

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.3	9.0	3.7	248
2.5	16	4.0	445
2.7	25	5.0	1,120
2.9	38	7.0	2,160
3.1	59	8.0	3,070
3.4	122	9.0	4,490

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	12	26	28	29	254	44	79	97	1,040	24	19
2	19	11	24	23	26	161	123	61	186	430	24	19
3	19	13	22	24	29	117	225	53	141	182	23	30
4	19	11	23	24	44	91	2,220	48	78	381	21	24
5	18	9.6	22	23	*49	77	3,190	52	53	513	19	16
6	21	17	23	22	36	67	2,300	46	44	161	18	16
7	18	18	83	22	41	62	1,190	36	40	174	18	14
8	14	18	45	24	58	59	1,770	33	80	160	18	14
9	13	18	47	26	326	54	1,460	31	48	180	18	17
10	11	20	34	28	493	49	1,420	68	40	152	21	25
11	9.9	17	36	24	232	49	1,340	652	44	83	16	22
12	14	16	35	23	111	54	670	173	36	56	16	21
13	16	18	26	22	103	48	385	105	51	47	17	22
14	14	14	22	20	108	44	254	*449	75	44	15	19
15	16	20	26	b19	111	44	162	238	47	39	15	19
16	14	25	22	b18	98	40	126	210	185	27	21	25
17	13	20	20	b17	83	37	141	114	182	*26	14	22
18	13	18	*22	b16	70	42	1,100	344	102	26	16	19
19	19	16	27	b16	62	51	1,240	649	61	26	14	20
20	24	18	29	b15	49	47	635	1,610	41	24	20	214
21	19	59	61	b45	49	*46	965	691	32	22	20	55
22	15	22	32	553	47	40	684	517	31	23	21	52
23	14	20	29	1,310	48	38	1,230	649	34	121	*20	37
24	*15	24	28	582	44	35	517	517	24	34	25	26
25	22	23	29	111	48	42	294	248	25	25	29	24
26	30	24	27	37	692	45	194	165	22	19	23	24
27	26	26	29	32	1,590	45	344	104	24	22	26	22
28	22	26	28	31	650	44	248	74	1,950	18	24	21
29	19	25	28	39	-	44	159	56	3,660	16	22	19
30	20	24	24	34	--------	40	106	51	2,070	30	14	19
31	19	--------	27	32	--------	37	--------	53	--------	22	14	--------
Total	541.9	602.6	956	3,240	5,326	1,903	24,736	8,176	9,503	4,123	606	896
Mean	17.5	20.1	30.8	105	190	61.4	825	264	317	133	19.5	29.9
Cfsm	0.104	0.120	0.183	0.625	1.13	0.365	4.91	1.57	1.89	0.792	0.116	0.178
In.	0.12	0.13	0.21	0.72	1.18	0.42	5.48	1.81	2.11	0.91	0.13	0.20

Calendar year 1956: Max 1,610 Min 9.6 Mean 111 Cfsm 0.661 In. 8.93
Water year 1956-57: Max 3,660 Min 9.6 Mean 166 Cfsm 0.988 In. 13.42

Peak discharge (base, 1,600 cfs).--Feb. 27 (3 a.m.) 2,010 cfs (6.76 ft); Apr. 5 (4:30 a.m.) 3,430 cfs (8.28 ft); Apr. 8 (8 a.m.) 1,920 cfs (6.59 ft); Apr. 11 (1:30 a.m.) 1,680 cfs (6.08 ft); Apr. 18 (9 p.m.) 1,920 cfs (6.62 ft); Apr. 23 (10:30 a.m.) 1,720 cfs (6.19 ft); May 20 (12 m.) 1,950 cfs (6.65 ft); June 29 (3 a.m.) 5,300 cfs (9.45 ft).

* Discharge measurement made on this day.

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.--October 1946 to July 1957 (discontinued). Prior to January 1947, monthly discharge only, published in WSP 1307.

Gage.--Water-stage recorder. Datum of gage is 780.02 ft above mean sea level (State Highway Department bench mark). Prior to Jan. 1, 1949, wire-weight gage at same site and datum.

Average discharge.--10 years (1946-56), 46.1 cfs.

Extremes.--Maximum discharge during period October 1956 to July 1957, 2,850 cfs June 29 (gage height, 13.45 ft); no flow on many days.

1946-57: Maximum discharge, 2,920 cfs June 7, 1947; maximum gage height, that of June 29, 1957; no flow for many days.

Remarks.--Records good except those for periods of ice effect or no gage-height record and those below 1 cfs, which are fair.

Rating table, Oct. 1, 1956, to July 31, 1957, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 13-18)

2.3	0	5.0	89
2.4	.2	6.0	156
2.5	1.0	7.0	245
2.7	3.2	9.0	508
2.9	6.5	10.0	705
3.1	12	11.0	1,020
3.5	24	12.0	1,570
4.0	41	13.0	2,440

Discharge, in cubic feet per second, October 1956 to July 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.2	1.8	7.0	70	6.4	19	532	104		
2	0	0	.6	1.4	6.0	48	155	15	217	51		
3	0	0	.7	1.1	6.1	31	121	12	80	32		
4	0	0	.6	1.0	22	24	1,180	10	39	41		
5	0	0	.6	.8	*60	18	1,060	8.7	25	70		
6	0	0	.8	.7	80	15	594	7.5	17	33		
7	0	0	2.0	.8	43	13	273	6.5	71	145		
8	0	0	3.6	.8	41	12	735	5.8	39	56		
9	0	0	4.1	.9	116	10	313	5.4	25	459		
10	0	0	2.6	b1.0	149	8.7	523	6.0	19	92		
11	0	0	1.9	b.8	67	8.2	444	14	15	37		
12	0	0	1.9	b.6	39	8.9	172	22	17	23		
13	0	0	2.2	b.6	28	7.9	107	*12	13	18		
14	0	0	2.1	b.5	28	7.0	70	31	14	13		
15	0	0	1.8	.5	30	7.9	51	70	19	9.4		
16	0	.2	1.6	b.5	27	6.7	43	32	59	6.7		
17	0	.1	1.2	b.4	21	6.0	50	19	48	5.4		
18	0	.1	*1.0	b.4	16	6.1	352	17	24	*4.9		
19	0	.2	1.0	b.4	14	8.7	321	61	16	a5		
20	0	.1	1.0	b.4	11	*10	110	189	9.4	a4		
21	0	.6	1.5	b4	8.2	8.2	152	106	6.7	a4		
22	0	.2	1.9	193	7.5	7.5	95	103	5.1	a4		
23	*0	0	2.4	374	7.2	7.0	184	121	4.4	a4		
24	0	0	2.6	98	8.2	6.0	98	105	6.8	a5		
25	0	0	2.1	51	14	5.6	126	47	6.5	a7		
26	0	0	1.9	30	232	6.3	53	32	4.9	a5		
27	.1	.1	2.0	21	685	*7.0	45	22	3.8	a4		
28	.1	.1	2.1	15	140	7.0	40	14	759	a3		
29	0	.1	2.1	13	-	7.0	29	11	1,860	a2.8		
30	0	.1	2.4	10	--------	6.5	24	8.4	310	a2.6		
31	0	--------	2.1	8.7	--------	5.8	--------	39	--------	a2.4		--------
Total	0.2	1.9	54.6	833.1	1,913.2	401.0	7,526.4	1,171.3	4,265.6	1,253.2		
Mean	0.006	0.06	1.76	26.9	68.3	12.9	251	37.8	142	40.4		
Cfsm	0.00013	0.0013	0.038	0.578	1.47	0.277	5.40	0.813	3.05	0.869		
In.	0.0002	0.001	0.04	0.67	1.53	0.32	6.02	0.94	3.40	1.00		

Calendar year 1956: Max 1,090 Min 0 Mean 36.2 Cfsm 0.778 In. 10.61
Water year 1956-57: Max - Min - Mean - Cfsm - In. -

Peak discharge (base, 800 cfs).--Feb. 27 (4:30 a.m.) 1,210 cfs (11.36 ft); Apr. 4 (9 p.m.) 1,710 cfs (12.25 ft); Apr. 8 (6:30 a.m.) 980 cfs (10.90 ft); Apr. 11 (1 a.m.) 810 cfs (10.44 ft); Apr. 18 (10 p.m.) 810 cfs (10.37 ft); June 1 (6:30 a.m.) 1,020 cfs (10.95 ft); June 29 (4 a.m.) 2,850 cfs (13.45 ft).

* Discharge measurement or observation of no flow made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Blanchard River near Findlay.

b Stage-discharge relation affected by ice.

Blanchard River near Findlay, Ohio

Location.--Lat 41°03'21", long 83°41'17", on east line of 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 1957.

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.--28 years (1924-35, 1940-57), 235 cfs.

Extremes.--Maximum discharge during year, 6,580 cfs Apr. 6 (gage height, 12.72 ft); minimum, 4.3 cfs Oct. 8; minimum gage height, 0.62 ft Sept. 7.

1923-35, 1940-57: Maximum discharge, 11,800 cfs Dec. 1, 1927 (gage height, 15.4 ft, from graph based on gage readings); minimum, 0.4 cfs Aug. 26, 27, Sept. 3, 1934.

Flood in March 1913 reached a stage of 18.5 ft (discharge, 22,000 cfs, from rating curve extended above 9,500 cfs).

Remarks.--Records fair.

Revisions (water years).--WSP 974: 1942. WSP 1054: 1927-30, 1933(M), 1945. WSP 1387: 1926, 1928(M), 1930(M), 1952.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.9	9.3	9.8	20	52	910	50	116	1,200	2,640	14	8.2
2	8.2	8.6	9.3	18	41	466	363	81	1,020	945	11	14
3	7.9	10	10	17	36	277	805	52	1,120	355	20	15
4	7.9	13	10	17	63	204	3,080	51	686	185	35	8.6
5	7.5	8.2	9.8	16	194	159	5,800	51	248	322	24	7.9
6	5.9	8.2	9.3	14	199	118	6,040	43	165	180	17	7.5
7	6.5	9.3	36	16	209	104	3,820	38	143	312	16	7.2
8	4.6	8.6	34	15	*206	92	3,580	31	204	258	13	7.9
9	6.8	8.2	43	17	480	87	2,970	31	129	791	14	7.9
10	7.5	7.9	36	17	910	90	2,920	37	104	875	14	14
11	7.5	7.9	38	12	685	66	3,310	56	102	286	15	11
12	7.5	8.9	36	12	314	69	2,270	100	95	139	13	14
13	7.5	9.3	31	12	183	62	1,160	*120	109	100	13	12
14	7.5	8.9	27	11	155	62	705	157	102	82	14	11
15	8.2	*11	27	11	147	58	488	395	111	68	14	11
16	8.2	11	26	10	145	48	327	500	425	55	9.7	14
17	7.9	10	24	9.8	114	41	345	205	535	*46	7.9	*12
18	8.2	9.3	*22	9.3	90	36	1,080	133	428	28	8.6	9.8
19	8.2	9.3	18	8.2	75	58	2,020	331	199	34	8.9	9.8
20	7.9	11	24	8.2	62	*61	1,580	945	135	31	8.9	142
21	8.9	32	30	31	59	58	980	745	107	27	8.2	428
22	11	13	28	442	61	58	*945	555	80	24	*7.5	645
23	*7.9	12	28	1,540	54	58	805	705	62	27	7.2	426
24	7.9	10	28	1,050	54	51	622	765	97	32	8.4	300
25	9.8	9.8	31	630	82	51	545	510	107	52	11	147
26	9.8	10	29	210	456	56	309	248	76	40	10	87
27	9.3	10	30	113	2,570	*54	238	196	63	27	10	58
28	8.9	10	36	95	1,820	52	187	172	1,600	19	9.3	43
29	12	11	30	80	-	52	153	129	5,440	19	9.8	35
30	8.6	9.8	26	45	--------	51	131	104	3,900	17	9.8	21
31	8.2	--------	27	58	--------	42	--------	160	--------	16	8.9	--------
Total	251.6	315.5	803.2	4,564.5	9,516	3,651	47,628	7,762	18,792	8,032	391.1	2,534.8
Mean	8.12	10.5	25.9	147	340	118	1,588	250	626	259	12.6	84.5
Cfsm	0.024	0.031	0.076	0.429	0.991	0.344	4.63	0.729	1.83	0.755	0.037	0.246
In.	0.03	0.03	0.09	0.49	1.03	0.40	5.17	0.84	2.04	0.87	0.04	0.27

Calendar year 1956:	**Max**	3,880	**Min**	4.6	**Mean**	224	**Cfsm**	0.653	**In.**	8.86
Water year 1956-57:	**Max**	6,040	**Min**	4.6	**Mean**	286	**Cfsm**	0.834	**In.**	11.30

Peak discharge (base, 2,400 cfs).--Feb. 27 (10 a.m.) 2,870 cfs (8.57 ft); Apr. 6 (6 a.m.) 6,580 cfs (12.72 ft); Apr. 11 (6 a.m.) 3,580 cfs (9.85 ft); June 29 (2 p.m.) 6,040 cfs (12.30 ft).

* Discharge measurement made on this day.

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 Defiance, Defiance 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 1957.

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 1¾ miles downstream at different datum. Apr. 13, 1915, to Dec. 6, 1933, staff gage near right bank on upstream side of dam at datum 6.00 ft higher. Auxiliary tailwater staff gage near right bank on downstream side of dam at present datum.

Average discharge.--37 years (1915-35, 1940-57), 1,692 cfs.

Extremes.--Maximum discharge during year, 33,900 cfs Apr. 6 (gage height, 21.75 ft); minimum daily, 21 cfs Jan. 6, 12.

1915-35, 1940-57: Maximum discharge, 52,500 cfs Feb. 16, 1950 (gage height, 26.4 ft, from graph based on hourly powerplant tailwater gage readings); minimum daily, 0.5 cfs Oct. 13, 14, 1952 (during repairs to powerplant dam).

Flood in 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 (capacity of reservoir 9,800 acre-ft). Some diversion by Miami & Erie Canal from Grand Lake into Jennings Creek, tributary to Auglaize River above station. (See miscellaneous discharge measurements on p. 368).

Revisions (water years).--WSP 759: Drainage area. WSP 954: 1941.

Rating tables, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 6				Apr. 7 to Sept. 30			
4.6	19	5.5	284	4.8	30	6.5	860
4.7	26	6.0	605	4.9	42	7.0	1,360
4.8	37	7.0	1,520	5.1	90	9.0	3,950
4.9	52	9.0	4,080	5.5	240	13.0	11,000
5.0	73	13.0	11,000	6.0	487	22.0	34,500
5.2	140	22.0	34,500				

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	59	42	55	29	648	8,340	956	1,660	2,680	19,700	79	61
2	55	42	53	27	422	6,110	2,500	1,310	2,680	14,200	196	58
3	55	42	57	336	316	4,080	3,560	807	2,100	7,260	68	54
4	55	42	53	183	*282	3,180	12,000	873	1,730	4,560	68	52
5	57	42	52	23	604	1,250	22,000	765	1,460	3,580	79	52
6	55	42	52	21	408	811	31,300	432	1,260	4,400	266	54
7	53	41	52	221	1,240	811	31,900	406	920	3,370	*71	54
8	53	41	53	195	1,760	811	26,700	504	637	2,230	68	56
9	53	41	52	215	3,100	811	22,800	178	818	2,160	66	56
10	53	41	52	24	5,150	477	21,800	150	464	3,160	66	54
11	52	38	246	217	5,630	902	22,000	1,690	304	3,160	71	52
12	52	38	279	21	4,230	489	18,400	3,440	46	2,000	76	48
13	50	38	280	212	3,350	556	13,300	3,800	574	1,240	79	46
14	50	37	315	147	1,990	606	9,240	4,560	1,920	68	76	46
15	50	*38	151	27	1,460	475	*6,560	4,250	1,990	400	161	44
16	50	44	210	25	1,000	55	4,250	4,880	1,300	406	71	42
17	50	42	306	202	1,260	258	3,230	3,580	2,350	356	184	44
18	50	42	50	28	787	786	3,720	3,230	2,160	431	71	122
19	50	42	282	26	771	440	9,240	2,070	*2,100	480	74	44
20	50	42	50	27	538	238	13,300	2,640	1,130	71	71	236
21	48	44	684	465	500	444	11,000	3,800	258	66	71	822
22	48	42	257	2,360	746	664	8,700	5,370	542	61	76	1,310
23	48	44	342	4,830	380	972	7,080	3,230	427	63	79	1,920
24	48	44	316	8,160	466	63	7,260	3,440	194	1,190	79	1,180
25	47	42	53	6,790	58	980	6,220	3,510	278	1,920	74	689
26	47	42	344	4,230	1,170	63	4,250	2,920	312	196	74	653
27	47	42	38	2,900	4,680	583	3,370	1,140	66	294	63	337
28	47	42	653	1,250	10,200	819	3,650	1,150	2,640	71	58	260
29	47	41	35	953	-	819	3,580	951	8,440	279	54	40
30	45	427	128	755	--------	1,030	2,510	66	16,800	184	249	224
31	44	--------	379	462	--------	465	--------	1,620	--------	76	52	--------
Total	1,568	1,627	5,929	35,361	53,146	38,388	336,376	68,422	58,580	77,632	2,890	8,710
Mean	50.6	54.2	191	1,141	1,898	1,238	11,210	2,207	1,953	2,504	93.2	290
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 21,500 Min 35 Mean 1,553 Cfsm - In. -
Water year 1956-57: Max 31,900 Min 21 Mean 1,887 Cfsm - In. -

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Peak discharge (base, 13,000 cfs).--Apr. 6 (10 p.m.) 33,900 cfs (21.75 ft); Apr. 20 (12 m.) 13,500 cfs (14.12 ft); July 1 (1 p.m.) 20,200 cfs (16.68 ft).

* Discharge measurement made on this day.

Miami & Erie Canal near Defiance, Ohio

Location.--Lat 41°17'30", long 84°16'50", in NW¼ sec. 22, T. 4 N., R. 5 E., on right bank adjacent to Independence Dam, 275 ft downstream from point of diversion from Maumee River and 4½ miles east of Defiance, Defiance County.

Records available.--November 1924 to July 1929, May to December 1935, October 1952 to September 1957. Published as "near Florida" May to December 1935.

Gage.--Water-stage recorder. Datum of gage is 656.12 ft above mean sea level. Prior to July 23, 1929, water-stage recorder at same site at datum 2.69 ft higher. May to December 1935, staff gage at site 5½ miles downstream at different datum. Oct. 1, 1952, to Mar. 25, 1953, staff gage at present site and datum.

Extremes.--1924-29, 1935, 1952-57: Maximum daily discharge, 301 cfs Dec. 9, 1927; no flow at times.

Remarks.--Records good except those for period of ice effect, which are poor. Flow is diverted from Maumee River into canal at headgates 275 ft upstream and returned to river above station at Waterville.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	53	44	44	23		33	18	9.6	35	69	39	2.0
2	52	44	42	24		29	23	11	35	66	38	2.0
3	53	44	42	24		28	26	11	34	59	37	2.0
4	52	45	42	24		28	81	10	33	55	37	1.8
5	53	45	42	23		27	64	9.3	32	54	37	39
6	52	44	42			25	44	7.8	31	53	37	86
7	50	44	43			24	38	7.2	31	50	37	89
8	50	44	44		35	24	35	6.9	31	51	*37	89
9	50	43	44			21	29	6.4	31	49	37	89
10	51	46	42	(*)		21	42	21	34	52	37	89
11	51	44	43			20	44	37	34	50	38	89
12	51	42	45			18	28	43	33	48	38	89
13	50	42	44			18	20	47	35	45	38	89
14	50	*44	44			19	16	49	38	42	37	89
15	49	47	43	20		16	13	48	46	42	37	89
16	49	41	42			14	12	49	49	41	37	89
17	48	44	42			17	*12	47	45	40	36	89
18	47	44	42			19	23	46	44	40	36	89
19	47	45	42		*25	18	19	45	*42	40	36	89
20	46	46	43			16	15	45	43	39	31	92
21	46	43	43			18	13	46	42	38	11	96
22	46	40	42			19	13	48	41	37	4.1	106
23	46	43	42			19	11	46	39	39	3.4	113
24	46	43	40		24	20	11	44	38	40	3.4	113
25	46	43	40		23	23	9.9	44	39	43	2.9	106
26	45	43	32	35	32	19	9.3	42	38	42	2.4	106
27	46	42	22		44	18	9.3	39	39	41	2.2	99
28	46	42	23		36	18	11	38	70	40	2.2	99
29	45	42	23		-	17	10	37	67	40	2.2	96
30	44	42	23		--------	18	10	31	67	39	2.2	96
31	45	--------	22		--------	18	--------	32	--------	39	2.0	--------
Total	1,505	1,305	1,209	773	874	642	709.5	1,003.2	1,216	1,423	775.0	2,411.8
Mean	48.5	43.5	39.0	24.9	31.2	20.7	23.6	32.4	40.5	45.9	25.0	80.4
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956:	Max 214	Min -	Mean 51.1	Cfsm -	In. -
Water year 1956-57:	Max 113	Min 1.8	Mean 37.9	Cfsm -	In. -

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 6 to Feb. 23.

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, Defiance County.

Drainage area.--5,530 sq mi.

Records available.--October 1924 to December 1935, March 1939 to September 1957.

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.--29 years, 4,022 cfs (not including flow in Miami & Erie Canal).

Extremes.--Maximum discharge during year, 55,500 cfs Apr. 7 (gage height, 9.55 ft); minimum, 68 cfs Oct. 11 (gage height, 1.43 ft).

1924-35, 1939-57: Maximum discharge, 87,100 cfs Feb. 16, 1950 (gage height, 13.70 ft); minimum, 2 cfs Sept. 3, 1925 (gage height, 1.14 ft).

Remarks.--Records good. Flow affected by regulation of Auglaize River at hydroelectric plant of Toledo Edison Co., 3 miles south of Defiance. Water diverted into Miami & Erie Canal, 275 ft upstream, bypasses station. These records do not include flow in canal; record of diversion published as Miami & Erie Canal near Defiance (see preceding page).

Revisions (water years).--WSP 974: 1926-27, 1930. WSP 1387: 1925-28, 1946.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

1.4	54	2.5	2,440
1.5	115	3.0	4,400
1.6	240	4.0	9,600
1.8	605	6.0	25,100
2.1	1,260	10.0	58,500

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	136	157	473	472	1,920	16,400	1,860	7,520	5,510	26,100	586	226
2	126	136	226	275	1,390	11,600	4,060	6,570	5,330	22,000	605	211
3	108	147	182	500	1,190	9,000	7,800	5,240	4,660	12,600	510	197
4	115	168	197	510	1,050	7,800	21,600	4,200	3,580	9,600	398	168
5	108	157	226	380	1,200	5,150	40,800	3,540	3,100	8,400	328	157
6	115	157	226	292	1,050	3,500	51,700	2,400	2,440	9,000	529	147
7	93	147	275	453	1,590	2,800	53,200	2,100	2,040	7,800	328	226
8	100	100	275	491	2,720	2,200	47,100	2,010	1,520	6,570	*310	157
9	85	100	434	472	5,330	1,980	42,400	1,470	1,550	5,840	240	115
10	85	108	380	*258	9,900	1,580	41,600	1,290	1,420	7,520	211	126
11	85	115	567	363	12,000	1,470	44,800	2,160	1,050	6,620	240	108
12	100	115	769	380	9,600	1,600	41,600	5,240	687	4,970	472	108
13	93	126	666	434	7,240	1,320	34,100	7,800	1,710	3,220	362	115
14	93	*147	666	398	5,600	1,550	25,100	8,400	3,210	1,800	240	108
15	85	168	605	258	4,660	1,630	19,200	11,600	4,660	1,490	292	136
16	93	147	626	310	3,820	1,010	13,700	10,900	4,400	1,240	226	147
17	100	147	586	382	3,220	1,150	*10,900	8,100	5,510	1,080	275	115
18	93	182	453	197	2,510	1,520	11,200	6,170	5,330	1,010	226	136
19	93	226	626	168	*2,070	1,370	19,000	4,490	4,880	1,000	240	136
20	108	226	472	168	1,740	1,120	24,200	5,510	*4,200	646	240	236
21	115	310	736	451	1,320	1,720	21,600	7,800	2,240	605	211	826
22	115	415	658	2,350	1,490	1,720	18,000	10,200	2,040	567	197	1,440
23	126	548	728	6,680	1,050	1,950	15,600	6,720	1,550	548	197	2,910
24	126	362	666	12,600	1,190	1,320	15,200	6,420	1,100	1,520	240	2,620
25	108	310	646	11,600	942	1,630	13,700	6,420	1,010	2,430	258	1,690
26	108	275	769	8,100	1,930	1,230	10,600	6,220	942	1,420	240	1,470
27	115	211	646	5,560	8,420	1,190	11,200	4,280	728	1,170	275	964
28	136	168	1,060	3,260	17,200	1,740	13,000	3,580	4,070	769	258	832
29	157	168	646	2,980	-	2,040	12,000	3,060	15,000	832	226	491
30	157	358	605	2,720	--------	2,300	9,600	1,770	22,800	769	367	529
31	157	--------	769	2,170	--------	1,860	--------	2,800	--------	666	258	--------
Total	3,434	6,101	16,859	65,632	113,342	94,450	696,420	165,980	118,267	149,802	9,585	16,847
Mean	111	203	544	2,117	4,048	3,047	23,210	5,354	3,942	4,832	309	562
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 35,100 Min 85 Mean 3,844 Cfsm - In. -
Water year 1956-57: Max 53,200 Min 85 Mean 3,991 Cfsm - In. -

Peak discharge (base, 25,000 cfs).--Apr. 7 (3 a.m.) 55,500 cfs (9.55 ft); July 1 (2 p.m.) 26,900 cfs (6.15 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 end 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 1957.

Gage.--Water-stage recorder. Datum of gage is 596.33 ft above mean sea level, adjustment of 1912. Nov. 19, 1898, to Dec. 31, 1901, 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.--32 years (1921-35, 1939-57), 4,745 cfs (includes flow in Miami & Erie Canal at Waterville 1922-29; canal was abandoned in 1929 and was filled in prior to March 1939).

Extremes.--Maximum discharge during year, 62,400 cfs Apr. 7; maximum gage height, 12.23 ft Apr. 7; minimum discharge, 55 cfs Nov. 18 (gage height, 1.30 ft), affected by regulation.

1921-35, 1939-57: Maximum discharge, 94,000 cfs Feb. 16, 1950 (gage height, 14.52 ft); minimum, practically no flow at times prior to June 30, 1929, when entire river flow was being diverted by canal; minimum since canal was abandoned, 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 include flow of Miami & Erie Canal near Defiance (see p. 236), which returns to river above this station. Records of water temperatures and sediment loads for the water year 1957 are given in WSP 1520.

Revisions (water years).--WSP 759: Drainage area. WSP 894: 1930(M). WSP 1084: 1946. WSP 1387: 1900(M), 1922-23, 1933.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	55	3.0	2,420
1.5	113	4.0	5,550
1.7	221	6.0	13,900
2.0	516	10.0	41,900
2.5	1,270	13.0	72,000

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	184	270	468	900	b2,400	18,000	1,810	8,550	6,460	27,600	567	313
2	201	270	459	657	b2,000	13,400	3,170	7,200	6,820	26,200	505	295
3	200	270	333	436	1,810	10,400	7,960	6,090	5,910	16,800	618	313
4	136	262	278	567	1,480	8,350	20,700	4,860	4,530	11,200	470	238
5	159	262	287	541	1,560	6,820	48,600	4,210	3,810	9,550	343	136
6	153	262	333	448	1,980	4,530	*60,000	3,020	2,900	9,350	*323	158
7	270	323	392	372	1,560	3,350	62,400	2,420	2,450	8,750	459	215
8	194	343	402	470	2,960	2,790	51,300	2,180	2,050	7,770	352	270
9	165	262	541	541	5,730	2,500	48,600	1,900	1,540	7,960	333	237
10	83	188	670	b550	11,000	1,850	45,100	1,460	1,720	8,550	287	262
11	96	146	541	b370	12,600	1,460	52,200	1,310	1,540	7,960	270	246
12	141	299	643	b450	12,600	2,120	51,300	4,020	*930	6,460	278	221
13	184	*190	885	b500	9,350	1,350	40,300	7,770	885	4,020	459	246
14	190	142	725	b550	7,390	1,520	29,700	8,150	2,910	3,140	413	202
15	184	237	810	b550	5,550	2,230	22,000	10,800	5,730	1,590	323	221
16	171	535	766	b360	5,200	1,270	16,200	11,200	5,550	1,500	313	323
17	171	156	739	b440	3,560	885	12,200	9,350	6,270	1,230	278	218
18	171	68	698	b490	3,440	1,110	12,400	7,010	6,460	1,130	295	190
19	171	171	567	b300	2,560	1,980	18,600	5,730	5,550	1,130	287	215
20	184	295	725	b230	2,260	1,630	25,500	5,550	5,200	1,060	295	333
21	246	762	643	b230	1,650	1,830	23,400	7,200	3,440	725	278	516
22	237	470	1,070	b1,600	1,630	1,740	18,600	9,950	2,180	605	237	1,270
23	221	277	766	*9,350	1,460	2,200	16,200	8,550	1,950	493	237	2,340
24	215	432	1,140	15,600	1,230	2,120	15,000	6,640	1,330	529	366	3,290
25	184	382	900	15,600	1,440	1,230	15,000	6,820	1,070	1,710	657	2,420
26	221	413	753	12,200	1,280	2,420	11,700	6,820	915	2,560	425	1,560
27	303	362	1,010	8,750	9,320	1,330	10,600	5,380	915	1,250	287	1,290
28	209	b300	712	6,820	*16,200	1,880	12,900	4,020	2,850	1,010	287	962
29	221	270	1,310	4,180	-	2,310	12,600	3,500	14,400	739	323	825
30	254	237	698	4,090	--------	2,370	10,600	2,960	24,100	855	278	567
31	270	--------	739	3,930	--------	2,500	--------	2,390	--------	684	323	--------
Total	5,989	8,856	21,003	92,072	131,200	109,475	776,640	177,010	132,365	174,110	11,166	19,892
Mean	193	295	678	2,970	4,686	3,531	25,890	5,710	4,412	5,616	360	663
Cfsm	0.031	0.047	0.107	0.470	0.742	0.559	4.10	0.904	0.699	0.889	0.057	0.105
In.	0.04	0.05	0.12	0.54	0.77	0.64	4.57	1.04	0.78	1.02	0.07	0.12

Calendar year 1956: Max 42,700 Min 68 Mean 4,554 Cfsm 0.721 In. 9.81
Water year 1956-57: Max 62,400 Min 68 Mean 4,547 Cfsm 0.720 In. 9.76

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

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, Sandusky County.

Drainage area.--433 sq mi.

Records available.--July 1928 to December 1935, October 1939 to September 1957.

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 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.--25 years, 306 cfs (adjusted for diversion).

Extremes.--Maximum discharge during year, 8,180 cfs Apr. 6 (gage height, 12.28 ft); minimum, 5.2 cfs Aug. 22, 23 (gage height, 1.88 ft).

1928-35, 1939-57: 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 in 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 or those below 10 cfs, which are fair. Flow supplemented by water diverted from Maumee River basin for municipal supply of Bowling Green 16 miles upstream. Diversion began Sept. 1, 1951.

Revisions (water years).--WSP 894: 1929-30. WSP 1207: 1933. WSP 1387: 1931, 1933.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 6 to Dec. 22)

1.8	2.9	3.0	150
1.9	5.8	3.5	273
2.0	11	4.0	446
2.1	18	5.0	920
2.3	38	8.0	3,070
2.6	80	12.0	7,760

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.7	9.2	6.8	103	110	735	103	177	964	1,280	7.7	10
2	7.7	9.6	6.3	68	100	435	172	146	1,100	447	7.7	11
3	6.3	8.7	6.3	59	95	279	725	126	546	235	7.7	11
4	7.2	8.7	6.8	48	110	192	2,460	110	279	156	7.7	9.6
5	8.2	7.7	9.2	45	407	172	6,420	94	177	154	*7.7	8.2
6	9.6	7.2	9.2	40	469	140	7,760	83	131	142	9.6	10
7	11	6.8	16	35	466	124	6,150	74	106	104	9.2	11
8	11	6.3	41	35	565	111	3,730	71	90	101	7.2	11
9	19	6.3	96	30	1,020	103	2,980	65	76	567	6.8	11
10	13	5.8	127	25	2,050	96	2,580	64	64	878	7.2	13
11	9.6	6.3	99	25	1,160	85	3,930	64	57	338	7.2	12
12	9.6	6.8	91	25	565	88	5,050	82	58	211	7.2	12
13	11	*6.3	90	20	376	94	3,020	158	61	142	7.2	19
14	11	5.8	64	*20	302	88	1,630	142	58	104	6.8	19
15	12	6.8	50	20	302	78	1,010	340	57	77	5.8	21
16	12	8.2	58	19	264	71	700	352	51	58	6.6	16
17	12	7.7	71	19	214	65	588	181	46	46	16	13
18	11	10	59	18	150	59	1,400	126	54	37	11	16
19	11	8.2	42	18	130	64	2,820	172	46	30	8.2	*14
20	11	8.7	35	18	120	83	1,700	536	*54	24	7.2	13
21	14	13	47	35	110	91	830	610	41	22	6.3	216
22	13	39	184	950	100	90	545	352	32	19	5.2	158
23	11	26	386	2,660	93	85	*412	240	29	18	5.5	117
24	12	13	267	1,840	91	77	355	188	23	16	8.7	137
25	11	11	192	898	*106	68	352	148	21	21	13	83
26	11	9.2	152	438	171	68	299	122	20	16	13	51
27	11	7.7	135	243	2,160	118	261	106	21	13	16	31
28	12	6.8	137	214	1,980	179	431	88	239	12	13	20
29	*13	7.2	140	197	-	160	308	71	3,000	11	10	16
30	11	6.3	115	129	--------	146	224	58	3,930	9.2	9.6	13
31	9.6	--------	110	166	--------	120	--------	225	--------	7.7	10	--------
Total	340.5	290.3	2,848.6	8,460	13,786	4,364	58,945	5,371	11,431	5,295.9	272.0	1,102.8
Mean	11.0	9.68	91.9	273	492	141	1,965	173	381	171	8.77	36.8
(†)	1.84	1.52	1.45	1.64	1.70	1.69	1.48	1.37	1.38	1.55	2.00	3.26

Adjusted for diversion

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean	9.16	8.16	90.4	271	490	139	1,964	172	380	169	6.77	33.5
Cfsm	0.021	0.019	0.209	0.626	1.13	0.321	4.54	0.397	0.878	0.390	0.016	0.077
In.	0.02	0.02	0.24	0.72	1.18	0.37	5.06	0.46	0.98	0.45	0.02	0.09

	Observed			Adjusted		
Calendar year 1956:	Max 8,180	Min 5.8	Mean 383	Mean 381	Cfsm 0.880	In. 11.99
Water year 1956-57:	Max 7,760	Min 5.2	Mean 308	Mean 307	Cfsm 0.709	In. 9.61

Peak discharge (base, 3,500 cfs).--Apr. 6 (1 a.m.) 8,180 cfs (12.28 ft); Apr. 12 (8 a.m.) 5,290 cfs (10.14 ft); June 30 (7 a.m.) 4,580 cfs (9.54 ft).

* Discharge measurement made on this day.

† Diversion from Maumee River basin for municipal supply of city of Bowling Green, equivalent in cubic feet per second.

Note.--Stage-discharge relation affected by ice Jan. 5-22, Feb. 1-4, 19-22.

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 1957. Gage-height records (fragmentary) collected at site 3 miles upstream since 1912 are contained in reports of U. S. Weather Bureau.

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.--33 years, 239 cfs.

Extremes.--Maximum discharge during year, 7,670 cfs Apr. 6 (gage height, 10.08 ft); minimum, 3.0 cfs Oct. 25; minimum gage height, 0.85 ft Oct. 6.

1921-35, 1938-57: Maximum discharge, 8,900 cfs Dec. 15, 1927 (gage height, 10.5 ft); minimum, 0.6 cfs Sept. 13, 14, 1955; 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 below 10 cfs, which are fair, and those for periods of ice effect, which are poor.

Revisions (water years).--WSP 874: 1927-30, 1933. WSP 1387: 1922(M), 1923-29, 1944.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	2.0	2.1	220
.9	4.5	2.5	366
1.0	8.5	3.0	610
1.1	15	7.0	3,310
1.2	24	9.0	5,240
1.4	55	10.0	7,370
1.7	116		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.1	8.5	7.3	41	105	698	90	163	144	887	15	5.7
2	5.3	8.5	7.7	b35	88	424	371	134	506	410	13	7.7
3	5.3	7.3	8.5	b40	82	298	1,170	112	256	242	13	11
4	4.9	5.7	8.5	34	98	220	2,510	98	161	179	13	6.1
5	4.2	6.9	9.8	24	198	174	5,720	88	116	146	15	12
6	4.2	7.3	8.5	b20	295	144	5,510	80	94	118	10	8.1
7	6.1	9.8	26	20	190	130	2,140	72	94	98	9.8	21
8	9.7	7.7	32	b18	190	123	2,580	66	96	86	8.1	18
9	15	8.1	55	b17	*267	121	3,070	61	105	105	8.5	12
10	6.9	7.3	68	b18	1,140	109	2,440	68	98	109	7.7	46
11	4.2	7.7	80	b17	780	107	2,300	232	84	105	7.7	66
12	3.5	8.5	70	b16	388	134	1,500	599	98	*94	8.1	38
13	4.0	6.9	72	b15	246	273	900	*780	109	76	6.1	17
14	4.5	6.5	88	b14	190	187	632	573	84	70	5.7	13
15	4.9	6.5	55	b13	185	144	462	1,600	61	59	6.1	12
16	4.9	8.1	40	b12	168	123	362	1,170	57	50	14	10
17	5.3	6.5	*30	b12	156	109	329	384	138	41	14	7.3
18	6.9	6.1	29	b12	128	96	934	368	116	35	9.1	9.8
19	6.9	8.5	30	b11	116	98	1,950	682	121	31	13	*9.1
20	6.5	8.5	26	b11	92	*103	1,050	960	139	30	8.5	648
21	6.1	17	24	b12	98	112	960	1,170	123	26	13	1,560
22	6.1	14	21	b90	92	103	810	930	72	23	*11	1,050
23	14	30	22	1,520	76	94	589	1,200	55	42	7.3	1,260
24	*15	14	24	1,500	72	86	1,170	704	89	53	7.3	716
25	5.0	10	35	532	78	76	810	410	146	45	8.5	317
26	4.0	9.1	41	276	353	78	573	273	318	37	7.3	187
27	7.3	9.8	43	174	2,230	78	366	202	137	27	6.5	123
28	9.1	10	43	144	1,950	86	259	156	762	23	6.5	84
29	9.1	7.7	48	144	-	88	217	123	2,510	20	7.7	61
30	8.5	8.5	52	109	--------	84	196	105	2,930	18	5.7	50
31	9.1	--------	59	112	--------	90	--------	96	--------	18	6.5	--------
Total	212.6	281.0	1,163.3	5,013	10,051	4,790	41,970	13,659	9,819	3,303	292.7	6,385.8
Mean	6.86	9.37	37.5	162	359	155	1,399	441	327	107	9.44	213
Cfsm	0.023	0.031	0.125	0.542	1.20	0.518	4.68	1.47	1.09	0.358	0.032	0.712
In.	0.03	0.03	0.14	0.62	1.25	0.60	5.22	1.70	1.22	0.41	0.04	0.79

Calendar year 1956:	Max 3,630	Min 3.5	Mean 225	Cfsm 0.753	In. 10.24
Water year 1956-57:	Max 5,720	Min 3.5	Mean 266	Cfsm 0.890	In. 12.05

Peak discharge (base, 2,500 cfs).--Feb. 27 (12 p.m.) 2,650 cfs (6.14 ft); Apr. 6 (12:30 a.m.) 7,670 cfs (10.08 ft); Apr. 9 (6 a.m.) 3,230 cfs (6.90 ft); June 30 (2 p.m.) 3,230 cfs (6.88 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

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 at 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 1957.

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.--31 years, 558 cfs.

Extremes.--Maximum discharge during year, 11,800 cfs Apr. 7 (gage height, 17.74 ft); minimum, 11 cfs Oct. 4 (gage height, 1.66 ft).

1923-35, 1938-57: Maximum discharge, 15,200 cfs Mar. 22, 1927 (gage height, 19.9 ft, from graph based on gage readings); minimum, 1.8 cfs Oct. 31, 1942 (during repairs to small dam above station).

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 poor.

Revisions (water years).--WSP 714: 1929-30. WSP 874: 1927(M). WSP 1387: 1925, 1928-29, 1930(M), 1931.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 6 to Nov. 6)

1.5	6.2	4.0	526
1.6	12	5.0	895
1.7	19	8.0	2,450
2.0	54	13.0	6,270
2.5	142	18.0	12,200
3.0	252		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	25	34	77	205	3,100	152	341	750	4,970	44	20
2	12	26	34	68	181	1,410	499	297	985	3,160	41	18
3	12	26	34	68	152	830	1,660	250	1,410	1,080	39	22
4	11	27	33	63	177	574	4,470	212	1,210	558	39	26
5	12	28	33	62	368	436	7,670	194	555	480	39	26
6	12	26	34	56	558	354	10,300	179	328	354	34	21
7	12	26	57	53	465	305	11,200	*160	250	280	30	20
8	12	25	80	50	394	272	8,570	146	247	252	28	22
9	12	25	83	49	*534	250	6,850	136	257	381	26	29
10	13	25	99	b50	1,560	235	6,650	134	272	501	25	49
11	18	25	94	b50	1,820	212	6,950	152	284	770	26	75
12	17	25	101	46	1,080	221	6,000	559	228	*436	26	83
13	15	24	103	b45	608	270	3,870	1,120	272	280	24	66
14	14	24	94	b40	436	354	1,940	850	354	207	23	49
15	15	*25	99	b40	394	282	1,310	1,770	436	170	23	40
16	14	28	90	b40	368	228	985	2,450	262	138	21	34
17	12	27	*75	b35	328	201	850	1,250	257	116	21	31
18	12	26	65	b35	274	185	1,630	625	254	99	26	30
19	12	28	57	b35	230	181	3,800	988	250	87	28	*28
20	12	26	54	b35	194	*190	3,660	1,560	270	79	27	509
21	12	33	59	b40	170	196	2,820	1,770	245	69	26	2,390
22	13	46	62	b300	179	201	2,160	1,720	203	65	*21	2,450
23	*13	45	59	2,570	164	185	1,460	1,940	152	63	23	2,210
24	13	42	54	2,890	154	166	1,360	2,040	140	77	24	1,990
25	18	45	57	1,990	172	156	1,660	1,360	156	101	42	978
26	30	44	65	895	616	150	1,120	790	250	94	29	495
27	27	39	69	574	4,010	148	810	510	318	85	26	320
28	22	35	72	422	4,330	144	574	381	544	68	22	219
29	20	34	82	368	-	150	450	297	4,010	57	20	154
30	19	34	85	307	--------	156	381	233	4,570	52	20	116
31	23	--------	85	235	--------	148	--------	272	--------	48	20	--------
Total	472	914	2,102	11,588	20,121	11,890	101,811	24,686	19,719	15,177	863	12,520
Mean	15.2	30.5	67.8	374	719	384	3,394	796	657	490	27.8	417
Cfsm	0.020	0.039	0.087	0.482	0.927	0.495	4.37	1.03	0.847	0.631	0.036	0.537
In.	0.02	0.04	0.10	0.56	0.97	0.57	4.88	1.19	0.94	0.73	0.04	0.60

Calendar year 1956: Max 6,650 Min 11 Mean 525 Cfsm 0.677 In. 9.21
Water year 1956-57: Max 11,200 Min 11 Mean 608 Cfsm 0.784 In. 10.64

Peak discharge (base, 4,200 cfs).--Feb. 27 (12 p.m.) 4,490 cfs (10.88 ft); Apr. 7 (4 a.m.) 11,800 cfs (17.74 ft); July 1 (11 a.m.) 5,130 cfs (11.70 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, 2.3 miles upstream from Ballville power dam, 2½ miles downstream from Wolf Creek, and 3½ miles southwest of Fremont, Sandusky County.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 626.3 ft above mean sea level, adjustment of 1912. Nov. 18, 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.--31 years (1923-35, 1938-57), 914 cfs.

Extremes.--Maximum discharge during year, 15,800 cfs Apr. 6; maximum gage height, 7.85 ft Apr. 6; minimum discharge, 9.4 cfs Oct. 7 (gage height, 0.88 ft).

1923-35, 1938-57: Maximum discharge, 27,300 cfs Jan. 15, 1930 (gage height, 11.1 ft); maximum gage height, 12.12 ft Dec. 30, 1951 (ice jam); minimum discharge, 5.0 cfs Sept. 27, 28, 1941 (gage height, 0.80 ft).

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

Revisions (water years).--WSP 744: 1931-32. WSP 759: Drainage area. WSP 874: 1938. WSP 1144: 1924-30. WSP 1387: 1925, 1928-29, 1931-35.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	7.0	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	8.0	16,400
1.7	401		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	26	34	122	342	5,150	260	528	2,000	6,200	58	28
2	15	28	37	110	320	2,740	448	458	1,880	4,630	55	28
3	14	30	40	110	287	1,550	2,170	394	1,860	2,060	49	28
4	14	30	40	100	300	1,040	8,580	342	1,700	992	46	28
5	12	28	37	95	636	756	15,200	300	1,100	744	46	26
6	11	30	40	85	992	594	15,800	287	584	624	46	30
7	11	30	52	80	1,010	510	15,500	*254	450	483	43	30
8	13	28	87	75	950	450	14,200	230	364	442	37	30
9	14	30	121	75	1,240	401	10,800	213	357	1,100	34	26
10	14	24	131	75	2,740	371	10,200	213	342	1,010	34	42
11	13	24	135	75	*2,810	349	12,900	230	371	*1,170	32	87
12	13	24	131	70	1,980	349	10,800	320	349	978	30	91
13	21	24	140	70	1,140	371	7,150	1,090	320	565	30	95
14	23	24	135	65	829	*492	3,880	1,290	417	401	30	84
15	19	24	135	60	710	475	2,460	1,610	519	307	37	68
16	17	26	144	60	*645	371	1,820	2,920	519	236	34	80
17	15	28	*131	55	584	320	1,520	2,080	434	201	40	58
18	14	26	108	55	501	287	2,630	1,040	394	165	32	46
19	17	26	91	55	426	280	5,800	881	371	126	28	43
20	19	26	84	55	349	287	5,150	1,570	371	117	32	149
21	17	49	99	55	300	300	3,880	1,940	364	99	*34	2,180
22	14	64	112	400	273	307	2,920	2,040	327	91	34	2,920
23	17	68	112	4,800	267	300	2,160	1,980	260	91	32	2,590
24	17	61	117	4,380	260	267	1,660	2,370	207	84	30	2,500
25	17	49	112	3,270	320	248	2,080	1,880	196	91	37	1,630
26	19	49	108	1,590	973	242	1,940	1,190	213	112	55	816
27	26	46	117	881	8,540	273	1,460	756	357	108	52	492
28	32	46	121	675	7,420	294	1,010	565	708	95	37	342
29	*30	40	131	501	-	287	744	442	6,740	84	34	248
30	28	37	135	475	--------	280	604	342	6,740	76	32	196
31	26	--------	126	426	--------	267	--------	520	--------	64	28	--------
Total	549	1,045	3,143	19,000	37,144	20,208	165,726	30,275	30,814	23,546	1,178	15,011
Mean	17.7	34.8	101	613	1,327	652	5,524	977	1,027	760	38.0	500
Cfsm	0.014	0.028	0.081	0.491	1.06	0.522	4.43	0.783	0.823	0.609	0.030	0.401
In.	0.02	0.03	0.09	0.57	1.10	0.60	4.94	0.90	0.92	0.70	0.03	0.45

Calendar year 1956: Max	14,200	Min	11	Mean	921	Cfsm	0.738	In.	10.05
Water year 1956-57: Max	15,800	Min	11	Mean	952	Cfsm	0.763	In.	10.35

Peak discharge (base, 7,000 cfs).--Feb. 27 (4 p.m.) 9,940 cfs (5.92 ft); Apr. 6 (4 p.m.) 15,800 cfs (7.85 ft); Apr. 11 (6 p.m.) 13,900 cfs (7.15 ft); June 29 (6 p.m.) 8,540 cfs (5.37 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 2-23.

Huron River at Milan, Ohio

Location.--Lat 41°18'00", long 82°36'30", in SE¼ sec. 4, T. 5 N., R. 22 W., on right bank 500 ft downstream from 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 1957.

Gage.--Water-stage recorder. Datum of gage is 573.43 ft above mean sea level, adjustment of 1912. Prior to July 29, 1953, wire-weight gage at site of former highway bridge 45 ft upstream at same datum.

Average discharge.--7 years, 285 cfs.

Extremes.--Maximum discharge during year, 10,500 cfs Apr. 4 (gage height, 18.56 ft); minimum, 5.6 cfs Oct. 6; minimum gage height, 5.43 ft Aug. 23, 24.

1950-57: Maximum discharge, 18,200 cfs May 12, 1956 (gage height, 21.10 ft); minimum, 2.2 cfs Sept. 10, 15, 19, 20, 21, 1955 (gage height, 5.26 ft).

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

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 3

5.6	6.0	6.5	140
5.7	14	7.0	250
5.8	24	8.0	540
6.1	66		

Note.--Same as following table above 8.0 ft.

Apr. 4 to Sept. 30

5.4	7.5	7.0	267
5.5	12	8.0	540
5.6	19	10.0	1,420
5.7	28	13.0	3,250
6.0	68	15.0	4,970
6.5	158	17.0	7,580

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.4	19	22	38	118	650	138	158	308	490	19	16
2	7.4	19	20	*45	95	455	726	132	232	289	18	16
3	8.1	18	27	45	99	310	*872	114	128	193	17	20
4	7.4	20	21	41	311	222	6,670	117	87	150	16	16
5	7.4	19	27	38	770	189	6,480	96	65	170	16	14
6	8.8	17	25	34	396	158	2,840	87	60	232	15	12
7	18	18	60	b30	396	152	1,200	81	56	340	14	11
8	10	17	76	b25	326	146	2,740	73	50	511	14	10
9	8.8	16	80	b25	758	*142	1,790	*66	48	2,010	13	10
10	11	15	76	23	1,140	140	2,340	99	44	518	12	*20
11	12	14	66	b25	558	169	5,080	193	42	1,030	12	19
12	11	15	69	b25	305	368	3,660	208	41	1,940	12	20
13	9.5	16	74	b25	215	354	1,470	142	39	522	11	16
14	8.8	15	68	b20	222	211	810	231	38	303	13	15
15	9.5	15	56	b20	*233	167	575	872	56	208	21	12
16	10	16	51	b19	219	136	460	378	239	148	13	20
17	11	15	48	b18	191	114	430	206	217	108	11	16
18	11	15	45	b18	154	104	1,270	148	148	89	10	15
19	10	16	38	b17	b130	118	1,620	136	804	73	11	13
20	11	16	38	b17	b120	134	670	223	384	48	11	58
21	11	42	56	b60	b110	156	445	230	146	53	11	261
22	12	32	56	b1,700	102	138	378	197	105	*46	11	152
23	13	30	62	3,290	87	126	527	158	162	50	9.9	208
24	14	24	62	888	118	96	670	140	164	44	9.9	176
25	14	23	60	488	169	89	475	123	340	40	24	84
26	15	25	62	290	1,480	108	650	89	239	35	39	53
27	17	20	60	197	5,490	272	365	76	123	31	34	36
28	15	19	63	180	1,620	240	315	64	2,710	27	21	27
29	15	23	64	167	-	197	237	54	4,390	24	16	23
30	21	18	50	132	--------	195	191	49	1,200	24	17	21
31	*16	--------	71	138	--------	160	--------	284	--------	21	22	--------
Total	361.1	587	1,653	8,078	15,932	6,216	46,094	5,224	12,665	9,767	493.8	1,390
Mean	11.6	19.6	53.3	261	569	201	1,536	169	422	315	15.9	46.3
Cfsm	0.032	0.054	0.147	0.719	1.57	0.554	4.23	0.466	1.16	0.868	0.044	0.128
In.	0.04	0.06	0.17	0.83	1.64	0.64	4.72	0.54	1.29	1.00	0.05	0.14

Calendar year 1956:	Max	11,700	Min	7.4	Mean	328	Cfsm	0.904	In. 12.30
Water year 1956-57:	Max	6,670	Min	7.4	Mean	297	Cfsm	0.818	In. 11.12

Peak discharge (base, 3,000 cfs).--Jan. 23 (1:30 a.m.) 4,480 cfs (14.50 ft); Feb. 27 (7 a.m.) 6,810 cfs (16.46 ft); Apr. 4 (8 p.m.) 10,500 cfs (18.56 ft); Apr. 8 (1 p.m.) 3,250 cfs (13.04 ft); Apr. 11 (9 p.m.) 6,390 cfs (16.15 ft); June 29 (1:30 a.m.) 6,390 cfs (16.20 ft); July 9 (5 a.m.) 3,180 cfs (12.88 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., on right bank 40 ft downstream from bridge on North Ridge Road in Lorain County, 3½ miles southeast of Vermilion, Erie County, and 4½ miles upstream from mouth.

Drainage area.--260 sq mi.

Records available.--March 1950 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 592.58 ft above mean sea level (Lorain County benchmark). Prior to Aug. 3, 1953, wire-weight gage at site 40 ft upstream at same datum.

Average discharge.--7 years, 240 cfs.

Extremes.--Maximum discharge during year, 5,540 cfs Apr. 5 (gage height, 9.27 ft); minimum, 0.9 cfs Oct. 6; minimum gage height recorded, 2.75 ft Aug. 24.

1950-57: Maximum discharge, 9,820 cfs Jan. 26, 1952, May 12, 1956; maximum gage height, 11.5 ft Jan. 26, 1952, from graph based on gage readings; no flow at times in most years.

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

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 4				Apr. 5 to Sept. 30			
2.8	0.3	4.5	246	2.75	1.7	4.5	246
2.9	2.3	5.0	410	2.8	2.7	5.0	400
3.0	6.5	5.5	660	2.9	5.5	5.5	650
3.1	12	6.0	1,020	3.1	14	6.0	1,010
3.4	39	7.0	2,170	3.4	39	7.0	2,170
3.7	77	9.0	5,060	3.7	77	10.0	6,700
4.0	126			4.0	126		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	15	12	62	132	607	132	110	404	473	9.1	10
2	3.1	11	12	50	106	386	222	86	454	210	*7.4	6.6
3	2.3	9.4	13	55	103	284	*1,090	70	150	122	8.6	8.7
4	1.7	8.2	14	45	300	187	3,760	61	94	83	9.2	6.3
5	1.5	8.2	14	35	972	153	5,220	53	61	69	5.9	5.5
6	3.5	8.8	15	30	462	126	3,140	48	46	71	4.9	3.9
7	11	9.9	35	25	311	110	1,220	44	42	153	4.5	3.4
8	4.7	9.4	53	25	272	108	1,760	39	35	351	3.9	3.2
9	3.1	9.4	57	25	414	*110	1,720	*35	30	2,370	3.7	2.7
10	2.3	8.2	73	25	872	112	1,390	45	28	*780	3.4	6.1
11	1.7	8.2	71	30	647	188	3,000	117	26	736	2.9	6.6
12	1.9	8.2	82	25	311	893	3,710	238	25	2,440	2.7	*5.5
13	8.2	8.2	92	20	197	890	1,380	157	23	990	2.3	4.5
14	7.6	7.6	94	18	173	345	711	148	20	375	a2.6	3.9
15	6.1	8.2	69	16	175	224	458	530	28	208	a3.0	3.2
16	4.3	8.8	58	15	173	161	353	480	283	130	a2.6	5.2
17	*3.1	8.2	51	*14	161	126	344	202	161	90	a2.3	5.5
18	2.7	8.8	45	14	124	105	669	128	71	67	a2.1	4.9
19	1.7	9.4	39	14	105	103	1,320	103	998	53	a2.3	3.7
20	2.0	9.4	35	14	92	128	613	365	434	42	a2.4	9.1
21	2.3	25	45	50	90	170	359	990	148	34	a2.2	9.1
22	3.5	21	50	1,600	83	153	278	480	80	28	a1.9	63
23	4.3	16	58	3,560	70	122	421	275	53	25	a1.8	61
24	3.9	13	70	1,550	77	102	330	200	45	21	1.7	93
25	3.9	12	71	585	132	86	338	132	72	21	19	66
26	4.3	12	67	355	731	88	421	97	115	22	13	35
27	5.2	*11	65	224	3,140	185	266	73	66	20	6.6	21
28	6.1	14	67	197	1,980	200	170	58	418	16	4.9	14
29	8.8	13	69	159	-	164	166	47	2,100	14	5.9	12
30	9.4	13	62	134	-------	175	142	39	1,360	12	5.9	9.5
31	10	-------	69	148	-------	159	-------	180	-------	11	15	-------
Total	137.7	332.5	1,627	9,119	12,405	6,950	35,103	5,630	7,870	10,037	163.7	492.1
Mean	4.44	11.1	52.5	294	443	224	1,170	182	262	324	5.28	16.4
Cfsm	0.017	0.043	0.202	1.13	1.70	0.862	4.50	0.700	1.01	1.25	0.020	0.063
In.	0.02	0.05	0.23	1.30	1.77	0.99	5.02	0.81	1.13	1.44	0.02	0.07

	Max		Min		Mean		Cfsm		In.	
Calendar year 1956:	Max	6,880	Min	1.5	Mean	274	Cfsm	1.05	In.	14.34
Water year 1956-57:	Max	5,220	Min	1.5	Mean	246	Cfsm	0.946	In.	12.85

Peak discharge (base, 3,200 cfs).--Jan. 23 (3 a.m.) 3,710 cfs (8.11 ft); Feb. 27 (4 p.m.) 3,560 cfs (8.02 ft); Apr. 5 (2 a.m.) 5,540 cfs (9.27 ft); Apr. 12 (1 a. m.) 4,610 cfs (8.68 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 Huron River at Milan.

Note.--Stage-discharge relation affected by ice Nov. 23-30, Dec. 4, Jan. 2-22.

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 downstream from confluence of East and West Branches.

Drainage area.--392 sq mi.

Records available.--October 1944 to September 1957. Records for May 1903 to July 1906 (published as "near Elyria") published in WSP 97, 129, and 205 have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 621.6 ft above mean sea level (city of Elyria bench mark).

Average discharge.--13 years, 322 cfs.

Extremes.--Maximum discharge during year, 8,820 cfs Apr. 5 (gage height, 13.88 ft); no flow for part of Oct. 10 (result of temporary storage at dam upstream).

1944-57: Maximum discharge, 14,900 cfs May 13, 1956 (gage height, 18.02 ft); minimum, that of Oct. 10, 1956.

Remarks.--Records good except those for period of ice effect or those below 20 cfs, which are fair. Some regulation at low flow for industrial use.

Revisions.--See Records available.

Rating table, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 6 to Nov. 21)

0.6	2.7	2.5	235
.7	5.7	3.0	353
.8	9.9	4.0	675
1.0	22	5.0	1,100
1.3	50	7.0	2,280
1.6	85	11.0	5,540
2.0	143	14.0	8,950

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.5	14	17	72	143	722	204	127	359	526	16	14
2	8.2	15	15	*65	114	440	824	98	940	246	19	16
3	8.6	15	16	55	105	329	1,760	80	337	143	16	20
4	6.5	14	17	42	473	221	4,970	66	187	95	14	21
5	6.1	14	*20	34	1,220	167	8,190	56	109	77	14	15
6	11	15	26	27	619	138	5,340	54	78	71	14	13
7	14	17	63	27	396	126	1,960	49	109	72	14	9.9
8	6.7	15	67	27	308	122	2,380	45	118	212	14	9.1
9	6.2	11	62	29	470	129	2,770	*42	72	4,550	14	9.5
10	3.5	14	66	30	1,020	135	2,420	59	56	3,210	11	*27
11	5.2	10	73	29	835	265	*4,700	142	47	880	9.5	15
12	5.4	16	75	27	381	1,880	5,150	410	43	2,700	11	14
13	6.4	20	85	b25	223	1,600	1,960	225	38	1,980	12	17
14	5.6	17	85	b20	*192	532	880	237	41	529	12	11
15	6.1	19	75	b19	202	280	520	1,430	56	254	14	7.0
16	8.2	16	64	b18	221	194	381	812	70	158	13	18
17	*10	16	50	b17	221	148	353	308	96	116	9.5	14
18	7.4	14	45	b16	164	122	901	167	148	89	12	15
19	13	19	39	b16	124	122	2,000	129	1,020	71	12	13
20	6.9	15	37	b15	98	178	950	1,620	324	57	10	34
21	10	40	54	b50	90	237	440	3,450	153	48	6.5	24
22	9.5	17	55	2,180	83	213	299	1,570	86	*44	7.0	54
23	14	16	70	4,340	77	165	283	456	56	42	7.4	74
24	11	15	78	2,400	85	130	267	278	47	36	6.1	78
25	9.5	15	79	675	138	112	280	192	50	33	105	85
26	8.0	18	79	396	701	112	425	133	53	33	22	57
27	14	22	78	237	3,610	312	337	102	63	33	17	36
28	13	19	83	206	2,360	308	426	83	2,030	29	15	24
29	13	19	83	171	-	235	287	67	5,150	26	15	18
30	16	18	77	129	--------	221	176	55	2,100	25	12	15
31	15	--------	73	146	--------	237	--------	278	--------	22	23	--------
Total	285.5	505	1,806	11,540	14,673	10,132	51,833	12,820	14,036	16,407	497.0	777.5
Mean	9.21	16.8	58.3	372	524	327	1,728	414	468	529	16.0	25.9
Cfsm	0.023	0.043	0.149	0.949	1.34	0.834	4.41	1.06	1.19	1.35	0.041	0.066
In.	0.03	0.05	0.17	1.09	1.40	0.96	4.92	1.22	1.33	1.56	0.05	0.07

Calendar year 1956: Max 11,000 Min 3.5 Mean 375 Cfsm 0.957 In. 12.99
Water year 1956-57: Max 8,190 Min 3.5 Mean 371 Cfsm 0.946 In. 12.85

Peak discharge (base, 3,200 cfs).--Jan. 23 (9 a.m.) 4,430 cfs (9.83 ft); Feb. 27 (5 p.m.) 3,850 cfs (9.12 ft); Apr. 5 (6 p.m.) 8,820 cfs (13.88 ft); Apr. 8 (11 p.m.) 3,370 cfs (8.53 ft); Apr. 12 (1 a.m.) 6,240 cfs (11.66 ft); May 21 (3 a.m.) 3,690 cfs (8.92 ft); June 29 (3 a.m.) 5,940 cfs (11.40 ft); July 9 (9 p.m.) 5,540 cfs (11.02 ft); July 12 (10 p.m.) 3,450 cfs (8.65 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 downstream from confluence of East and West Branches, 3 miles northwest of Berea, Cuyahoga County.

Drainage area.--269 sq mi.

Records available.--November 1923 to September 1935, September 1943 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 649.9 ft above mean sea level, datum of 1929 (Cuyahoga County bench mark). Prior to Aug. 31, 1929, chain gage and Aug. 31, 1929, to Sept. 30, 1935, staff gage, at same site and datum.

Average discharge.--26 years, 255 cfs.

Extremes.--Maximum discharge during year, 6,440 cfs Apr. 4 (gage height, 6.50 ft); minimum, 4.0 cfs Aug. 16; minimum gage height, 1.10 ft Oct. 2, 4, 6, Aug. 16.

1923-35, 1943-57: Maximum discharge, 16,600 cfs Jan. 19, 1929 (gage height, 11.0 ft, from graph based on gage readings), from rating curve extended above 11,000 cfs; maximum gage height, 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 fair except those for periods of ice effect, which are poor. Some regulation at low flow by small reservoirs on East Branch.

Revisions (water years).--WSP 1437: 1924, 1925(M), 1926, 1927(M), 1928-29, 1930-35(M), 1945.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	5.0	2.0	196
1.2	11	2.5	470
1.3	20	3.0	865
1.4	34	4.0	2,040
1.7	99	6.0	5,490

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.8	19	16	82	99	412	146	119	115	182	12	8.0
2	6.2	18	17	75	89	334	1,100	92	147	*96	11	10
3	6.2	19	17	65	94	218	924	70	72	65	10	15
4	5.6	24	17	55	744	140	*4,480	50	48	47	9.9	14
5	5.6	23	*26	40	830	116	4,030	45	36	41	9.3	15
6	7.4	22	39	35	351	102	2,100	43	30	43	8.7	12
7	10	22	91	30	245	96	818	45	41	39	8.0	11
8	11	26	99	30	209	110	2,170	43	56	164	8.0	9.9
9	8.0	22	121	30	406	119	1,430	38	39	3,640	7.4	9.3
10	*12	19	119	30	1,150	127	2,120	61	33	*1,550	6.8	20
11	9.3	20	96	30	554	415	3,850	446	30	565	6.2	19
12	8.0	18	99	30	250	2,120	2,620	292	24	1,240	5.6	20
13	5.6	33	130	25	166	717	1,120	137	34	381	5.0	23
14	5.6	22	82	25	*178	290	669	374	36	192	5.6	19
15	6.2	19	61	20	174	189	490	1,480	24	130	5.6	17
16	5.6	38	52	19	170	137	369	414	23	84	5.0	25
17	6.2	20	47	18	163	107	398	178	29	61	5.6	17
18	6.8	16	41	18	110	92	1,150	130	41	48	9.9	14
19	9.3	15	38	17	92	113	1,420	137	318	39	15	11
20	11	13	36	17	76	270	535	3,480	219	33	9.9	45
21	16	27	54	150	70	250	329	1,390	82	27	*7.4	66
22	15	41	82	2,700	65	185	260	*424	47	24	6.8	79
23	15	54	124	4,120	72	143	266	260	36	23	6.8	102
24	15	30	113	962	99	110	534	159	36	20	6.8	70
25	17	24	89	483	185	92	846	107	115	19	37	33
26	17	22	74	296	768	105	629	76	120	18	12	23
27	19	18	72	189	2,740	392	329	59	59	16	7.4	17
28	19	17	79	159	901	275	586	47	1,730	15	6.8	14
29	17	17	82	137	-	*196	255	38	2,120	15	6.8	12
30	20	16	89	130	--------	255	159	31	545	13	6.8	9.9
31	22	--------	89	119	--------	205	--------	162	--------	14	9.9	--------
Total	344.4	694	2,191	10,136	11,050	8,432	36,132	10,427	6,285	8,844	279.0	760.1
Mean	11.1	23.1	70.7	327	395	272	1,204	336	210	285	9.00	25.3
Cfsm	0.041	0.086	0.263	1.22	1.47	1.01	4.48	1.25	0.781	1.06	0.033	0.094
In.	0.05	0.10	0.30	1.41	1.53	1.16	5.00	1.44	0.87	1.22	0.04	0.10

Calendar year 1956: Max 7,150 Min 5.0 Mean 298 Cfsm 1.11 In. 15.10
Water year 1956-57: Max 4,480 Min 5.0 Mean 262 Cfsm 0.974 In. 13.22

Peak discharge (base, 4,000 cfs).--Jan. 23 (5 a.m.) 5,490 cfs (6.00 ft); Apr. 4 (9 p.m.) 6,440 cfs (6.50 ft); Apr. 11 (10 p.m.) 4,390 cfs (5.38 ft); May 20 (12 m.) 5,680 cfs (6.06 ft); July 9 (5:30 p.m.) 5,110 cfs (5.84 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 2-22, Feb. 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 1957. Published as "near Hiram" 1927-35.

Gage.--Water-stage recorder. Datum of gage is 1,087.46 ft above mean sea level, unadjusted. Prior to Aug. 26, 1927, staff gage and Aug. 26, 1927, to Dec. 31, 1935, water-stage recorder, at site 2¼ miles downstream at different datum. Oct. 20, 1944, to Oct. 22, 1946, wire-weight gage at present site and datum.

Average discharge.--21 years, 192 cfs (unadjusted).

Extremes.--Maximum discharge during year, 2,170 cfs Apr. 26 (gage height, 6.14 ft); minimum, 20 cfs Sept. 30; minimum gage height, 1.32 ft July 28.

1927-35, 1944-57: 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 or shifting control, which are fair. Flow regulated by East Branch Reservoir (usable capacity, 4,140 acre-ft) since 1939.

Revisions.--WSP 1054: 1945. WSP 1437: 1931.

Rating table, water year 1956-57, except periods of ice effect or shifting control (gage height, in feet, and discharge, in cubic feet per second)

1.0	20	2.5	251
1.2	29	3.0	437
1.4	42	4.0	925
1.7	70	6.0	2,100
2.0	117		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	43	71	123	178	740	160	690	68	790	34	42
2	42	44	70	b110	143	617	201	492	71	790	34	44
3	41	44	74	b110	128	488	222	350	94	642	34	45
4	41	44	89	99	170	369	462	251	117	492	34	44
5	40	44	99	94	201	*275	925	186	134	376	34	44
6	40	44	108	91	219	222	1,410	145	123	278	35	44
7	45	44	130	91	238	184	1,440	117	104	201	35	48
8	52	43	150	91	232	162	1,260	97	88	160	34	55
9	56	43	198	91	275	150	1,010	85	72	140	41	60
10	54	44	248	93	384	145	842	80	61	130	52	62
11	50	43	275	b100	497	152	870	112	53	121	58	66
12	46	45	278	b100	501	254	1,040	128	49	108	61	66
13	43	45	251	96	421	327	1,230	128	48	94	64	68
14	42	45	229	b95	331	425	1,140	126	48	80	*67	69
15	41	46	207	b95	258	425	925	145	47	70	70	70
16	*41	46	178	b95	213	346	740	150	52	58	73	70
17	40	48	152	b95	178	268	617	150	58	48	75	69
18	39	48	130	b95	145	198	574	143	61	41	75	*68
19	38	47	110	94	132	165	555	132	66	37	76	63
20	39	47	96	91	119	173	523	261	74	34	78	58
21	38	64	103	*99	b105	186	475	454	78	31	75	54
22	38	96	128	396	103	198	396	740	73	30	66	58
23	38	106	162	1,320	112	189	327	765	60	31	49	69
24	35	103	184	2,040	140	170	1,180	607	*59	32	36	67
25	34	94	198	1,800	207	145	2,040	441	113	*31	31	54
26	35	86	195	1,290	310	132	2,040	316	134	31	32	44
27	36	80	178	898	555	134	1,620	229	143	30	32	36
28	36	75	162	617	715	136	1,200	170	206	29	29	28
29	40	*75	150	441	-	140	1,060	132	528	30	27	24
30	39	74	132	320	--------	160	*925	101	603	31	28	21
31	40	--------	128	238	--------	162	--------	82	--------	34	34	--------
Total	1,281	1,750	4,863	11,408	7,210	7,837	27,409	8,005	3,485	5,030	1,503	1,610
Mean	41.3	58.3	157	368	258	253	914	258	116	162	48.5	53.7
(†)	-0.1	-3.0	+3.0	+0.5	+3.2	-2.6	+1.3	-2.0	+3.6	-3.8	-27.4	-24.0

Adjusted for change in contents in East Branch Reservoir

Mean	41.2	55.3	160	368	261	250	915	256	120	158	21.1	29.7
Cfsm	0.280	0.376	1.09	2.50	1.78	1.70	6.22	1.74	0.816	1.07	0.144	0.202
In.	0.32	0.42	1.26	2.88	1.85	1.96	6.94	2.01	0.91	1.23	0.17	0.23

	Observed			Adjusted		
Calendar year 1956:	Max 1,860	Min 34	Mean 261	Mean 261	Cfsm 1.78	In. 24.14
Water year 1956-57:	Max 2,040	Min 21	Mean 223	Mean 219	Cfsm 1.49	In. 20.18

* Discharge measurement made on this day.
† Change in contents, equivalent in cubic feet per second, in East Branch Reservoir.
b Stage-discharge relation affected by ice.
Note.--Shifting-control method used Oct. 1 to Dec. 8, May 14 to Sept. 30.

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, three-quarters of a mile upstream from Fritch Lake Outlet, and 0.8 mile north of Mogadore, Summit County.

Drainage area.--12.3 sq mi.

Records available.--February 1946 to September 1957.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,065 ft (from topographic map).

Average discharge.--11 years, 13.4 cfs.

Extremes.--Maximum discharge during year, 107 cfs July 9 (gage height, 3.38 ft); minimum, 1.4 cfs Mar. 25; minimum gage height, 0.45 ft Mar. 25, 28, 29.

1946-57: Maximum discharge, 155 cfs Nov. 16, 1955 (gage height, 3.46 ft); minimum, 0.2 cfs Nov. 20, 1954; minimum gage height, 0.24 ft Nov. 18, 19, 1954.

Remarks.--Records fair. Flow regulated by Mogadore Reservoir (usable capacity, 6,540 acre-ft).

Rating tables, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 28 to July 5, July 8-14)

Oct. 1 to Jan. 22

0.4	1.4	1.0	15
.5	2.5	1.2	27
.6	4.1	1.3	36
.8	8.8		

Jan. 23 to Sept. 30

0.4	1.2	1.0	13
.5	2.2	1.2	26
.6	3.5	1.3	35
.7	5.2	1.6	78

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.2	3.2	4.7	13	24	19	2.0	17	2.9	20	8.7	8.7
2	8.5	3.1	5.1	13	23	18	2.2	19	2.8	19	8.7	10
3	13	3.1	5.5	*13	23	17	4.5	17	2.8	18	10	9.2
4	11	3.1	5.5	13	25	17	69	15	2.9	19	9.5	8.0
5	9.4	3.1	5.8	12	24	17	42	13	7.9	17	8.7	7.5
6	7.4	3.0	6.0	12	23	17	35	13	9.2	17	7.5	6.5
7	7.2	*2.8	11	12	23	17	38	12	24	17	6.5	8.2
8	6.4	2.6	14	12	22	16	45	11	9.7	28	6.1	7.0
9	6.0	2.5	15	18	23	16	48	10	6.5	*43	5.9	6.3
10	5.8	2.4	13	29	24	15	62	12	6.1	25	6.5	8.0
11	5.5	2.3	12	26	23	16	57	18	5.9	23	6.3	6.8
12	5.1	2.3	12	25	23	17	53	17	4.5	23	5.9	5.7
13	4.9	2.1	11	25	*24	16	49	16	3.7	21	4.7	*9.5
14	4.7	2.1	10	24	24	16	46	17	3.5	19	4.7	13
15	4.7	2.3	10	23	23	16	45	19	3.5	17	5.7	12
16	4.9	2.5	11	23	22	15	36	17	3.7	15	5.2	9.0
17	4.9	2.5	11	22	21	15	40	16	4.0	15	4.7	7.2
18	5.1	2.4	10	22	21	15	42	15	4.2	17	4.2	6.5
19	5.1	2.3	10	21	21	15	42	14	4.9	15	4.2	5.9
20	4.7	2.3	11	20	20	13	39	13	5.2	15	4.0	13
21	4.5	3.8	11	21	19	3.8	38	*13	5.7	13	4.0	13
22	4.1	4.1	12	34	19	3.4	35	12	6.1	12	3.5	13
23	4.1	4.1	13	34	19	3.1	33	9.2	5.9	9.2	3.1	14
24	3.9	4.1	12	30	19	2.9	33	8.5	8.8	*7.5	3.1	12
25	3.8	4.9	11	29	19	1.7	32	7.5	11	6.5	4.0	11
26	3.6	5.1	11	27	19	1.6	28	6.3	9.5	8.2	5.1	11
27	3.8	4.9	12	26	19	1.7	27	5.9	9.5	14	4.9	9.5
28	3.9	4.9	12	26	19	*1.7	25	5.5	19	13	4.3	8.7
29	3.6	4.5	13	27	-	1.8	23	4.9	31	11	4.3	8.2
30	3.6	4.5	13	27	--------	1.9	19	4.3	20	10	4.2	8.2
31	3.4	--------	13	26	--------	1.9	--------	3.5	--------	9.2	4.9	--------
Total	173.8	96.9	326.6	685	608	348.5	1,089.7	381.6	244.4	516.6	173.1	276.6
Mean	5.61	3.23	10.5	22.1	21.7	11.2	36.3	12.3	8.15	16.7	5.58	9.22
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max	100	Min	1.0	Mean	17.6	Cfsm	-	In.	-
Water year 1956-57: Max	69	Min	1.6	Mean	13.5	Cfsm	-	In.	-

* Discharge measurement made on this day.

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 1957.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,005.20 ft above mean sea level (city of Akron bench mark).

Average discharge.--11 years, 29.9 cfs.

Extremes.--Maximum discharge during year, about 680 cfs July 9; minimum, 9.0 cfs Nov. 2, 3, 9, 10, June 15; minimum gage height, 0.46 ft June 15.
1946-57: Maximum discharge, 706 cfs May 12, 1956 (gage height, 3.42 ft); minimum, 2.9 cfs May 10, 1955 (gage height, 0.22 ft).

Remarks.--Records good. Flow regulated by Mogadore Reservoir (usable capacity, 6,540 acre-ft) and Fritch Lake.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

0.4	7.2	1.1	50
.5	10	1.4	102
.7	19	1.8	216
.9	31	2.3	360

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	9.3	12	18	34	33	14	35	24	50	17	13
2	15	9.3	13	18	31	30	35	35	22	42	16	16
3	19	9.3	14	*18	34	29	21	34	13	37	18	15
4	19	10	15	18	51	28	220	32	11	38	17	14
5	17	10	15	18	37	27	144	27	13	37	16	13
6	19	9.6	15	17	34	27	91	26	16	42	15	13
7	20	9.6	33	18	33	30	77	26	24	48	13	13
8	14	*9.3	34	17	31	29	124	24	21	116	12	14
9	13	9.0	42	19	42	30	127	23	15	*335	12	13
10	12	9.6	29	31	48	29	122	48	13	96	12	15
11	12	12	27	25	36	36	96	70	13	93	13	14
12	12	12	29	29	32	54	85	38	12	85	12	11
13	11	10	22	29	*33	32	74	31	11	70	11	*30
14	11	9.3	19	26	35	28	69	47	11	64	14	19
15	11	9.3	19	27	33	27	64	47	9.6	53	17	16
16	11	9.6	20	25	33	24	60	35	11	44	12	15
17	11	9.6	18	25	31	24	64	34	10	35	12	13
18	11	9.6	17	25	29	26	81	33	12	34	15	13
19	11	9.3	16	24	29	29	74	35	23	29	16	12
20	11	10	17	24	27	30	60	40	12	28	15	56
21	11	22	21	36	26	19	55	*31	12	26	15	30
22	11	16	23	*110	26	16	50	30	11	23	14	40
23	11	13	22	108	28	14	48	23	12	32	13	34
24	10	12	20	51	29	13	57	20	67	*18	13	23
25	10	12	19	42	30	12	72	18	58	16	14	20
26	10	13	18	38	37	16	48	16	22	16	16	18
27	11	13	20	35	40	15	44	15	19	23	16	17
28	10	13	20	35	30	*12	43	14	126	23	15	16
29	10	13	19	43	-	15	41	13	169	21	15	15
30	9.6	12	19	38		16	37	12	62	19	15	15
31	9.6		19	35		12		11		19	22	
Total	388.2	334.7	646	1,022	939	762	2,197	923	854.6	1,612	453	566
Mean	12.5	11.2	20.8	33.0	33.5	24.6	73.2	29.8	28.5	52.0	14.6	18.9
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956:	Max 438	Min 9.0	Mean 36.4	Cfsm -	In. -
Water year 1956-57	Max 335	Min 9.0	Mean 29.3	Cfsm -	In. -

* Discharge measurement made on this day.

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 1957.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,015.34 ft above mean sea level (city of Akron bench mark).

Average discharge.--11 years, 6.87 cfs.

Extremes.--Maximum discharge during year, 144 cfs July 9 (gage height, 2.42 ft); minimum, 0.1 cfs all or part of several days; minimum gage height, 0.37 ft Nov. 18.

1946-57: Maximum discharge, 226 cfs May 12, 1956; maximum gage height, 2.72 ft Feb. 14, 1948 (backwater from ice); no flow at times 1953-54.

Remarks.--Records fair except those for periods of ice effect, which are poor. Flow regulated by Springfield Lake.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 21

0.3	0.1	1.1	3.3
.4	.2	1.2	4.5
.5	.4	1.3	6.4
.7	1.0	1.4	9.2
.9	1.9		

Jan. 22 to Sept. 30

0.4	0.2	1.3	5.8
.5	.4	1.5	11
.7	1.0	1.6	14
.9	1.9	1.8	28
1.0	2.4	2.0	57
1.1	3.2	2.2	96

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.6	2.5	0.4	1.4	5.2	5.0	3.3	6.4	8.0	18	4.4	0.7
2	1.6	2.3	.6	1.3	5.3	4.3	8.4	6.0	4.3	14	4.3	.6
3	1.6	2.1	.8	b1.1	7.7	3.8	5.6	5.6	2.6	11	4.3	.5
4	1.6	.4	.7	*b1.5	11	3.4	70	4.4	3.5	8.8	4.1	.5
5	1.6	.4	.6	1.2	8.8	3.2	54	2.9	5.0	8.5	3.9	.4
6	3.3	.4	.6	1.2	7.3	2.9	26	2.6	5.2	8.4	4.1	.4
7	3.3	.4	5.1	1.4	6.8	3.7	19	2.4	5.0	7.7	4.1	.4
8	2.0	*.3	5.5	1.3	6.4	4.1	42	2.3	3.5	*28	3.9	.3
9	1.8	.2	8.3	1.4	9.0	4.9	47	2.3	1.7	86	4.1	.3
10	1.7	.2	4.6	1.5	10	4.6	38	10	1.9	28	3.9	.6
11	1.7	.2	3.7	b1.1	8.0	6.2	24	18	1.8	27	3.8	.8
12	1.8	.2	4.2	b1.1	7.1	10	18	7.9	1.6	22	3.7	1.8
13	1.8	.2	3.2	b1.1	*7.0	6.2	15	5.5	*1.6	16	3.7	*8.8
14	1.7	.2	2.4	b.8	7.0	4.7	13	11	1.4	13	6.4	3.1
15	1.6	.2	2.2	.5	6.8	4.3	12	13	1.0	10	4.9	2.2
16	1.6	.3	2.6	.6	6.4	4.4	11	9.6	1.7	8.5	3.8	2.0
17	1.5	.2	2.0	.4	6.1	5.5	11	8.0	1.6	7.3	2.6	2.0
18	1.4	.2	1.6	.4	5.6	5.5	15	7.3	2.1	6.8	1.0	2.0
19	1.6	.1	1.4	.3	5.1	6.4	14	7.6	5.6	6.0	1.2	2.0
20	1.9	.5	1.5	.6	2.3	6.4	12	*7.8	1.6	5.6	1.0	19
21	.6	3.8	2.3	4.5	2.2	6.0	11	7.5	1.4	5.3	.9	6.6
22	.4	1.1	2.8	*b20	2.2	5.5	10	7.5	1.1	5.3	.8	11
23	.5	.5	2.3	28	2.6	5.2	9.9	6.6	1.2	7.9	.8	8.2
24	2.4	.4	1.9	14	2.6	4.6	12	5.8	18	*5.3	.8	4.7
25	2.6	.4	1.8	8.3	3.1	4.6	14	5.5	20	5.0	.8	3.7
26	2.7	.5	1.6	6.6	5.1	5.8	10	5.3	5.8	5.0	.7	3.1
27	2.8	.5	2.0	5.5	6.0	5.5	9.3	5.3	3.7	4.9	.7	2.9
28	2.5	.5	2.0	6.2	4.5	*5.2	8.5	5.0	29	4.7	.6	2.7
29	2.5	.5	1.7	7.8	-	5.8	7.8	4.9	84	4.7	.6	2.6
30	2.5	.5	1.9	6.3	--------	5.2	7.3	4.6	26	4.7	.6	2.4
31	2.3	--------	1.6	5.5	--------	2.9	--------	4.3	--------	4.6	2.8	--------
Total	58.5	20.2	73.9	132.9	167.2	155.8	558.1	202.9	250.9	398.0	83.3	96.3
Mean	1.89	0.67	2.38	4.29	5.97	5.03	18.6	6.55	8.36	12.8	2.69	3.21
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 136 Min 0.1 Mean 8.85 Cfsm - In. -
Water year 1956-57: Max 86 Min 0.1 Mean 6.02 Cfsm - In. -

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

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 1957.

Gage.--Water-stage recorder. Datum of gage is 740.11 ft above mean sea level, unadjusted. Prior to Dec. 21, 1923, chain gage at same site and datum.

Average discharge.--32 years, 416 cfs.

Extremes.--Maximum discharge during year, 4,000 cfs July 8 (gage height, 9.83 ft); minimum, 53 cfs Oct. 31, Nov. 1 (gage height, 0.58 ft).

1921-35, 1939-57: Maximum discharge, 4,540 cfs Jan. 26, 1952, Nov. 16, 1955; maximum gage height, 10.8 ft June 28, 1924; minimum discharge, 14 cfs Aug. 27, 1944; minimum gage height, 0.33 ft Nov. 19-24, Dec. 11-13, 1954.

Remarks.--Records good. 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 65 cfs was diverted for municipal supply of city of Akron. Sewage from city enters river below station.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

0.7	75	4.0	976
1.0	134	7.0	2,190
2.0	369	8.0	2,700

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	145	103	128	240	472	840	332	1,010	290	1,120	132	128
2	136	115	121	212	394	874	586	806	288	1,080	130	107
3	138	109	138	*176	369	774	616	646	245	1,050	132	128
4	141	109	145	192	472	662	1,840	514	231	874	128	107
5	128	121	145	206	486	542	2,440	407	212	678	124	105
6	198	117	163	201	459	459	2,240	369	219	565	124	119
7	252	*107	290	212	459	420	2,290	332	231	500	124	89
8	203	100	344	194	446	433	2,590	305	229	1,020	124	89
9	183	97	433	199	514	446	2,490	312	196	2,070	121	93
10	185	99	407	212	694	407	2,290	399	185	1,120	121	119
11	183	99	407	196	694	486	2,100	433	174	976	117	107
12	180	103	472	185	678	678	1,780	300	163	806	156	105
13	174	105	446	206	*710	678	1,580	247	173	631	185	187
14	174	107	407	203	662	646	1,540	407	154	514	230	132
15	124	95	356	171	586	678	1,460	486	141	394	226	107
16	107	100	332	178	500	646	1,270	420	165	305	201	109
17	110	93	290	154	420	571	1,080	382	141	259	141	101
18	111	95	264	174	369	528	1,120	382	149	229	117	*97
19	109	93	226	167	332	500	1,080	446	226	206	117	95
20	113	104	206	169	285	514	976	556	169	206	117	395
21	119	280	215	247	252	486	874	*586	167	185	115	196
22	115	205	259	770	252	459	806	646	156	183	111	242
23	116	189	288	1,340	245	420	710	774	160	*233	111	226
24	121	169	302	1,460	269	382	806	806	486	187	111	138
25	123	166	307	1,500	312	319	1,420	710	514	160	117	143
26	117	167	305	1,620	433	356	1,880	571	319	160	113	119
27	117	142	305	1,540	601	382	1,960	459	252	163	113	126
28	113	141	300	1,160	710	*344	1,660	369	854	160	113	101
29	120	130	276	908	-	314	1,340	307	1,190	156	115	99
30	105	128	254	694	--------	344	1,120	249	1,230	143	117	91
31	108	--------	238	556	--------	332	--------	217	--------	128	156	--------
Total	4,368	3,788	8,769	15,642	13,075	15,920	44,276	14,853	9,309	16,461	4,159	4,000
Mean	141	126	283	505	467	514	1,476	479	310	531	134	133
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 2,820 Min 87 Mean 545 Cfsm - In. -
Water year 1956-57: Max 2,590 Min 89 Mean 424 Cfsm - In. -

* Discharge measurement made on this day.

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 1940 to September 1957.

Gage.--Water-stage recorder above dam. Datum of gage is 605.31 ft above mean sea level. Prior to Dec. 9, 1946, staff or chain gage, or water-stage recorder at site 0.4 mile downstream at various datums. Dec. 10, 1946, to Nov. 3, 1950, staff gage at present site and datum.

Extremes.--1921-23, 1927-35, 1940-57: Maximum daily discharge, 146 cfs Nov. 26, 1952; no flow June 4, 1947, July 2-7, 1950.

Remarks.--Records good except those for periods of indefinite stage-discharge relation, which are fair. Water is diverted from Cuyahoga River into canal at headgates at Brecksville, 6 miles upstream. Some diurnal fluctuation caused by small mill above station.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	68	66	76	50	48	57	60	62	*67	80	77
2	69	68	67	74	53	45	69	62	64	68	81	78
3	69	68	67	73	53	51	65	60	63	68	e80	72
4	69	69	67	73	64	68	65	58	63	67		64
5	69	76	67	74	59	62	68	54	63	67		64
6	69	76	67	67	55	60	72	56	62	64		63
7	72	74	71	69	52	60	84	64	63	64		64
8	70	73	67	63	51	60	78	63	63	68	79	63
9	67	73	68	64	61	60	64	63	63	67	95	64
10	67	65	65	67	62	60	67	65	62	68	94	66
11	68	65	64	67	55	63	63	69	62	67	93	65
12	68	65	66	64	52	65	66	63	62	67	*93	64
13	68	66	64	64	53	62	68	62	62	63	93	64
14	69	67	63	64	55	59	65	67	62	61	89	66
15	70	67	62	*63	53	58	64	61	60	59	78	65
16	69	67	62	63	52	58	61	55	63	58	75	70
17	68	67	64	62	52	58	62	72	61	57	75	*76
18	68	67	63	60	50	58	66	72	61	57	76	72
19	68	67	62	60	49	60	53	72	74	57	75	79
20	68	*67	63	62	48	61	59	62	64	57	76	84
21	68	72	69	68	47	59	58	57	63	57	76	81
22	68	62	71	61	47	58	61	65	62	56	76	78
23	68	59	70	66	49	58	74	64	62	67	76	78
24	68	59	69	56	50	56	67	63	65	79	76	74
25	68	59	70	53	52	56	58	62	70	78	76	75
26	68	59	70	52	53	58	66	57	65	78	77	75
27	69	59	70	47	*59	59	62	53	64	78	77	75
28	68	58	72	48	48	58	65	52	67	e80	76	75
29	69	58	78	55	-	58	*67	52	69	80	*77	75
30	68	59	77	52		58	72	51	71	84	77	74
31	68		76	51		57		55		81	78	
Total	2,123	1,979	2,097	1,938	1,484	1,811	1,963	1,891	1,917	2,089	2,494	2,140
Mean	68.5	66.0	67.6	62.5	53.0	58.4	65.4	61.0	63.9	67.4	80.5	71.3
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max - Min 34 Mean 60.3 Cfsm - In. -
Water year 1956-57: Max 95 Min 45 Mean 65.6 Cfsm - In. -

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* Discharge measurement made on this day.
e Stage-discharge relation indefinite; discharge computed on basis of normal flow.

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 1957.

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 to Oct. 8, 1927, staff gage at present site and datum.

Average discharge.--26 years (1921-22, 1927-35, 1940-57), 740 cfs (not including flow in Ohio Canal).

Extremes.--Maximum discharge during year, 8,940 cfs May 20 (gage height, 16.53 ft); minimum, 91 cfs Aug. 12 (gage height, 2.37 ft).

1921-23, 1927-35, 1940-57: Maximum discharge, 14,200 cfs Oct. 16, 1954 (gage height, 20.04 ft); minimum, 14 cfs Nov. 30, 1930; minimum combined daily discharge of river and canal, 55 cfs Aug. 28, 1933.

Remarks.--Records good except those for period of ice effect, which are fair. Diurnal fluctuations caused by powerplants above station. Flow slightly regulated by reservoirs and lakes above station. Some diversion from Tuscarawas River 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 preceding page). Records of water temperatures and suspended sediment loads for the water year 1957 are given in WSP 1520.

Revisions (water years).--WSP 894: 1929(M).

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 19				May 20 to Sept. 30			
2.5	118	12.0	4,810	2.4	95	7.0	1,820
3.0	265	15.0	7,350	2.7	151	12.0	4,810
7.0	1,800			3.0	237	14.0	6,410

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	175	166	199	416	844	1,540	604	1,500	366	*2,060	154	156
2	190	163	193	360	714	1,460	1,750	1,300	501	1,550	156	136
3	178	161	212	335	659	1,300	1,500	1,070	380	1,430	180	114
4	*193	149	258	321	1,380	1,110	5,980	900	359	1,190	228	167
5	187	141	245	324	1,340	936	6,320	752	338	1,010	189	140
6	193	163	248	332	1,030	807	4,950	640	331	754	203	147
7	412	155	531	328	955	752	3,680	604	335	774	169	131
8	310	152	659	352	881	733	4,460	549	335	1,080	136	112
9	268	141	807	332	1,340	733	4,460	549	307	4,670	121	102
10	251	147	770	384	1,800	714	5,020	513	273	2,620	120	136
11	258	141	696	346	1,460	881	5,740	1,300	267	1,680	110	169
12	262	136	900	335	1,220	1,710	4,740	770	254	1,680	*96	147
13	234	158	807	342	1,180	1,340	3,320	585	231	1,150	104	172
14	245	155	678	b340	1,180	1,070	2,780	1,100	263	950	118	247
15	215	158	604	*b300	1,070	993	2,490	1,540	209	734	273	159
16	190	152	531	b300	993	936	2,160	955	244	578	180	133
17	181	141	473	b290	826	826	1,950	733	237	449	142	*129
18	169	141	437	b290	714	714	2,440	733	501	395	125	136
19	155	132	370	b280	659	788	2,380	733	910	366	123	121
20	158	*158	352	282	567	1,030	1,800	6,160	387	331	138	486
21	166	416	463	562	513	936	1,540	2,540	263	304	129	445
22	141	477	567	5,300	495	788	1,380	1,770	240	277	125	420
23	161	290	604	6,500	585	696	1,720	1,470	234	352	120	598
24	166	272	549	3,800	678	585	4,100	1,310	287	280	118	311
25	163	245	531	3,080	807	549	3,740	1,110	1,150	228	129	225
26	172	238	513	2,960	1,430	678	3,980	910	618	222	123	194
27	202	248	531	2,440	*2,600	770	3,500	754	413	215	129	174
28	172	221	549	1,760	1,580	622	2,900	637	1,720	263	123	164
29	152	218	513	1,500	-	640	*2,160	520	4,810	174	*123	136
30	169	205	441	1,220	--------	826	1,710	475	2,900	192	140	123
31	163	--------	430	993	--------	678	--------	391	--------	194	183	--------
Total	6,251	5,840	15,661	36,704	29,500	28,141	95,254	34,873	19,663	28,152	4,507	6,030
Mean	202	195	505	1,184	1,054	908	3,175	1,125	655	908	145	201
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: **Max** 7,850 **Min** 132 **Mean** 1,072 **Cfsm** - **In.** -
Water year 1956-57: **Max** 6,500 **Min** 96 **Mean** 851 **Cfsm** - **In.** -

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* 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 1957 (July 1925 to September 1932 monthly runoff in inches, adjusted for diversion, published in WSP 1307; previously published runoff was unadjusted and should not be used.

Gage.--Water-stage recorder. Datum of gage is 594.24 ft above mean sea level, datum of 1929. 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.--28 years, 314 cfs (adjusted for diversion).

Extremes.--Maximum discharge during year, 14,800 cfs May 20 (gage height, 14.74 ft); minimum daily, 22 cfs Aug. 10, 13-18, 23, 24.

1925-35, 1939-57: Maximum discharge, 28,000 cfs Mar. 22, 1948 (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 poor. Water diverted at dam just above station for municipal supply of city of Willoughby.

Revisions (water years).--WSP 1084: 1929(M), 1931(M). See also Records available.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.8	22	3.0	371
1.9	34	4.0	880
2.0	50	6.0	2,530
2.2	98	11.0	8,260
2.5	180		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	53	98	190	196	527	208	301	163	309	30	31
2	53	53	90	170	169	423	665	242	879	196	30	30
3	53	53	126	150	166	301	581	205	322	157	29	29
4	50	53	232	140	572	242	3,760	174	180	132	29	32
5	45	53	208	130	610	208	2,530	151	140	114	27	34
6	47	50	246	120	366	192	1,590	135	119	98	26	29
7	93	53	876	110	348	*189	792	121	116	86	26	27
8	90	55	610	110	280	192	880	121	111	347	25	26
9	71	53	513	120	980	199	880	106	98	427	25	25
10	*60	62	404	130	1,150	218	1,080	162	83	199	22	36
11	53	60	*322	130	635	307	2,830	261	73	138	25	45
12	53	55	451	130	348	1,040	2,730	214	78	121	*24	34
13	53	55	313	110	276	532	1,230	160	83	111	22	34
14	55	50	232	95	309	313	1,010	371	111	111	22	34
15	53	53	199	90	261	239	1,020	708	83	98	22	32
16	53	57	180	85	257	202	940	305	102	86	22	37
17	47	55	160	80	222	171	850	183	241	76	22	31
18	47	55	146	80	183	157	1,080	157	317	68	22	28
19	47	50	121	80	189	208	940	174	1,020	60	26	*25
20	49	55	119	80	148	489	566	*7,310	269	52	30	51
21	53	186	335	500	166	380	418	1,640	138	45	28	88
22	50	265	413	6,000	177	292	313	710	86	42	26	106
23	50	163	409	4,930	254	228	490	484	66	50	22	132
24	50	129	280	1,150	432	186	*7,440	*353	102	49	22	78
25	47	120	254	765	758	160	3,130	265	446	*40	62	47
26	45	108	232	508	1,510	183	1,680	211	211	34	55	40
27	55	103	239	385	2,010	265	792	166	119	32	39	32
28	66	95	269	330	710	214	850	132	2,040	31	30	29
29	66	88	254	*313	-	208	595	114	3,940	31	28	30
30	57	96	218	254	--------	399	404	96	758	30	26	29
31	50	--------	220	228	--------	284	--------	86	--------	31	29	--------
Total	1,716	2,436	8,769	17,693	13,682	9,148	42,274	15,818	12,494	3,401	873	1,261
Mean	55.4	81.2	283	571	489	295	1,409	510	416	110	28.2	42.0
(†)	3.0	2.7	2.6	2.8	2.8	2.8	2.8	3.0	3.3	3.7	4.2	3.5

Adjusted for diversion

Mean	58.4	83.9	286	574	492	298	1,412	513	419	114	32.4	45.5
Cfsm	0.233	0.334	1.14	2.29	1.96	1.19	5.63	2.04	1.67	0.454	0.129	0.181
In.	0.27	0.37	1.31	2.64	2.04	1.37	6.28	2.35	1.86	0.52	0.15	0.20

	Observed						Adjusted					
Calendar year 1956:	Max	5,090	Min	45	Mean	410	Mean	413	Cfsm	1.65	In.	22.38
Water year 1956-57:	Max	7,440	Min	22	Mean	355	Mean	358	Cfsm	1.43	In.	19.36

Peak discharge (base, 4,000 cfs).--Jan. 22 (8 p.m.) 9,480 cfs (11.75 ft); Apr. 4 (4 p.m.) 5,570 cfs (8.92 ft); Apr. 11 (9:30 p.m.) 4,800 cfs (8.19 ft); Apr. 24 (6 a.m.) 13,200 cfs (13.86 ft); May 20 (9 a.m.) 14,800 cfs (14.74 ft); June 29 (1:30 a.m.) 6,770 cfs (9.93 ft).

* Discharge measurement made on this day.

† Diversion, equivalent in cubic feet per second, for municipal supply of city of Willoughby.

Note.--Stage-discharge relation affected by ice Nov. 25, 28, Dec. 31 to Jan. 22.

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 1957.

Gage.--Water-stage recorder. Altitude of gage is 800 ft (from topographic map). Prior to June 11, 1942, wire-weight gage at same site and datum.

Average discharge.--15 years, 35.4 cfs.

Extremes.--Maximum discharge during year, 2,040 cfs Jan. 22 (gage height, 8.01 ft), from rating curve extended above 1,600 cfs; minimum, 0.3 cfs on Aug. 24, 25, Sept. 28-30; minimum gage height, 0.12 ft Aug. 15, 16-18.

1942-57: Maximum discharge, 2,700 cfs Mar. 22, 1948 (gage height, 8.97 ft), from rating curve extended above 1,600 cfs; no flow Aug. 20, 21, 1943, Oct. 24, 25, 1946.

Remarks.--Records fair except those below 5 cfs and those for periods of ice effect or no gage-height record, which are poor.

Revisions (water years).--WSP 1387: 1948(M).

Rating table, water year 1956-57, 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, Aug. 4-15, Aug. 21 to Sept. 30)

0.1	0.4	1.5	75
.2	1.3	2.0	136
.3	2.6	3.0	274
.4	4.5	5.0	655
.6	10	6.0	1,010
.8	20	7.0	1,500
1.0	33		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.9	3.0	6.1	15	b12	36	13	11	3.1	14	0.5	0.5
2	1.0	3.0	6.1	13	11	37	72	7.5	11	5.9	.4	.5
3	1.0	2.8	11	11	11	22	48	5.9	9.6	3.7	.4	.6
4	.9	2.8	43	10	80	19	479	4.9	4.2	2.8	.4	.7
5	.9	2.8	29	11	96	*19	*669	4.7	2.6	2.3	.4	.5
6	1.1	2.6	31	10	39	16	186	4.1	2.3	1.9	.4	.5
7	2.0	2.6	84	11	34	17	83	3.5	1.8	1.5	.4	.4
8	2.9	2.6	94	11	32	18	68	3.3	1.4	3.3	.4	.4
9	3.1	2.5	59	13	235	17	72	3.1	1.3	14	.4	.4
10	2.8	2.5	46	12	182	22	158	4.5	1.3	6.0	.4	.4
11	2.5	2.5	36	12	60	64	454	8.1	1.3	3.1	.4	.5
12	2.3	2.6	76	b11	23	390	332	6.4	1.8	2.6	.4	.5
13	1.8	2.6	35	b10	18	66	116	5.4	1.9	2.2	.4	.5
14	1.7	2.8	21	b9	19	30	96	9.9	1.8	1.7	*.5	.5
15	1.5	3.0	16	b8	17	20	67	40	2.0	1.5	.4	.5
16	*1.4	3.1	15	b8	21	15	67	14	2.8	1.1	.4	.5
17	1.4	3.0	12	b7	18	11	59	7.2	2.3	.9	.4	.5
18	1.3	2.6	10	b7	b15	*9.7	98	5.9	2.8	.8	.4	*.5
19	1.2	a2.5	7.3	b7	b13	18	88	6.1	3.0	.8	.5	.5
20	1.3	a2.5	6.9	b7	b11	48	38	254	4.3	.7	.5	.5
21	1.2	a8	56	*21	10	35	23	84	3.0	.7	.5	.5
22	1.1	a25	108	b1,200	11	24	15	32	2.0	.7	.5	.9
23	1.4	a15	73	558	26	17	43	18	1.3	.7	.5	1.5
24	2.8	a9	34	98	107	13	574	10	*1.4	.6	.5	1.0
25	3.0	a7	26	49	274	10	195	6.9	4.5	.6	.4	.6
26	3.0	a6	22	31	228	12	136	5.4	5.4	.6	.5	.5
27	3.3	a6	22	22	287	36	56	4.5	3.1	.6	.5	.4
28	3.3	a6	29	19	56	23	159	3.7	146	.5	.5	.4
29	3.1	*6.9	26	b16	-	18	34	3.3	769	.5	.5	.4
30	3.0	6.1	16	b14	--------	29	*17	3.0	53	.5	.5	.4
31	3.0	--------	19	b13	--------	17	--------	3.0	--------	.5	.5	--------
Total	61.2	149.4	1,075.4	2,244	1,946	1,128.7	4,515	583.3	1,051.3	77.3	13.8	16.5
Mean	1.97	4.98	34.7	72.4	69.5	36.4	150	18.8	35.0	2.49	0.45	0.55
Cfsm	0.075	0.189	1.31	2.74	2.63	1.38	5.68	0.712	1.33	0.094	0.017	0.021
In.	0.09	0.21	1.51	3.16	2.74	1.59	6.34	0.82	1.48	0.11	0.02	0.02

Calendar year 1956:	Max	1,170	Min	0.7	Mean	43.6	Cfsm	1.65	In. 22.47
Water year 1956-57:	Max	1,200	Min	0.4	Mean	35.2	Cfsm	1.33	In. 18.09

Peak discharge (base, 900 cfs).--Jan. 22 (6:30 p.m.) 2,040 cfs (8.01 ft); Apr. 4 (10:30 p.m.) 1,350 cfs (6.67 ft); Apr. 24 (5:30 a.m.) 1,100 cfs (6.19 ft); June 29 (5:30 a.m.) 1,550 cfs (7.11 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 Rock Creek near Rock Creek.

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.--56.6 sq mi.

Records available.--March 1942 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 810 ft (from topographic map). Prior to June 10, 1942, chain gage at same site and datum.

Average discharge.--15 years, 83.4 cfs.

Extremes.--Maximum discharge during year, 2,260 cfs Jan. 22 (gage height, 6.90 ft); no flow for many days.

1942-57: 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 below 1 cfs and those for periods of ice effect, which are poor.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 11

0.45	2.1	1.5	65
.5	3.1	2.0	114
.6	5.5	2.5	189
.8	12	3.0	342
1.0	22	4.0	735
1.2	37	6.0	1,650

Mar. 12 to Sept. 30

0.20	0	1.1	34
.30	.2	1.5	65
.35	.5	2.0	114
.40	1.2	2.5	185
.5	3.1	3.0	305
.6	5.6	6.0	1,650
.8	15		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.1	5.8	9.2	41	21	117	21	24	4.5	59		
2	2.9	5.8	8.9	32	b20	116	76	17	105	23		
3	2.7	5.5	12	b25	b19	80	111	12	36	11		
4	2.7	5.5	33	19	112	62	747	9.6	12	6.3		
5	2.7	5.3	31	18	166	50	1,260	8.2	5.6	4.8		
6	2.7	5.0	28	18	88	*40	536	6.6	3.8	3.3		
7	5.5	4.8	82	18	65	39	236	5.6	2.7	2.5		
8	8.2	4.8	109	19	64	44	195	4.8	2.1	7.8		
9	9.2	4.8	97	21	296	55	210	4.0	1.9	31		
10	5.8	4.3	91	b22	449	82	454	5.1	1.6	16		
11	4.5	4.5	77	b22	172	151	900	10	1.6	6.6		
12	3.6	4.8	*118	b21	80	608	832	17	1.6	4.2		
13	3.3	4.8	88	b18	44	180	342	15	2.9	3.8		
14	3.1	4.5	58	b16	56	79	194	16	1.7	3.1	(*)	
15	2.9	4.5	41	b15	50	52	116	61	1.2	2.7		
16	*2.7	4.8	35	b14	54	38	91	39	1.2	1.9		
17	2.5	4.3	32	b13	b45	28	91	20	.9	1.6		
18	2.5	4.3	27	b13	b40	*21	143	12	1.1	1.2		(*)
19	2.9	4.1	18	b13	b35	30	141	14	2.5	.9		
20	3.3	4.1	15	b13	b35	76	85	216	6.6	.9		
21	4.1	15	97	*b70	31	70	54	196	3.8	.9		
22	4.3	38	259	b1,400	28	47	36	76	2.1	.6		
23	5.0	23	234	1,420	58	35	31	45	1.2	.8		
24	5.5	13	107	488	216	26	495	29	1.2	.6		
25	5.5	11	75	165	438	20	878	19	*1.4	.4		
26	5.5	8.9	57	96	318	21	649	11	.9	.3		
27	5.8	9.2	52	b60	635	37	177	8.2	.8	.2		
28	5.5	9.9	65	b45	193	35	123	5.9	30	.2		
29	5.5	9.9	67	b32	-	29	59	4.8	878	.1		
30	5.8	10	50	b25	--------	33	*35	4.0	319	.1		
31	5.8	--------	48	b25	--------	29	--------	3.6	--------	.1		--------
Total	135.1	244.2	2,121.1	4,217	3,828	2,330	9,318	919.4	1,434.9	195.9	0	0
Mean	4.36	8.14	68.4	136	137	75.2	311	29.7	47.8	6.32	0	0
Cfsm	0.077	0.144	1.21	2.40	2.42	1.33	5.49	0.525	0.845	0.112	0	0
In.	0.09	0.16	1.40	2.77	2.52	1.53	6.12	0.61	0.94	0.13	0	0

Calendar year 1956:	Max	1,300	Min	1.9	Mean	112	Cfsm	1.98	In. 27.06
Water year 1956-57:	Max	1,420	Min	0	Mean	67.8	Cfsm	1.20	In. 16.27

Peak discharge (base, 1,200 cfs).--Jan. 22 (7 p.m.) 2,260 cfs (6.90 ft); Apr. 4 (12 p.m.) 1,830 cfs (6.34 ft); Apr. 11 (9 p.m.) 1,220 cfs (5.07 ft); Apr. 25 (11 p.m.) 1,300 cfs (5.26 ft).

* Discharge measurement or observation of no flow 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, 1¾ miles northwest of Jefferson, Ashtabula County, and 3½ miles downstream from Griggs Creek.

Drainage area.--78.3 sq mi.

Records available.--March 1942 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 822.59 ft above mean sea level (Ashtabula County bench mark). Prior to June 10, 1942, wire-weight gage at same site and datum.

Average discharge.--15 years, 111 cfs (unadjusted).

Extremes.--Maximum discharge during year, 3,620 cfs Jan. 22 (gage height, 9.45 ft); no flow for many days.

1942-57: Maximum discharge, 7,010 cfs Mar. 22, 1948 (gage height, 9.95 ft); maximum gage height, 10.28 ft Dec. 4, 1950 (backwater from ice); no flow for many days.

Remarks.--Records fair except those below 20 cfs or those for periods of ice effect, which are poor. Water diverted above station for municipal supply for city of Jefferson.

Revisions.--Revised figures of diversion, in cubic feet per second, and adjusted monthly discharge and runoff for the water year 1956, superseding those published in WSP 1437, are given herewith:

Month	Observed				Diversion†	Adjusted for diversion		
	Cfs-days	Maximum	Minimum	Mean		Mean	Per square mile	Runoff in inches
October	595.3	171	0	19.2	0.24	19.4	0.248	0.29
November	4,401	1,110	11	147	.26	147	1.88	2.10
December	5,731	1,340	16	185	.28	185	2.36	2.72
Calendar year 1955	-	1,340	0	92.8	-	-	1.19	16.09
January	850.0	187	3.5	27.4	.26	27.7	.354	.41
February	11,249	1,400	14	388	.28	388	4.96	5.35
March	10,687	1,540	47	345	.28	345	4.41	5.08
April	6,818	1,160	21	227	.29	227	2.90	3.24
May	8,437.2	2,250	4.8	274	.29	274	3.50	4.04
June	2,271.8	654	1.3	75.7	.30	76.0	.971	1.08
July	180.1	55	.2	5.81	.29	6.10	.078	.09
August	5,188.4	1,350	.1	167	.29	167	2.13	2.46
September	1,783.1	654	1.7	59.4	.29	59.7	.762	.85
Water year 1955-56	-	2,250	0	159	.28	159	2.03	27.71

† Diversion, equivalent in cubic feet per second, for municipal supply of city of Jefferson.

Mill Creek near Jefferson, Ohio--Continued

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-10, Oct. 21 to Nov. 22)

0.75	0	1.7	34
.8	.2	2.0	58
.9	.9	2.5	112
1.0	1.8	3.0	178
1.1	2.9	4.0	400
1.2	4.8	6.0	1,080
1.3	7.7	8.0	2,180
1.4	12	9.0	3,090

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.6	56	67	b30	137	32	45	97	190		0
2	0	.6	55	54	26	132	50	29	756	81		0
3	0	.4	77	42	24	96	98	20	224	46		0
4	0	.4	227	35	114	67	535	14	86	24		0
5	0	.4	324	33	248	56	1,690	12	47	13		0
6	0	.3	790	32	154	*50	620	10	29	8.2		0
7	.1	.1	756	33	111	45	335	9.5	16	6.2		0
8	0	0	654	34	102	50	214	8.2	9.5	20		0
9	0	0	312	35	355	55	172	7.4	6.2	80		0
10	1.0	0	207	35	654	64	413	14	4.4	117		0
11	3.6	0	154	35	212	98	1,110	31	3.8	74		0
12	2.6	0	*218	b30	84	*916	1,420	29	3.5	42		0
13	1.8	0	156	b25	54	368	586	31	3.6	24	(*)	0
14	1.1	0	98	b20	48	106	358	33	3.8	11		0
15	.6	0	71	b19	43	62	196	84	3.5	6.5		0
16	*.4	0	62	b18	51	43	144	88	3.8	4.4		0
17	.3	0	56	b17	b45	31	119	46	3.1	3.1		0
18	.3	0	46	b17	b40	22	220	29	4.7	2.3		*0
19	.3	0	35	b17	b35	22	205	28	8.6	1.7		0
20	.4	.1	29	b17	b30	58	120	630	10	1.2		0
21	.8	1.1	54	b60	29	93	69	458	7.4	.8		.2
22	.8	2.2	210	2,340	29	62	45	144	4.8	.6		.2
23	.7	37	345	2,470	45	44	35	77	3.3	1.0		.1
24	.6	29	167	490	162	31	59	52	2.7	.3		0
25	.5	23	111	176	860	21	*542	37	2.3	0		0
26	.4	26	98	82	620	19	1,380	26	1.8	0		0
27	.6	34	98	55	1,080	38	675	18	*1.5	0		0
28	.7	42	120	b40	319	53	797	12	35	0		0
29	1.0	51	122	*b35	-	45	193	9.1	1,520	0		0
30	.8	55	84	b30	--------	55	79	6.5	828	0		0
31	.7	--------	85	b30	--------	49	--------	5.0	--------	0		--------
Total	20.3	303.2	5,877	6,423	5,604	2,988	12,511	2,042.7	3,730.3	758.3	0	0.5
Mean	0.65	10.1	190	207	200	96.4	417	65.9	124	24.5	0	0.02
(†)	0.30	0.32	0.32	0.34	0.37	0.37	0.35	0.38	0.38	0.43	0.44	0.40

Adjusted for diversion

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean	0.95	10.4	190	207	200	96.8	417	66.3	124	24.9	0.44	0.42
Cfsm	0.012	0.133	2.43	2.64	2.55	1.24	5.33	0.847	1.58	0.318	0.0056	0.0054
In.	0.01	0.15	2.80	3.04	2.66	1.43	5.95	0.98	1.76	0.37	0.006	0.006

	Observed			Adjusted		
Calendar year 1956:	Max 2,250	Min 0	Mean 147	Mean 147	Cfsm 1.88	In. 25.56
Water year 1956-57:	Max 2,470	Min 0	Mean 110	Mean 110	Cfsm 1.40	In. 19.16

Peak discharge (base, 1,500 cfs).--Jan. 22 (10 p.m.) 3,620 cfs (9.45 ft); Apr. 5 (8 a.m.) 2,180 cfs (7.97 ft); Apr. 12 (5 a.m.) 1,830 cfs (7.53 ft); Apr. 26 (12:30 a.m.) 1,770 cfs (7.38 ft); June 29 (4:30 p.m.) 2,340 cfs (8.20 ft).

* Discharge measurement or observation of no flow made on this day.

† Diversion, equivalent in cubic feet per second, for municipal supply of city of Jefferson.

b Stage-discharge relation affected by ice.

Grand River near Madison, Ohio

Location.--Lat 41°44'26", long 81°02'48", on downstream end of center pier of 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 1957.

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.--32 years, 657 cfs.

Extremes.--Maximum discharge during year, 12,000 cfs Jan. 23 (gage height, 11.18 ft); minimum, 4.3 cfs Aug. 23 (gage height, 0.89 ft).

1922-35, 1938-57: 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 periods of ice effect or no gage-height record, which are poor.

Revisions (water years).--WSP 1437: 1923-24(M), 1925-30, 1932(M), 1933, 1934(M), 1935, 1938(M), 1946, 1948(M).

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 25				Apr. 26 to Sept. 30			
1.1	21	4.0	880	0.9	4.5	1.7	84
1.3	36	5.0	1,540	1.0	7.7	2.0	152
1.6	77	6.0	2,510	1.1	12	3.0	430
2.0	160	7.0	3,880	1.2	18	4.0	880
3.0	433	11.0	11,500	1.4	36		

Note.--Same as preceding table above 4.0 ft.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	37	26	186	356	b300	1,500	335	530	80	2,250	12	6.4
2	34	28	186	310	283	1,280	376	336	2,310	1,460	11	6.4
3	30	29	244	278	268	1,050	635	252	1,030	1,240	11	6.7
4	28	33	570	265	418	775	2,200	198	379	880	10	7.7
5	27	32	825	229	1,020	590	7,900	164	196	406	8.6	8.6
6	26	32	1,630	209	935	474	6,760	142	119	191	7.7	7.7
7	31	29	2,050	196	775	*397	5,310	123	80	103	7.7	7.1
8	32	28	2,250	196	635	370	4,140	101	60	112	7.4	6.4
9	38	29	1,280	199	1,170	376	2,860	94	51	211	7.4	5.5
10	63	27	990	b240	2,800	410	2,620	97	44	255	7.1	5.8
11	*71	28	800	b240	1,950	576	4,860	142	42	221	6.7	6.1
12	60	28	962	b220	1,210	3,400	7,330	186	37	157	6.7	6.1
13	47	28	908	b200	908	3,030	5,850	208	37	110	*6.4	6.1
14	43	*28	680	b180	658	1,460	4,320	234	44	82	7.1	5.8
15	37	28	530	b160	506	990	2,740	357	44	69	6.7	5.1
16	34	29	440	b160	444	658	1,720	406	41	54	5.8	5.1
17	31	28	364	b150	433	440	1,110	379	39	41	5.5	4.5
18	29	28	305	b150	410	333	1,210	322	37	35	5.1	4.5
19	26	28	270	b150	388	278	1,240	322	67	30	5.5	*5.1
20	25	28	234	b150	341	356	1,020	3,330	86	25	5.1	6.1
21	26	48	270	b250	283	510	750	2,800	166	24	5.1	9.1
22	24	179	691	b5,000	276	510	570	1,360	133	21	4.5	12
23	24	a250	1,310	11,300	294	444	440	702	84	23	4.5	22
24	24	a230	1,080	7,330	575	364	*614	482	65	20	8.6	27
25	25	a220	800	4,140	2,350	294	3,540	330	76	17	9.1	16
26	25	204	658	3,060	3,190	255	7,520	244	*62	17	7.4	25
27	27	177	570	2,050	5,310	291	6,950	181	69	15	6.4	15
28	26	182	550	1,080	3,120	347	6,760	135	289	14	5.5	14
29	26	*192	570	612	-	364	3,060	101	4,000	14	5.8	14
30	26	186	470	*437	--------	361	1,050	84	4,950	14	5.5	14
31	26	--------	413	b350	--------	353	--------	73	--------	12	6.4	--------
Total	1,028	2,442	23,086	39,847	31,250	22,836	95,790	14,415	14,717	8,123	219.3	290.9
Mean	33.2	81.4	745	1,285	1,116	737	3,193	465	491	262	7.07	9.70
Cfsm	0.057	0.139	1.27	2.19	1.90	1.26	5.44	0.792	0.836	0.446	0.012	0.017
In.	0.07	0.16	1.46	2.52	1.98	1.45	6.07	0.91	0.93	0.51	0.01	0.02

Calendar year 1956:	Max 8,860	Min 24	Mean 961	Cfsm 1.64	In. 22.28
Water year 1956-57:	Max 11,300	Min 4.5	Mean 696	Cfsm 1.19	In. 16.09

Peak discharge (base, 5,500 cfs).--Jan. 23 (11 a.m.) 12,000 cfs (11.18 ft); Apr. 5 (7:30 p.m.) 8,660 cfs (9.55 ft); Apr. 12 (3 p.m.) 7,520 cfs (9.05 ft); Apr. 26 (3 p.m.) 7,900 cfs (9.25 ft); June 30 (5 a.m.) 5,850 cfs (8.13 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Conneaut Creek at Amboy and other stations on nearby streams.

b Stage-discharge relation affected by ice.

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 1957.

Gage.--Water-stage recorder. Altitude of gage is 605 ft (from topographic map). Prior to Aug. 27, 1924, staff gage at same site and datum.

Average discharge.--26 years, 150 cfs.

Extremes.--Maximum discharge during year, 6,110 cfs Jan. 23 (gage height, 7.38 ft); no flow for many days.

1924-35, 1939-47, 1950-57: Maximum discharge, 10,800 cfs May 16, 1942 (gage height, 9.67 ft); no flow at times in most years.

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

Revisions (water years).--WSP 954: 1929(M). WSP 974: 1942. WSP 1437: 1926, 1932, 1934.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 22

0.1	3.5	1.0	149
.2	8.4	1.5	365
.3	17	2.0	660
.4	28	4.0	2,320
.7	76	6.0	4,350

Jan. 23 to Sept. 30

-0.1	0	0.4	9.2	1.6	265
0.0	.5	.5	15	2.0	490
.1	1.1	.7	34	3.0	1,260
.2	2.4	1.0	85	6.0	4,340
.3	5.0	1.3	158		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.7	4.7	b100	127	b65	197	56	93	34	218	0.2	0
2	3.9	4.7	b110	b100	b65	180	87	68	524	98	.2	0
3	3.9	5.1	b110	b85	b65	136	158	42	202	54	.1	0
4	3.9	4.7	b130	b75	b110	100	602	30	83	54	.1	0
5	3.9	4.7	609	69	b280	89	2,300	33	40	77	.1	.3
6	3.9	5.1	2,540	67	237	*77	856	23	21	45	.1	.3
7	4.7	4.3	1,820	67	197	70	568	24	14	24	.1	.1
8	7.9	5.1	1,040	69	161	74	382	16	8.7	46	.1	0
9	39	5.5	499	67	510	81	275	9.8	6.2	530	.1	0
10	26	5.1	323	b65	792	89	655	9.2	4.8	193	.1	.1
11	*15	5.1	*220	b85	275	118	1,480	22	4.2	81	.1	.1
12	9.9	6.1	329	b65	130	1,050	1,620	42	4.4	45	0	.1
13	7.2	7.2	212	b50	89	*418	704	28	5.6	31	*0	.2
14	5.5	6.7	141	b45	74	150	548	25	8.7	23	0	.2
15	4.7	6.7	104	b40	79	91	376	63	5.0	17	0	.1
16	4.3	8.4	97	b40	77	70	275	87	3.8	12	0	.2
17	4.3	9.2	95	b35	74	54	214	45	4.2	8.3	0	.2
18	4.3	9.2	84	b35	b70	43	394	25	6.7	6.2	0	*.2
19	4.3	8.4	74	b35	b65	40	300	28	14	4.8	0	.2
20	4.3	8.4	55	b40	b60	97	180	574	56	3.8	0	.7
21	4.3	17	108	b110	b60	158	123	490	54	2.9	0	1.1
22	3.9	b70	284	3,910	b65	102	87	177	24	2.2	0	1.1
23	3.9	b100	442	3,760	76	72	68	98	12	3.3	0	1.2
24	3.9	b100	212	568	189	52	74	*63	6.5	2.2	0	1.2
25	3.9	b110	146	270	824	39	*425	40	45	1.5	0	.7
26	3.5	b110	143	152	690	36	1,480	26	151	.9	0	.3
27	3.5	b110	141	120	1,440	61	824	19	*72	.6	0	.2
28	3.9	b110	175	b90	388	91	792	13	58	.4	0	0
29	4.7	b100	179	b75	-	70	270	9.8	3,200	.3	0	0
30	5.1	b100	129	*b70	--------	81	152	7.8	994	.3	0	0
31	5.1	--------	138	b65	--------	85	--------	5.4	--------	.2	0	--------
Total	211.3	1,051.4	10,789	10,451	7,207	4,071	16,325	2,236.0	5,666.8	1,585.9	1.3	8.8
Mean	6.82	35.0	348	337	257	131	544	72.1	189	51.2	0.04	0.29
Cfsm	0.058	0.297	2.95	2.86	2.18	1.11	4.61	0.611	1.60	0.434	0.00034	0.0025
In.	0.07	0.33	3.40	3.30	2.27	1.28	5.14	0.70	1.78	0.50	0.0004	0.003

Calendar year 1956:	Max 2,860	Min 1.8	Mean 204	Cfsm 1.73	In. 23.50
Water year 1956-57:	Max 3,910	Min 0	Mean 163	Cfsm 1.38	In. 18.77

Peak discharge (base, 2,600 cfs).--Dec. 6 (6 a.m.) 3,190 cfs (4.90 ft); Jan. 23 (3 a.m.) 6,110 cfs (7.38 ft); Apr. 5 (6 a.m.) 3,440 cfs (5.20 ft); June 29 (12 m.) 5,980 cfs (7.3 ft).

* Discharge measurement or observation of no flow made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record July 25 to Aug. 12; discharge estimated on basis of recorded range in stage, weather records, and records for Conneaut Creek at Amboy.

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 1957.

Gage.--Water-stage recorder. Altitude of gage is 605 ft (from topographic map). Prior to Aug. 17, 1924, chain gage at same site and datum.

Average discharge.--20 years, 241 cfs.

Extremes.--Maximum discharge during year, 7,400 cfs June 30 (gage height, 8.33 ft); maximum gage height, 10.35 ft Jan. 22 (ice jam); minimum discharge, 5.3 cfs Sept. 4, 9, 10, 19, 20; minimum gage height, 1.17 ft Aug. 22, 23, 24.

1922-35, 1950-57: Maximum discharge, 12,900 cfs Oct. 16, 1954; 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, which are poor.

Revisions (water years).--WSP 714: 1926. WSP 784: 1933. WSP 1437: 1923-25(M), 1926-30, 1931-32(M), 1933, 1935(M).

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 22				Jan. 23 to Sept. 30					
1.4	16	3.0	369	1.15	4.9	2.1	93	5.0	1,880
1.6	38	3.5	630	1.2	7.1	2.5	168	7.0	4,960
1.9	77	4.0	1,000	1.3	12	3.0	314	8.0	6,810
2.2	126	5.0	1,960	1.5	27	3.5	535		
2.6	229	6.0	3,280	1.8	56	4.0	880		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	18	b190	197	b120	392	142	187	103	651	12	6.7
2	25	19	b190	160	b120	341	150	140	971	202	12	6.2
3	25	19	b200	144	b120	296	269	112	804	124	12	6.7
4	23	17	b240	135	172	215	631	96	214	131	12	7.6
5	23	17	b600	124	463	185	2,700	86	110	104	11	10
6	23	17	b2,000	122	348	*173	2,380	79	75	94	10	8.6
7	25	17	2,840	118	273	164	1,090	70	56	68	9.6	7.1
8	83	17	2,440	116	269	168	730	64	46	97	9.1	6.2
9	139	19	1,020	122	461	175	565	60	40	135	9.6	5.8
10	85	18	593	102	1,370	182	757	59	35	384	9.6	6.9
11	*55	18	418	140	642	197	1,480	63	33	166	9.1	8.6
12	39	19	*461	b120	285	936	2,320	100	34	92	8.1	8.6
13	33	20	447	b95	173	*1,040	1,420	90	34	76	*7.6	9.1
14	28	19	280	b80	161	337	808	89	41	63	8.6	9.6
15	25	24	206	b75	157	210	660	103	32	54	10	9.1
16	24	27	184	b70	146	170	577	200	34	45	9.6	11
17	21	23	181	b70	146	148	454	122	28	37	8.6	9.1
18	20	21	158	b65	136	121	547	80	35	32	9.1	6.7
19	19	20	135	b65	115	115	547	88	79	27	8.1	*5.8
20	18	20	113	b65	b110	222	368	444	282	25	7.1	9.9
21	18	36	213	b150	b110	435	244	390	128	22	6.7	11
22	18	b300	435	b2,200	122	260	180	288	67	21	6.2	12
23	18	b230	744	6,810	134	178	146	155	43	23	6.2	13
24	20	b190	430	2,420	222	140	182	*106	35	20	5.8	12
25	20	b200	280	519	844	110	*355	81	185	18	7.1	11
26	19	b200	257	318	1,480	102	1,880	67	*524	18	7.1	12
27	20	b200	254	218	1,820	122	1,660	56	167	19	6.7	10
28	18	b200	270	178	1,260	166	980	49	128	16	6.2	8.6
29	18	b200	293	b150	-	146	656	42	2,520	15	6.7	7.6
30	18	b190	244	*b140		146	290	39	5,400	15	6.7	6.7
31	18		197	b130		210		34		14	6.7	
Total	964	2,335	16,513	15,418	11,779	7,802	25,168	3,639	12,283	2,808	264.9	263.2
Mean	31.1	77.8	533	497	421	252	839	117	409	90.6	8.55	8.77
Cfsm	0.175	0.437	2.99	2.79	2.37	1.42	4.71	0.657	2.30	0.509	0.048	0.049
In.	0.20	0.49	3.45	3.22	2.47	1.64	5.26	0.76	2.57	0.59	0.06	0.05

Calendar year 1956: Max	5,680	Min 16	Mean 345	Cfsm 1.94	In. 26.35
Water year 1956-57: Max	6,810	Min 5.8	Mean 272	Cfsm 1.53	In. 20.76

Peak discharge (base, 2,900 cfs).--Dec 7 (10 a.m.) 3,680 cfs (6.27 ft); Jan. 23 (1 p.m.) 7,200 cfs (8.24 ft); Apr. 5 (10 p.m.) 3,740 cfs (6.30 ft); Apr. 26 (9:30 p.m.) 3,260 cfs (6.00 ft); June 30 (7 a.m.) 7,400 cfs (8.33 ft).

* Discharge measurement made on this day.

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 and 4.2 miles downstream from South Branch.

Drainage area.--428 sq mi.

Records available.--November 1939 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 738.74 ft above mean sea level (village of Gowanda bench mark).

Average discharge.--17 years (1940-57), 728 cfs.

Extremes.--Maximum discharge during year, 22,900 cfs Jan. 23 (gage height, 11.64 ft); minimum, 54 cfs Aug. 26 (gage height, 1.88 ft); minimum daily, 98 cfs Aug. 26.

1939-57: Maximum discharge, 35,900 cfs Mar. 17, 1942, from rating curve extended above 6,500 cfs by logarithmic plotting; maximum gage height, 14.14 ft Mar. 7, 1956; minimum discharge, about 6 cfs Aug. 21, 1941; minimum gage height, 0.90 ft Oct. 26, 1951; minimum daily discharge, 52 cfs Sept. 13, 1945, Aug. 1, 1955.

Remarks.--Records good except those for periods of ice effect or partly obstructed intake, which are fair. Diurnal fluctuation at low and medium flow caused by several industrial plants above station.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 22				Jan. 23 to Sept. 30			
2.1	160	5.0	2,980	2.0	83	5.0	2,800
2.5	330	6.0	4,890	2.5	285	6.0	4,830
3.0	640	8.0	9,840	3.0	550	8.0	9,840
3.5	1,030	10.0	16,300	4.0	1,390	10.0	16,300
4.0	1,550						

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	281	192	b700	b640	b640	1,060	592	649	365	550	162	119
2	266	244	710	b600	b580	844	656	*580	583	391	148	117
3	281	271	b740	b660	b600	b700	*675	538	418	335	152	198
4	269	236	940	b700	768	b620	662	508	350	556	147	191
5	251	205	1,150	b600	629	b580	4,560	484	316	4,690	144	207
6	240	204	*7,990	b480	590	b600	8,200	457	312	1,120	142	150
7	894	200	13,600	b560	580	*717	2,460	424	520	610	*136	136
8	781	204	5,190	b540	586	642	1,990	396	408	490	142	121
9	*480	208	2,230	b500	1,250	636	1,470	370	321	468	133	119
10	386	208	b1,500	b470	2,420	b560	1,440	413	290	380	154	*112
11	329	200	1,390	b430	1,080	b540	1,560	574	280	*345	142	121
12	298	211	2,490	b450	664	4,170	2,400	550	345	330	149	112
13	279	268	1,780	b480	*675	2,950	1,520	508	364	462	143	247
14	262	254	1,170	b370	604	1,950	1,270	1,370	835	445	129	220
15	258	234	1,180	b320	562	1,810	1,130	1,840	487	340	127	163
16	254	233	2,080	*b340	526	1,490	1,390	876	340	296	142	142
17	240	223	1,510	b320	479	963	1,560	616	298	280	136	138
18	234	219	1,210	b310	490	775	1,610	544	262	252	119	130
19	226	208	892	b300	b480	752	2,090	1,280	365	240	110	120
20	216	194	868	b320	b440	1,010	1,210	4,280	298	210	110	264
21	221	899	900	b380	b460	909	918	1,970	258	198	110	260
22	213	1,330	1,240	b10,800	452	745	768	1,040	240	225	106	203
23	238	617	1,560	13,900	490	656	710	782	227	793	105	460
24	259	796	1,150	2,540	479	604	689	642	244	380	105	308
25	232	827	1,030	1,660	1,240	556	1,270	538	386	280	100	218
26	214	860	884	1,220	3,160	550	3,140	484	280	248	98	173
27	213	766	804	b920	5,060	592	1,280	452	231	222	101	146
28	208	738	804	b780	1,310	604	1,070	430	304	203	105	129
29	200	738	796	b800	-	598	918	391	3,580	190	119	134
30	198	724	b620	b720	-------	662	752	370	1,130	170	123	123
31	*189	-------	b720	b640	-------	689	-------	424	-------	170	124	-------
Total	9,110	12,711	59,828	43,750	27,294	30,534	49,960	24,780	14,637	15,869	3,963	5,281
Mean	294	424	1,930	1,411	975	985	1,665	799	488	512	128	176
Cfsm	0.687	0.991	4.51	3.30	2.28	2.30	3.89	1.87	1.14	1.20	0.299	0.411
In.	0.79	1.10	5.20	3.80	2.37	2.65	4.34	2.15	1.27	1.38	0.34	0.46

Calendar year 1956: Max 21,200 Min 145 Mean 1,008 Cfsm 2.36 In. 32.05
Water year 1956-57: Max 13,900 Min 98 Mean 816 Cfsm 1.91 In. 25.85

Peak discharge (base, 15,000 cfs).--Dec. 7 (12:15 p.m.) 18,100 cfs (10.47 ft); Jan. 23 (12:30 a.m.) 22,900 cfs (11.64 ft); Apr. 6 (1 a.m.) 17,900 cfs (10.40 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--Partly obstructed intake Apr. 8, 11, 12, 14, 15, Apr. 17 to May 1; discharge computed from reconstructed gage-height graph.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 604.04 ft above mean sea level, unadjusted.

Average discharge.--19 years, 193 cfs.

Extremes.--Maximum discharge during year, 11,400 cfs Jan. 23 (gage height, 8.84 ft), from rating curve extended above 3,200 cfs as explained below; minimum, 6.0 cfs Aug. 28 (gage height, 1.11 ft, backwater from aquatic vegetation).

1938-57: Maximum discharge, 13,000 cfs Mar. 1, 1955, Mar. 7, 1956, from rating curve extended above 3,200 cfs on basis of slope-area determination at gage height 7.07 ft; 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, backwater from aquatic vegetation or debris, or no gage-height record, which are fair. Diurnal fluctuation at low flow caused by mill 3.2 miles above station.

Revisions (water years).--WSP 1337: 1939-52.

Rating tables, water year 1956-57, 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 Feb. 26				Feb. 27 to Sept. 30			
1.3	22	3.0	870	1.1	6	2.2	330
1.5	58	4.0	1,870	1.2	14	2.5	500
1.7	108	5.0	3,260	1.4	42	3.0	870
2.0	214	6.0	4,960	1.6	84	4.0	1,870
2.5	490	7.0	6,950	1.9	185	5.0	3,260

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47	27	190	150	145	220	98	126	72	82	24	14
2	61	38	190	145	150	190	115	106	100	53	22	12
3	90	69	280	185	160	160	143	95	97	42	18	16
4	69	52	582	180	250	130	126	95	*70	90	18	20
5	53	43	*630	145	180	122	1,580	90	61	749	26	21
6	47	37	2,810	106	140	145	2,040	84	55	192	*16	22
7	212	36	2,450	124	135	*220	624	77	60	82	13	19
8	*175	35	1,040	130	130	210	467	70	72	61	12	13
9	96	35	448	*118	680	200	324	63	57	55	12	11
10	69	33	300	100	1,110	160	*495	70	52	48	14	12
11	60	33	310	100	280	145	685	110	48	40	16	14
12	52	33	743	118	125	1,520	798	237	52	36	19	13
13	47	36	360	102	*155	802	395	145	53	39	18	19
14	45	40	210	94	127	436	310	131	94	46	17	50
15	43	38	180	92	118	372	259	430	70	40	14	36
16	41	38	418	100	102	335	252	168	50	*32	13	31
17	39	35	312	92	86	194	279	106	42	a31	12	21
18	38	36	240	86	100	154	301	84	39	a29	11	*18
19	36	34	135	84	102	150	436	1,040	36	a24	10	16
20	35	33	160	90	86	317	245	3,040	36	a20	9.6	18
21	35	251	189	220	92	235	177	*628	33	a18	9.2	35
22	35	591	317	5,600	90	162	143	275	30	a22	9.2	44
23	35	175	405	5,170	112	136	126	194	29	a147	8.8	94
24	36	165	246	640	114	122	125	146	39	a66	8.0	68
25	35	170	269	400	720	106	1,210	119	46	a40	8.8	44
26	32	180	200	280	1,580	101	1,070	106	41	31	8.8	29
27	30	175	180	205	2,070	101	306	106	33	26	8.8	22
28	29	175	198	200	260	101	325	92	43	24	7.6	19
29	28	175	190	190	-	98	241	82	321	31	9.2	17
30	*27	180	140	180	-------	115	154	75	227	28	13	16
31	27	--------	160	160	-------	126	--------	72	---------	25	13	----- --
Total	1,704	2,998	14,482	15,586	9,399	7,585	13,849	8,262	2,058	2,249	419.0	784
Mean	55.0	99.9	467	503	336	245	462	267	68.6	72.5	13.5	26.1
Cfsm	0.379	0.689	3.22	3.47	2.32	1.69	3.19	1.84	0.473	0.500	0.093	0.180
In.	0.44	0.77	3.71	4.00	2.41	1.95	3.55	2.12	0.53	0.58	0.11	0.20

Calendar year 1956: Max 7,650 Min 8.0 Mean 264 Cfsm 1.82 In. 24.74
Water year 1956-57: Max 5,600 Min 7.6 Mean 217 Cfsm 1.50 In. 20.37

Peak discharge (base, 6,000 cfs).--Jan. 23 (2:30 a.m.) 11,400 cfs (8.84 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated from reconstructed gage-height graph based on observer's inspections and records for Cazenovia Creek at Ebenezer.

Note.--Backwater from debris Oct. 12 to Nov. 2. Stage-discharge relation affected by ice Nov. 23 to Dec. 3, Dec. 10, 11, 13-15, 18, 19, 26, 27, Dec. 29 to Jan. 22, Jan. 24 to Feb. 9, Feb. 11-25, Feb. 28 to Mar. 11. Backwater from aquatic vegetation Aug. 28 to Sept. 21, Sept. 26-30.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 672.80 ft above mean sea level, unadjusted.

Average discharge.--19 years, 128 cfs.

Extremes.--Maximum discharge during year, 7,460 cfs Jan. 22 (gage height, 9.33 ft); minimum, 1.0 cfs Aug. 24, 25 (gage height, 2.835 ft).

1938-57: Maximum discharge, 8,700 cfs Mar. 7, 1956; 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 good except those for periods of ice effect or backwater from debris, which are fair.

Revisions (water years).--WSP 1437: 1955.

Rating tables, water year 1956-57, except periods of ice effect or backwater from debris (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 22			
3.3	10	4.7	278
3.7	21	5.0	463
3.9	29	5.5	868
4.0	35	6.0	1,430
4.1	48	7.0	3,120
4.2	69	8.0	5,050
4.4	137		

Jan. 23 to Sept. 30			
2.8	0.6	3.8	28
2.9	1.8	4.0	43
3.0	3.5	4.2	80
3.1	5.9	4.5	181
3.5	18	5.0	463

Note.--Same as preceding table above 5.0 ft.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	16	114	94	125	165	61	80	36	31	7.8	2.2
2	52	21	110	94	130	138	79	71	60	19	5.6	2.1
3	84	27	153	130	140	108	89	63	55	16	5.1	4.7
4	55	22	385	125	200	106	84	61	36	27	c14	c5.0
5	40	20	*468	98	165	102	1,070	59	*28	73	c6.2	c4.5
6	34	18	1,130	72	112	*120	1,120	52	24	52	c4.7	c3.0
7	235	17	963	82	110	177	388	46	27	22	*c3.8	c2.7
8	*126	18	618	94	98	177	236	41	26	20	3.1	c2.3
9	64	17	209	88	600	153	174	36	22	33	3.0	c2.0
10	45	16	158	*66	800	120	*352	43	19	19	4.1	c1.9
11	37	16	187	66	200	117	611	77	18	14	4.5	c3.4
12	33	16	391	79	98	1,320	644	180	23	11	4.6	c2.9
13	30	16	169	68	120	453	297	92	21	16	4.1	c4.7
14	27	16	82	64	*90	239	204	80	24	13	3.6	c4.8
15	26	16	88	62	80	200	162	217	22	13	2.9	c3.6
16	24	16	214	66	70	180	169	101	17	*9.4	2.4	c5.4
17	23	15	150	60	50	114	225	69	16	8.8	2.1	c4.3
18	21	14	114	58	74	96	190	59	14	7.6	1.9	*c3.2
19	20	14	60	56	72	99	266	710	13	6.5	1.8	2.6
20	20	14	76	60	58	250	138	2,600	12	5.8	1.5	3.1
21	20	130	110	145	64	149	102	*436	10	5.1	1.5	5.5
22	19	312	205	4,800	62	104	85	186	9.7	11	1.4	8.6
23	19	134	217	2,710	88	91	76	134	8.2	22	1.3	18
24	20	86	150	475	89	78	77	102	12	14	1.1	17
25	18	82	171	270	563	69	725	79	21	9.1	1.2	8.7
26	17	88	121	200	1,160	67	709	73	15	7.5	1.4	6.3
27	16	91	106	160	1,590	71	174	76	10	6.3	1.3	4.8
28	17	94	118	175	190	69	232	63	22	5.6	1.3	4.0
29	16	92	110	165	-	67	148	55	154	5.9	1.4	3.6
30	*16	98	48	155		78	101	46	72	18	2.3	3.3
31	16		98	140		69		40		11	2.2	
Total	1,235	1,552	7,293	10,977	7,198	5,346	8,988	6,027	846.9	532.6	103.2	148.2
Mean	39.8	51.7	235	354	257	172	300	194	28.2	17.2	3.33	4.94
Cfsm	0.427	0.554	2.52	3.79	2.75	1.84	3.22	2.08	0.302	0.184	0.036	0.053
In.	0.49	0.62	2.91	4.38	2.87	2.13	3.58	2.40	0.34	0.21	0.04	0.06

Calendar year 1956:	Max 4,740	Min 3.6	Mean 184	Cfsm 1.97	In. 26.86
Water year 1956-57:	Max 4,800	Min 1.1	Mean 138	Cfsm 1.48	In. 20.03

Peak discharge (base, 3,300 cfs).--Jan. 22 (9:30 p.m.) 7,460 cfs (9.33 ft); Feb. 26 (9:45 p.m.) 3,410 cfs (7.16 ft); May 20 (10:15 a.m.) 3,690 cfs (7.31 ft).

* Discharge measurement made on this day.

c Backwater from debris.

Note.--Stage-discharge relation affected by ice Nov. 24, 25, 28-30, Dec. 14, 18, 19, 29-31, Jan. 2-8, 10, 11, 13-22, Jan. 25 to Feb. 5, Feb. 8-22, 28, Mar. 3-6, 10.

Cazenovia Creek at Ebenezer, N. Y.

Location.--Lat 42°49'45", long 78°46'40", on right bank 30 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 1957.

Gage.--Water-stage recorder. Datum of gage is 604.86 ft above mean sea level, unadjusted. Prior to Apr. 4, 1955, at datum 2 ft higher than present datum. Apr. 4 to Oct. 12, 1955, wire-weight gage at temporary site 1.3 miles downstream at different datum, during period of construction of highway bridge.

Average discharge.--17 years, 221 cfs.

Extremes.--Maximum discharge during year, 12,100 cfs Jan. 22 (gage height, 14.09 ft), from rating curve extended above 630 cfs by logarithmic plotting; minimum, 5.3 cfs Aug. 26 (gage height, 2.02 ft, backwater from aquatic vegetation).

1940-57: Maximum discharge, 13,500 cfs Mar. 1, 1955 (gage height, 13.82 ft, datum then in use), from rating curve extended above 7,700 cfs by logarithmic plotting; minimum, 2.6 cfs Nov. 7, 1953; minimum gage height, 0.42 ft Aug. 25, 1941, Aug. 17, 1950 (datum then in use).

Remarks.--Records good except those for periods of ice effect or backwater from aquatic vegetation or debris, which are fair.

Rating table, water year 1956-57, except periods of ice effect or backwater from aquatic vegetation or debris (gage height, in feet, and discharge, in cubic feet per second)

2.0	5.0	3.5	457
2.1	11	4.0	760
2.2	21	6.0	2,260
2.5	72	8.0	4,180
2.9	182	11.0	7,710

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	21	205	155	175	302	111	163	81	118	31	12
2	49	29	205	150	180	234	136	141	98	77	20	10
3	62	45	300	190	190	190	172	127	105	62	17	19
4	56	35	545	190	280	180	141	116	77	133	18	20
5	49	29	*687	150	220	150	1,910	111	*64	1,000	15	24
6	43	27	3,540	108	175	*160	2,610	103	56	258	14	22
7	136	26	3,900	124	165	218	728	93	92	121	*14	14
8	*122	27	1,480	135	160	207	523	86	103	88	13	11
9	77	26	540	*118	960	200	381	79	68	74	14	9.2
10	58	23	320	102	1,320	170	*507	93	50	60	16	9.8
11	47	22	330	102	350	155	675	134	45	49	16	13
12	43	22	751	120	180	1,910	882	196	46	45	17	12
13	40	24	365	106	*189	1,020	424	116	51	51	16	20
14	38	29	200	98	153	598	336	125	105	61	14	40
15	36	29	176	94	141	577	271	346	92	47	12	31
16	34	28	444	104	102	418	326	169	63	*38	11	27
17	32	27	338	94	100	234	408	121	49	34	12	17
18	30	27	275	90	116	186	389	105	45	30	12	*14
19	29	24	160	86	120	179	599	1,170	42	27	9.8	12
20	29	24	170	92	98	362	276	3,160	38	24	9.4	15
21	27	370	213	230	106	250	200	*726	37	23	9.2	44
22	27	724	315	7,000	100	193	166	298	35	29	8.4	47
23	28	220	402	5,400	124	163	141	207	34	144	7.6	145
24	27	210	271	900	130	147	150	163	36	74	7.2	86
25	27	220	313	500	737	130	1,310	127	46	44	7.4	50
26	24	214	210	326	1,820	124	1,750	124	55	34	8.0	33
27	22	204	189	267	2,790	124	391	113	38	29	12	23
28	22	195	204	220	392	124	430	103	38	26	9.2	19
29	22	195	195	211	-	118	289	90	1,130	34	12	17
30	21	200	145	205		130	196	79	336	32	13	15
31	*21		165	190		124		74		58	13	
Total	1,320	3,296	17,553	17,855	11,591	9,277	16,828	8,858	3,155	2,924	408.2	831.0
Mean	42.6	110	566	576	414	299	561	286	105	94.3	13.2	27.7
Cfsm	0.313	0.809	4.16	4.24	3.04	2.20	4.12	2.10	0.772	0.693	0.097	0.204
In.	0.36	0.90	4.80	4.88	3.17	2.54	4.60	2.42	0.86	0.80	0.11	0.23

Calendar year 1956: Max 7,560 Min 9.6 Mean 298 Cfsm 2.19 In. 29.82
Water year 1956-57: Max 7,000 Min 7.2 Mean 257 Cfsm 1.89 In. 25.67

Peak discharge (base, 5,300 cfs).--Jan. 22 (10:30 p.m.) 12,100 cfs (14.09 ft); Apr. 6 (1:30 a.m.) 5,900 cfs (9.54 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23-25, Nov. 28 to Dec. 2, Dec. 9, 10, 14, 18-20, 26, Dec. 29 to Jan. 25, Jan. 28, Jan. 30 to Feb. 9, Feb. 11, 12, 16-24, Mar. 3-6, 10, 11 (no gage-height record Jan. 4, 5, 23-26). Backwater from debris Oct. 11 to Nov. 21 (partly obstructed intake Nov. 21). Backwater from aquatic vegetation Aug. 13 to Sept. 30.

Niagara River at Buffalo, N. Y.

Location.--Lat 42°52'40", long 78°53'25", at head of Niagara River at Buffalo.

Drainage area.--260,400 sq mi.

Records available.--January 1905 to September 1957 in reports of Geological Survey (prior to October 1935, monthly discharge only). January 1860 to December 1904 in files of U. S. Lake Survey.

Gage.--Flow computed by means of several U. S. Lake Survey gages on river.

Average discharge.--98 years (January 1860 to September 1957), 203,000 cfs.

Extremes.--Maximum daily discharge during year, 242,000 cfs June 29; minimum daily, 168,000 cfs Mar. 25.

1935-57: Maximum daily discharge, 274,000 cfs Nov. 17, 1955; minimum daily, 100,000 cfs Feb. 6, 7, 1936.

1860-1957: Maximum monthly discharge, 254,000 cfs July 1862; minimum monthly, 117,000 cfs February 1936.

Remarks.--Records do not include water diverted from Lake Michigan by Illinois and Michigan Canal during period of its operation prior to 1910 and by Chicago Sanitary and Ship Canal, operation of which began in 1900, and from Lake Erie by Welland and Black Rock Canals. They include water diverted into Lake Superior from Hudson Bay drainage by the Long Lake project, operation of which began in July 1939, and by the Ogoki project, operation of which began in July 1943. The diversions into Lake Superior have averaged about 5,000 cfs since July 1943.

Cooperation.--Records of daily discharge furnished by Corps of Engineers.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	202	193	195	196	177	188	187	203	205	212	207	200
2	209	194	190	195	181	197	188	198	207	211	209	202
3	201	191	198	192	182	189	180	199	204	216	215	210
4	205	190	180	204	183	183	171	204	205	206	207	212
5	194	190	187	182	180	180	194	204	204	223	207	204
6	205	193	186	190	180	180	226	205	204	215	210	199
7	223	199	187	194	182	183	197	206	204	211	207	198
8	220	207	174	189	178	180	183	205	198	214	208	195
9	203	205	190	183	182	192	205	205	200	216	207	186
10	200	191	194	178	183	189	203	202	203	216	205	200
11	203	201	205	200	175	181	199	199	206	212	207	196
12	199	206	202	201	179	197	208	202	206	211	202	198
13	201	202	182	180	187	185	207	201	206	212	203	203
14	199	192	172	189	186	182	210	201	206	213	211	195
15	198	193	188	160	183	192	198	205	206	207	203	201
16	198	237	192	194	196	200	201	199	205	211	201	202
17	197	191	193	187	190	187	199	198	205	206	205	195
18	189	188	191	194	184	180	199	195	204	207	201	192
19	187	188	196	185	184	181	199	187	214	210	202	196
20	198	189	187	183	182	198	203	194	208	211	203	198
21	197	227	187	179	180	195	202	200	205	214	195	198
22	195	222	184	180	180	185	198	205	206	216	195	201
23	197	198	184	186	181	187	200	208	207	204	201	211
24	176	193	201	182	178	185	200	208	203	206	205	203
25	189	182	199	179	179	168	201	205	212	212	208	205
26	194	189	196	189	175	182	200	211	205	207	205	194
27	196	198	207	194	174	187	201	213	207	209	199	193
28	189	210	188	180	173	188	203	208	210	209	197	192
29	193	198	190	184	-	189	206	202	242	211	199	192
30	194	193	193	183	--------	190	202	202	223	211	200	197
31	192	--------	207	180	--------	184	--------	202	--------	211	199	--------
Total	6,143	5,950	5,925	5,812	5,074	5,784	5,970	6,276	6,220	6,550	6,323	5,968
Mean	198	198	191	187	181	187	199	202	207	211	204	199
Cfsm	0.760	0.760	0.733	0.718	0.695	0.718	0.764	0.776	0.795	0.810	0.783	0.764
In.	0.88	0.85	0.85	0.83	0.72	0.83	0.85	0.90	0.89	0.94	0.90	0.85

Calendar year 1956: Max 260 Min 164 Mean 202 Cfsm 0.776 In. 10.54
Water year 1956-57: Max 242 Min 168 Mean 197 Cfsm 0.757 In. 10.29

Note.--All figures of discharge are expressed in thousands of cubic feet per second.

Scajaquada Creek at Buffalo, N. Y.

Location.--Lat 42°54'40", long 78°47'45", on right bank 58 ft upstream from point where stream goes underground in concrete-lined tunnel, 86 ft upstream from Pine Ridge Road, and 0.16 mile east of boundary line of city of Buffalo, Erie County.

Drainage area.--15.7 sq mi.

Records available.--February to September 1957.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during period February to September, 746 cfs May 20 (gage height, 5.98 ft); minimum, 5.8 cfs Sept. 2 (gage height, 1.49 ft, may have been lower during period of partly obstructed intake).

Remarks.--Records good except those for periods of fragmentary gage-height record or partly obstructed intake, which are fair.

Rating table, Feb. 26 to Sept. 30, 1957 (gage height, in feet, and discharge, in cubic feet per second)

1.5	6.0	2.4	79
1.7	11	3.0	184
1.9	19	4.0	369
2.1	38	5.0	552

Discharge, in cubic feet per second, February to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					-	26	12	11	9.1	10	10	7.4
2					-	20	26	11	15	8.7	9.4	8.1
3					-	18	18	10	9.4	11	10	13
4					-	16	39	10	*9.2	20	17	14
5					-	14	240	9.0	9.2	30	9.4	9.2
6					-	*14	163	9.7	9.2	12	*9.0	9.4
7					-	19	74	9.4	9.2	10	8.6	9.2
8					-	31	31	9.4	9.2	10	8.4	8.4
9					-	42	48	9.4	8.4	10	9.0	9.0
10					-	37	*59	19	9.2	10	11	11
11					-	35	73	23	11	10	10	12
12					-	141	93	14	11	10	9.4	9.6
13					-	52	54	12	9.2	15	8.8	12
14					-	24	25	16	9.4	9.2	8.4	10
15					-	20	18	14	9.0	9.4	8.2	9.4
16					-	16	14	12	8.0	*9.2	8.0	13
17					-	13	15	11	9.0	9.2	7.8	10
18					-	12	19	10	9.7	9.2	7.6	8.2
19					-	17	22	112	11	9.2	7.4	*7.4
20					-	43	18	*506	9.0	9.0	7.4	8.6
21					-	28	13	78	8.7	9.0	7.4	11
22					-	17	12	27	9.0	28	7.4	21
23					-	14	11	16	8.0	11	7.4	26
24					-	12	18	13	13	9.2	7.2	14
25					-	12	142	11	12	9.2	8.4	11
26					f208	12	136	10	9.2	9.4	8.2	10
27					f241	11	32	11	9.2	9.2	8.0	9.2
28					*41	11	17	10	38	8.0	8.4	8.6
29					-	12	14	9.7	54	23	9.2	8.2
30						13	12	9.0	14	14	9.0	8.0
31						11		9.2		12	8.2	
Total					-	763	1,468	1,041.8	368.5	373.1	273.6	325.9
Mean					-	24.6	48.9	33.6	12.3	12.0	8.83	10.9
Cfsm					-	1.57	3.11	2.14	0.783	0.764	0.562	0.694
In.					-	1.81	3.48	2.47	0.87	0.88	0.65	0.77

Calendar year 1956: Max - Min - Mean - Cfsm - In. -
Water year 1956-57: Max 506 Min 7.2 Mean 23.5 Cfsm 1.50 In. 12.09

* Discharge measurement made on this day.

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

Note.--Partly obstructed intake Aug. 4-27, Sept. 11-30; discharge computed on basis of discharge measurements, weather records, engineers' notes, and records for nearby stations.

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, 7 miles upstream from mouth.

Drainage area.--22.0 sq mi.

Records available.--July 1912 to September 1957.

Gage.--Water-stage recorder. Concrete control since Oct. 15, 1930. Datum of gage is 1,081.62 ft above mean sea level, datum of 1929. Prior to Aug. 26, 1943, staff gage at same site and datum.

Average discharge.--44 years (1912-19, 1920-57), 27.6 cfs.

Extremes.--Maximum discharge during year, 1,500 cfs Jan. 22 (gage height, 10.07 ft); minimum, 0.6 cfs Sept. 8, 9 (gage height, 0.275 ft).

1912-57: Maximum discharge, 2,700 cfs Mar. 7, 1956 (gage height, 16.04 ft, from high-water mark); minimum, 0.08 cfs Aug. 3, 4, 1955 (gage height, 0.145 ft, backwater from aquatic vegetation and debris).

Remarks.--Records excellent except those for discharges below 2 cfs, which are good, and those for periods of ice effect or no gage-height record, which are fair.

Revisions (water years).--WSP 564: 1919(M). WSP 729: 1931.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 22

0.5	2.7	2.0	68
.7	6.5	3.0	157
1.1	19	5.0	437
1.5	38	7.0	822

Jan. 23 to Sept. 30

0.25	0.4	1.5	37
.3	.7	2.0	64
.4	1.6	3.0	156
.5	2.8	5.0	437
.7	6.3	7.0	822
1.0	15		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.2	3.0	13	b19	24	45	16	23	11	9.3	2.1	0.8
2	5.2	3.1	13	b17	22	38	20	19	18	6.5	1.9	.8
3	6.1	3.2	*16	b20	23	b33	19	17	14	5.5	a1.8	1.0
4	*5.9	3.5	28	b19	33	*b29	17	16	11	6.3	a1.7	1.0
5	a5.6	3.4	31	b17	b24	b25	260	15	9.9	18	a1.6	.8
6	a5.2	3.4	136	b14	b20	b26	254	13	9.3	11	1.6	.8
7	a15	3.2	116	b17	21	31	103	12	9.6	7.3	1.6	.7
8	a12	3.1	78	16	20	28	*71	10	9.0	5.7	1.6	.6
9	a8.6	2.9	43	15	90	28	58	9.9	8.0	5.9	1.5	.6
10	a7.3	2.8	33	b14	111	25	67	14	7.0	4.8	1.7	.7
11	a6.3	2.8	37	*b15	b38	b23	128	30	*6.3	3.8	1.7	.8
12	5.7	2.9	74	b14	b24	219	130	60	6.3	3.6	1.6	1.0
13	5.2	3.2	42	b13	26	132	72	*33	5.9	16	1.5	1.2
14	4.9	3.6	25	b12	23	91	59	38	6.8	9.6	1.3	1.1
15	4.6	3.6	28	b12	*21	80	50	76	6.1	5.8	1.2	1.1
16	4.3	3.6	54	b13	20	56	49	37	5.1	4.6	1.3	*.9
17	3.9	3.5	38	b12	b17	38	64	25	4.4	3.7	1.2	.9
18	3.9	3.3	31	b11	b17	32	58	20	4.1	*3.4	1.1	.8
19	3.8	3.3	b18	b11	b17	33	67	242	3.9	3.1	1.1	.7
20	3.7	3.2	19	b12	b16	50	44	656	4.3	2.8	1.1	1.0
21	3.8	16	29	b22	b15	38	34	122	3.5	2.6	1.0	1.0
22	3.8	28	51	b740	b15	32	29	64	3.3	5.9	1.0	1.3
23	3.7	b16	51	523	19	28	27	50	3.0	9.0	1.0	2.1
24	3.7	b13	38	b96	20	24	26	38	3.3	4.4	.8	1.6
25	3.4	b12	36	b64	120	21	70	31	3.4	3.4	.8	1.2
26	3.6	13	26	b47	239	21	76	29	3.0	3.0	.9	1.2
27	3.4	13	25	b37	300	21	41	24	3.0	2.8	.8	1.0
28	3.3	13	25	b33	b52	19	51	20	5.7	2.6	.9	1.0
29	*3.2	14	b24	31	-	19	36	17	39	2.4	.8	1.0
30	3.2	13	b17	28	-------	20	27	14	18	2.2	1.0	.8
31	3.0	-------	21	b26	-------	b16	-------	13	-------	2.2	.9	-------
Total	160.5	215.6	1,216	1,940	1,387	1,321	2,023	1,787.9	245.2	177.2	40.1	29.5
Mean	5.18	7.19	39.2	62.6	49.5	42.6	67.4	57.7	8.17	5.72	1.29	0.98
Cfsm	0.235	0.327	1.78	2.85	2.25	1.94	3.06	2.62	0.371	0.260	0.059	0.045
In.	0.27	0.36	2.06	3.28	2.34	2.23	3.42	3.02	0.41	0.30	0.07	0.05

Calendar year 1956: Max 1,260 Min 1.2 Mean 37.0 Cfsm 1.68 In. 22.91
Water year 1956-57: Max 740 Min 0.6 Mean 28.9 Cfsm 1.31 In. 17.81

Peak discharge (base, 530 cfs).--Jan. 22 (10:30 p.m.) 1,500 cfs (10.07 ft); Feb. 26 (10:30 p.m.) 711 cfs (6.47 ft); Apr. 5 (11:45 p.m.) 835 cfs (7.06 ft); May 20 (2:45 a.m.) 1,100 cfs (8.25 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage, observer's notes, and records for nearby stations.
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 1957.

Gage.--Water-stage recorder and concrete control. Datum of gage is 876.01 ft above mean sea level (city of Batavia bench mark).

Average discharge.--13 years, 204 cfs.

Extremes.--Maximum discharge during year, 7,790 cfs Jan. 23 (gage height, 11.72 ft), from rating curve extended above 3,000 cfs on basis of contracted-opening determination of peak flow; minimum, 8.8 cfs Aug. 27 (gage height, 1.285 ft).

1944-57: Maximum discharge, 8,420 cfs Mar. 7, 1956 (gage height, 12.07 ft), from rating curve extended above 3,000 cfs on basis of contracted-opening determination of peak flow; maximum gage height, 13.85 ft Apr. 6, 1947; minimum discharge, 0.4 cfs Aug. 5, 6, 7, 1955; 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, and doubtful or no gage-height record, which are fair. Slight regulation at low flow by plants above station.

Rating tables, water year 1956-57, 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 May 20

1.5	22	5.0	1,740
1.7	47	8.0	3,450
2.0	107	10.0	5,220
2.4	236	12.0	8,290
3.0	545		

May 21 to Sept. 30

1.2	5.5	1.5	24
1.3	9.5	1.7	48
1.4	16	2.0	107

Note.--Same as preceding table above 2.0 ft.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	c70	40	143	143	195	453	120	181	100	96	21	15
2	c70	40	140	120	174	301	126	152	120	59	17	13
3	c100	49	152	123	161	236	158	134	129	47	16	14
4	*c88	47	*280	134	231	198	131	129	96	58	18	20
5	c72	41	315	129	216	*181	436	120	82	257	*17	20
6	c62	39	708	112	178	184	2,240	110	72	253	16	21
7	c165	37	1,330	120	178	232	1,250	100	72	93	14	16
8	c230	37	1,340	120	164	213	690	93	80	64	14	13
9	c116	36	684	118	260	213	*432	86	68	59	14	12
10	c84	36	359	b110	904	188	468	89	60	53	18	12
11	c72	34	301	*102	679	178	605	146	*58	42	19	12
12	c66	34	545	105	248	586	1,000	324	54	39	19	14
13	c64	39	422	107	221	1,600	a720	*216	60	66	18	17
14	c60	44	233	96	184	794	a420	155	72	70	17	42
15	c58	41	195	b88	*167	533	a310	426	70	54	14	31
16	c54	39	354	b90	149	509	a280	245	52	40	14	*21
17	c52	36	347	b84	126	301	a300	158	43	*37	13	18
18	c50	36	253	b82	126	232	a330	126	38	32	12	16
19	c50	34	164	b82	131	209	a400	325	39	28	11	14
20	c50	34	164	84	110	322	a350	2,330	45	26	12	15
21	c49	56	176	96	120	327	270	2,500	38	25	12	20
22	c54	383	283	1,330	112	236	221	807	33	32	11	32
23	c52	194	457	6,690	143	202	198	417	31	75	11	66
24	c52	131	296	2,720	140	174	195	278	33	51	10	62
25	c52	126	278	d971	397	152	641	209	35	32	10	39
26	c46	155	225	539	1,100	143	852	178	38	26	9.8	27
27	c43	143	191	339	2,380	143	521	164	31	25	9.5	21
28	c41	143	184	257	1,060	137	406	140	43	24	9.2	19
29	*c40	140	188	244	-	131	322	126	184	21	10	18
30	39	131	b120	225	-------	140	225	110	227	32	12	17
31	40	-------	134	188	-------	134	-------	100	-------	29	15	-------
Total	2,141	2,375	10,961	15,748	10,254	9,582	14,617	10,674	2,103	1,846	433.5	677
Mean	69.1	79.2	354	508	366	309	487	344	70.1	59.5	14.0	22.6
Cfsm	0.402	0.460	2.06	2.95	2.13	1.80	2.83	2.00	0.408	0.346	0.081	0.131
In.	0.46	0.51	2.37	3.41	2.22	2.07	3.16	2.31	0.45	0.40	0.09	0.15

Calendar year 1956: Max 5,560 Min 16 Mean 294 Cfsm 1.71 In. 23.28
Water year 1956-57: Max 6,690 Min 9.2 Mean 223 Cfsm 1.30 In. 17.60

Peak discharge (base, 1,800 cfs).--Jan. 23 (1 p.m.) 7,790 cfs (11.72 ft); Feb. 27 (3 p.m.) 3,000 cfs (7.28 ft); Mar. 13 (7:15 a.m.) 2,020 cfs (5.52 ft); Apr. 6 (2:30 p.m.) 3,040 cfs (7.35 ft); May 20 (10:30 p.m.) 3,880 cfs (8.57 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for upstream and downstream stations.

b Stage-discharge relation affected by ice.

c Backwater from aquatic vegetation and debris.

d Doubtful gage-height record; discharge estimated on basis of reconstructed gage-height record.

Note.--Backwater from aquatic vegetation June 4-28, July 25 to Aug. 5.

Tonawanda Creek near Alabama, N. Y.

Location.--Lat 43°05'25", long 78°27'15", near center of span on upstream side of highway bridge on Meadville Road, 0.4 mile downstream from canal feeder connecting Tonawanda and Oak Orchard Creeks, 1.1 miles upstream from small tributary, and 3.2 miles west of Alabama, Genesee County.

Drainage area.--230 sq mi.

Records available.--October 1955 to September 1957.

Gage.--Wire-weight gage read twice daily; crest-stage indicator since Sept. 5, 1956.

Extremes.--Maximum discharge during year, 6,180 cfs Jan. 24 (gage height, 13.69 ft, from graph based on gage readings for preceding and subsequent days); minimum daily, 14 cfs Aug. 28, 29.

1955-57: Maximum discharge, 6,860 cfs Mar. 8, 1956 (gage height, 13.92 ft, from graph based on gage readings); minimum daily, 10 cfs Oct. 4, 5, 1955.

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

Rating tables, water year 1956-57, 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	
5.4	44	9.0	1,250	5.0	9.3
5.7	83	10.0	1,750	5.3	38
6.0	131	11.0	2,320	5.6	74
6.5	232	12.0	3,160	6.0	140
7.0	370	13.0	4,600	7.0	377
8.0	750	14.0	7,100	8.0	750

Note.--Same as preceding table above 8.0 ft.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	92	54	180	195	350	828	176	274	122	169	42	15
2	90	55	174	195	300	490	195	222	133	94	31	17
3	96	57	172	190	320	380	195	191	178	68	27	21
4	131	72	*245	195	340	330	187	176	140	69	27	21
5	*106	64	409	190	400	*280	323	162	115	103	*25	23
6	88	59	601	180	350	270	1,750	148	98	378	24	25
7	117	55	1,320	170	320	310	2,240	124	93	167	23	27
8	319	56	1,640	170	300	341	1,010	127	99	96	d22	27
9	204	54	1,120	170	290	325	*624	117	93	78	d22	23
10	126	54	506	*155	450	314	628	115	*81	68	23	23
11	101	51	412	145	1,400	306	810	131	75	55	d26	21
12	86	51	506	160	1,300	419	1,120	261	78	53	d27	19
13	82	54	645	160	800	1,840	a1,160	309	73	59	d27	21
14	80	57	399	155	*420	1,280	692	*238	75	119	d26	21
15	77	61	302	145	310	777	494	389	102	87	d25	37
16	70	61	279	130	250	692	444	259	81	62	25	49
17	66	54	452	125	240	479	494	233	65	*50	23	*32
18	64	51	351	130	210	352	632	172	57	44	21	26
19	61	50	274	120	200	312	624	213	53	38	20	24
20	61	49	198	115	190	386	512	1,650	51	34	18	25
21	60	56	216	115	185	516	371	3,600	59	33	19	25
22	59	189	305	560	180	366	299	1,550	50	35	17	31
23	66	360	514	a2,680	195	299	264	647	46	53	17	48
24	64	196	456	a5,350	205	259	245	415	44	78	16	76
25	61	160	345	a3,240	376	231	819	a299	50	57	16	62
26	65	180	319	2,000	1,180	200	1,290	249	45	42	15	47
27	61	172	266	1,200	2,270	195	905	236	45	35	15	37
28	59	176	246	800	1,700	191	494	209	51	33	14	28
29	*54	176	251	540	-	187	477	174	106	32	14	26
30	54	190	180	450	-------	184	346	150	290	31	15	25
31	55	-------	180	380	-------	178	-------	135	-------	53	15	-------
Total	2,775	2,974	13,463	20,510	15,031	13,517	19,820	13,175	2,648	2,373	677	902
Mean	89.5	99.1	434	662	537	436	661	425	88.3	76.5	21.8	30.1
Cfsm	0.389	0.431	1.89	2.88	2.33	1.90	2.87	1.85	0.384	0.333	0.095	0.131
In.	0.45	0.48	2.18	3.32	2.43	2.19	3.20	2.13	0.43	0.38	0.11	0.15

Calendar year 1956:	Max 6,370	Min 26	Mean 377	Cfsm 1.64	In. 22.32
Water year 1956-57:	Max 5,350	Min 14	Mean 296	Cfsm 1.29	In. 17.45

Peak discharge (base, 2,100 cfs).--Jan. 24 (8 a.m.) 6,180 cfs (13.69 ft); Feb. 27 (6:30 p.m.) 2,720 cfs (11.52 ft); Mar. 13 (2:30 p.m.) 2,280 cfs (10.94 ft); Apr. 7 (2:15 a.m.) 3,330 cfs (12.14 ft); May 21 (3:30 p.m.) 4,260 cfs (12.80 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for nearby stations.

d Doubtful gage-height record; discharge computed on basis of record for adjacent days and records for nearby stations.

Note.--Stage-discharge relation affected by ice Dec. 30 to Jan. 22, Jan. 26 to Feb. 24, Mar. 2-7 (no gage-height record Jan. 15, 19, Feb. 16, 22, 23).

Tonawanda Creek at Rapids, N. Y.

Location.--Lat 43°05'35", long 78°38'05", on right bank at downstream side of highway bridge at Rapids, Niagara County, 4¼ miles downstream from Beeman Creek, 4.7 miles east of Pendleton, and 5¾ miles upstream from Mud Creek.

Drainage area.--358 sq mi.

Records available.--August 1955 to September 1957.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 5,210 cfs Jan. 25 (gage height, 15.46 ft); minimum, 18 cfs Aug. 28; minimum gage height, 1.27 ft Sept. 30.
1955-57: Maximum discharge, that of Jan. 25, 1957; minimum, 16 cfs Oct. 5, 1955; minimum gage height, 1.27 ft Oct. 5, 1955, Sept. 30, 1957.

Remarks.--Records good except those for periods of ice effect or backwater from aquatic vegetation or debris, which are fair.

Rating tables, water year 1956-57, except periods of ice effect or backwater from aquatic vegetation and/or debris (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 25				Jan. 26 to Sept. 30			
1.4	53	5.0	1,260	1.1	10	3.0	513
1.7	119	10.0	3,030	1.3	36	5.0	1,190
2.0	211	15.0	5,000	1.6	94	10.0	3,000
3.0	560			2.0	201	15.0	5,000

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	c170	70	208	b290	b680	3,030	234	442	189	270	64	23
2	c150	70	218	b280	b560	1,770	228	350	184	210	56	24
3	c140	72	221	b240	510	869	228	297	195	140	46	29
4	c140	72	*242	b260	426	b540	261	261	210	110	41	30
5	*c160	79	336	b250	493	*470	400	234	189	106	39	29
6	c140	81	469	b220	562	445	997	219	161	145	*36	28
7	c140	74	775	221	445	435	2,050	201	141	320	34	29
8	c175	72	1,440	221	397	490	2,640	184	131	205	33	32
9	c310	68	1,810	218	448	516	*1,810	169	126	130	33	32
10	c270	68	1,670	*b210	961	493	1,140	164	*123	108	33	29
11	c200	70	1,020	b200	1,400	464	993	175	113	94	34	27
12	c155	68	690	185	1,700	680	1,220	228	106	86	36	27
13	c135	66	704	b190	1,100	1,220	1,650	341	104	76	36	25
14	c122	68	746	b200	589	2,020	1,640	*356	104	84	36	24
15	c116	70	539	b185	432	1,950	1,090	294	101	108	34	23
16	c108	72	427	b170	b370	1,230	748	381	113	114	34	33
17	c102	72	455	b165	b330	891	636	400	104	*102	33	*50
18	c92	70	542	b170	b290	629	615	285	88	86	32	39
19	c88	66	462	b155	b270	483	697	240	78	72	30	32
20	c84	66	378	b150	b260	477	687	904	70	64	27	30
21	c78	68	322	b150	240	559	615	2,150	68	56	26	29
22	c78	94	326	b700	237	592	467	3,260	72	52	24	31
23	c80	268	413	2,860	255	483	384	2,900	66	54	23	36
24	c80	378	567	3,640	285	397	341	1,490	62	66	22	52
25	83	280	546	4,980	448	347	592	683	60	94	22	84
26	81	231	476	4,740	*1,120	303	1,770	426	62	78	22	83
27	81	231	438	3,640	2,470	279	1,900	338	64	62	21	61
28	81	221	388	2,210	2,970	267	1,460	303	70	52	19	46
29	76	214	378	1,280	-	258	840	267	92	48	19	38
30	*72	211	b330	925	--------	246	599	243	150	43	20	33
31	70	--------	b260	836	--------	240	--------	216	--------	46	21	--------
Total	3,857	3,610	17,796	30,141	20,248	23,073	28,932	18,401	3,396	3,281	986	1,088
Mean	124	120	574	972	723	744	965	594	113	106	31.8	36.3
Cfsm	0.346	0.335	1.60	2.72	2.02	2.08	2.70	1.66	0.316	0.296	0.089	0.101
In.	0.40	0.38	1.85	3.13	2.10	2.40	3.01	1.91	0.35	0.34	0.10	0.11

Calendar year 1956:	Max	4,870	Min	46	Mean	542	Cfsm 1.51	In. 20.62
Water year 1956-57:	Max	4,980	Min	19	Mean	424	Cfsm 1.18	In. 16.08

Peak discharge (base, 2,400 cfs).--Jan. 25 (7 p.m.) 5,210 cfs (15.46 ft); Mar. 1 (2:15 a.m.) 3,350 cfs (10.91 ft); Apr. 8 (6:30 p.m.) 2,780 cfs (9.43 ft); May 22 (8:30 p.m.) 3,480 cfs (11.25 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice (no gage-height record Dec. 30 to Jan. 6).

c Backwater from aquatic vegetation.

Note.--Backwater from aquatic vegetation and/or debris June 18 to Sept. 25.

Ellicott Creek at Williamsville, N. Y.

Location.--Lat 42°57'10", long 78°44'15", over right span on upstream side of bridge on Wehrle Drive, 0.4 mile upstream from small tributary and 0.8 mile south of Williamsville, Erie County.

Drainage area.--76.3 sq mi.

Records available.--October 1955 to September 1957.

Gage.--Wire-weight gage read twice daily. Crest-stage indicator since Sept. 6, 1956.

Extremes.--Maximum discharge during year, 2,410 cfs Jan. 23 (gage height, 9.39 ft); minimum daily, 0.9 cfs Aug. 25.

1955-57: Maximum discharge, 2,510 cfs Mar. 7, 1956 (gage height, 10.44 ft, from graph based on gage readings); minimum daily, that of Aug. 25, 1957.

Remarks.--Records fair.

Rating table, water year 1956-57, except periods of ice effect or backwater from aquatic vegetation or debris (gage height, in feet, and discharge, in cubic feet per second)

0.95	0.9	1.7	36	6.0	1,290
1.0	1.4	2.0	66	7.0	1,820
1.1	2.4	2.5	131	8.0	2,140
1.2	4.6	3.0	214	9.0	2,340
1.3	8.0	4.0	449		
1.4	13	5.0	798		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	5.6	90	67	52	278	67	62	34	25	9.0	1.8
2	30	7.0	90	67	78	172	68	56	40	16	6.0	1.8
3	44	9.2	100	68	82	143	68	52	45	13	4.8	2.1
4	69	11	120	67	89	118	69	50	*35	22	8.0	3.8
5	*33	9.0	330	66	124	98	164	48	27	32	13	4.1
6	28	8.6	410	67	116	*89	576	42	23	60	*10	3.6
7	51	8.6	1,000	b60	109	146	377	37	23	25	5.0	2.2
8	193	9.0	880	b52	103	151	288	33	23	16	4.5	1.9
9	104	9.2	170	*b45	204	152	226	30	19	20	3.5	1.6
10	37	9.0	143	b43	810	134	*206	32	17	25	3.0	1.5
11	30	9.0	136	b41	462	134	201	60	16	10	4.0	2.7
12	27	9.0	181	b43	230	156	289	91	18	7.9	4.3	2.5
13	25	9.0	156	b41	b150	956	387	72	17	9.8	4.4	2.9
14	22	9.0	99	39	*b90	597	314	54	18	11	3.5	3.6
15	21	9.0	87	38	b78	222	130	63	17	8.7	2.4	2.7
16	18	9.0	102	37	b72	143	75	74	14	6.2	2.0	3.5
17	17	8.8	109	35	b70	110	70	60	13	*5.7	1.7	*2.6
18	14	8.6	92	34	b66	64	72	50	12	5.1	1.6	2.3
19	13	8.6	74	33	b62	62	100	81	11	4.8	1.5	2.1
20	12	8.6	66	32	b60	65	120	*815	10	4.4	1.2	2.3
21	12	30	65	100	b58	76	80	967	9.0	4.1	1.1	3.5
22	11	90	82	874	b56	72	65	420	8.0	4.8	1.1	5.6
23	10	230	101	2,330	b80	70	60	250	7.0	10	1.1	9.0
24	10	134	109	1,230	90	67	65	150	8.0	17	1.0	15
25	8.3	77	99	524	101	68	115	90	10	11	.9	7.1
26	7.3	121	89	368	282	67	441	70	13	6.1	1.0	5.2
27	6.4	75	85	225	882	68	400	60	8.0	5.2	1.1	3.9
28	6.3	77	76	149	556	66	214	52	11	4.7	1.1	3.3
29	5.6	75	69	78	-	66	113	45	40	4.8	1.1	3.0
30	*5.4	80	69	64		66	69	40	80	7.0	1.4	2.7
31	5.5		67	58		66		35		12	1.9	
Total	906.8	1,163.8	5,346	6,975	5,212	4,741	5,489	4,041	626.0	414.3	106.2	109.9
Mean	29.3	38.8	172	225	186	153	183	130	20.9	13.4	3.43	3.66
Cfsm	0.384	0.509	2.25	2.95	2.44	2.01	2.40	1.70	0.274	0.176	0.045	0.048
In.	0.44	0.57	2.61	3.40	2.54	2.31	2.68	1.97	0.31	0.20	0.05	0.05

Calendar year 1956:	Max 1,930	Min 2.5	Mean 127	Cfsm 1.66	In. 22.71
Water year 1956-57:	Max 2,330	Min 0.9	Mean 96.2	Cfsm 1.26	In. 17.13

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Oct. 1 to Dec. 9 (backwater from aquatic vegetation Oct. 1 to Nov. 10), Jan. 14-21, June 23 to Sept. 25; doubtful gage-height record Mar. 2-5, Apr. 19-23, May 1-12, 14-18, May 22 to June 22 (backwater from debris May 26 to Sept. 25); discharge estimated on basis of records for nearby streams and discharge measurements.

Erie (Barge) Canal at lock 30, Macedon, N. Y.
(Formerly published as Barge Canal at lock 30, Macedon)

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 1957. Prior to October 1956, published as Barge Canal at lock 30, Macedon.

Gage.--Water-stage recorder. Datum of gage is 448.80 ft above mean sea level, New York State Erie (Barge) Canal bench mark. Nov. 1, 1919, to Dec. 28, 1920, staff gage at same site at different datum.

Extremes.--1919-20, 1950-57: Maximum daily discharge, 762 cfs Dec. 9, 1954; minimum daily, 1.1 cfs Mar. 20, 21, 1953.

Remarks.--Records excellent above and good below 50 cfs except those for periods of no record of head on needle sill, which are fair. This record represents net diversion from Niagara River basin into Oswego River basin through Erie (Barge) Canal. During period of no navigation, Dec. 13 to Mar. 25, discharge consists chiefly of 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 Erie (Barge) Canal above and below lock 30 furnished by New York State Department of Public Works.

Revisions (water years).--WSP 1237: 1951.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*412	416	397	a8.2	6.2	21	3.1	96	150	389	372	368
2	398	405	380	7.9	a7.0	a15	272	98	147	398	382	368
3	398	401	223	6.2	a7.9	a11	363	103	138	386	379	365
4	395	398	120	7.0	8.8	7.5	203	107	150	392	373	356
5	406	403	276	a6.2	7.9	8.4	158	98	297	405	369	359
6	407	401	389	a5.5	7.0	7.5	165	96	370	398	363	371
7	405	407	363	4.8	7.0	8.0	131	102	376	395	369	380
8	405	398	354	6.2	6.2	8.9	11	94	367	385	357	385
9	404	407	305	6.2	a8.5	a9.1	71	*99	364	398	389	379
10	401	395	249	7.0	a9.8	a8.0	79	106	370	398	365	385
11	410	395	210	6.2	14	8.0	88	127	374	389	355	375
12	407	395	180	a6.2	a11	27	*90	141	374	412	365	372
13	413	398	*144	a5.5	7.9	36	90	141	371	389	372	387
14	413	409	50	4.8	5.5	20	90	143	380	386	366	372
15	400	*403	a37	4.8	8.4	22	94	149	377	397	368	384
16	400	406	a22	4.8	a7.0	a16	94	140	370	394	*370	390
17	398	400	19	4.8	a5.5	a12	90	148	367	384	361	384
18	398	392	19	*5.1	4.2	*8.0	92	148	377	381	374	*372
19	394	403	12	a5.1	*4.8	4.8	98	148	375	*381	359	378
20	398	406	9.8	a5.7	5.5	18	92	145	*372	389	380	381
21	400	403	8.9	5.4	5.9	18	90	140	394	374	365	378
22	400	394	a9.4	14	a6.2	12	92	145	385	386	365	375
23	407	392	a9.1	50	a6.2	a11	92	142	382	377	368	378
24	400	401	a8.0	49	a7.0	a9.1	92	153	376	389	368	387
25	406	400	a7.9	25	7.1	8.3	99	150	391	370	358	372
26	397	395	7.9	a19	8.5	1.3	109	149	376	388	361	372
27	394	398	8.0	a13	46	1.3	102	138	376	379	361	378
28	403	400	8.2	7.9	30	1.3	94	147	388	379	356	375
29	394	391	a8.2	7.9	-	2.3	89	141	392	366	362	380
30	400	390	a8.2	7.9	--------	3.3	112	141	383	367	365	371
31	404	--------	a8.2	8.0	--------	3.1	--------	144	--------	378	371	--------
Total	12,467	12,002	3,850.8	325.3	267.0	347.2	3,345.1	4,019	10,309	11,999	11,388	11,277
Mean	402	400	124	10.5	9.54	11.2	112	130	344	387	367	376
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 428 Min 5 Mean 221 Cfsm - In. -
Water year 1956-57: Max 416 Min 1.3 Mean 224 Cfsm - In. -

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* Discharge measurement made on this day.

a No record of head on needle sill; discharge estimated on basis of records of lock operation, weather records, and notes by observer and engineers.

West Creek near Hilton, N. Y.

Location.--Lat 43°18'10", long 77°48'50", on downstream side of bridge on Collamer Road, 0.5 mile north of Collamer and 1.5 miles northwest of Hilton, Monroe County.

Drainage area.--31.0 sq mi.

Records available.--May to September 1957.

Gage.--Wire-weight gage.

Extremes.--Maximum daily discharge during period May to September, 170 cfs May 21; minimum daily, 0.7 cfs June 17, 18.

Remarks.--Records fair.

Discharge, in cubic feet per second, May to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								-	2.1	9.2	5.8	4.5
2								-	3.0	6.4	4.5	4.4
3								-	7.6	5.6	4.7	5.4
4								-	3.7	7.6	4.5	5.4
5								-	2.6	11	5.2	5.6
6								-	2.0	7.6	4.8	5.6
7								-	1.6	6.6	4.4	5.6
8								-	1.5	6.6	5.6	4.7
9								-	1.7	6.6	4.7	4.5
10								-	1.4	6.2	6.8	6.6
11								-	1.4	5.8	7.0	5.8
12								-	1.2	5.6	8.4	5.6
13								-	1.2	6.6	8.2	5.8
14								-	1.1	7.2	5.6	6.0
15								-	.8	6.4	5.0	6.2
16								*6.6	.8	5.6	5.2	6.0
17								6.4	*.7	5.4	4.1	*5.8
18								4.1	.7	*5.4	4.3	5.2
19								3.8	.8	4.8	*4.4	3.1
20								130	1.2	5.2	4.0	2.8
21								170	1.4	5.0	6.4	3.5
22								54	1.7	5.0	5.4	3.7
23								37	1.7	5.2	5.2	3.9
24								22	3.4	5.2	4.8	3.8
25								13	5.2	5.0	5.4	3.4
26								8.0	5.0	4.5	5.2	3.1
27								6.2	4.4	5.8	5.0	3.2
28								4.4	5.2	8.4	5.0	3.4
29								3.4	14	7.8	5.4	3.7
30					--------			2.8	18	6.4	5.6	3.4
31		--------			--------		--------	2.3	--------	7.6	5.2	--------
Total								-	97.1	197.3	165.8	139.7
Mean								-	3.24	6.36	5.35	4.66
Cfsm								-	0.105	0.205	0.173	0.150
In.								-	0.12	0.24	0.20	0.17

Calendar year 1956: Max - Min - Mean - Cfsm - In. -
Water year 1956-57: Max 170 Min 0.7 Mean 7.78 Cfsm 0.251 In. 1.30

* Discharge measurement made on this day.
Note.--Backwater from aquatic vegetation May 16 to Sept. 30.

Dyke Creek at Wellsville, N. Y.

Location.--Lat 42°07'10", long 77°56'25", near center of span on upstream side of South Broad Street Bridge at Wellsville, Allegany County, 0.4 mile upstream from Genesee River and 1.4 miles downstream from Trapping Brook.

Drainage area.--71.4 sq mi.

Records available.--August 1955 to September 1957.

Gage.--Wire-weight gage read twice daily. Crest-stage indicator since June 19, 1956. Datum of gage is 1,480.95 ft above mean sea level, datum of 1929. Prior to Apr. 16, 1957, at datum 4.05 ft higher.

Extremes.--Maximum discharge during year not determined, occurred Jan. 23; minimum observed, 1.0 cfs Sept. 9 (occurred during period of channel improvement).

1955-57: Maximum discharge, 5,110 cfs Mar. 8, 1956 (gage height, 11.06 ft); minimum observed, that of Sept. 9, 1957.

Remarks.--Records fair.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	20	46	97	80	164	113	164	38	16	7.6	1.6
2	32	135	51	76	69	140	192	135	45	14	6.8	1.6
3	32	96	52	79	63	121	143	116	38	13	6.2	1.7
4	30	*76	60	73	79	99	*121	96	31	52	5.9	1.6
5	30	55	63	65	69	90	232	81	29	28	5.6	1.5
6	26	48	115	45	58	90	869	64	*27	21	4.9	1.4
7	59	45	162	55	58	105	506	53	26	17	4.6	1.3
8	50	41	181	*48	74	*74	404	*45	25	15	4.5	1.2
9	35	39	156	45	93	72	313	40	23	*14	*4.3	*1.0
10	30	38	134	44	155	70	278	40	21	13	3.6	1.2
11	*29	34	*130	39	91	67	362	116	20	12	3.3	1.3
12	28	34	238	42	54	235	630	324	21	11	3.1	1.5
13	25	36	296	48	68	383	327	121	21	12	3.0	1.4
14	24	35	225	32	60	348	268	133	28	14	2.7	1.5
15	23	33	247	40	55	352	232	204	21	12	2.8	1.6
16	22	33	280	39	50	306	245	135	20	10	2.5	1.8
17	21	34	210	38	41	219	278	105	21	9.7	2.4	1.9
18	20	30	188	32	38	183	348	98	18	9.1	2.2	1.8
19	20	28	148	31	36	169	536	161	17	8.5	2.2	1.7
20	20	27	145	31	*28	186	334	327	16	8.5	2.5	1.8
21	19	100	216	35	29	156	275	241	16	9.7	3.2	2.0
22	19	158	307	305	31	133	213	169	15	10	2.3	2.9
23	27	83	338	1,210	38	118	189	145	14	11	2.0	3.2
24	31	70	280	351	36	107	172	125	14	10	1.9	2.8
25	24	62	236	240	58	94	1,010	100	15	9.1	1.8	2.5
26	22	74	187	189	161	94	662	86	15	8.5	1.7	2.6
27	21	70	169	152	411	103	452	76	14	8.0	1.7	2.6
28	21	63	155	130	175	109	313	67	14	24	1.5	2.7
29	20	60	141	117	-	103	248	55	32	13	1.5	2.8
30	20	52	102	100	--------	133	195	48	30	9.7	1.5	2.9
31	19	--------	109	86	--------	133	--------	43	--------	8.5	1.6	--------
Total	833	1,709	5,367	3,914	2,258	4,756	10,360	3,713	685	431.3	101.4	57.4
Mean	26.9	57.0	173	126	80.6	153	345	120	22.8	13.9	3.27	1.91
Cfsm	0.377	0.798	2.42	1.76	1.13	2.14	4.83	1.68	0.319	0.195	0.046	0.027
In.	0.43	0.89	2.80	2.04	1.18	2.48	5.40	1.93	0.36	0.22	0.05	0.03

Calendar year 1956: Max 3,580 Min 8.5 Mean 124 Cfsm 1.74 In. 23.60
Water year 1956-57: Max 1,210 Min 1.0 Mean 93.7 Cfsm 1.31 In. 17.81

Peak discharge (base, 1,200 cfs).--Jan. 23 (time and discharge unknown); Apr. 6 (time unknown) about 1,300 cfs; Apr. 25 (time unknown) about 1,550 cfs (6.48 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 19 to Nov. 1, Nov. 4, Nov. 27 to Dec. 11, Dec. 15, 16, 18-20, 22, Dec. 24 to Feb. 26, Mar. 4, 5, July 26 to Sept. 30; discharge estimated on basis of discharge measurements, engineer's notes, and records for nearby stations.

Genesee River at Wellsville, N. Y.

Location.--Lat 42°07'20", long 77°57'00", near center of span on upstream side of West Pearl Street Bridge at Wellsville, Allegany County, a quarter of a mile downstream from Dyke Creek.

Drainage area.--288 sq mi.

Records available.--August 1955 to September 1957.

Gage.--Wire-weight gage read twice daily. Crest-stage indicator since June 19, 1956. Datum of gage is 1,478.00 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 5,820 cfs Jan. 23 (gage height, 8.82 ft, from graph based on gage readings); minimum daily, 18 cfs Sept. 9.

1955-57: Maximum discharge, 15,800 cfs Mar. 8, 1956 (gage height, 12.65 ft, from graph based on gage readings); minimum daily, that of Sept. 9, 1957.

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

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	138	79	186	b370	315	670	*c440	647	151	60	30	22
2	127	547	206	b310	b270	524	c860	540	184	54	28	22
3	124	379	211	b330	b250	455	c640	462	144	52	28	24
4	117	*260	242	b310	b310	395	c580	417	125	209	28	25
5	114	224	255	b290	270	350	876	369	114	114	29	22
6	101	194	461	b225	234	361	3,100	308	116	83	26	20
7	242	179	670	270	244	435	2,100	271	109	66	25	19
8	190	167	697	*246	295	*375	1,710	*237	97	61	25	19
9	134	156	559	224	380	355	1,330	203	90	*61	*24	*18
10	114	149	b520	b220	650	305	1,160	203	86	52	24	19
11	*105	134	*541	b165	350	270	1,400	501	83	47	23	20
12	98	134	969	b180	b220	922	1,980	1,110	89	44	25	22
13	95	145	1,200	b200	b280	1,450	1,380	480	86	46	27	21
14	92	141	937	b118	234	1,370	1,130	502	114	56	25	22
15	90	134	1,020	167	222	1,480	962	820	86	47	26	23
16	90	134	1,150	156	210	1,250	988	512	85	42	24	26
17	87	138	882	152	b185	898	1,180	399	84	38	23	27
18	84	124	753	127	180	730	1,450	369	74	37	22	25
19	82	114	577	127	b170	676	2,120	619	68	36	22	22
20	79	111	577	127	*b135	767	1,430	1,350	65	33	29	24
21	76	379	993	145	b140	612	1,140	971	63	38	37	26
22	76	638	1,320	1,000	b135	524	874	658	59	42	29	29
23	111	343	1,350	4,050	158	470	774	555	57	44	25	40
24	124	b290	1,220	1,420	155	420	687	480	56	40	23	41
25	98	b240	977	1,020	268	385	3,280	382	59	36	22	30
26	90	b300	774	760	855	395	2,470	332	57	33	22	27
27	87	284	690	618	1,620	c430	1,860	293	53	32	21	25
28	87	255	613	509	689	c450	1,310	261	53	93	20	25
29	82	242	559	470	-	c430	1,010	212	140	47	20	24
30	79	211	b400	400	--------	c540	774	184	79	36	21	24
31	76	--------	b450	330	--------	c540	--------	160	--------	31	22	--------
Total	3,289	6,825	21,959	15,036	9,424	19,234	40,995	14,807	2,726	1,710	775	733
Mean	106	228	708	485	337	620	1,366	478	90.9	55.2	25.0	24.4
Cfsm	0.368	0.792	2.46	1.68	1.17	2.15	4.74	1.66	0.316	0.192	0.087	0.085
In.	0.42	0.88	2.84	1.94	1.22	2.48	5.29	1.91	0.35	0.22	0.10	0.09

Calendar year 1956: Max 11,700 Min 58 Mean 509 Cfsm 1.77 In. 24.05
Water year 1956-57: Max 4,050 Min 18 Mean 377 Cfsm 1.31 In. 17.74

Peak discharge (base, 3,600 cfs).--Jan. 23 (9:15 a.m.) 5,820 cfs (8.82 ft); Apr. 6 (4:30 a.m.) 3,760 cfs (7.27 ft); Apr. 25 (8:30 a.m.) 4,700 cfs (8.07 ft).

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

Note.--No gage-height record Aug. 14 to Sept. 30; discharge estimated on basis of records for nearby stations. Shifting-control method used Oct. 1 to Nov. 22, Nov. 27 to Dec. 9, Dec. 11-29, July 8-15, 19, 20, 22-27.

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 1957.

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.--41 years, 390 cfs.

Extremes.--Maximum discharge during year, 8,240 cfs Jan. 23 (gage height 8.98 ft), from rating curve extended above 4,500 cfs as explained below; minimum, 19 cfs Sept. 9 (gage height, 0.81 ft, backwater from aquatic vegetation).

1916-57: Maximum discharge, 16,900 cfs Mar. 8, 1956, from rating curve extended above 4,500 cfs by logarithmic plotting and comparison with peak discharge for station at Wellsville; maximum gage height, 11.22 ft Nov. 25, 1950; minimum discharge, 5.8 cfs Sept. 4, 1939; minimum gage height, 0.18 ft Aug. 28, 1949, Aug. 16, 18, 1950.

Remarks.--Records excellent except those for periods of ice effect or backwater from aquatic vegetation, which are good.

Revisions.--WSP 759: Drainage area.

Rating table, water year 1956-57, except periods of ice effect or backwater from aquatic vegetation (gage height, in feet, and discharge, in cubic feet per second)

0.6	20	2.0	285
.7	27	3.0	616
.9	45	4.0	1,060
1.1	69	6.0	2,550
1.3	102	8.0	5,500
1.5	146		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	148	86	b200	b420	346	713	491	709	161	68	33	24
2	139	588	220	b330	b300	605	892	594	196	60	31	24
3	139	417	223	b350	273	522	717	518	164	56	30	26
4	130	*279	261	b330	343	b430	*635	461	135	225	30	27
5	128	238	273	318	b300	b390	1,160	412	122	122	31	24
6	112	209	496	b235	b250	b390	4,030	352	122	92	28	22
7	259	193	700	291	252	454	2,180	303	116	72	27	21
8	215	179	784	*255	321	390	1,740	264	108	66	27	21
9	151	168	674	238	402	374	1,350	*229	98	*66	*26	20
10	128	161	b580	232	673	321	1,200	220	92	58	26	21
11	*119	146	601	b190	396	291	1,560	501	88	52	25	22
12	112	146	*1,030	b195	b235	1,020	2,300	1,240	*92	48	27	*24
13	106	156	1,280	212	294	1,660	1,410	540	92	50	29	23
14	102	151	975	b140	258	1,500	1,160	577	120	62	27	24
15	98	144	1,070	b175	240	1,530	1,010	892	92	52	28	25
16	97	141	1,210	b170	223	1,330	1,050	585	88	45	26	28
17	95	148	919	b165	195	952	1,200	458	90	41	25	29
18	91	132	814	b140	190	792	1,510	425	78	39	24	27
19	88	123	b640	b135	184	733	2,320	691	72	38	24	24
20	86	119	627	b135	*b145	809	1,450	1,410	70	36	31	26
21	82	388	933	b150	b150	*670	1,190	1,050	68	41	40	28
22	82	690	1,330	1,320	b145	572	928	733	66	45	31	31
23	116	371	1,460	5,240	168	512	818	627	62	48	27	43
24	134	309	1,230	1,520	161	461	735	543	62	45	25	44
25	106	b270	1,020	b1,040	252	409	4,350	435	64	39	24	32
26	95	b320	809	b820	698	409	2,860	377	66	36	24	29
27	93	303	733	b660	1,780	444	1,960	327	60	35	23	27
28	93	273	670	561	b760	467	1,350	288	60	106	22	27
29	88	258	612	508	-	444	1,070	240	140	58	22	26
30	86	226	b440	431	--------	570	845	209	88	41	23	26
31	84	--------	b470	371	--------	571	--------	184	--------	36	24	--------
Total	3,602	7,332	23,284	17,277	9,934	20,735	45,471	16,394	2,932	1,878	840	795
Mean	116	244	751	557	355	669	1,516	529	97.7	60.6	27.1	26.5
Cfsm	0.375	0.790	2.43	1.80	1.15	2.17	4.91	1.71	0.316	0.196	0.088	0.086
In.	0.43	0.88	2.80	2.08	1.20	2.50	5.47	1.97	0.35	0.23	0.10	0.10

Calendar year 1956:	Max	12,500	Min	64	Mean	543	Cfsm	1.76	In.	23.87
Water year 1956-57:	Max	5,240	Min	20	Mean	412	Cfsm	1.33	In.	18.11

Peak discharge (base, 3,800 cfs).--Jan. 23 (10:15 a.m.) 8,240 cfs (8.98 ft); Apr. 6 (4 a.m.) 5,640 cfs (8.06 ft); Apr. 25 (8 a.m.) 6,700 cfs (8.48 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--Backwater from aquatic vegetation June 4 to Sept. 30.

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 1957.

Gage.--Water-stage recorder.

Average discharge.--8 years, 90.1 cfs (adjusted for storage).

Extremes.--Maximum discharge during year, 1,090 cfs May 20 (gage height, 5.14 ft); minimum, 2.1 cfs Aug. 21, 22, 23, 24, 25 (gage height, 2.095 ft).

1949-57: Maximum discharge, 1,700 cfs Oct. 15, 1955 (gage height, 5.87 ft); minimum, 0.7 cfs Nov. 11, 13, 1954; minimum daily, 0.9 cfs Nov. 13, 14, 1954; minimum gage height, 1.63 ft Oct. 21, 1949.

Remarks.--Records good except those for periods of ice effect or backwater from debris, which are fair. Considerable regulation by Rushford Lake (capacity, 1,106,000,000 cu ft) about 2 miles above station.

Rating tables, water year 1956-57, except periods of ice effect or backwater from debris (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 6, Apr. 26)

Oct. 1 to Dec. 6				Dec. 7 to Arp. 26				Apr. 27 to Sept. 30			
2.3	11	3.1	128	2.0	2.0	3.2	136	2.1	2.2	3.0	109
2.4	17	3.5	265	2.1	3.8	3.6	252	2.2	5.6	3.5	252
2.6	34	4.0	490	2.3	10	4.0	400	2.4	19	4.0	457
2.8	62	5.0	1,040	2.5	23	4.5	630	2.7	53	5.0	1,000
				2.8	57						

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	16	66	434	195	b6.6	3.7	2.7	11	47	8.0	2.7
2	26	*18	68	434	396	b5.6	4.0	2.6	15	38	7.1	3.5
3	25	20	73	429	388	b5.2	3.8	2.6	17	32	7.7	7.7
4	24	20	90	446	b220	b5.0	*b4.7	2.7	19	38	8.0	9.2
5	23	20	103	446	b6.8	b5.0	7.3	3.4	18	59	5.8	9.7
6	22	19	342	442	b5.8	b5.6	10	6.8	18	58	6.0	5.4
7	40	18	675	429	b5.6	5.8	7.4	12	19	45	5.0	5.6
8	64	18	556	421	153	5.4	b11	15	19	37	4.2	5.4
9	57	18	376	417	380	b5.0	b9.4	17	18	34	4.6	4.6
10	46	16	142	413	*183	b4.4	6.5	*19	18	27	5.0	5.2
11	*40	16	36	*413	b5.0	b4.0	6.2	71	18	22	5.2	6.0
12	35	16	*144	408	b205	5.2	6.2	466	*20	18	5.2	*5.2
13	31	17	196	408	446	5.8	5.4	443	21	23	4.4	7.1
14	29	18	170	408	523	5.6	5.0	380	24	24	4.6	8.3
15	26	18	170	408	514	b5.2	4.8	457	24	23	4.0	8.9
16	24	20	293	404	500	5.1	5.0	367	22	19	*4.4	11
17	23	18	304	400	491	4.7	5.4	342	20	17	3.7	8.9
18	23	18	242	396	537	4.6	6.7	196	18	15	3.2	8.3
19	22	17	91	392	561	4.4	6.8	45	19	*13	2.6	8.0
20	21	17	b19	384	221	4.4	5.4	853	16	12	2.6	11
21	20	45	39	206	b5.6	4.2	4.8	687	13	11	2.3	12
22	20	131	278	b8.8	b160	*4.0	5.0	402	12	13	2.2	15
23	22	118	227	b12	272	3.8	12	346	11	15	2.4	23
24	22	94	56	b9.0	266	3.6	24	186	9.9	14	2.4	21
25	22	77	b76	7.7	262	3.6	51	5.0	11	12	2.3	18
26	19	73	79	7.0	106	3.8	414	4.4	11	11	2.7	16
27	18	70	77	b6.6	b7.2	3.8	383	4.2	9.9	11	3.2	13
28	18	70	311	b7.0	b7.6	3.8	315	4.2	15	9.9	2.3	11
29	17	70	438	7.6	-	3.8	133	3.5	60	9.6	2.4	9.6
30	16	68	438	7.4	--------	3.8	3.0	3.7	63	9.2	2.6	8.9
31	16	--------	438	b7.6	--------	3.8	--------	6.8	--------	9.6	2.7	--------
Total	840	1,174	6,613	8,618.7	7,022.6	144.6	1,469.5	5,356.6	589.8	726.3	128.8	289.2
Mean	27.1	39.1	213	278	251	4.66	49.0	173	19.7	23.4	4.15	9.64

Adjusted for change in contents in Rushford Lake

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean	25.3	43.8	177	135	101	117	248	176	23.4	19.8	4.15	10.6
Cfsm	0.411	0.712	2.88	2.20	1.64	1.90	4.03	2.86	0.380	0.322	0.067	0.172
In.	0.47	0.79	3.33	2.53	1.71	2.19	4.51	3.29	0.42	0.37	0.08	0.19

	Observed						Adjusted					
Calendar year 1956:	Max	1,220	Min	1.0	Mean	100	Mean	125	Cfsm	2.03	In.	27.72
Water year 1956-57:	Max	853	Min	2.2	Mean	90.3	Mean	90.1	Cfsm	1.47	In.	19.88

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--Backwater from debris Oct. 26 to Nov. 21.

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 1957. Records published for both sites December 1945 to September 1950.

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.--49 years, 1,231 cfs (unadjusted).

Extremes.--Maximum discharge during year, 19,700 cfs Apr. 6 (gage height, 13.58 ft); minimum, 68 cfs Sept. 12 (gage height, 2.44 ft).

1908-57: Maximum discharge, 44,400 cfs May 17, 1916 (gage height, 12.81 ft, site and datum then in use); maximum gage height, 21.70 ft Mar. 7, 1956; 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 doubtful gage-height 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).--WSP 264: 1908. WSP 564: 1916(M). WSP 759: Drainage area.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 23				Jan. 24 to Sept. 30			
3.2	205	6.0	2,560	2.5	74	5.0	1,370
3.6	355	8.0	6,150	2.9	134	6.0	2,560
4.0	580	13.0	18,200	3.4	270	8.0	6,150
5.0	1,400			4.0	560	12.0	15,700
				4.5	910		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	387	226	798	b1,450	b1,000	2,110	1,230	1,520	624	487	153	85
2	351	*341	790	b1,250	b1,250	1,610	1,560	1,260	540	265	139	81
3	346	1,280	*870	b1,250	b1,140	1,370	2,190	1,120	586	247	140	98
4	356	740	1,180	b1,350	1,220	b1,160	1,520	990	504	393	120	105
5	326	581	1,260	b1,350	b900	b940	3,090	926	441	1,830	114	102
6	311	511	3,310	b1,200	b760	b980	15,500	838	385	926	119	103
7	408	453	5,750	b1,220	b740	1,230	7,320	762	561	527	111	90
8	954	427	4,470	b1,220	913	1,140	*5,290	678	457	336	105	76
9	644	400	2,660	1,180	1,550	1,030	3,670	602	379	333	108	76
10	481	366	1,960	b1,120	3,070	910	3,300	*602	348	241	105	76
11	402	353	1,680	b1,040	1,620	b860	3,560	874	*396	241	108	87
12	*374	342	3,580	b1,080	b1,040	3,060	6,910	3,430	340	231	105	81
13	338	358	3,530	b1,120	1,290	6,190	4,070	2,170	335	212	105	89
14	310	398	2,830	b860	1,290	5,080	3,290	2,330	609	277	103	113
15	290	390	2,700	b780	*1,240	4,240	2,640	3,810	544	200	104	89
16	283	375	3,400	b980	1,160	3,900	3,080	2,500	362	198	*105	*92
17	264	373	2,880	b840	1,110	2,450	3,530	1,680	294	186	98	118
18	250	438	2,240	*b940	1,080	1,910	3,790	1,410	330	*153	107	92
19	257	330	1,700	b880	1,120	1,680	6,500	2,950	276	164	134	95
20	229	284	1,400	b880	934	1,920	3,720	8,530	195	157	90	103
21	240	648	1,520	b920	b470	1,840	2,820	6,170	215	134	86	111
22	218	3,240	2,650	b5,400	564	*1,440	2,170	2,860	206	530	84	129
23	232	1,610	4,980	d16,700	815	1,250	1,780	2,170	216	1,190	93	185
24	270	1,090	2,800	5,350	822	1,120	1,660	1,760	169	412	89	157
25	316	b980	2,660	2,920	1,090	982	4,180	1,220	212	261	85	147
26	284	938	1,980	2,150	2,730	966	7,530	998	172	211	82	134
27	252	896	1,700	1,590	7,220	982	4,420	868	191	187	79	120
28	252	946	1,680	1,300	2,880	1,140	3,190	796	218	155	78	105
29	237	930	1,860	1,260	-	1,040	2,530	702	957	179	80	100
30	227	878	b1,550	1,130	--------	1,160	1,840	596	812	182	85	97
31	222	--------	b1,450	945	--------	1,470	--------	818	--------	169	86	--------
Total	10,311	21,122	73,818	61,655	41,018	57,160	117,880	57,940	11,874	11,214	3,200	3,136
Mean	333	704	2,381	1,989	1,465	1,844	3,929	1,869	396	362	103	105

Adjusted for change in contents in Rushford Lake

Mean	331	709	2,332	1,888	1,315	1,956	4,129	1,872	400	358	103	105
Cfsm	0.337	0.722	2.37	1.92	1.34	1.99	4.20	1.91	0.407	0.365	0.105	0.107
In.	0.39	0.81	2.74	2.22	1.39	2.30	4.69	2.20	0.45	0.42	0.12	0.12

	Observed			Adjusted		
Calendar year 1956:	**Max** 31,400	**Min** 166	**Mean** 1,674	**Mean** 1,698	**Cfsm** 1.73	**In.** 23.55
Water year 1956-57:	**Max** 16,700	**Min** 76	**Mean** 1,289	**Mean** 1,288	**Cfsm** 1.31	**In.** 17.81

Peak discharge (base, 15,000 cfs).--Jan. 23 (11 a.m.) 18,100 cfs (12.94 ft); Apr. 6 (8:30 a.m.) 19,700 cfs (13.58 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record; discharge computed from reconstructed gage-height graph based on available gage-height record and high-water mark.

Note.--Records of change in contents in Rushford Lake furnished by Rochester Gas and Electric Corp.

Mount Morris Reservoir near Mount Morris, N. Y.

Location.--Lat 42°44'00", long 77°54'40", at Mount Morris Dam on Genesee River, 2½ miles northwest of Mount Morris, Livingston County, 5 miles upstream from Canaseraga Creek, and 40 miles upstream from mouth.

Drainage area.--1,077 sq mi (measured by Corps of Engineers).

Records available.--January 1952 to September 1957.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers). Prior to Apr. 8, 1952, reference point at same site and datum.

Extremes.--Maximum elevation during year, 639.11 ft Jan. 24; minimum, 586.14 ft Nov. 20, 21.

1952-57: Maximum elevation, 706.93 ft Mar. 10, 1956; minimum, 585.17 ft Sept. 14, 1952.

Remarks.--Reservoir is formed by a concrete gravity-type dam with overflow spillway, completed by Corps of Engineers in 1951 for flood control; first used for flood regulation on Nov. 24, 1951. Usable capacity, 337,000 acre-ft between elevations 585.0 ft (sill of conduits) and 760.0 ft (crest of spillway). Dead storage, 609 acre-ft. Floods are controlled by the operation of nine gates. Water is stored during high flows and released when downstream conditions warrant.

Cooperation.--Capacity table furnished by Corps of Engineers.

Revisions (water years).--WSP 1437: 1955.

Capacity table, water year 1956-57 (elevation, in feet, and contents, in acre-feet)

586.0	782	610.0	11,600
588.0	1,210	620.0	19,800
590.0	1,730	630.0	30,500
595.0	3,410	640.0	43,700
600.0	5,610		

Elevation, in feet, at 12 p.m., water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	597.3	595.5	587.9	589.0	588.6	591.2	589.8	590.6	597.7	597.9	597.9	597.5
2	597.3	591.3	588.0	588.3	589.1	590.3	591.6	589.8	597.9	597.7	597.9	597.7
3	597.2	588.5	588.3	589.6	a589.4	589.7	591.9	589.5	598.0	598.0	598.0	597.9
4	597.6	587.4	589.1	589.4	589.3	a589.2	591.0	589.1	597.9	598.3	598.3	598.1
5	597.5	587.1	589.2	589.0	588.3	a588.9	599.2	589.1	597.8	598.3	598.2	598.0
6	597.4	586.9	594.1	588.8	588.0	a589.1	625.2	588.9	598.3	597.9	598.1	597.9
7	597.7	586.7	598.8	589.0	587.9	589.8	621.7	588.6	598.4	598.5	598.1	597.8
8	599.0	586.7	593.7	588.9	588.4	589.4	613.4	588.1	598.3	597.8	598.0	597.5
9	598.1	586.6	591.7	588.8	590.8	a588.8	598.7	588.1	598.0	597.9	597.8	597.4
10	597.7	586.4	590.4	588.4	593.0	588.8	593.9	587.7	598.0	597.9	597.8	597.4
11	597.6	586.4	590.3	588.4	589.4	589.1	594.9	588.1	598.1	597.7	597.7	597.5
12	597.4	586.3	594.0	589.1	588.6	598.1	603.8	593.6	598.4	597.8	597.6	597.7
13	597.2	586.4	594.1	588.4	a589.2	602.7	594.4	590.8	598.4	597.4	597.5	597.8
14	597.3	586.6	591.7	587.7	a589.3	599.1	593.7	593.4	598.0	597.6	597.6	597.9
15	597.3	586.5	592.5	587.3	a589.1	595.0	592.7	594.0	597.4	597.7	597.8	597.9
16	597.5	586.4	593.9	588.4	a588.8	594.3	593.5	591.8	597.4	597.8	598.1	597.6
17	597.6	586.4	592.1	587.5	a588.8	592.4	594.7	590.4	598.0	597.9	598.2	597.7
18	597.5	586.6	591.2	587.9	a589.1	591.3	594.5	590.0	598.4	597.9	598.3	597.5
19	597.3	586.3	589.8	587.8	a589.0	591.0	602.6	596.4	598.3	597.8	598.6	597.4
20	597.2	586.1	589.5	588.0	588.7	592.1	593.9	613.7	597.9	597.7	598.4	597.3
21	597.2	587.1	590.0	589.7	587.4	591.1	593.2	618.3	597.8	597.6	598.2	597.3
22	597.3	591.8	593.2	608.6	587.5	590.3	591.8	609.7	597.8	598.2	597.8	597.6
23	597.3	589.5	593.8	638.1	588.6	589.8	591.1	599.2	597.9	602.0	597.6	597.8
24	597.5	588.0	592.7	636.2	588.5	589.5	590.8	598.0	597.7	599.5	597.3	597.6
25	598.2	588.5	591.9	630.6	589.4	a589.2	600.1	597.8	598.2	597.5	597.1	597.6
26	598.6	588.4	590.6	622.1	594.0	a589.1	607.9	597.8	598.2	597.5	597.1	597.9
27	598.7	588.2	590.3	605.1	607.9	a589.2	599.1	597.9	598.4	597.8	597.1	598.0
28	598.8	588.2	590.6	589.5	592.1	a589.4	593.8	598.6	598.2	597.8	597.2	598.0
29	598.7	588.2	590.5	589.3	-	a589.2	592.6	598.3	598.4	597.6	597.2	597.9
30	598.7	588.0	588.9	589.0		a589.7	591.3	598.4	598.1	597.9	597.3	597.8
31	598.5		589.6	588.6		590.5		598.8		597.9	597.5	
(†)	4,900	1,210	1,626	1,366	2,374	1,880	2,123	5,044	4,708	4,617	4,445	4,574
(‡)	+412	-3,690	+416	-260	+1,008	-494	+243	+2,921	-336	-91	-172	+129

Calendar year 1956.................... ‡ +543
Water year 1956-57.................... ‡ +86

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† Contents, in acre-feet, at end of month.
‡ Change in contents in acre-feet.
a No gage-height record; elevation at 12 p.m. estimated from reconstructed gage-height graph based on record for adjacent days and record for Genesee River at Jones Bridge, near Mount Morris.

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 1957.

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 15.70 ft lower.

Average discharge.--37 years (1920-57), 150 cfs.

Extremes.--Maximum discharge during year, 2,970 cfs Apr. 6 (gage height, 9.96 ft); minimum, 20 cfs Aug. 25 (gage height, 6.18 ft).

1910-12, 1915-57: 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 gage height at present site, 13.68 ft Mar. 7, 1956; maximum discharge 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 daily, 3 cfs Apr. 28, 1912.

Remarks.--Records good except those for periods of ice effect, backwater from debris, partly obstructed intake or shifting control, which are fair.

Revisions.--WSP 604: 1923-24. WSP 759: Drainage area. WSP 894: 1935. WSP 1389: 1919.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	44	76	125	134	250	145	190	147	62	47	28
2	49	49	76	120	126	217	170	180	157	55	46	28
3	50	56	88	120	129	180	170	170	137	56	42	32
4	49	49	113	116	153	165	150	165	122	100	40	30
5	48	49	110	92	135	160	600	160	113	184	39	30
6	46	48	226	82	125	165	1,600	155	105	100	37	26
7	56	46	333	89	128	187	880	150	160	83	36	26
8	78	45	273	92	150	177	660	140	125	75	34	25
9	60	44	201	89	221	177	580	135	108	71	37	24
10	56	42	165	84	302	156	540	120	98	63	40	23
11	52	42	168	78	185	150	600	320	92	58	37	25
12	49	43	320	76	135	648	820	520	102	53	40	25
13	*49	46	255	70	137	757	560	260	106	68	*36	33
14	48	45	196	54	*123	635	500	580	119	65	33	31
15	46	43	201	60	117	540	420	*720	92	55	31	28
16	43	46	239	62	108	410	450	380	79	48	32	34
17	42	*48	191	58	98	290	500	280	75	*46	30	32
18	45	42	*160	56	96	245	*520	250	69	44	30	28
19	46	38	125	54	93	225	700	900	*71	43	28	26
20	46	42	126	54	84	260	460	1,300	69	40	27	36
21	44	104	126	72	86	225	380	625	63	52	27	31
22	46	182	283	900	82	195	320	372	60	253	26	33
23	52	107	313	1,420	90	180	270	304	60	340	24	41
24	54	82	229	440	85	170	240	258	60	174	22	34
25	52	70	201	290	124	155	370	225	65	119	21	*31
26	48	76	169	241	316	155	480	204	60	88	23	29
27	46	76	161	195	774	*155	320	185	55	83	24	28
28	44	78	153	*170	280	150	280	171	55	76	24	28
29	44	78	135	166	-	150	250	147	106	62	29	28
30	44	78	130	153	-------	150	210	143	75	55	33	27
31	43	-------	135	145	-------	150	-------	185	-------	52	30	-------
Total	1,523	1,838	5,677	5,823	4,616	7,829	14,145	9,894	2,805	2,723	1,005	880
Mean	49.1	61.3	183	188	165	253	472	319	93.5	87.8	32.4	29.3
Cfsm	0.321	0.401	1.20	1.23	1.08	1.65	3.08	2.08	0.611	0.574	0.212	0.192
In.	0.37	0.45	1.38	1.42	1.12	1.90	3.44	2.40	0.68	0.66	0.24	0.21

Calendar year 1956: Max 3,300 Min 32 Mean 203 Cfsm 1.33 In. 18.04
Water year 1956-57: Max 1,600 Min 21 Mean 161 Cfsm 1.05 In. 14.27

Peak discharge (base, 2,000 cfs).--Jan. 23 (2:30 a.m.) 2,180 cfs (9.32 ft); Apr. 6 (1:15 a.m.) 2,970 cfs (9.96 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 24, 25, Dec. 18, 19, Dec. 29 to Jan. 3, Jan. 6, 10-22, 24, 25, 27, 28, 31, Feb. 5, 6, 11, 12, 17, 18, 20-22, 28, Mar. 1, 3-6, 11; partly obstructed intake and/or backwater from debris Oct. 1 to Nov. 20, Sept. 11-23; shifting-control and/or partly obstructed intake Mar. 15 to May 19; discharge computed on basis of discharge measurements, gage-height record and records for other stations in the Genesee River basin.

Canaseraga Creek at Groveland, N. Y.

Location.--Lat 42°39'45", long 77°46'10", on left bank at downstream side of highway bridge at Groveland, Livingston County, 0.2 mile downstream from small tributary.

Drainage area.--181 sq mi.

Records available.--August 1915 to September 1916 (gage heights and discharge measurements only) and February 1917 to March 1920 (no winter records in 1917, 1918, 1920), published as "at Groveland Station"; October 1955 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 565.42 ft above mean sea level (levels by Corps of Engineers). Prior to Mar. 30, 1916, inclined staff gage at site 400 ft upstream at datum about 5.42 ft lower. Mar. 30, 1916, to Mar. 31, 1920, chain gage on downstream side of bridge at practically same datum as inclined staff gage.

Extremes.--Maximum discharge during year, 2,810 cfs Apr. 6 (gage height, 12.39 ft); minimum daily, 23 cfs Aug. 25; minimum gage height, 2.02 ft Sept. 10.

1917-20, 1955-57: Maximum discharge observed, 4,380 cfs May 22, 1919; maximum gage height, 13.71 ft Mar. 7, 1956; minimum discharge, 18 cfs Oct. 2, 5, 1955 (gage height, 1.96 ft).

Remarks.--Records good except those for periods of ice effect, partly obstructed intake, or shifting control, which are fair.

Rating tables, water year 1956-57, except periods of ice effect or shifting control (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 5				Apr. 6 to Sept. 30			
2.5	42	7.0	846	2.0	23	6.0	698
3.0	95	9.0	1,390	2.4	47	8.0	1,210
4.0	237	11.0	2,130	3.0	106	11.0	2,240
5.0	416			4.0	265		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	47	91	b160	b190	319	172	229	177	75	52	31
2	55	55	91	b145	b175	264	182	211	187	65	48	30
3	59	63	105	b150	b170	220	212	201	174	61	46	35
4	56	56	144	b145	214	b200	174	197	155	104	44	33
5	55	53	140	b125	b185	b195	582	191	145	255	42	33
6	52	52	266	b106	b175	204	e2,070	172	138	146	40	28
7	87	50	432	b112	182	237	1,120	171	197	102	39	27
8	99	50	405	b114	209	225	828	160	167	94	37	26
9	76	50	286	b106	302	230	676	150	136	88	38	26
10	65	49	b230	b96	455	198	652	136	122	77	43	25
11	61	45	235	b90	268	185	709	179	111	71	41	26
12	58	47	434	b90	b230	785	1,020	697	112	67	43	27
13	*58	52	363	b84	217	906	650	303	131	76	40	30
14	54	50	276	b62	*163	728	550	592	169	81	*36	38
15	52	48	283	b64	155	672	469	*846	118	67	35	30
16	51	52	330	b76	144	558	502	476	100	59	34	32
17	51	*60	268	b66	127	372	*562	332	90	*54	33	36
18	51	46	*228	b64	b125	310	578	290	86	51	32	30
19	51	40	176	b62	122	286	837	1,210	*81	48	31	28
20	50	39	178	b60	b110	336	513	2,100	78	46	30	34
21	48	71	173	b82	b114	295	416	1,110	71	48	29	34
22	50	247	290	b1,060	105	254	346	640	66	211	28	34
23	59	133	471	1,900	118	234	307	476	66	557	27	44
24	63	b98	309	*675	113	215	288	378	67	217	24	36
25	62	b84	268	456	147	199	374	312	74	133	23	32
26	57	96	223	b340	337	198	521	274	72	98	24	*30
27	54	94	215	b270	992	*196	358	247	63	81	26	29
28	52	94	207	b240	376	188	320	224	61	95	26	29
29	50	95	188	237	-	185	297	184	119	68	30	29
30	48	94	b175	210	-------	185	254	169	96	61	42	28
31	47	-------	b175	b195	-------	184	-------	230	-------	57	38	-------
Total	1,786	2,110	7,655	7,642	6,220	9,763	16,539	13,087	3,429	3,313	1,101	930
Mean	57.6	70.3	247	247	222	315	551	422	114	107	35.5	31.0
Cfsm	0.318	0.388	1.36	1.36	1.23	1.74	3.04	2.33	0.630	0.591	0.196	0.171
In.	0.37	0.43	1.57	1.57	1.28	2.01	3.40	2.69	0.70	0.68	0.23	0.19

Calendar year 1956: Max 3,190 Min 37 Mean 238 Cfsm 1.31 In. 17.91
Water year 1956-57: Max 2,100 Min 23 Mean 202 Cfsm 1.12 In. 15.12

Peak discharge (base, 2,200 cfs).--Jan. 23 (4:15 a.m.) 2,580 cfs (12.05 ft); Apr. 6 (4:45 a.m.) 2,810 cfs (12.39 ft); May 20 (5 a.m.) 2,590 cfs (11.84 ft).

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

Note.--Partly obstructed intake Aug. 4 to Sept. 5; discharge estimated on basis of 1 discharge measurement, weather records, gage heights, engineer's and observer's notes, 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 1957.

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.--47 years (1908-13, 1915-57), 1,608 cfs (unadjusted).

Extremes.--Maximum discharge during year, 11,600 cfs Apr. 7; maximum gage height, 17.47 ft Jan. 25 (ice jam); minimum discharge, 64 cfs Sept. 19 (gage height, 0.67 ft); minimum daily, 96 cfs Sept. 10.

1903-6, 1908-14, 1915-57: Maximum discharge, 55,100 cfs May 17, 1916 (gage height, 25.44 ft); minimum, 12 cfs July 23, 1955 (gage height, 0.22 ft); minimum daily, 30 cfs Aug. 8, 1909.

Remarks.--Records good except those for periods of ice effect or partly obstructed intake, which are fair. Diurnal fluctuation at low flow caused by powerplants. Flow regulated to some extent by Rushford Lake (capacity, 1,106,000,000 cu ft) since July 1928 and, at high flows, since November 1951 by Mount Morris Reservoir (see p. 280).

Revisions (water years).--WSP 759: Drainage area. WSP 1277: 1952. WSP 1387: 1913. WSP 1437: 1955.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	523	618	894	b1,700	1,710	3,440	1,680	2,200	1,280	748	246	125
2	477	699	900	b1,600	1,740	2,650	1,590	1,850	899	526	227	102
3	449	1,260	933	b1,500	1,870	2,180	2,760	1,610	845	326	201	130
4	429	981	1,240	1,750	1,800	1,820	2,080	1,440	788	440	190	120
5	429	706	1,450	b1,650	1,670	b1,450	3,360	1,310	700	1,930	180	155
6	426	609	2,560	1,580	b1,300	1,460	9,760	1,200	564	1,750	175	149
7	445	559	5,630	b1,600	1,150	1,720	11,500	1,080	820	732	175	145
8	723	519	6,590	1,530	1,250	1,780	10,300	965	781	647	170	143
9	910	502	3,650	1,450	2,020	1,660	8,620	869	705	500	170	135
10	688	473	2,650	1,440	4,370	1,480	6,290	781	559	414	175	96
11	523	445	2,140	b1,400	3,200	1,310	5,360	953	513	398	175	104
12	*477	441	2,700	b1,550	1,750	2,680	7,240	3,380	508	359	170	112
13	457	441	4,250	b1,600	1,700	7,420	7,320	3,330	544	411	170	120
14	407	465	3,800	b1,250	1,800	7,310	5,280	*2,610	968	410	*155	145
15	377	477	3,040	b1,100	*1,700	6,230	4,250	4,830	902	333	140	149
16	377	465	3,750	b1,300	1,580	5,670	4,300	3,910	660	302	122	145
17	380	*457	3,730	b1,160	1,450	4,060	4,460	2,640	428	265	112	160
18	380	485	*2,800	b1,200	1,350	3,110	*5,080	2,100	412	*268	125	160
19	380	453	2,240	b1,120	1,460	2,670	6,380	3,260	*473	271	135	145
20	380	395	1,770	b1,120	b1,300	*2,840	6,440	8,120	436	265	155	165
21	358	441	1,710	b1,140	b860	2,920	4,250	7,200	360	258	150	196
22	333	2,900	2,280	b2,500	b700	2,300	3,410	7,290	344	378	145	152
23	348	2,200	5,720	b8,200	920	1,950	2,760	6,100	326	1,520	145	202
24	358	1,380	3,820	b9,000	1,060	1,730	2,500	3,280	316	1,220	143	298
25	358	b1,040	3,330	*b8,600	1,140	1,520	3,150	2,360	281	836	136	248
26	358	b1,140	2,610	b7,800	2,710	1,400	6,770	1,900	281	391	118	174
27	362	1,020	2,170	b7,800	7,440	1,400	6,980	1,630	269	281	108	*169
28	362	1,050	2,030	b6,000	7,300	1,500	5,070	1,280	315	288	114	157
29	362	1,030	2,220	2,720	-	1,500	3,660	1,200	1,050	261	106	157
30	362	1,030	1,810	2,250	--------	1,500	2,730	1,000	1,290	252	112	157
31	366	--------	b1,650	1,890	--------	1,770	--------	1,040	--------	249	108	--------
Total	13,564	24,681	86,067	86,500	58,300	82,430	155,330	82,718	18,617	17,229	4,753	4,615
Mean	438	823	2,776	2,790	2,082	2,659	5,178	2,668	621	556	153	154

Adjusted for change in contents †

Mean	442	765	2,747	2,643	1,951	2,763	5,381	2,719	619	551	151	157
Cfsm	0.311	0.539	1.94	1.86	1.37	1.95	3.79	1.92	0.436	0.388	0.106	0.111
In.	0.36	0.60	2.23	2.15	1.43	2.25	4.23	2.21	0.49	0.45	0.12	0.12

	Observed						Adjusted					
Calendar year 1956:	Max	11,800	Min	210	Mean	2,252	Mean	2,278	Cfsm	1.61	In.	21.85
Water year 1956-57:	Max	11,500	Min	96	Mean	1,739	Mean	1,739	Cfsm	1.23	In.	16.64

* 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.).

b Stage-discharge relation affected by ice.

Note.--Intake partly obstructed Dec. 9-14, Feb. 11-15, Aug. 4-21, Aug. 26 to Sept. 5, Sept. 9-14, 16-20; discharge computed on basis of gage-height record and records for other stations in Genesee River basin.

Genesee River at Avon, N. Y.

Location.--Lat 42°55'05", long 77°45'30", on left bank at downstream side of bridge on U. S. Highway 20 (State Highway 5), 0.3 mile west of Avon, Livingston County, and 0.8 mile downstream from Conesus Creek.

Drainage area.--1,666 sq mi.

Records available.--August 1955 to September 1957.

Gage.--Water-stage recorder; wire-weight gage read twice daily used for stages below 23.8 ft gage height. Datum of gage is 500.00 ft above mean sea level (levels by Corps of Engineers).

Extremes.--Maximum discharge during year, 12,400 cfs Apr. 7; maximum gage height, 37.04 ft Jan. 25 (result of ice jam); minimum discharge, 103 cfs Aug. 28 (gage height, 14.04 ft, from graph based on gage readings).

1955-57: Maximum discharge, 15,600 cfs Mar. 7, 1956 (gage height, 13.73 ft, from graph based on gage readings).

Remarks.--Records good except those for periods of ice effect, partly obstructed intake, or no gage-height record, which are fair. Diurnal fluctuation at low flow caused by powerplants. Flow regulated to some extent by Rushford Lake (capacity, 1,106,000,000 cu ft) and, at high flows, by Mount Morris Reservoir (see p. 280).

Rating tables, water year 1956-57, 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			
15.0	343	14.1	113	24.0	4,290
18.0	1,420	14.5	200	30.0	8,230
24.0	4,140	15.0	343	35.0	12,900
32.0	9,850	18.0	1,420		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	653	428	1,030	1,810	2,100	5,660	a1,960	2,550	1,430	1,060	270	126
2	a557	720	974	a1,700	2,000	3,380	1,720	2,160	1,160	712	259	134
3	504	903	955	1,600	2,150	2,680	2,180	1,840	1,020	491	248	128
4	*464	1,380	1,080	1,850	2,200	2,230	2,570	1,660	966	416	216	140
5	448	858	1,460	1,800	2,150	1,900	2,830	1,520	909	891	205	138
6	a448	695	1,710	1,750	1,750	1,770	7,830	1,410	740	2,290	195	169
7	471	625	4,040	1,700	1,500	1,830	12,000	1,290	712	1,140	193	a174
8	517	574	6,260	1,650	1,450	2,060	12,000	1,170	916	772	190	162
9	941	530	5,110	1,600	1,750	a2,050	10,500	1,060	880	656	186	151
10	930	517	3,280	1,550	3,800	1,820	8,290	a989	737	497	188	142
11	639	474	2,530	1,550	4,600	1,660	6,560	1,010	632	461	193	128
12	540	468	2,610	1,600	2,700	2,300	6,870	1,850	588	434	193	115
13	501	468	4,270	1,700	1,950	6,680	8,220	*3,790	598	422	183	117
14	478	484	*4,150	1,600	2,050	8,150	6,770	2,730	776	520	181	126
15	422	504	3,420	1,300	2,000	7,240	5,000	3,740	1,100	441	*158	151
16	400	*494	3,450	1,200	1,850	6,280	4,330	4,620	912	377	138	167
17	396	488	3,980	1,350	1,750	5,160	4,450	3,300	653	334	134	169
18	393	488	3,360	1,250	1,550	3,650	5,050	2,430	*474	*303	132	176
19	393	524	a2,760	1,240	1,550	3,020	*5,640	a2,380	544	297	136	171
20	393	451	2,110	1,200	1,500	*3,080	7,080	8,290	551	294	151	171
21	387	425	1,820	1,220	1,180	3,340	5,340	9,520	474	279	171	174
22	362	1,380	2,060	1,900	1,000	2,900	3,780	8,370	448	297	162	190
23	349	2,990	3,990	6,800	1,020	2,390	3,100	7,590	390	1,080	160	167
24	362	1,880	5,050	9,000	1,250	2,100	a2,740	4,680	358	1,430	158	210
25	380	a1,170	3,640	*9,400	1,350	1,830	2,640	3,080	337	1,120	155	297
26	384	1,220	3,140	9,000	2,130	1,630	5,360	2,290	331	653	149	213
27	387	1,240	2,510	8,400	6,320	1,600	7,370	1,990	318	380	124	*171
28	387	1,120	2,200	7,600	8,690	1,580	6,370	1,630	331	384	121	a162
29	387	1,110	2,220	3,900	-	1,710	4,250	1,420	747	334	130	162
30	387	1,100	a2,160	2,800	--------	1,610	3,280	1,300	1,440	312	119	160
31	387	--------	1,710	2,400	--------	1,720	--------	1,130	--------	297	a126	--------
Total	14,647	25,708	89,039	93,420	65,290	95,010	166,080	92,789	21,472	19,374	5,324	4,861
Mean	472	857	2,872	3,014	2,332	3,065	5,536	2,993	716	625	171	162

Adjusted for change in contents in Rushford Lake and Mount Morris Reservoir

Mean	477	800	2,843	2,866	2,200	3,169	5,740	3,043	714	620	169	165
Cfsm	0.286	0.480	1.71	1.72	1.32	1.90	3.45	1.83	0.429	0.372	0.101	0.099
In.	0.33	0.53	1.97	1.98	1.38	2.19	3.84	2.11	0.48	0.43	0.12	0.11

	Observed						Adjusted					
Calendar year 1956:	Max	14,300	Min	212	Mean	2,592	Mean	2,617	Cfsm	1.57	In.	21.39
Water year 1956-57:	Max	12,000	Min	115	Mean	1,899	Mean	1,899	Cfsm	1.14	In.	15.47

* Discharge measurement made on this day.

a No gage-height record; discharge estimated from graph based on twice-daily water-level observations at stations near Fowlerville and West Rush and records for station at Jones Bridge, near Mount Morris.

Note.--Stage-discharge relation affected by ice Jan. 3 to Feb. 25, Mar. 5 (no gage-height record Jan. 3, 4, 21, Feb. 6, 7, 16-25). Partly obstructed intakes Feb. 27 to Mar. 1, Mar. 13-17, Apr. 6-21, May 21-24; discharge computed from twice-daily wire-weight-gage readings. Records of change in contents in Rushford Lake furnished by Rochester Gas & Electric Corp.

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 1957.

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.--54 years, 11.8 cfs (unadjusted).

Cooperation.--Records furnished by Department of Public Works, city of Rochester.

Monthly discharge, water year October 1956 to September 1957

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	1,094.76	12.6	0.54	0.043	0.05
November	1,093.66	12.3	2.14	.170	.19
December	1,094.01	14.4	24.4	1.94	2.23
Calendar year 1956	1,096.37	19.2	18.9	1.50	20.42
January	1,094.19	15.3	21.7	1.71	1.98
February	1,094.64	11.5	15.9	1.26	1.32
March	1,095.99	5.77	24.3	1.93	2.22
April	1,098.36	8.76	35.7	2.83	3.16
May	1,098.82	19.2	18.5	1.47	1.69
June	1,098.66	4.18	-1.02	-.081	-.09
July	1,097.81	14.5	.35	.028	.03
August	1,096.43	15.5	-4.51	-.358	-.41
September	1,094.75	17.5	1.86	.148	-.16
Water year 1956-57	1,096.01	12.6	11.1	.881	12.21

† Adjusted for change in contents in Canadice Lake. Negative figures indicate that natural losses from Canadice Lake exceeded inflow.

Note.--Elevations of Canadice Lake: 1,095.24 ft at 12 p.m. Sept. 30, 1956, and 1,093.88 ft at 12 p.m. Sept. 30, 1957; 1,094.54 ft at 12 p.m. Dec. 31, 1955, and 1,094.20 ft at 12 p.m. Dec. 13, 1956.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 609.98 ft above mean sea level (levels by Corps of Engineers).

Average discharge.--12 years, 176 cfs (adjusted for storage and diversion).

Extremes.--Maximum discharge during year, 1,700 cfs May 20 (gage height, 4.44 ft); minimum, 0.9 cfs Sept. 4 (gage height, 0.53 ft).

1945-57: 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.

Remarks.--Records good except those for periods of ice effect or backwater from aquatic vegetation, 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 1956-57, except periods of ice effect or backwater from aquatic vegetation (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 22

0.6	1.3	1.4	34
.7	2.7	1.7	64
.8	4.6	2.0	124
.9	7.3	2.4	256
1.1	15		

Jan. 23 to Sept. 30

0.5	0.7	1.6	63
.6	1.7	2.0	131
.7	3.4	2.5	264
.8	5.7	3.0	484
.9	8.8	3.5	815
1.1	18	4.0	1,250
1.3	31	4.5	1,770

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	4.2	9.2	56	124	194	95	135	109	25	12	1.2
2	*4.2	4.2	9.2	58	114	150	95	122	100	20	10	1.0
3	4.4	4.2	9.2	56	118	125	100	104	91	16	8.8	1.3
4	3.8	4.2	9.5	56	112	94	93	94	83	16	8.4	1.2
5	4.4	4.4	12	56	125	82	254	88	74	20	7.5	1.1
6	5.0	4.8	16	52	122	86	812	80	67	22	7.5	1.1
7	6.6	4.8	25	54	110	94	620	74	63	25	6.6	1.1
8	6.2	4.6	37	54	106	94	382	72	64	29	6.0	1.1
9	6.2	4.2	40	52	145	94	312	60	57	27	5.7	1.2
10	6.8	4.2	34	50	320	92	380	*58	51	22	5.4	1.8
11	6.8	4.4	35	40	200	106	453	76	49	19	4.4	1.8
12	6.6	4.4	49	30	140	390	*535	110	44	17	3.8	1.7
13	5.8	4.8	*63	25	108	866	425	98	48	17	3.4	1.6
14	5.6	4.8	58	22	90	456	320	78	49	18	3.2	1.8
15	5.2	4.4	60	20	88	296	275	152	61	20	*3.2	1.7
16	4.5	*4.6	63	24	80	304	245	151	50	21	3.6	1.8
17	4.0	5.3	69	23	80	245	271	98	42	18	3.0	*1.8
18	3.2	5.3	61	*23	86	*206	282	80	*37	15	2.6	1.8
19	2.5	4.8	54	26	*56	190	300	159	35	*13	2.6	1.7
20	3.0	4.6	53	31	64	254	312	1,390	33	12	2.4	2.0
21	3.4	5.9	38	41	64	278	304	1,240	32	11	2.7	2.6
22	3.2	9.2	51	240	64	215	248	607	28	12	3.0	3.5
23	3.4	14	80	880	66	185	226	422	26	14	2.3	4.0
24	3.8	13	91	502	68	167	209	308	25	21	1.8	3.6
25	4.0	11	78	258	82	151	198	251	28	23	1.7	3.2
26	4.6	9.8	69	182	132	142	209	248	28	20	1.4	3.4
27	4.6	9.2	63	155	*485	138	190	235	24	17	1.3	3.2
28	4.8	8.5	63	135	291	125	177	258	24	16	1.2	2.6
29	4.6	8.9	60	125	-	117	170	193	26	18	1.2	2.6
30	4.4	8.6	58	120	--------	109	158	146	25	17	1.3	2.1
31	4.4	--------	56	118	--------	100	--------	131	--------	16	1.3	--------
Total	144.4	189.3	1,473.1	3,564	3,640	6,145	8,650	7,318	1,473	577	129.3	60.6
Mean	4.66	6.31	47.5	115	130	198	288	236	49.1	18.6	4.17	2.02
						Adjusted†						
Mean	10.5	19.5	149	212	211	309	419	287	67.9	33.3	-11.5	-0.32
Cfsm	0.053	0.099	0.756	1.08	1.07	1.57	2.13	1.46	0.345	0.169	-0.058	-0.002
In.	0.06	0.11	0.87	1.24	1.12	1.81	2.37	1.68	0.38	0.19	-0.07	0.00

	Observed			Adjusted		
Calendar year 1956:	Max 2,910	Min 2.4	Mean 189	Mean 245	Cfsm 1.24	In. 16.95
Water year 1956-57:	Max 1,390	Min 1.0	Mean 91.4	Mean 142	Cfsm 0.721	In. 9.76

* 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 controlled (records of diversion and change in contents furnished by Department of Public Works, city of Rochester). Negative figures indicate that losses from Hemlock, Canadice, and Honeoye Lakes exceeded inflow.

Note.--Stage-discharge relation affected by ice Nov. 22-26, 30, Dec. 1, 5, 19, Dec. 29 to Jan. 23, Jan. 27 to Feb. 9, Feb. 11-25, Mar. 2-12 (no gage-height record Jan. 15-18). Backwater from aquatic vegetation Oct. 1-16, May 1-14, 17, 18, July 17-30.

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, 2 miles southwest of Scottsville, and 3½ miles upstream from mouth.

Drainage area.--208 sq mi.

Records available.--October 1945 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 560.89 ft above mean sea level (levels by Corps of Engineers).

Average discharge.--12 years, 210 cfs.

Extremes.--Maximum discharge during year, 3,500 cfs Jan. 24 (gage height, 6.65 ft); minimum, 4.5 cfs Aug. 28 (gage height, 1.94 ft, result of regulation).
1945-57: Maximum discharge, 6,080 cfs Mar. 29, 1950 (gage height, 8.52 ft); minimum, that of Aug. 28.

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

Rating tables, water year 1956-57, except periods of ice effect or backwater from debris (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 24

2.3	40	4.0	725
2.5	73	5.0	1,530
2.8	149	6.0	2,670
3.2	298	7.0	3,950
3.6	490		

Jan. 25 to Sept. 30

2.2	21	2.9	180
2.3	33	3.2	290
2.4	50	3.6	490
2.6	90		

Note.--Same as preceding table above 3.6 ft.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47	44	98	b122	218	653	180	229	156	142	47	31
2	46	40	104	b135	212	380	180	204	159	92	43	29
3	*47	40	108	b125	198	304	187	190	156	77	42	31
4	49	40	140	126	212	250	190	180	145	73	42	31
5	58	41	190	123	232	243	316	170	133	77	42	29
6	54	46	170	b112	212	236	1,630	159	124	189	42	29
7	62	46	410	115	198	250	1,900	152	118	190	42	31
8	80	44	738	115	190	266	902	142	118	110	40	28
9	108	43	623	112	237	262	660	133	115	86	40	28
10	80	44	339	b104	658	246	578	130	105	75	40	28
11	62	43	225	b92	589	236	*706	139	98	67	40	29
12	54	43	283	b78	380	399	916	187	95	63	40	29
13	52	43	*361	b54	258	1,050	902	240	90	61	36	31
14	49	43	286	b50	222	1,300	612	*184	98	92	36	31
15	47	46	195	b46	204	686	490	236	95	82	*36	29
16	46	*47	218	b84	190	556	425	286	95	69	35	31
17	44	44	294	*b80	166	452	415	198	84	61	35	*32
18	44	43	236	b78	166	340	430	162	*77	*56	35	32
19	44	40	181	b102	166	*304	452	253	73	52	33	32
20	44	40	143	b125	*148	340	474	1,400	71	50	33	36
21	46	47	149	b145	148	405	365	1,870	71	48	35	33
22	44	76	185	431	148	322	304	1,160	69	47	35	31
23	46	160	297	2,150	166	274	270	564	67	52	33	36
24	46	100	316	2,930	173	250	250	390	65	67	32	29
25	46	78	244	1,190	227	232	322	308	63	61	32	28
26	44	94	217	610	519	215	490	266	61	54	32	27
27	46	100	185	405	1,360	212	479	240	58	48	31	28
28	46	94	171	308	1,230	204	365	222	61	45	25	28
29	44	102	171	270	-	201	308	201	105	43	31	31
30	43	94	b135	250		194	266	184	179	43	32	31
31	43		b130	226		194		170		45	31	
Total	1,611	1,805	7,542	10,893	9,027	11,456	15,964	10,549	3,004	2,317	1,128	909
Mean	52.0	60.2	243	351	322	370	532	340	100	74.7	36.4	30.3
Cfsm	0.250	0.289	1.17	1.69	1.55	1.78	2.56	1.63	0.481	0.359	0.175	0.146
In.	0.29	0.32	1.35	1.95	1.61	2.05	2.85	1.89	0.54	0.41	0.20	0.16

Calendar year 1956:	Max 5,160	Min 40	Mean 300	Cfsm 1.44	In. 19.65
Water year 1956-57:	Max 2,930	Min 25	Mean 209	Cfsm 1.00	In. 13.62

Peak discharge (base, 1,500 cfs).--Jan. 24 (4:30 a.m.) 3,500 cfs (6.65 ft); Feb. 28 (2 a.m.) 1,560 cfs (5.03 ft); Apr. 7 (5:45 a.m.) 2,240 cfs (5.64 ft); May 20 (9:15 p.m.) 1,970 cfs (5.41 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--Backwater from debris Oct. 1 to Dec. 7.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 552.45 ft above mean sea level (levels by Corps of Engineers).

Average discharge.--12 years, 110 cfs.

Extremes.--Maximum discharge during year, 1,910 cfs Jan. 24 (gage height, 6.36 ft); minimum, 2.2 cfs Sept. 2; minimum gage height, 1.07 ft Sept. 9.

1945-57: 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 ice effect, no gage-height record, or backwater from aquatic vegetation, which are fair. Prior to May 1952, small diversion by New York Central Railroad Co. and slight regulation by pumping operations above station.

Rating tables, water year 1956-57, except periods of ice effect or backwater from aquatic vegetation (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 6			
1.3	10	3.0	271
1.5	22	4.0	580
1.8	51	5.0	1,040
2.1	91	6.0	1,650
2.5	161	7.0	2,450

Apr. 7 to Sept. 30			
1.0	0.9	2.0	81
1.1	3.2	2.5	175
1.2	7.1	3.0	300
1.3	12	4.0	635
1.6	36	5.0	1,070

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	20	29	43	86	574	85	151	62	82	9.5	3.2
2	*29	21	31	38	82	290	101	121	80	46	10	3.2
3	30	22	32	35	76	210	119	99	87	33	9.5	8.0
4	33	22	42	36	78	165	109	90	71	30	11	7.2
5	30	22	63	37	92	140	229	84	60	32	10	5.8
6	26	20	72	36	90	135	630	82	50	31	9.5	4.2
7	34	21	90	33	82	157	934	78	48	30	9.5	4.2
8	43	21	117	35	76	179	621	71	46	27	8.5	4.2
9	47	21	144	34	130	185	381	66	43	27	5.8	3.0
10	35	20	112	30	320	165	363	66	39	23	5.4	5.4
11	27	a19	79	23	410	165	*446	84	36	19	6.2	6.6
12	26	a18	85	17	280	270	537	103	38	17	4.2	6.2
13	25	20	105	13	165	642	554	106	38	22	3.6	8.5
14	24	22	94	12	122	619	381	*93	37	24	4.2	8.0
15	22	*22	68	11	102	360	276	92	35	25	4.5	8.5
16	22	23	70	18	86	284	224	93	32	23	7.6	8.0
17	22	20	79	*17	70	233	198	93	*28	18	6.6	*6.2
18	22	19	*76	16	68	187	193	71	27	*15	4.9	5.8
19	20	18	46	20	66	*163	215	78	26	14	*3.6	5.8
20	20	18	41	23	*64	196	217	337	24	13	3.6	9.5
21	20	30	38	34	64	240	193	838	23	12	4.2	9.5
22	20	47	58	166	66	215	160	904	21	10	7.6	12
23	22	63	84	854	80	169	134	431	20	13	7.2	13
24	23	47	104	1,690	93	142	126	244	18	16	4.2	10
25	22	34	93	a980	146	121	211	173	21	18	3.6	9.0
26	20	37	72	a520	330	110	613	134	22	13	3.2	6.6
27	22	33	66	a310	870	105	586	117	20	9.5	3.6	6.2
28	20	31	66	225	1,080	101	354	96	30	9.0	3.6	5.8
29	20	31	70	140	-	97	242	80	88	9.0	3.8	5.8
30	20	29	46	114	-------	97	196	72	124	8.0	4.2	5.3
31	20	-------	46	98	-------	93	-------	64	-------	7.1	4.2	-------
Total	795	791	2,218	5,658	5,274	6,809	9,628	5,211	1,294	675.6	187.1	204.7
Mean	25.6	26.4	71.5	183	188	220	321	168	43.1	21.8	6.04	6.82
Cfsm	0.208	0.215	0.581	1.49	1.53	1.79	2.61	1.37	0.350	0.177	0.049	0.055
In.	0.24	0.24	0.67	1.71	1.59	2.06	2.91	1.58	0.39	0.20	0.06	0.06

Calendar year 1956: Max 2,680	Min 7.1	Mean 169	Cfsm 1.37	In. 18.64
Water year 1956-57: Max 1,690	Min 3.0	Mean 106	Cfsm 0.862	In. 11.71

Peak discharge (base, 1,000 cfs).--Jan. 24 (9:30 a.m.) 1,910 cfs (6.36 ft); Feb. 28 (2:30 a.m.) 1,400 cfs (5.62 ft); May 21 (11:30 p.m.) 1,110 cfs (5.08 ft).

* 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 Dec. 19-22, Dec. 30 to Jan. 2, Jan. 9-21, Jan. 28 to Feb. 23, Mar. 2-6, 9-12. Backwater from aquatic vegetation Aug. 9 to Sept. 12.

Genesee River at Driving Park Avenue, Rochester, N. Y.

Location.--Lat 43°10'50", 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 1957.

Gage.--Water-stage recorder. Prior to June 20, 1956, water-stage recorder at datum 3.00 ft higher.

Average discharge.--37 years (1920-57), 2,783 cfs.

Extremes.--Maximum discharge during year, 17,000 cfs Apr. 8 (gage height, 12.37 ft); minimum, 51 cfs Oct. 26; minimum gage height, 1.06 ft Aug. 30; minimum daily, 436 cfs Aug. 30.

1919-57: Maximum discharge, 34,400 cfs Mar. 19, 1942; maximum gage height, 17.08 ft Apr. 2, 1940 (present datum); minimum discharge, 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. Extensive diurnal fluctuation caused by powerplants above station. New York State Erie (Barge) Canal crosses river 5.4 miles above station. 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 and Mount Morris Reservoir. Records of chemical analyses and water temperatures for the water year 1957 are given in WSP 1520.

Revisions.--WSP 759: Drainage area.

Rating tables, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 23				Jan. 24 to Sept. 30			
2.0	490	7.0	5,430	1.3	432	7.0	4,980
2.5	775	8.0	7,180	2.0	600	9.0	8,610
3.0	1,110	S.6	8,440	3.0	1,110	11	13,400
5.0	2,730			5.0	2,600	12	16,000

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,190	600	1,580	1,500	2,450	*8,960	2,730	3,920	2,330	2,040	596	515
2	944	912	1,470	1,630	2,080	4,860	2,500	3,480	2,610	1,410	712	496
3	984	1,020	2,060	1,570	2,080	3,840	2,720	3,010	2,110	1,120	658	616
4	872	1,620	2,410	1,760	2,700	3,700	3,320	2,800	2,030	948	721	504
5	814	1,290	2,520	2,100	2,500	2,810	3,590	2,690	1,830	1,370	608	538
6	872	1,050	3,370	1,870	2,380	2,550	9,490	2,560	1,570	2,820	541	476
7	1,070	1,050	4,780	1,730	2,220	2,550	15,200	2,340	1,450	2,310	562	498
8	998	931	7,380	1,890	1,970	2,970	15,400	2,340	1,500	1,310	556	472
9	1,470	931	7,850	1,970	2,460	3,420	13,900	2,190	1,380	1,290	572	458
10	1,520	892	5,050	1,860	4,320	2,690	11,400	*1,950	1,550	1,090	559	478
11	1,200	721	4,580	1,550	5,830	2,730	*9,010	1,820	1,190	1,010	572	500
12	924	763	3,850	1,450	4,370	3,060	9,010	2,450	1,230	885	553	454
13	970	715	5,060	1,500	2,850	8,680	9,770	4,550	1,170	900	538	482
14	938	763	5,570	1,680	2,720	12,000	8,610	4,010	1,280	972	568	480
15	879	*763	4,930	1,440	2,750	10,300	6,630	4,120	1,660	1,060	510	512
16	769	931	4,750	931	2,460	8,380	5,500	5,650	1,540	815	532	*514
17	775	757	*5,210	*950	2,190	6,890	5,710	4,560	*1,330	815	518	521
18	782	638	5,130	1,430	2,100	4,730	6,770	3,510	1,070	785	500	530
19	721	727	4,580	872	2,020	*4,190	7,620	3,450	1,110	*721	*480	548
20	650	834	4,020	1,220	*2,020	4,080	9,630	10,600	1,040	726	492	604
21	691	931	2,300	1,700	1,900	4,360	7,960	14,900	1,100	676	476	603
22	715	1,230	2,110	2,750	1,640	4,140	5,490	12,700	830	735	515	746
23	703	4,010	3,630	8,240	1,190	3,450	4,520	11,600	865	1,030	515	612
24	655	2,800	5,650	12,400	1,360	3,010	4,110	7,640	895	1,940	510	569
25	562	1,590	4,600	12,900	2,600	3,100	4,080	4,680	890	1,680	492	660
26	562	1,740	4,600	12,000	3,020	2,300	6,360	3,920	760	1,350	532	613
27	685	1,780	3,260	10,000	8,400	2,090	9,720	3,640	855	740	538	524
28	739	1,660	2,830	8,830	12,800	2,070	9,030	3,000	860	805	498	591
29	667	1,750	2,760	5,220	-	2,220	6,150	2,750	1,650	972	462	486
30	572	1,620	2,100	3,260		2,110	4,540	2,520	1,790	644	436	526
31	528		2,870	2,820		2,110		2,320		716	484	
Total	26,421	37,019	122,860	111,023	87,380	134,350	220,470	141,670	41,475	35,685	16,806	16,126
Mean	852	1,234	3,963	3,581	3,121	4,334	7,349	4,570	1,382	1,151	542	538
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 23,000 Min 438 Mean 3,876 Cfsm 1.57 In. 21.39
Water year 1956-57: Max 15,400 Min 436 Mean 2,716 Cfsm 1.10 In. 14.93

* Discharge measurement made on this day.

Sterling Creek at Sterling, N. Y.

Location.--Lat 43°19'30", long 76°38'50", on right bank at Sterling, Cayuga County, 25 ft downstream from bridge on State Highway 104A, 1.8 miles southwest of Sterling Valley, and 1.9 miles upstream from Sterling Valley Creek.

Drainage area.--44.4 sq mi.

Records available.--April to September 1957.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during period, 214 cfs May 21 (gage height, 3.15 ft); minimum, 0.6 cfs Sept. 26; minimum gage height, 1.64 ft Sept. 20.

Remarks.--Records good except those for periods of backwater from aquatic vegetation, which are fair.

Rating tables, Apr. 30 to Sept. 30, 1957, except periods of backwater from aquatic vegetation (gage height, in feet, and discharge, in cubic feet per second)

Apr. 30 to July 22				July 23 to Sept. 30			
1.76	4.2	2.3	42	1.6	1.6	1.8	8.2
1.9	9.4	2.6	84	1.7	3.8	1.9	15
2.1	22	3.1	202				

Discharge, in cubic feet per second, April to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								35	15	22	3.8	2.3
2								35	9.4	16	3.5	c2.3
3								27	9.4	14	5.8	c2.3
4								16	11	16	9.3	c2.1
5								23	10	30	4.1	c1.9
6								c19	10	27	3.8	c1.7
7								c18	12	21	3.8	c1.6
8								*c17	11	19	3.5	c1.4
9								c16	8.5	15	3.5	c1.4
10								c15	7.6	9.4	3.8	c1.3
11								c14	*7.6	9.9	3.5	c1.3
12								c23	9.4	8.5	3.2	c1.1
13								27	12	6.1	3.2	c1.1
14								21	16	6.1	3.2	c1.0
15								28	16	6.1	3.2	c1.0
16								26	12	4.8	3.2	c.9
17								26	9.9	4.2	3.2	c.9
18								26	6.8	4.2	3.2	c.8
19								22	12	4.2	3.0	c.8
20								125	23	4.2	*3.0	*c.8
21								180	23	4.4	3.0	c.8
22								125	19	*4.2	3.0	c.8
23								98	19	4.1	3.0	c.8
24								49	24	3.8	2.7	c.8
25								49	38	3.8	2.5	c.8
26								39	31	3.8	2.5	c.7
27								33	31	3.8	2.3	c.8
28								27	26	4.4	2.3	c.8
29								18	35	4.4	2.3	c.8
30					--------		*41	18	24	5.2	2.3	c.8
31		--------			--------		--------	18	--------	4.8	2.3	--------
Total							-	1,213	498.6	294.4	105.0	35.9
Mean							-	39.1	16.6	9.50	3.39	1.20
Cfsm							-	0.881	0.374	0.214	0.076	0.027
In.							-	1.02	0.42	0.25	0.09	0.03

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

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* Discharge measurement made on this day.
c Backwater from aquatic vegetation.

Seneca Lake at Watkins Glen, N. Y.

Location.--Lat 42°23'00", long 76°52'05", on east bank about 300 ft from lake on shorter of two boat slips at Watkins Glen, Schuyler County.

Drainage area.--714 sq mi.

Records available.--October 1956 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 440.00 ft above mean sea level, Barge Canal datum.

Extremes.--Maximum gage height during year, 7.66 ft May 22; minimum, 5.26 ft Dec. 5.

Remarks.--Capacity of lake not determined; area of water surface, 66.7 sq mi. Figures of change in contents computed from surface area and change in stage.

Mean gage height, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	f6.74	6.11	5.61	5.95	6.36	6.97	6.61	7.34	7.46	7.22	6.71	6.06
2	6.63	6.08	5.61	5.92	6.37	6.96	6.63	7.32	7.54	7.16	6.61	6.05
3	6.62	6.05	5.60	5.86	6.31	6.96	6.60	7.27	7.57	7.33	6.57	6.03
4	6.59	6.09	5.59	5.82	6.37	6.95	a6.56	7.23	7.56	7.05	6.66	6.05
5	6.56	6.09	5.50	5.84	6.38	6.89	a6.60	7.25	7.54	7.14	6.66	6.06
6	6.49	6.04	5.50	5.81	6.37	6.85	a6.83	7.23	7.52	7.12	6.52	6.09
7	6.48	6.01	5.52	5.82	6.38	6.82	a6.96	7.18	7.57	7.13	6.49	6.04
8	6.52	6.01	5.56	5.83	6.41	6.84	a7.06	7.13	7.58	7.10	6.44	6.06
9	6.48	5.99	5.60	5.82	6.42	6.88	a7.20	7.11	7.57	7.13	6.44	6.01
10	6.46	a5.97	5.55	5.90	6.55	6.86	a7.22	7.11	7.53	a7.16	6.47	5.95
11	6.44	a5.86	5.50	5.85	6.57	6.80	a7.30	7.12	7.50	a7.05	6.42	5.94
12	6.34	a5.91	5.56	5.83	6.54	6.82	7.34	7.17	7.52	a6.99	6.48	5.97
13	6.28	a5.91	5.58	5.89	6.53	6.96	7.33	7.21	7.51	7.05	6.41	5.93
14	6.34	a5.84	5.59	a5.87	6.55	7.08	7.31	7.20	7.50	7.06	6.27	6.02
15	6.34	5.81	5.59	a5.86	6.58	7.14	7.28	7.24	7.51	7.10	6.36	5.96
16	6.30	5.78	5.66	a5.85	6.57	7.21	7.24	7.25	7.54	7.04	6.35	5.98
17	6.28	5.81	5.66	a5.84	6.58	7.22	7.22	7.22	7.50	6.97	6.30	6.04
18	6.29	5.82	5.67	a5.83	6.59	7.24	7.19	7.22	7.45	6.98	6.27	5.98
19	6.25	5.77	5.62	5.82	6.61	7.18	7.17	7.32	7.38	6.89	6.30	5.96
20	6.17	5.71	5.66	5.77	6.62	7.21	7.17	7.57	7.38	6.86	6.25	5.96
21	6.16	5.69	5.66	5.78	6.62	7.20	7.27	7.62	7.31	6.87	6.25	6.00
22	6.21	5.70	5.71	5.81	6.60	7.14	7.28	7.55	7.25	6.86	6.24	6.02
23	6.23	5.74	5.84	6.14	6.62	7.06	7.26	7.53	7.27	6.99	6.12	6.08
24	6.27	5.73	5.89	6.19	6.62	7.00	7.26	7.50	7.30	6.93	6.08	6.03
25	6.21	5.71	5.94	6.22	6.62	6.91	7.25	7.45	7.25	6.84	6.11	6.00
26	6.11	5.71	5.93	6.24	6.68	6.82	7.28	7.39	7.20	6.79	6.13	6.03
27	6.09	5.70	5.90	a6.24	6.92	6.75	7.30	7.34	7.15	6.76	6.14	6.01
28	6.18	5.66	5.93	a6.23	6.95	6.67	7.38	7.34	7.08	6.75	6.10	5.93
29	6.13	5.65	5.97	a6.28	-	6.63	7.39	7.32	7.09	6.74	6.03	5.93
30	6.06	5.63	5.95	a6.31	------	6.63	7.38	7.31	7.16	6.71	6.11	5.86
31	6.08	------	5.93	6.32	------	6.64	------	7.44	------	6.72	6.09	------
Mean	6.33	5.85	5.69	5.96	6.55	6.94	7.13	7.31	7.41	6.98	6.33	6.00
(†)	-437.4	-365.9	+249.9	+249.9	+476.6	-222.2	+502.2	+83.3	-179.4	-340.2	-465.2	-157.8

Calendar year 1956: Max - Min - Mean - -
Water year 1956-57: Max 7.62 Min 5.50 Mean 6.54 † -54.8

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† Change in contents, equivalent cubic feet per second, in Seneca Lake.
a No gage-height record; gage heights estimated on basis of recorded range in stage.
f Fragmentary gage-height record; gage heights partly estimated.

Cayuga Inlet near Ithaca, N. Y.

Location.--Lat 42°23'35", long 76°32'40", on left bank half a mile upstream from Butternut Creek and 5 miles south of Ithaca, Tompkins County.

Drainage area.--36.7 sq mi.

Records available.--March 1937 to September 1957.

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.--20 years, 38.5 cfs.

Extremes.--Maximum discharge during year, 920 cfs Apr. 5 (gage height, 3.35 ft); minimum, 2.6 cfs Aug. 24, 25 (gage height, 0.55 ft).

1937-57: 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, 1.7 cfs July 22, 1955; minimum gage height, 0.42 ft Aug. 30, 31, Sept. 1, 2, 1939, July 22, 1955.

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

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 14		Dec. 15 to Sept. 30			
0.7	6.6	0.55	2.6	1.1	38
.9	17	.6	4.0	1.4	83
1.1	34	.7	7.8	1.8	185
1.3	60	.9	20	2.5	464

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.0	11	10	36	30	*66	39	36	24	12	5.8	4.3
2	8.6	13	11	38	27	56	82	34	24	9.7	5.2	4.2
3	9.3	15	12	36	26	45	59	34	22	8.4	5.0	3.7
4	12	13	14	36	28	44	56	32	*20	14	5.2	3.6
5	12	13	13	30	26	38	242	30	19	12	4.8	3.6
6	9.6	11	18	28	25	40	363	28	18	9.0	4.7	3.4
7	17	11	21	26	26	36	173	26	23	8.0	4.2	3.2
8	14	11	27	26	28	34	150	24	18	8.2	4.3	3.1
9	11	11	22	25	32	36	142	24	16	8.7	4.3	3.0
10	10	10	18	23	a62	34	142	25	15	7.6	5.6	3.1
11	9.6	9.3	21	24	a34	34	159	30	14	7.4	5.2	3.4
12	9.3	9.8	28	24	a20	84	172	45	16	6.8	5.0	4.2
13	8.8	10	33	22	a22	170	123	34	15	27	4.5	5.8
14	8,8	9.8	60	19	a21	160	116	34	17	15	4.2	5.2
15	8.6	9.0	88	16	a21	160	96	39	16	12	3.7	5.0
16	*8.3	9.3	72	19	a21	135	79	32	27	9.4	3.7	5.2
17	8.0	9.8	54	18	a17	100	76	*28	18	8.0	3.6	5.2
18	8.0	9.3	44	*16	a19	76	70	32	13	7.4	3.6	4.7
19	7.8	8.3	34	19	a19	76	*79	130	22	6.8	3.6	4.0
20	7.8	8.8	36	20	a15	*96	76	161	16	6.4	3.6	4.8
21	7.8	16	*34	23	a17	92	69	111	13	5.6	3.4	5.0
22	7.6	24	109	94	a16	70	60	83	11	*16	3.4	13
23	14	14	124	205	a22	58	52	70	11	17	3.6	*17
24	15	12	96	104	20	53	46	56	10	9.4	3.1	8.0
25	12	11	87	68	35	46	52	44	12	7.4	3.0	6.0
26	10	13	65	54	93	50	49	40	11	7.0	*5.6	5.6
27	14	13	54	45	155	49	42	36	17	6.6	4.5	4.8
28	15	*13	53	34	68	44	64	32	15	6.4	4.2	4.8
29	12	12	46	38	-	45	45	30	31	8.4	4.3	4.7
30	11	11	32	32	--------	49	39	26	16	7.4	5.4	4.7
31	11	--------	40	26	--------	42	--------	24	--------	8.8	5.2	--------
Total	326.9	351.4	1,376	1,224	945	2,118	3,012	1,410	520	303.8	135.5	156.3
Mean	10.5	11.7	44.4	39.5	33.8	68.3	100	45.5	17.3	9.80	4.37	5.21
Cfsm	0.286	0.319	1.21	1.08	0.921	1.86	2.72	1.24	0.471	0.267	0.119	0.142
In.	0.33	0.36	1.39	1.24	0.96	2.15	3.05	1.43	0.53	0.31	0.14	0.16

Calendar year 1956:	Max 1,300	Min 4.0	Mean	48.3	Cfsm	1.32	In.	17.92
Water year 1956-57:	Max 363	Min 3.0	Mean	32.5	Cfsm	0.886	In.	12.05

Peak discharge (base, 1,100 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of observer's notes, recorded range in stage, and records for nearby stations.

Note.--Stage-discharge relation affected by ice Nov. 23-25, Nov. 30 to Dec. 1, Dec. 9, 10, 18, 19, Dec. 29 to Jan. 3, Jan. 6, Jan. 10 to Feb. 3, Feb. 5, 6, Feb. 27 to Mar. 1, Mar. 3-6, 10, 11. Partly obstructed intake Mar. 12-22; discharge computed on basis of discharge measurement, engineers' notes, and records for nearby stations.

Cayuga Lake at Ithaca, N. Y.

Location.--Lat 42°26'45", long 76°30'45", on left bank of Cayuga Inlet 1 mile from mouth, at Ithaca, Tompkins County.

Drainage area.--780 sq mi.

Records available.--August 1956 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 380.00 ft above mean sea level, Barge Canal datum.

Extremes.--1956: Maximum gage height during period August to September, 3.38 ft Aug. 15; minimum, 2.17 ft Sept. 23.

1956-57: Maximum gage height during water year, 4.92 ft May 27; minimum, -0.14 ft Feb. 26.

Remarks.--Lake regulated at outlet at Mud Lock by New York State Department of Public Works. Capacity of lake not determined; area of water surface, 66.4 sq mi. Figures of change in contents computed from surface area and change in stage.

Mean gage height, in feet, 1956

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	-	2.86	7	-	2.86	13	-	2.56	19	3.23	2.58	25	2.98	2.68
2	-	2.90	8	-	2.76	14	-	2.61	20	3.17	2.66	26	2.90	2.66
3	-	2.90	9	-	2.74	15	f3.32	2.65	21	3.13	2.63	27	2.88	2.63
4	-	2.84	10	-	2.65	16	3.24	2.61	22	3.04	2.57	28	2.84	2.64
5	-	2.81	11	-	2.62	17	3.24	2.67	23	2.82	2.65	29	2.87	2.63
6	-	2.78	12	-	2.61	18	3.19	2.79	24	3.02	2.68	30	2.82	2.58
												31	2.84	-
Mean													-	2.69
(†)													-	-150.0

† Change in contents, equivalent in cubic feet per second, in Cayuga Lake.
f Fragmentary gage-height record; gage height partly estimated.

Mean gage height, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.65	2.69	2.22	2.10	0.90	0.25	1.79	3.52	4.11	4.10	3.86	2.99
2	2.56	2.71	2.19	2.03	.87	.26	1.87	3.54	4.09	4.01	3.81	2.93
3	2.61	2.71	2.16	1.91	.78	.29	1.84	3.53	3.99	3.88	3.79	2.92
4	2.63	2.74	2.18	1.83	.84	.27	1.82	3.47	3.94	3.94	3.87	2.86
5	2.69	2.73	2.04	1.79	.80	.25	1.90	3.39	3.88	3.98	3.91	2.88
6	2.57	2.70	2.06	1.65	.77	.26	2.25	3.35	3.84	3.96	3.84	2.80
7	2.61	2.68	2.13	1.61	.77	.26	2.37	3.35	3.89	3.88	3.83	2.74
8	2.62	2.73	2.18	1.52	.77	.31	2.44	3.36	3.85	3.83	3.76	2.72
9	2.66	2.75	2.22	1.42	.74	.42	2.61	3.38	3.77	3.86	3.78	2.64
10	2.66	2.74	2.12	1.44	.91	.41	2.66	3.43	3.72	3.90	3.79	2.48
11	2.65	2.56	2.05	1.27	.95	.30	2.77	3.46	3.70	3.81	3.73	2.52
12	2.56	2.61	2.17	1.16	.85	.38	2.96	3.51	3.76	3.77	3.77	2.49
13	2.56	2.62	2.19	1.13	.83	.64	3.07	3.55	3.80	3.81	3.69	2.45
14	2.58	2.58	2.18	1.01	.80	.89	3.16	3.59	3.91	3.80	3.60	2.50
15	2.57	2.55	2.16	.88	.77	1.04	3.22	3.71	3.95	3.85	3.67	2.39
16	2.57	2.57	2.30	.78	.68	1.24	3.25	3.80	3.99	3.77	3.66	2.42
17	2.60	2.60	2.26	.65	.62	1.30	3.32	3.79	4.02	3.73	3.60	2.44
18	2.65	2.60	2.32	.56	.53	1.31	3.38	3.81	4.04	3.70	3.51	2.34
19	2.61	2.53	2.21	.49	.48	1.36	3.42	3.89	4.10	3.68	3.52	2.29
20	2.53	2.50	2.23	.37	.44	1.48	3.40	4.23	4.16	3.69	3.47	2.25
21	2.53	2.47	2.19	.33	.32	1.64	3.44	4.45	4.10	3.64	3.48	2.26
22	2.56	2.51	2.19	.39	.20	1.71	3.38	4.51	4.03	3.69	3.42	2.26
23	2.62	2.51	2.36	.96	.15	1.79	3.39	4.64	4.01	3.84	3.34	2.30
24	2.73	2.44	2.41	.88	.05	1.88	3.42	4.73	4.04	3.81	3.24	2.25
25	2.67	2.37	2.50	.89	-.04	1.91	3.40	4.75	4.05	3.76	3.24	2.18
26	2.58	2.36	2.44	.90	.00	1.92	3.49	4.78	4.07	3.72	3.25	2.24
27	2.63	2.37	2.38	.88	.31	1.99	3.50	4.80	4.06	3.73	3.25	2.16
28	2.69	2.29	2.39	.85	.26	2.02	3.50	4.71	4.01	3.70	3.17	2.05
29	2.64	2.30	2.41	.91	-	2.01	3.49	4.55	4.04	3.70	3.06	2.00
30	2.62	2.37	2.28	.94	-------	2.00	3.51	4.39	4.09	3.74	3.08	1.93
31	2.65	-------	2.14	.89	-------	1.89	-------	4.25	-------	3.81	3.04	-------
Mean	2.61	2.56	2.23	1.11	0.58	1.09	2.93	3.94	3.97	3.81	3.55	2.46
(†)	+20.7	-328.5	-27.6	-850.1	-566.2	+1,105.8	+1,185.5	+483.8	-64.3	-159.0	-587.5	-785.6

Calendar year 1956: Max - Min - Mean - -
Water year 1956-57: Max 4.80 Min -0.04 Mean 2.58 † -44.0

† Change in contents, equivalent in cubic feet per second, in Cayuga Lake.

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 1957.

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.--32 years (1925-57), 184 cfs.

Extremes.--Maximum discharge during year, 1,650 cfs Jan. 23; maximum gage height, 5.58 ft Jan. 22 (backwater from ice); minimum discharge, 14 cfs Sept. 11 (gage height, 0.35 ft).

1925-57: 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, which are fair. Cornell University diverted 65,381,595 cu ft during year from point about 1 mile above station for water supply, equivalent to a mean discharge at station of 2.07 cfs.

Revisions (water years).--WSP 759· Drainage area. WSP 874: 1935-38.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 22				Jan. 23 to Sept. 30			
0.7	40	2.0	444	0.35	14	1.5	191
.9	60	2.5	795	.4	17	2.0	430
1.2	104	3.0	1,260	.6	31	2.5	780
1.5	197			.9	58	3.0	1,260
				1.2	99	3.5	1,910

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74	58	74	205	150	*300	130	127	89	84	65	26
2	62	65	76	180	140	230	229	112	84	62	44	23
3	77	178	81	190	124	200	244	102	*85	51	40	23
4	87	112	106	195	155	160	173	102	73	114	138	25
5	142	85	102	180	130	140	350	96	66	185	111	20
6	84	75	171	135	116	145	1,080	87	54	157	62	20
7	102	69	248	140	140	173	484	81	78	87	50	20
8	142	65	340	140	177	160	402	76	74	72	43	20
9	93	61	222	135	213	185	408	70	60	72	40	17
10	71	59	170	124	354	130	386	73	53	66	40	16
11	64	55	160	98	200	130	415	104	49	54	39	18
12	59	55	235	114	108	349	597	259	55	47	36	17
13	58	58	276	102	122	695	380	155	59	88	34	22
14	55	63	278	76	114	642	333	114	152	92	32	58
15	52	61	633	74	112	655	275	203	195	60	28	34
16	*48	56	468	82	106	624	266	127	119	48	28	67
17	48	58	329	80	88	397	262	92	97	43	29	62
18	47	54	276	*74	100	304	253	*97	70	38	26	42
19	44	49	175	84	96	271	*383	578	76	35	24	34
20	41	47	218	86	78	386	280	1,090	72	32	23	31
21	41	97	*201	106	90	370	271	626	57	30	22	38
22	41	262	280	320	78	289	211	313	49	*46	22	39
23	59	132	954	1,350	106	253	177	253	46	142	20	*298
24	100	84	531	507	97	223	166	195	55	65	19	111
25	77	78	493	330	157	187	249	155	70	45	18	61
26	60	96	334	270	430	185	271	140	78	38	25	47
27	65	96	280	215	1,000	184	191	130	56	35	36	38
28	96	*88	262	170	374	*169	312	116	114	60	26	35
29	72	87	257	190	-	166	207	104	147	43	*24	32
30	63	78	130	170	--------	159	146	94	127	127	35	31
31	62	--------	180	125	--------	136	--------	96	--------	89	31	--------
Total	2,186	2,481	8,540	6,247	5,155	8,597	9,531	5,967	2,459	2,207	1,210	1,325
Mean	70.5	82.7	275	202	184	277	318	192	82.0	71.2	39.0	44.2
Cfsm	0.569	0.667	2.22	1.63	1.48	2.23	2.56	1.55	0.661	0.574	0.315	0.356
In.	0.66	0.74	2.56	1.87	1.55	2.58	2.86	1.79	0.74	0.66	0.36	0.40

Calendar year 1956: Max 3,680 Min 22 Mean 225 Cfsm 1.81 In. 24.68
Water year 1956-57: Max 1,350 Min 16 Mean 153 Cfsm 1.23 In. 16.77

Peak discharge (base, 1,900 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23-26, 28, Nov. 30 to Dec. 2, Dec. 10, 11, 19, Dec. 29 to Jan. 23, Jan. 25 to Feb. 7, Feb. 11-22, Mar. 1-6, 8-11, 26.

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 1957. 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 daily gage height during year, 7.27 ft May 22 (contents, 43,162 acre-ft); minimum daily, 5.47 ft Dec. 4 (contents, 24,073 acre-ft).

1939-57: Maximum daily gage height, 9.13 ft Mar. 11, 1956 (contents, 62,886 acre-ft); minimum daily, 4.45 ft Jan. 30, 1942 (contents, 13,256 acre-ft).

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 3.2 ft, gage datum, extending across a masonry-arch opening under roadway. East outlet is at head of natural outlet channel from lake; flow regulated above about 4.6 ft, gage datum, by two gates at highway bridge half a mile downstream. City of Canandaigua regulates storage in lake for Oswego River Watershed Corp., Fulton, by operation of gates and stoplogs on outlets. Water diverted for municipal supply by village of Newark since about December 1951. An additional small diversion is made by village of Palmyra for water-supply purposes. Capacity of lake between 3.2 ft and 9.3 ft, gage datum, 64,689 acre-ft, on basis of water-surface area of 16.57 sq mi. Total capacity of lake not determined.

Capacity table, water year 1956-57 (gage height, in feet, and contents, in acre-feet)

5.0	19,089
6.0	29,693
7.0	40,298
7.3	43,480

Mean gage height, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.05	5.75	5.49	5.98	6.20	6.06	6.32	6.68	7.01	6.78	6.66	6.13
2	6.07	5.74	5.48	5.96	6.18	6.06	6.27	6.62	6.99	6.75	6.65	6.13
3	6.05	5.74	5.48	5.98	6.18	6.06	6.26	6.57	6.99	6.77	6.66	6.16
4	6.05	5.73	5.47	5.97	6.14	6.04	6.27	6.52	6.98	6.77	6.64	6.15
5	6.02	5.72	5.52	5.94	6.13	6.03	6.39	6.47	6.97	6.86	6.59	6.10
6	6.10	5.72	5.51	5.96	6.09	6.02	6.63	6.44	6.98	6.83	6.57	6.07
7	6.04	5.72	5.54	5.94	6.08	6.02	6.78	6.41	6.98	6.82	6.55	6.06
8	6.02	5.68	5.59	5.95	6.07	6.03	6.83	6.38	6.97	6.84	6.54	6.03
9	5.97	5.67	5.65	5.95	6.09	6.06	6.92	6.38	6.97	6.83	6.52	6.01
10	5.95	5.64	5.69	5.94	6.11	6.04	6.95	6.37	6.96	6.79	6.49	6.05
11	5.92	5.70	5.72	5.97	6.11	6.04	6.98	6.38	6.96	6.78	6.49	5.99
12	5.95	5.62	5.68	5.96	6.09	6.09	7.06	6.41	6.94	6.76	6.46	6.00
13	5.91	5.60	5.70	5.94	6.08	6.25	7.11	6.42	6.95	6.79	6.45	6.01
14	5.89	5.60	5.72	5.94	6.04	6.38	7.10	6.46	7.02	6.80	6.45	5.99
15	5.88	5.58	5.80	5.93	6.01	6.46	7.10	6.53	6.99	6.77	6.40	6.02
16	5.87	5.57	5.77	5.93	6.00	6.51	7.09	6.53	6.97	6.76	6.39	6.00
17	5.86	5.52	5.78	5.92	5.99	6.52	7.07	6.53	6.96	6.76	6.37	5.98
18	5.83	5.50	5.78	5.89	5.96	6.50	7.04	6.53	6.95	6.74	6.36	5.97
19	5.83	5.51	5.80	5.88	5.92	6.52	7.05	6.64	6.96	6.73	6.33	5.97
20	5.84	5.50	5.79	5.89	5.88	6.54	7.07	7.01	6.91	6.71	6.32	5.96
21	5.82	5.55	5.79	5.88	5.87	6.56	7.02	7.19	6.91	6.71	6.30	5.96
22	5.80	5.55	5.83	5.96	5.84	6.56	6.99	7.27	6.90	6.74	6.30	5.96
23	5.82	5.55	5.93	6.15	5.82	6.55	6.94	7.24	6.89	6.75	6.31	6.00
24	5.80	5.54	5.95	6.26	5.80	6.51	6.90	7.21	6.87	6.73	6.30	5.96
25	5.82	5.54	5.96	6.29	5.81	6.49	6.91	7.17	6.88	6.73	6.23	5.95
26	5.84	5.53	5.98	6.29	5.82	6.47	6.88	7.15	6.86	6.72	6.22	5.89
27	5.79	5.53	6.00	6.28	5.94	6.44	6.85	7.11	6.85	6.72	6.19	5.87
28	5.76	5.53	5.99	6.26	6.02	6.42	6.81	7.04	6.87	6.70	6.18	5.87
29	5.77	5.51	5.99	6.26	-	6.39	6.77	7.00	6.93	6.70	6.17	5.86
30	5.75	5.50	5.98	6.26	-------	6.35	6.73	6.99	6.85	6.68	6.16	5.85
31	5.75	-------	5.99	6.23	-------	6.33	-------	7.01	-------	6.68	6.13	-------
(†)	27,042	24,391	29,375	31,920	30,224	33,193	37,329	40,510	38,495	36,799	31,178	28,103
(‡)	-3,288	-2,651	+4,984	+2,545	-1,696	+2,969	+4,136	+3,181	-2,015	-1,696	-5,621	-3,075

Calendar year 1956.................... ‡ -5,521
Water year 1956-57.................... ‡ -2,227

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† Contents, in acre-feet, at 12 p.m. on last day of month, above 3.2 ft gage datum, elevation of lowest outlet.

‡ Change in contents, in Canandaigua Lake and diversion by village of Newark for water supply (records of diversion furnished by village of Newark).

Note.--Contents at 12 p.m. Dec. 31, 1955, 34,890 acre-ft; at 12 p.m. Sept. 30, 1956, 30,330 acre-ft.

Canandaigua Lake Outlet at Chapin, N. Y.

Location.--Lat 42°55'00", long 77°14'00", on left bank at 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 1957.

Gage.--Water-stage recorder. Datum of gage is 673.6 ft above mean sea level (levels by Corps of Engineers).

Average discharge.--17 years (1940-57), 151 cfs (unadjusted).

Extremes.--Maximum discharge during year, 532 cfs May 21 (gage height, 3.59 ft, backwater from debris); minimum daily, 19 cfs Sept. 29, 30; minimum gage height, 1.66 ft Sept. 30.
1939-57: 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 aquatic vegetation or debris, which are fair. Flow regulated by Canandaigua Lake (see preceding page), from which water is diverted for municipal supply by village of Newark. An additional small diversion is made by village of Palmyra for water-supply purposes.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*54	30	28	b76	196	207	258	360	106	54	66	64
2	52	37	28	b78	194	209	244	340	104	47	64	58
3	49	49	29	b66	b190	212	214	330	102	46	64	60
4	44	40	28	62	191	b210	214	330	102	54	66	60
5	42	37	29	60	b195	b205	280	320	98	60	62	54
6	45	35	29	60	194	199	290	290	100	52	56	47
7	44	35	30	60	191	196	300	240	102	52	52	45
8	40	35	31	60	194	201	310	190	96	56	47	42
9	37	35	33	60	233	209	350	*62	90	54	46	42
10	38	34	34	b60	244	b210	400	66	88	47	46	47
11	36	36	36	b60	b220	207	430	68	82	46	45	46
12	36	36	35	b58	b220	269	*430	76	76	46	44	44
13	36	36	*34	b54	209	261	420	72	84	54	42	45
14	34	*47	34	b52	207	261	410	76	96	54	44	45
15	33	46	40	b50	199	272	410	96	70	54	41	44
16	33	42	41	b49	194	286	410	86	64	54	*38	44
17	33	40	40	b46	b195	289	410	86	62	54	38	38
18	30	37	40	*b44	186	*292	440	86	62	52	40	36
19	30	37	42	b45	*181	292	450	175	66	*52	40	36
20	29	32	47	b45	176	316	450	490	*74	54	41	35
21	31	36	50	b44	b170	310	430	520	70	54	42	33
22	32	34	62	b104	166	304	420	520	58	60	44	35
23	35	33	66	207	164	301	410	500	58	66	45	37
24	32	32	66	b215	157	292	400	480	60	64	47	31
25	33	31	66	b205	159	286	410	470	60	60	44	28
26	33	32	70	209	171	284	400	460	60	60	45	23
27	31	32	74	204	225	278	390	450	60	60	45	21
28	30	31	74	b200	201	272	390	420	60	62	42	20
29	30	30	72	201	-	269	380	310	72	60	44	19
30	30	28	b70	201	--------	261	370	118	66	62	45	*19
31	30	--------	b78	b205	--------	258	--------	104	--------	68	66	--------
Total	1,122	1,075	1,436	3,140	5,422	7,918	11,120	8,191	2,348	1,718	1,491	1,198
Mean	36.2	35.8	46.3	101	194	255	371	264	78.3	55.4	48.1	39.9

Adjusted for change in contents in Canandaigua Lake and diversions by village of Newark

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean	-14.6	-4.24	126	145	168	308	441	317	49.2	30.9	-36.7	-12.2
Cfsm	-0.073	-0.021	0.633	0.729	0.844	1.55	2.22	1.59	0.247	0.155	-0.184	-0.061
In.	-0.08	-0.02	0.73	0.84	0.88	1.78	2.47	1.84	0.28	0.18	-0.21	-0.07

	Observed			Adjusted		
Calendar year 1956:	Max 1,000	Min 11	Mean 227	Mean 221	Cfsm 1.11	In. 15.15
Water year 1956-57:	Max 520	Min 19	Mean 127	Mean 126	Cfsm 0.633	In. 8.62

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--Backwater from aquatic vegetation Oct. 1 to Dec. 26. Backwater from debris Apr. 5 to May 30. Backwater from debris and aquatic vegetation May 31 to Sept. 30. 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 1957.

Gage.--Water-stage recorder and concrete control.

Average discharge.--44 years (1913-57), 283 cfs.

Extremes.--Maximum discharge during year, 800 cfs Apr. 25 (gage height, 3.10 ft); minimum, 20 cfs Sept. 28 (gage height, 1.44 ft); minimum daily, 59 cfs Oct. 10.
1912-57: 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; minimum gage height, 1.325 ft Dec. 3, 1953; minimum daily discharge, 5 cfs Nov. 11, 1934.

Remarks.--Records good except those for periods of no gage-height record or backwater from aquatic vegetation, which are fair. 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).--WSP 759: Drainage area. WSP 824: 1913-14, 1916, 1920(M), 1922(M), 1928(M), 1929, 1932(M).

Rating tables, water year 1956-57, except periods of backwater from aquatic vegetation (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 9		Jan. 10 to Sept. 30	
1.6	42	1.7	61
1.9	106	1.9	106
2.3	241	2.2	210
2.6	415	2.6	435
		3.1	800

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	136	180	114	209	494	454	454	247	272	450	90	100
2	154	181	113	217	480	448	448	247	299	450	76	100
3	78	172	122	213	474	442	333	242	278	260	125	100
4	105	173	118	213	461	428	247	238	270	420	130	100
5	92	176	116	213	454	422	269	233	270	580	175	100
6	78	176	118	213	448	422	261	228	260	580	200	100
7	78	176	125	217	435	409	228	147	250	580	205	100
8	*82	176	125	221	428	409	*238	*181	245	560	200	99
9	80	176	133	351	422	395	251	228	235	540	205	97
10	59	173	134	468	416	409	242	228	*235	490	205	*101
11	99	173	188	448	*416	409	256	215	230	340	205	97
12	81	144	*180	435	409	454	261	210	225	215	210	102
13	75	*124	184	428	304	480	272	206	245	225	215	103
14	121	115	184	*402	318	528	278	219	200	220	220	99
15	116	115	184	383	376	584	288	215	170	230	215	111
16	87	118	184	390	370	612	294	210	170	220	150	101
17	99	113	190	376	358	626	299	210	165	225	120	99
18	115	126	201	364	346	633	310	206	165	220	118	98
19	120	115	205	346	346	633	328	233	165	225	118	96
20	118	117	205	334	328	640	322	288	160	225	126	102
21	140	118	205	322	322	612	316	310	150	220	107	83
22	187	126	225	376	311	626	328	328	150	*155	*97	97
23	180	121	221	390	299	612	334	328	185	84	106	115
24	*185	121	229	480	283	591	322	316	180	84	106	90
25	183	110	225	535	288	577	509	310	165	84	109	95
26	212	124	225	556	316	556	768	323	118	86	109	93
27	179	116	221	556	409	*542	736	305	150	94	107	86
28	184	113	221	549	442	521	696	299	150	82	103	91
29	180	114	217	542	-	507	416	294	310	125	104	86
30	180	112	213	521	--------	487	251	283	450	92	101	*98
31	184	--------	213	507	--------	468	--------	283	--------	92	102	--------
Total	3,967	4,194	5,538	11,775	10,753	15,936	10,555	7,810	6,517	8,453	4,459	2,939
Mean	128	140	179	380	384	514	352	252	217	273	144	98.0
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 1,760 Min 48 Mean 327 Cfsm 1.57 In. 21.43
Water year 1956-57: Max 768 Min 59 Mean 255 Cfsm 1.23 In. 16.63

* Discharge measurement made on this day.

Note.--Backwater from aquatic vegetation June 4 to Aug. 16 (no gage-height record June 30 to July 7, Aug. 4). No gage-height record Oct. 14-21, 25-31, Dec. 25-30, Jan. 10-13, 18-20, 22-27, Jan. 29 to Feb. 10, Feb. 14-17, 20, 21, Sept. 1-10.

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 Erie (Barge) Canal system.

Drainage area.--3,130 sq mi.

Records available.--November 1949 to September 1957 in reports of Geological Survey. November 1898 to December 1908 prior to construction of Erie (Barge) Canal, not equivalent to later records at same site because of extensive development of Erie (Barge) Canal system. January 1909 to September 1925 (gage heights only) in reports of State engineer and surveyor.

Gage.--Water-stage recorder. Datum of gage is 362.60 ft above mean sea level, New York State Erie (Barge) Canal datum. November 1898 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.

Average discharge.--7 years (1950-57), 3,377 cfs.

Extremes.--Maximum daily discharge during year, 7,430 cfs Jan. 24; maximum gage height, 4.73 ft Jan. 24; minimum daily discharge, 610 cfs Oct. 18; minimum gage height, 0.96 ft Sept. 30.

1949-57: Maximum daily discharge, 16,700 cfs Mar. 12, 1956; maximum gage height, 8.84 ft Mar. 12, 1956; minimum daily discharge, 373 cfs Feb. 14, 1954; minimum gage height, 0.81 ft Aug. 10, 1952.

Remarks.--Records good. This record represents total discharge at Baldwinsville and includes flow in Baldwin and Erie (Barge) Canals. A large amount of natural storage and some artificial regulation is afforded by many large lakes and the Erie (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 (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 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,890	1,400	2,040	3,630	2,380	5,760	a4,140	3,820	4,600	2,470	1,630	1,420
2	1,850	1,420	2,020	3,470	2,570	5,540	a4,050	3,080	4,550	2,580	1,700	1,280
3	1,600	1,370	2,200	3,470	2,660	5,070	a3,860	2,910	3,680	2,320	1,190	1,950
4	1,620	1,430	2,220	3,490	2,740	4,620	a3,550	3,000	3,260	2,660	1,820	1,460
5	1,560	1,450	2,440	3,530	2,760	4,240	a3,720	3,020	3,150	2,650	1,880	1,650
6	1,270	1,460	2,380	3,530	2,740	4,010	a4,620	*3,060	3,080	3,060	1,920	1,560
7	1,310	1,450	2,390	3,580	2,720	3,910	a5,200	2,820	2,570	3,130	1,590	1,290
8	1,860	*1,440	2,560	3,550	2,680	3,960	*a5,340	2,510	2,330	3,160	1,220	1,290
9	2,010	1,910	2,680	3,530	2,720	4,170	5,390	2,010	2,330	3,070	1,670	1,530
10	*1,500	2,420	2,670	3,550	3,180	4,460	5,200	2,090	*2,380	2,940	1,860	1,520
11	1,250	2,150	*2,590	3,550	*3,600	4,680	5,040	1,500	2,390	2,760	1,860	1,640
12	1,340	2,020	2,680	3,530	3,490	4,850	5,140	1,160	2,460	2,500	1,640	1,540
13	1,260	1,900	2,760	3,510	3,230	6,030	5,250	1,830	2,360	2,250	1,910	1,640
14	1,240	1,690	3,110	*3,640	2,980	7,180	5,280	1,560	2,280	2,290	1,350	1,330
15	1,790	1,500	3,300	3,820	3,290	7,020	5,130	1,650	2,240	2,170	1,840	1,370
16	1,620	1,500	3,150	3,730	3,560	6,690	4,970	1,690	2,130	2,140	1,910	1,990
17	691	1,490	3,060	3,120	3,690	6,290	4,900	1,500	2,120	1,770	1,360	2,040
18	610	1,420	3,050	2,540	3,600	5,900	4,760	1,520	1,830	2,230	1,270	*1,950
19	911	1,540	2,940	2,620	3,470	5,570	4,640	1,110	1,530	2,170	1,860	1,280
20	1,100	1,540	2,710	2,640	3,400	5,420	4,720	2,030	2,080	2,090	*1,900	1,500
21	1,210	1,880	2,550	2,680	3,270	5,440	4,760	4,140	2,120	1,640	1,410	1,280
22	1,270	2,410	2,740	3,260	3,190	5,420	4,620	6,000	2,080	1,810	1,420	1,350
23	1,350	2,470	3,340	6,090	3,190	5,280	4,400	6,020	1,910	1,350	1,830	1,970
24	1,390	2,320	3,990	7,430	3,140	5,040	4,070	5,640	1,870	*1,300	1,440	1,780
25	1,440	2,130	4,060	6,960	3,210	4,820	4,270	5,150	1,810	1,670	1,290	1,630
26	1,450	2,150	4,000	6,330	3,450	*4,500	4,490	4,780	2,020	1,620	1,810	1,650
27	1,400	2,310	3,830	5,520	4,980	4,400	4,490	4,640	2,070	1,560	1,660	1,280
28	1,370	2,170	3,680	4,920	5,780	4,400	4,380	4,920	2,050	1,520	1,290	1,250
29	1,370	2,220	3,740	3,940	-	4,400	4,270	5,510	2,200	1,770	1,280	1,250
30	1,370	2,170	3,770	3,380	--------	4,330	4,070	5,550	2,380	1,840	1,810	766
31	1,310	--------	3,720	2,630	--------	a4,220	--------	5,100	--------	1,980	1,920	--------
Total	43,212	54,730	92,370	121,170	91,670	157,620	138,720	101,320	73,860	68,470	50,540	45,436
Mean	1,394	1,824	2,980	3,909	3,274	5,085	4,624	3,268	2,462	2,209	1,630	1,515
Cfsm	0.445	0.583	0.952	1.25	1.05	1.62	1.48	1.04	0.787	0.706	0.521	0.484
In.	0.51	0.65	1.10	1.44	1.09	1.87	1.65	1.20	0.88	0.81	0.60	0.54

Calendar year 1956: Max 16,700 Min 610 Mean 4,272 Cfsm 1.36 In. 18.58
Water year 1956-57: Max 7,430 Min 610 Mean 2,847 Cfsm 0.910 In. 12.34

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* Discharge measurement made on this day.

a No gage-height record at gage 2; discharge estimated from reconstructed gage-height graph based on record for adjacent days, recorded range in stage, and record from gage 1.

Onondaga Reservoir near Nedrow, N. Y.

Location.--Lat 42°55'55", long 76°10'25", at Onondaga Dam on Onondaga Creek, 3½ miles southwest of Nedrow, Onondaga County, 4 miles south of Syracuse, and 10½ miles upstream from Onondaga Lake.

Drainage area.--68.1 sq mi (measured by Corps of Engineers).

Records available.--June 1949 to September 1952 (monthly elevations and contents). October 1952 to September 1957.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers).

Extremes.--Maximum elevation during year, 473.18 ft Jan. 23; minimum, 458.30 ft Sept. 11. 1949-57: Maximum elevation, 484.51 ft Mar. 29, 1950; minimum, 457.98 ft Aug. 23, 1949, Sept. 5, 1953, Sept. 21, 22, 1955.

Remarks.--Reservoir is formed by a rolled earth-fill dam, completed by Corps of Engineers in August 1949 for flood control; first used for flood regulation about a year prior to completion. Usable capacity, 18,200 acre-ft between elevations 457.0 ft (conduit invert at intake) and 504.5 ft (crest of spillway). No dead storage. The flood-control works consist of a pressure conduit and a side-channel spillway and are not provided with gates. Water is stored during high flows and released gradually.

Cooperation.--Capacity curve furnished by Corps of Engineers.

Capacity table, water year 1956-57 (elevation, in feet, and contents, in acre-feet)

460.0	0	468.0	350
462.0	15	470.0	700
464.0	50	475.0	1,980
466.0	135		

Elevation, in feet, at 12 p.m., water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	458.6	458.7	459.0	459.8	460.6	461.6	460.2	459.7	459.3	459.1	459.2	458.5
2	459.1	459.1	459.1	460.0	460.4	461.4	460.9	459.6	460.0	459.0	458.9	458.6
3	458.8	458.8	459.5	460.1	460.8	461.0	460.3	459.5	459.4	459.7	459.6	458.7
4	459.4	458.8	459.5	460.1	460.9	460.9	460.5	459.6	459.2	459.8	468.6	458.6
5	458.8	458.7	459.3	459.4	460.6	460.8	462.3	459.5	459.2	463.5	461.7	458.5
6	458.7	458.7	460.0	460.1	460.6	461.0	462.1	459.4	459.2	460.2	460.0	458.4
7	459.1	458.6	461.7	460.0	461.0	460.8	461.4	459.3	459.4	459.8	459.5	458.4
8	458.8	458.6	460.6	459.9	460.7	461.2	461.2	459.2	459.2	459.7	459.4	458.4
9	458.7	458.6	460.2	459.9	462.6	460.9	461.8	459.2	459.0	459.6	459.3	458.4
10	458.6	458.6	460.1	459.6	462.0	460.8	462.0	459.4	458.9	459.4	459.5	458.3
11	458.6	458.6	460.7	459.9	460.5	460.9	462.0	459.5	458.9	459.2	459.2	458.3
12	458.6	458.7	460.9	459.9	460.7	465.5	462.3	459.5	458.9	459.1	459.1	458.3
13	458.6	459.0	460.4	459.3	460.4	465.7	462.0	459.3	463.7	459.4	459.0	458.4
14	458.6	458.8	461.3	459.7	460.3	465.8	461.5	460.5	460.1	459.1	458.9	458.4
15	458.5	458.8	461.8	459.7	460.2	465.7	461.2	460.2	459.3	459.0	458.9	458.6
16	458.5	458.9	461.4	459.7	460.2	463.0	461.0	459.5	459.0	458.9	458.8	459.1
17	458.5	458.8	460.7	459.6	460.0	462.1	461.1	459.3	458.9	458.8	458.8	458.6
18	458.5	458.7	460.3	459.5	460.1	461.7	460.9	459.3	458.8	458.7	458.8	458.4
19	458.5	458.7	460.2	459.5	460.0	461.7	460.9	461.9	459.2	458.7	458.7	458.4
20	458.5	458.7	460.1	459.5	459.9	462.5	460.8	464.1	459.0	458.6	458.7	458.6
21	458.5	460.4	460.5	460.3	459.9	461.8	460.5	461.1	458.8	458.6	458.7	458.4
22	458.5	459.7	464.0	469.0	460.2	461.4	460.4	460.6	458.7	459.4	458.6	459.6
23	459.2	459.2	462.4	472.8	460.1	461.2	460.3	460.2	461.4	458.7	458.6	458.9
24	458.9	459.1	461.7	469.3	460.0	460.9	460.2	459.9	459.5	458.6	458.6	458.6
25	458.7	459.1	461.3	464.0	462.2	460.8	460.8	459.8	459.9	458.5	458.5	458.5
26	458.6	459.3	460.9	461.6	464.1	460.8	460.3	460.6	459.2	458.5	458.8	458.4
27	459.0	459.2	460.8	461.2	465.6	460.7	460.2	459.9	460.3	460.1	458.6	458.4
28	458.8	459.1	460.7	461.3	462.4	460.5	460.2	459.8	459.1	458.9	458.6	458.4
29	458.7	459.1	460.5	461.0	-	460.6	460.0	459.6	460.5	459.8	458.6	458.4
30	458.7	459.1	459.8	460.5		460.4	459.8	459.7	459.7	460.8	458.6	458.4
31	458.7		460.3	460.9		460.3		459.4		460.2	458.5	
(†)	0	0	2	4	21	2	0	0	0	1	0	0
(‡)	0	0	+2	+2	+17	-19	-2	0	0	+1	-1	0

Calendar year 1956.................... ‡ +2
Water year 1956-57.................... ‡ 0

† Contents, in acre-feet, at end of month.
‡ Change in contents in acre-feet.

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 1957.

Gage.--Water-stage recorder.

Average discharge.--6 years, 107 cfs (adjusted).

Extremes.--Maximum discharge during year, 1,290 cfs Aug. 4 (gage height, 4.32 ft); minimum, 23 cfs Sept. 10 (gage height, 1.605 ft).
1951-57: Maximum discharge, 1,440 cfs Mar. 8, 1956; maximum gage height, 4.64 ft Mar. 11, 1952; minimum discharge, 10 cfs Sept. 26, 1953; minimum gage height, 1.57 ft Aug. 18, 1956.

Remarks.--Records good except those for periods of ice effect, backwater from aquatic vegetation or debris, or no gage-height record, which are fair. High flow regulated by Onondaga Reservoir (see preceding page).

Rating tables, water year 1956-57, 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 July 5

1.7	24	3.0	337
2.0	63	3.5	610
2.2	99	4.0	990
2.4	143	4.1	1,080
2.6	197		

July 6 to Sept. 30

1.6	22	2.4	154
1.8	49	2.7	229
2.0	80	3.0	337
2.2	115		

Note.--Same as previous table above 3.0 ft.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	40	b48	b104	b135	a219	105	86	65	72	100	33
2	30	45	51	b102	b122	183	129	78	97	52	51	34
3	44	51	54	b104	b112	b160	125	77	86	43	92	55
4	40	45	70	105	141	b140	107	78	66	134	824	46
5	51	42	b62	b98	132	b125	180	75	58	328	630	41
6	35	40	77	b84	114	b130	283	68	58	219	186	32
7	42	38	143	b94	122	148	206	63	70	113	117	30
8	44	38	c165	b90	132	148	166	*62	63	102	97	32
9	*35	37	c114	b88	145	166	*180	60	54	104	90	28
10	31	*39	c98	b86	251	b140	200	60	*47	86	92	27
11	30	36	c92	b84	b165	b125	206	66	45	76	87	27
12	28	36	*c135	b88	b100	343	244	80	45	68	77	27
13	27	51	c130	b78	b110	539	225	70	53	72	69	27
14	28	54	c135	b76	105	533	212	94	208	76	64	30
15	27	45	c165	*b74	105	521	177	129	88	62	61	34
16	26	43	206	b78	103	439	166	93	58	56	58	50
17	26	48	159	b76	95	268	164	70	47	52	55	58
18	26	43	134	b76	93	219	159	66	43	48	54	38
19	26	39	97	b74	93	200	159	104	57	42	50	*31
20	27	38	103	b74	b84	251	141	380	51	39	46	31
21	28	50	112	b76	b84	244	141	295	44	38	45	35
22	28	104	160	b420	b80	191	120	153	38	36	*43	37
23	40	a72	337	1,040	95	172	112	127	74	52	41	90
24	58	a48	234	b800	91	156	110	103	136	*36	38	50
25	42	a45	200	653	*a125	*141	136	88	77	32	36	38
26	35	a54	159	279	a260	141	132	144	77	30	48	31
27	42	a60	141	b190	a480	136	112	114	62	49	45	28
28	48	a56	141	b155	a300	127	114	91	78	82	38	28
29	40	56	136	b170	-	127	101	82	106	109	37	29
30	35	b50	b98	b145		122	91	75	114	112	38	26
31	34		b108	b135		110		80		167	38	
Total	1,082	1,443	4,064	5,796	3,974	6,664	4,703	3,211	2,165	2,587	3,347	1,103
Mean	34.9	48.1	131	187	142	215	157	104	72.2	83.5	108	36.8

Adjusted for change in contents in Onondaga Reservoir

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean	34.9	48.1	131	187	142	215	157	104	72.2	83.5	108	36.8
Cfsm	0.393	0.541	1.47	2.10	1.60	2.42	1.77	1.17	0.812	0.939	1.21	0.414
In.	0.45	0.60	1.70	2.43	1.67	2.78	1.97	1.34	0.91	1.08	1.40	0.46

	Observed			Adjusted		
Calendar year 1956:	Max 1,240	Min 14	Mean 135	Mean 135	Cfsm 1.52	In. 20.72
Water year 1956-57:	Max 1,040	Min 26	Mean 110	Mean 110	Cfsm 1.24	In. 16.79

* Discharge measurement made on this day.
a No gage-height record; discharge estimated from reconstructed gage-height graph or on basis of records for nearby stations.
b Stage-discharge relation affected by ice.
c Backwater from debris.
Note.--Backwater from aquatic vegetation July 8-28. Backwater from aquatic vegetation and/or debris Sept. 26-30.

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, 2¾ miles upstream from confluence of East and West Branches near Blossvale.

Drainage area.--189 sq mi.

Records available.--April 1923 to September 1957.

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.--34 years, 544 cfs (unadjusted).

Extremes.--Maximum discharge during year, 4,540 cfs Jan. 23 (gage height, 5.34 ft); minimum, 15 cfs Sept. 10 (gage height, 0.04 ft).

1923-57: 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 or fragmentary or no gage-height record, 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 118,493,000 cu ft during the water year 1957, equivalent to a mean discharge of 3.8 cfs. Diurnal fluctuation at low flow caused by diversion and small power operations upstream.

Revisions (water years).--WSP 604: 1924. WSP 759: Drainage area. WSP 1034: 1944. WSP 1054: 1923-45.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Apr. 6)

Oct. 1 to Apr. 6		Apr. 6 to Sept. 30			
0.8	99	0.2	25	1.3	346
1.1	189	.4	44	2.0	850
1.5	373	.6	76	3.0	1,830
2.0	707	.9	160	5.0	4,330
3.0	1,570				
5.0	4,030				

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	286	185	315	280	320	1,360	684	358	230	552	294	35
2	288	243	301	280	301	833	1,850	308	a389	304	184	38
3	379	250	301	270	282	548	1,520	282	a360	203	147	84
4	336	208	320	270	282	419	953	287	a240	843	353	99
5	296	175	270	250	254	340	1,150	268	a220	1,510	250	85
6	224	151	520	250	*225	330	3,020	243	a220	1,240	157	81
7	521	142	1,650	250	240	310	1,920	212	a320	539	113	60
8	1,130	139	2,080	230	216	313	1,350	191	a235	326	92	54
9	666	145	1,060	220	216	385	986	176	a205	253	83	64
10	437	151	670	*210	310	325	818	188	164	225	83	29
11	341	130	548	210	310	270	675	405	134	191	78	45
12	277	162	582	220	260	379	675	641	*147	164	76	*60
13	246	256	618	220	230	*548	615	571	172	137	62	57
14	220	237	514	210	220	860	638	450	172	119	57	57
15	201	205	475	205	205	*1,600	554	886	449	99	70	55
16	186	367	782	200	189	2,200	675	863	276	88	63	80
17	185	618	809	190	180	1,500	1,470	490	156	78	55	168
18	164	419	611	185	185	937	1,600	387	f125	71	51	119
19	157	286	370	195	186	654	1,530	335	*f720	62	45	86
20	139	229	444	200	172	548	2,100	2,130	579	57	39	74
21	136	790	419	260	170	481	2,880	1,920	291	52	37	121
22	148	2,410	616	740	165	437	*2,320	878	178	59	36	461
23	156	1,050	1,360	3,700	172	520	*1,360	645	141	78	*34	810
24	112	540	1,330	2,090	170	654	1,060	548	199	69	32	540
25	122	440	1,280	1,580	189	604	1,030	424	424	*67	30	335
26	122	431	680	1,110	460	568	867	444	532	54	30	212
27	156	408	575	785	2,300	501	660	645	302	47	32	147
28	232	*362	488	575	1,770	596	608	464	324	48	32	121
29	193	341	462	475	-	723	498	381	645	2,330	30	105
30	164	300	260	390	--------	654	412	303	1,130	1,630	32	94
31	*151	--------	290	340	--------	615	--------	272	--------	560	37	--------
Total	8,371	11,770	21,000	16,590	10,179	21,012	36,478	16,595	9,679	12,055	2,714	4,376
Mean	270	392	677	535	364	678	1,216	535	323	389	87.5	146
(†)	18.0	17.9	18.9	21.0	21.0	20.9	20.0	20.9	23.4	22.4	23.1	19.9

	Observed			Adjusted		
Calendar year 1956:	Max 4,660	Min 36	Mean 529	Mean 547	Cfsm 2.89	In. 39.43
Water year 1956-57:	Max 3,700	Min 29	Mean 468	Mean 489	Cfsm 2.59	In. 35.09

Peak discharge (base, 4,900 cfs).--No peak above base.

* Discharge measurement made on this day.

† Diversion, equivalent in cubic feet per second, by city of Rome for water supply; for calendar year 1956, 18.4 cfs; for water year 1957, 20.6 cfs (figures furnished by city of Rome, N. Y.). For diversion by city of Oneida, N. Y. see "Remarks."

a No gage-height record; discharge estimated on basis of recorded range in stage and records for Oneida Creek at Oneida and Chittenango Creek near Chittenango.

f Fragmentary gage-height record; discharge computed on same basis as no gage-height record.

Note.--Stage-discharge relation affected by ice Nov. 24, 25, 30, Dec. 5-7, 19, Dec. 30 to Jan. 23, Jan. 31, Feb. 6, 7, 12-14, 17, 18, 21, 22, 26, 27, Mar. 5, 6, 11, 14-16.

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 in Oneida County, 500 ft downstream from Sconondoa Creek.

Drainage area.--112 sq mi.

Records available.--October 1949 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 409.33 ft above mean sea level (Corps of Engineers bench mark).

Average discharge.--8 years, 151 cfs.

Extremes.--Maximum discharge during year, 6,480 cfs Aug. 4 (gage height, 13.30 ft); minimum, 15 cfs July 28 (gage height, 1.33 ft).

1949-57: Maximum discharge, 7,440 cfs Mar. 28, 1950 (gage height, 13.78 ft); minimum, 13 cfs Aug. 3, 6, Sept. 10, 1955; minimum gage height, 1.30 ft Aug. 3, 6, 1955.

Remarks.--Records good except those for periods of ice effect, backwater from weeds or fragmentary or no gage-height record, which are fair. Slight diurnal fluctuation at low flow caused by small mills above station.

Rating tables, water year 1956-57, except periods of ice effect or backwater from weeds (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 27

1.5	23	4.0	501
1.8	50	5.0	783
2.4	133	6.0	1,080
3.0	250	8.0	1,780

Feb. 27 to Sept. 30

1.3	13	4.0	518
1.6	34	5.0	796
2.0	82	7.0	1,400
2.5	166	9.0	2,250
3.0	269	11.0	3,650

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	37	34	44	90	110	220	102	88	54	49	64	29
2	a36	36	48	82	102	189	123	81	62	38	42	31
3	a49	40	53	82	94	164	122	76	58	35	186	54
4	a62	37	84	88	98	135	102	78	51	75	3,190	38
5	79	35	66	78	86	125	225	71	46	169	680	32
6	50	33	81	70	*80	114	477	67	46	95	f321	30
7	48	32	176	78	86	125	284	85	75	57	a155	29
8	52	32	201	68	80	132	218	69	58	43	a106	28
9	44	33	130	66	82	155	236	60	49	41	a96	27
10	39	38	102	*58	145	124	258	59	44	38	a90	26
11	36	35	98	58	100	106	258	67	41	36	a84	26
12	34	38	183	62	82	*400	333	86	*40	33	a78	*25
13	33	42	148	60	82	*483	251	74	39	31	a70	25
14	32	40	117	58	80	422	256	92	48	33	a60	25
15	32	38	202	56	78	422	220	122	46	30	a64	39
16	31	39	442	54	74	372	213	90	39	28	f56	54
17	32	44	221	54	68	262	239	68	36	27	f51	50
18	32	40	165	52	70	213	220	62	34	25	f49	34
19	32	36	108	54	70	185	179	71	40	23	44	27
20	30	34	117	56	64	211	157	308	39	22	41	27
21	30	57	125	60	66	218	152	223	34	22	39	29
22	30	117	190	720	68	183	*132	135	29	22	38	37
23	33	66	458	1,620	72	170	120	115	34	24	*36	130
24	39	44	280	440	72	152	118	90	38	22	34	70
25	36	46	230	290	131	134	143	72	66	20	31	49
26	34	52	161	205	344	130	127	129	85	20	42	37
27	36	64	136	170	897	127	110	116	52	*22	41	32
28	42	*56	128	150	320	118	134	90	49	18	35	29
29	38	54	131	140	-	118	116	76	67	319	33	29
30	*33	48	82	125	------	116	96	64	66	104	34	28
31	28	--------	96	116	-------	102	--------	59	--------	168	34	-------
Total	1,199	1,340	4,803	5,360	3,701	6,127	5,721	2,943	1,465	1,689	5,924	1,126
Mean	38.7	44.7	155	173	132	198	191	94.9	48.8	54.5	191	37.5
Cfsm	0.346	0.399	1.38	1.54	1.18	1.77	1.71	0.847	0.436	0.487	1.71	0.335
In.	0.40	0.44	1.59	1.78	1.23	2.03	1.90	0.98	0.49	0.56	1.97	0.37

Calendar year 1956: Max 2,420 Min 25 Mean 161 Cfsm 1.44 In. 19.59
Water year 1956-57: Max 3,190 Min 18 Mean 113 Cfsm 1.01 In. 13.74

Peak discharge (base, 1,900 cfs).--Jan. 23 (3:45 a.m.) 2,490 cfs (9.42 ft); Aug. 4 (4:30 a.m.) 6,480 cfs (13.30 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for East Branch of Fish Creek at Taberg and Chittenango Creek near Chittenango.

f Fragmentary gage-height record; discharge computed on basis of reconstructed gage-height graph based on existing gage heights.

Note.--Stage-discharge relation affected by ice Nov. 23-25, 30, Dec. 1, 5, 10, 11, 18, 19, Dec. 30 to Jan. 22, Jan. 24 to Feb. 24, Feb. 28, Mar. 1, 4-6, 10, 11. Backwater from weeds Aug. 24 to Sept. 30.

Chittenango Creek near Chittenango, N. Y.

Location.--Lat 43°01'25", long 75°51'30", on right bank at upstream side of 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 1957.

Gage.--Water-stage recorder. Datum of gage is 489.54 ft above mean sea level, datum of 1929.

Average discharge.--7 years, 109 cfs.

Extremes.--Maximum discharge during year, 2,400 cfs Aug. 3 (gage height, 6.24 ft); minimum, 20 cfs Sept. 12, 13; minimum gage height, 1.45 ft July 25.

1950-57: Maximum discharge, 2,630 cfs Apr. 4, 1956 (gage height, 7.18 ft); minimum, 9.8 cfs Oct. 11, 1953; minimum gage height, 1.265 ft Oct. 15, 1952.

Flood of Mar. 29, 1950, reached a stage of 6.8 ft (backwater from debris present), from floodmarks (discharge, 2,760 cfs, by slope-area method).

Remarks.--Records excellent except those for periods of ice effect, which are good, or shifting control, which are fair. Flow regulated by storage in Cazenovia Lake and Erieville Reservoir.

Rating tables, water year 1956-57, except periods of ice effect or shifting control (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 27		Feb. 27 to Aug. 4				Aug. 5 to Sept. 30	
1.4	16	1.4	19	3.0	387	1.5	17
1.7	50	1.7	52	4.0	830	1.7	33
2.0	97	2.0	105	5.0	1,400	2.0	73
2.5	217	2.5	225			2.5	205
3.0	387					3.0	387
4.0	830						

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	41	32	51	100	135	179	105	60	54	47	49	24
2	40	48	52	94	124	157	129	55	61	37	37	25
3	48	54	54	98	122	160	123	54	58	35	334	32
4	57	40	61	110	132	145	105	55	49	60	1,100	29
5	66	36	58	100	124	135	140	52	47	141	*331	25
6	47	33	96	88	*115	135	214	49	54	77	205	24
7	50	32	175	97	119	141	148	47	71	51	160	23
8	51	32	159	95	116	141	136	44	62	44	118	23
9	41	33	107	93	121	143	134	43	54	44	101	22
10	36	34	90	90	163	120	134	43	48	42	99	21
11	34	29	86	*88	124	116	132	46	47	38	88	21
12	33	32	117	92	102	*257	145	54	48	35	79	21
13	32	37	117	83	113	299	141	48	*48	35	68	*21
14	30	37	108	76	107	312	138	63	58	35	60	21
15	30	34	173	74	105	343	129	83	58	32	63	27
16	29	34	257	72	105	283	145	*61	46	30	59	36
17	28	37	163	70	95	207	167	48	43	29	49	37
18	27	34	140	66	95	182	141	47	40	28	47	26
19	27	29	108	72	97	169	120	60	47	28	43	23
20	26	28	119	72	90	184	112	192	46	27	42	24
21	25	50	126	74	92	176	109	132	40	27	40	24
22	26	95	220	340	92	164	*91	85	38	27	37	34
23	29	71	326	870	93	160	85	78	45	26	35	91
24	41	54	203	279	93	150	77	67	48	25	32	48
25	35	56	179	214	152	138	83	58	58	24	31	34
26	29	58	139	181	346	138	78	120	74	*24	33	29
27	33	59	126	163	550	134	72	89	54	27	33	26
28	36	*55	132	141	216	129	80	74	47	25	30	26
29	*33	55	137	156	-	132	71	67	64	54	27	29
30	*29	50	88	141	--------	129	62	61	74	76	26	29
31	29	--------	108	130	--------	109	--------	60	--------	110	26	------ --
Total	1,118	1,308	4,075	4,419	3,938	5,367	3,546	2,095	1,581	1,340	3,482	875
Mean	36.1	43.6	131	143	141	173	118	67.6	52.7	43.2	112	29.2
Cfsm	0.533	0.644	1.94	2.11	2.08	2.56	1.74	0.999	0.778	0.638	1.65	0.431
In.	0.61	0.72	2.24	2.43	2.16	2.95	1.95	1.15	0.87	0.74	1.91	0.48

	Max		Min		Mean		Cfsm		In.	
Calendar year 1956:	Max	1,530	Min	19	Mean	124	Cfsm	1.83	In.	25.00
Water year 1956-57:	Max	1,100	Min	21	Mean	90.8	Cfsm	1.34	In.	18.21

Peak discharge (base, 1,000 cfs).--Jan. 23 (8:15 a.m.) 1,350 cfs (4.92 ft); Aug. 3 (9 p.m.) 2,400 cfs (6.24 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 18, 19, Dec. 30 to Jan. 6, Jan. 14-22, Feb. 1-3, 8, 11, 12, 20, 21, Mar. 3-6, 10, 11. Shifting-control method used Jan. 23 to Feb. 26.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 427.62 ft above mean sea level (levels by Corps of Engineers).

Average discharge.--17 years (1940-57), 138 cfs.

Extremes.--Maximum discharge during year, 3,800 cfs Aug. 4 (gage height, 6.86 ft), from rating curve extended above 1,600 cfs by logarithmic plotting; minimum, 18 cfs July 23 (gage height, 1.41 ft).

1939-57: Maximum discharge, 7,010 cfs Mar. 28, 1950 (gage height, 7.78 ft), from rating curve extended above 3,500 cfs by logarithmic plotting; minimum, 12 cfs Oct. 4, 1953; minimum gage height, 1.23 ft Aug. 20, 1949.

Remarks.--Records good except those for periods of ice effect, no gage-height record, or backwater from aquatic vegetation or debris, which are fair. Canal diverts from Limestone Creek about 3 miles above station and returns water to creek about 400 ft above station.

Revisions (water years).--WSP 954: 1941.

Rating table, water year 1956-57, except periods of ice effect, backwater from aquatic vegetation or debris (gage height, in feet, and discharge, in cubic feet per second)

1.3	14	3.0	411
1.4	24	4.0	827
1.7	64	5.0	1,390
2.1	148	6.0	2,330
2.5	254		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	46	57	b124	141	229	98	80	57	a56	57	37
2	41	60	58	b112	124	194	128	75	68	a40	44	36
3	49	70	60	b116	115	168	124	75	64	a35	410	42
4	52	54	77	117	131	b140	102	73	54	a82	a1,650	42
5	68	49	73	111	124	b124	199	70	51	a220	a402	38
6	48	48	90	b96	111	b130	c280	66	48	a160	223	37
7	49	46	197	104	120	150	c185	64	56	a90	168	36
8	54	46	208	102	131	150	c165	*60	56	a80	124	36
9	45	46	138	98	148	158	*c170	57	48	a80	111	33
10	*40	*49	117	b96	248	126	c185	58	42	a64	120	33
11	37	44	115	b88	b145	127	c190	61	37	a58	109	33
12	36	45	*187	94	b100	382	c250	70	*37	a50	84	32
13	34	54	176	b92	109	523	c210	64	40	a54	75	30
14	33	58	147	b86	104	465	c205	80	57	a54	66	31
15	32	52	289	b82	102	446	c175	113	57	a41	61	32
16	32	49	307	b86	102	351	c175	80	42	a36	58	42
17	32	55	202	b84	92	251	c175	64	34	31	54	46
18	32	51	178	b82	92	202	c160	61	34	31	51	38
19	32	48	125	b80	92	186	c150	77	37	29	49	34
20	32	45	141	b78	86	237	138	307	a34	29	46	*33
21	34	61	156	*b78	84	221	138	208	a32	27	a44	34
22	34	141	261	b620	82	178	115	113	a31	26	*a42	38
23	40	b78	505	1,640	92	163	109	102	a60	25	40	110
24	58	b54	286	432	92	148	106	82	a110	*23	40	57
25	52	b52	254	257	*161	*134	124	70	a62	22	40	41
26	45	b62	189	b205	364	136	111	153	a60	22	41	37
27	46	68	163	183	786	131	100	104	a50	22	42	34
28	57	63	160	b140	294	122	106	80	a64	23	40	33
29	48	63	158	163	-	122	94	72	a94	74	38	32
30	45	57	b120	146	--------	117	82	64	a90	122	37	31
31	44	--------	b130	126	--------	102	--------	63	--------	148	37	--------
Total	1,321	1,714	5,324	5,918	4,372	6,313	4,549	2,766	1,606	1,854	4,403	1,168
Mean	42.7	57.1	172	191	156	204	152	89.2	53.5	59.8	142	38.9
Cfsm	0.498	0.666	2.01	2.23	1.82	2.38	1.77	1.04	0.624	0.698	1.66	0.454
In.	0.57	0.74	2.31	2.57	1.90	2.74	1.97	1.20	0.70	0.80	1.91	0.51

Calendar year 1956: Max 2,310 Min 29 Mean 153 Cfsm 1.79 In. 24.30
Water year 1956-57: Max 1,650 Min 22 Mean 113 Cfsm 1.32 In. 17.92

Peak discharge (base, 2,000 cfs).--Jan. 23 (9:15 a.m.) 2,720 cfs (6.27 ft); Aug. 4 (about 1:30 a.m.) 3,800 cfs (6.86 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 nearby stations.

b Stage-discharge relation affected by ice.

c Backwater from debris.

Note.--Backwater from aquatic vegetation Oct. 1-23. Backwater from aquatic vegetation and debris June 7-12, July 21-29.

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 1957. 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 year, 9.83 ft July 3; minimum, 6.33 ft Feb. 25, 26. 1951-57: Maximum gage height, 10.41 ft Oct. 14, 1955; minimum, 5.93 ft Jan. 20, 1954.

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. Figures of change in contents computed from surface area and change in stage.

Mean gage height, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.30	8.13	8.51	7.49	7.30	7.22	7.34	8.57	8.59	8.87	8.65	8.14
2	8.38	8.21	8.58	7.42	7.25	7.31	7.38	8.48	8.51	8.95	8.62	8.17
3	8.32	8.20	8.52	7.36	7.21	7.33	7.53	8.41	8.57	9.00	8.63	8.16
4	8.37	8.11	8.41	7.30	7.14	7.33	7.88	8.38	8.44	9.06	8.74	8.11
5	8.35	8.12	8.51	7.23	7.09	7.31	8.25	8.37	8.44	9.08	8.81	8.02
6	8.46	8.15	8.21	7.17	7.05	7.26	7.97	8.35	8.38	9.14	8.82	8.16
7	8.25	8.14	8.16	7.11	6.98	7.22	8.13	8.37	8.35	9.20	8.79	8.15
8	8.35	8.04	8.21	7.07	6.95	7.20	8.56	8.39	8.39	9.22	8.70	8.13
9	8.29	7.97	8.23	7.01	6.93	7.20	8.54	8.36	8.43	9.06	8.59	8.20
10	8.36	8.05	8.14	6.97	6.90	7.21	8.67	8.42	8.41	8.95	8.46	8.34
11	8.38	8.12	8.15	6.94	6.88	7.24	8.88	8.59	8.40	8.90	8.34	8.16
12	8.44	7.99	8.04	6.87	6.89	7.24	8.86	8.53	8.34	8.87	8.31	8.19
13	8.41	8.05	8.01	6.83	6.86	7.30	8.93	8.52	8.42	8.82	8.30	8.17
14	8.36	8.08	8.17	a6.79	6.81	7.38	8.89	8.64	8.44	8.67	8.31	8.18
15	8.35	8.07	8.14	a6.72	6.75	7.47	9.09	f8.62	8.45	8.58	8.26	8.29
16	8.34	8.05	7.88	a6.66	6.70	7.57	9.12	f8.63	8.47	8.49	8.22	8.21
17	8.32	8.05	7.92	d6.64	6.66	7.68	9.10	f8.72	8.47	8.44	8.21	8.23
18	8.28	8.06	7.81	d6.61	6.64	7.71	9.13	f8.71	8.48	8.42	8.21	8.29
19	8.34	8.17	7.86	d6.57	6.59	7.74	9.12	f8.92	8.48	8.39	8.20	8.29
20	8.33	8.13	7.75	d6.51	6.55	7.72	9.09	f9.03	8.53	8.36	8.17	8.27
21	8.25	8.17	7.73	6.46	6.53	7.68	9.00	f9.07	8.63	8.36	8.18	8.28
22	8.26	8.16	7.81	6.48	6.49	7.66	9.10	f9.17	8.66	8.31	8.17	8.30
23	8.22	8.35	7.89	6.79	6.44	7.63	9.05	f9.15	8.67	8.32	8.17	8.38
24	8.16	8.53	7.79	7.15	6.41	7.59	8.99	f8.93	8.71	8.29	8.16	8.35
25	8.29	8.84	7.75	7.33	6.39	7.57	9.01	f9.06	8.79	8.29	8.20	8.42
26	8.53	8.65	7.84	7.43	6.41	7.53	8.90	f9.02	8.85	8.31	8.17	8.32
27	8.20	8.51	7.80	7.47	6.70	7.48	8.83	f8.85	8.92	8.32	8.10	8.38
28	8.13	8.58	7.74	7.46	7.07	7.43	8.75	f8.69	8.99	8.29	8.14	8.42
29	8.16	8.50	7.65	7.44	-	7.40	8.65	f8.74	8.92	8.45	8.18	8.43
30	8.14	8.54	7.60	7.41	-------	7.33	8.62	f8.73	8.83	8.61	8.13	8.45
31	8.16	-------	7.55	7.36	-------	7.33	-------	8.67	-------	8.67	8.14	-------
Mean	8.31	8.22	8.01	7.03	6.81	7.43	8.65	8.68	8.57	8.67	8.36	8.25
(†)	+24.9	+352	-856	-191	-129	+141	+1,107	-8.3	+206	-158	-448	+249

Calendar year 1956: Max 10.01 Min 6.01 Mean 8.16 † +50.7
Water year 1956-57: Max 9.22 Min 6.39 Mean 8.09 † +20.5

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† Change in contents, equivalent in cubic feet per second, in Oneida Lake.

a No gage-height record; gage heights estimated on basis of recorded range in stage and records for Gage 1, Oneida River at Caughdenoy.

d Doubtful gage-height record; gage heights computed on basis of records for Gage 1, Oneida River at Caughdenoy.

f Fragmentary gage-height record; gage heights computed on basis of records for Gage 1, 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 Erie (Barge) Canal, 1.6 miles downstream from Oneida Lake, and 2.6 miles upstream from Caughdenoy, Oswego County.

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 1957 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 Erie (Barge) Canal bench mark. Prior to June 5, 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 different 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 Erie (Barge) Canal.

Average discharge.--10 years (1947-57), 2,369 cfs.

Extremes.--Maximum daily discharge during year, 4,900 cfs Dec. 5; minimum daily, 159 cfs Sept. 23.

1947-57: 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 aquatic vegetation or no gage-height record, 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 Erie (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 presumably caused by seiche in Oneida Lake. Water may be diverted into or received from Mohawk River basin through summit level of Erie (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 Erie (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 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,030	1,040	2,140	3,280	3,030	2,930	1,580	2,780	2,520	c536	2,010	218
2	1,060	1,060	2,280	3,210	2,960	3,010	289	2,680	2,550	c549	2,000	220
3	1,040	1,060	1,910	3,140	2,920	3,020	265	2,620	2,450	c585	1,930	211
4	1,060	1,050	3,440	3,050	2,830	3,040	257	2,250	2,430	c645	2,620	195
5	1,040	1,060	4,900	2,950	2,780	3,030	267	2,010	2,420	c873	3,170	185
6	1,050	1,100	4,380	2,880	2,730	2,980	325	1,250	1,610	c953	3,720	185
7	994	1,090	4,260	2,810	2,660	2,930	349	*702	c968	c980	3,990	191
8	1,010	1,080	4,320	2,760	2,600	2,900	276	683	c949	c1,990	3,930	205
9	*991	*1,070	4,370	2,710	2,580	2,870	1,190	682	c936	2,690	3,850	194
10	990	1,080	*4,270	2,660	2,520	2,880	*1,830	692	c769	2,550	3,780	185
11	1,020	1,100	4,300	2,610	2,520	2,960	1,840	729	c614	2,520	3,630	174
12	1,040	1,060	4,100	2,550	2,540	2,960	2,100	716	*c631	2,580	1,940	179
13	1,040	1,060	4,090	2,470	2,500	3,030	2,250	707	c614	2,530	965	169
14	1,020	1,070	4,330	2,420	2,450	3,140	2,220	736	c608	2,490	962	180
15	1,030	1,080	4,290	2,360	2,350	3,260	2,220	727	c595	2,380	956	189
16	1,040	1,060	3,860	*2,330	2,290	3,380	2,930	724	c568	2,390	824	166
17	1,040	1,040	3,930	2,220	2,200	3,530	3,550	743	c532	1,480	638	177
18	1,050	1,040	3,740	2,160	2,210	3,590	3,590	754	c417	995	643	181
19	1,030	1,050	3,840	2,100	2,140	3,640	4,130	794	c330	720	479	*171
20	1,020	1,060	3,680	2,040	2,080	3,620	4,350	1,300	c333	500	230	164
21	1,050	1,060	3,640	1,980	2,060	3,550	4,220	1,770	c334	499	*218	184
22	1,060	1,040	3,780	2,030	2,010	3,550	4,380	2,350	c342	470	224	172
23	1,060	1,060	3,900	2,370	1,950	3,500	4,350	3,500	c321	*468	228	159
24	1,060	1,110	3,740	2,830	1,910	3,420	4,290	3,680	c300	449	225	176
25	1,070	1,100	3,650	3,060	1,910	3,400	4,170	3,790	c299	445	227	169
26	1,080	1,430	3,800	3,190	*1,940	*3,360	4,080	3,740	c438	448	a206	169
27	1,040	1,950	3,760	3,230	2,280	3,280	4,020	3,640	c521	450	a193	180
28	1,040	2,000	3,670	3,240	2,720	3,220	3,920	3,500	c525	448	199	198
29	1,060	1,990	3,540	3,220	-	3,170	3,320	3,000	c560	438	198	193
30	1,050	1,960	3,430	3,180	--------	3,060	2,760	2,580	c536	449	199	235
31	1,040	--------	3,390	3,110	--------	3,060	--------	2,510	--------	1,320	215	--------
Total	32,205	36,010	116,730	84,150	67,670	99,270	75,318	58,339	27,020	36,820	44,599	5,574
Mean	1,039	1,200	3,765	2,715	2,417	3,202	2,511	1,882	901	1,188	1,439	186
Cfsm	0.755	0.871	2.73	1.97	1.76	2.33	1.82	1.37	0.654	0.863	1.05	0.135
In.	0.87	0.97	3.15	2.27	1.83	2.68	2.03	1.58	0.74	0.99	1.20	0.15

Calendar year 1956: Max 8,120 Min 252 Mean 2,413 Cfsm 1.75 In. 23.85
Water year 1956-57: Max 4,900 Min 159 Mean 1,873 Cfsm 1.36 In. 18.46

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* Discharge measurement made on this day.
a No gage-height record at gage 3; discharge estimated on basis of records for adjacent days.
c Backwater from aquatic vegetation.

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 1957. 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 Oswego (Barge) Canal datum. April 1897 to December 1901, headwater gage 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.--23 years (1934-57), 6,486 cfs.

Extremes.--Maximum discharge during year, 15,200 cfs Mar. 15 (gage height, 7.97 ft), includes mean daily discharge of canals; minimum daily, 827 cfs Sept. 8; minimum gage height, 1.21 ft May 8.

1933-57: 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. This record represents total discharge at Oswego and includes flow in Hydraulic and Oswego (Barge) Canals. A large amount of natural storage and some artificial regulation is afforded by the many large lakes and the Erie (Barge) and Oswego (Barge) Canal systems in the river basin. Large diurnal fluctuations at low and medium flow by powerplants above station. Oswego River basin receives water from Erie (Barge) Canal through lock 32 near Pittsford. Water may be diverted into or received from Mohawk River basin through summit level of Erie (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 16 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 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,120	2,590	4,400	7,550	6,560	11,100	7,770	7,180	7,480	3,670	5,100	1,370
2	3,290	2,670	4,040	8,170	6,420	10,700	4,720	6,330	7,170	3,380	3,630	1,710
3	2,930	2,620	5,790	8,450	6,310	9,990	4,050	5,090	7,320	3,560	3,400	2,390
4	3,020	2,280	5,880	7,420	6,340	9,760	4,560	5,250	6,780	3,770	5,240	2,530
5	2,920	3,710	7,150	7,130	6,700	9,220	4,520	5,250	5,800	4,290	7,130	1,820
6	2,860	2,330	8,330	6,830	6,640	8,700	5,640	5,050	4,940	5,290	6,650	2,110
7	2,310	2,760	8,670	7,670	6,270	8,090	6,540	3,270	3,990	4,820	6,560	1,790
8	*4,250	*2,600	8,890	7,470	6,540	7,570	7,850	3,230	3,120	5,040	6,230	827
9	2,320	2,640	8,830	7,070	6,390	8,100	*7,170	*3,000	2,150	5,600	5,670	2,220
10	2,840	3,120	8,860	7,140	5,860	8,160	8,910	2,890	4,590	5,810	6,150	1,920
11	3,360	2,870	*8,830	7,240	7,520	8,500	8,880	3,000	*3,380	5,780	5,820	1,920
12	2,080	3,720	8,560	7,360	7,520	9,690	8,390	1,910	2,420	5,890	5,510	1,890
13	1,820	3,860	8,450	6,450	7,180	10,800	8,100	2,840	2,930	5,470	2,660	1,860
14	2,090	3,560	8,880	6,840	6,660	13,000	8,230	2,700	2,880	4,760	3,010	1,850
15	3,020	2,710	9,940	*6,660	6,400	14,500	8,270	2,720	3,170	5,700	2,560	1,030
16	3,190	2,810	9,300	6,920	6,310	14,400	7,940	2,680	2,630	4,900	2,840	2,390
17	3,050	2,670	8,710	6,890	6,270	13,300	8,370	2,580	3,340	4,210	2,660	2,220
18	1,480	2,210	8,650	6,730	7,010	12,400	9,300	2,470	3,090	2,820	1,500	2,080
19	1,920	3,380	8,360	5,770	7,000	11,600	8,940	1,740	2,510	2,930	2,910	2,230
20	2,030	3,380	8,080	4,830	6,470	10,800	8,880	4,430	2,700	2,620	2,370	*1,880
21	1,900	3,330	7,760	5,340	*6,500	10,700	10,400	7,630	2,630	1,940	*2,140	1,720
22	2,850	3,360	7,600	6,090	6,180	10,400	9,280	7,180	2,580	3,010	1,690	1,100
23	2,520	4,970	8,280	11,000	5,970	10,400	9,530	10,100	2,060	*2,390	1,790	2,440
24	2,660	4,380	9,010	13,500	5,270	9,990	9,130	10,200	3,110	2,020	2,190	2,210
25	3,210	3,030	9,680	13,400	6,560	9,610	8,290	10,100	2,870	2,110	1,320	2,090
26	3,060	4,140	10,100	12,900	6,560	9,350	8,680	9,520	2,640	2,050	2,450	1,850
27	3,230	5,130	9,590	11,500	9,670	*8,040	9,020	9,140	2,870	2,190	2,060	1,780
28	2,310	4,910	8,560	10,200	11,300	8,460	9,110	8,940	2,970	1,520	1,830	1,720
29	3,000	3,940	8,620	9,350	-	8,340	8,860	9,020	3,360	2,730	1,850	1,100
30	2,680	4,530	8,510	8,820	--------	8,240	8,420	8,640	2,420	3,220	1,720	2,020
31	2,890	--- ----	8,110	7,510	--------	8,180	--------	8,410	--------	3,290	2,040	--------
Total	84,210	100,210	254,420	250,200	190,380	312,090	237,750	172,490	109,900	116,780	108,680	56,067
Mean	2,716	3,340	8,207	8,071	6,799	10,070	7,925	5,564	3,663	3,767	3,506	1,869
Cfsm	0.530	0.652	1.60	1.58	1.33	1.97	1.55	1.09	0.715	0.736	0.685	0.365
In.	0.61	0.73	1.85	1.82	1.38	2.27	1.73	1.25	0.80	0.85	0.79	0.41

Calendar year 1956: Max 26,000 Min 1,140 Mean 7,814 Cfsm 1.53 In. 20.71
Water year 1956-57: Max 14,500 Min 827 Mean 5,461 Cfsm 1.07 In. 14.49

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* Discharge measurement made on this day.

Black River Canal (flowing south) near Boonville, N. Y.

Location.--Lat 43°27'20", long 75°19'25", on left bank at lock 69, 2 miles south of Boonville, Oneida County.

Records available.--September 1915 to September 1942 (canal seasons only), October 1942 to September 1957.

Gage.--Water-stage recorder and concrete control. Datum of gage 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. Auxiliary water-stage recorder with concrete control 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.

Extremes.--1915-57: Maximum daily discharge recorded, 323 cfs Nov. 30, 1915; practically no flow at times when no water is being diverted.

Remarks.--Records good except those for periods of backwater from debris at main gage or auxiliary gage, or shifting control at main gage, which are fair, and those for periods of ice effect at main gage, which are poor. This record shows combined flow in Black River Canal and Lansingkill spillway, and represents total diversion from Black River at Forestport, through Forestport feeder, into Mohawk River basin. Discharge during periods Oct. 1 to May 30, Aug. 22 to Sept. 30, 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 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.5	1.7	0.5	0.2	0.2	0.2	0.8	0.4	6.5	21	7.0	3.0
2	2.6	1.7	.5	.2	.2	.1	.8	.4	8.5	13	7.2	3.1
3	2.8	1.7	.5	.2	.2	.1	.7	.4	21	*10	7.2	3.3
4	2.9	1.7	.5	.2	.2	.1	.7	.4	*20	22	7.6	2.4
5	3.0	1.6	*.2	.2	.1	.1	.7	.5	16	33	17	2.7
6	2.7	1.5	.2	.2	.1	.2	1.1	.7	13	27	20	3.5
7	2.6	1.5	.3	.2	.1	.2	.6	.6	12	12	13	3.7
8	2.6	1.4	.2	.2	.1	.2	.6	.5	7.3	9.1	11	3.7
9	2.4	1.5	.2	.1	.1	.1	.5	.6	9.2	8.6	10	3.7
10	2.4	1.4	.2	.2	.1	.1	.5	.7	11	8.1	10	3.5
11	2.2	1.4	.2	.3	.1	.1	.5	.7	9.4	7.7	10	3.3
12	2.0	1.3	.2	.2	.1	.2	.5	.7	12	7.7	9.8	*2.5
13	1.9	1.3	.2	.2	.1	.3	.5	.7	23	7.7	9.4	2.1
14	1.8	1.3	.2	.2	.1	.4	.6	.7	36	7.6	9.0	1.8
15	1.9	1.3	.2	.2	.1	.3	.5	.7	46	7.4	9.0	1.0
16	1.9	1.3	.2	.2	.1	.3	*.5	.7	40	6.6	*8.8	.8
17	1.9	1.4	.2	.2	.1	.2	.6	.8	45	5.7	8.5	1.0
18	1.9	1.4	.2	.2	.1	.2	.6	.8	23	5.7	8.5	1.4
19	1.9	1.3	.2	.2	.1	.2	.6	.8	60	5.4	8.7	1.6
20	1.8	1.3	.2	.1	.1	.2	.6	1.5	72	4.6	7.1	1.6
21	1.7	3.6	.2	.2	.1	.2	.7	1.3	75	9.9	2.8	1.7
22	1.6	11	.2	1.2	.1	.2	.7	1.0	88	24	.6	1.2
23	1.6	3.1	.2	1.7	.1	.2	.6	1.0	91	24	.6	1.5
24	*1.6	1.4	.2	.6	.1	.2	.6	.9	94	21	2.0	1.7
25	1.7	1.3	.2	.3	.1	.2	.6	.9	108	20	3.3	1.7
26	1.7	1.0	.2	.3	.3	.2	.6	.9	126	20	3.2	2.0
27	1.6	.9	.2	.2	.5	.2	.6	.8	55	20	3.1	2.2
28	1.6	.8	.2	.2	.3	*.2	.6	.8	15	22	2.9	2.2
29	1.5	.7	.2	.2	-	.3	.5	.8	18	42	2.9	1.6
30	1.4	.6	.2	.2		.7	.5	.8	32	15	2.8	.7
31	1.4		.2	.2		.8		5.6		7.2	3.0	
Total	63.1	53.4	7.5	9.2	4.0	7.2	18.5	28.1	1,192.9	455.0	226.0	66.2
Mean	2.04	1.78	0.24	0.30	0.14	0.23	0.62	0.91	39.8	14.7	7.29	2.21
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

	Max	Min	Mean	Cfsm	In.
Calendar year 1956:	20	0.1	2.07	-	-
Water year 1956-57:	126	0.1	5.84	-	-

* Discharge measurement made on this day at main gage.

Note.--Stage-discharge relation affected by ice Nov. 23-27, Dec. 9, 10, 13-26, Dec. 29 to Jan. 20, Jan. 23 to Feb. 13, Feb. 17, 18, Feb. 26 to Mar. 6, Mar. 8-12 (no gage-height record Dec. 15-22) at main gage. Backwater from debris Oct. 7-24, Mar. 28, 29, at main gage; Apr. 6-16, Aug. 24 to Sept. 12 (no gage-height record Sept. 4-11) at auxiliary gage. Shifting-control method used Jan. 7 to Mar. 28, at main gage.

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 1957.

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 and staff gages at same site and datum.

Average discharge.--46 years, 683 cfs.

Extremes.--Maximum discharge during year, about 3,100 cfs Jan. 25 (gage height, 8.24 ft, backwater from ice); maximum gage height, 11.29 ft Jan. 23 (ice jam); minimum discharge, 100 cfs Aug. 27 (gage height, 3.67 ft); minimum daily, 114 cfs Aug. 25.

1911-57: 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 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.

Revisions (water years).--WSP 759: Drainage area. WSP 784: 1934. WSP 1084: 1912(M), 1913, 1917-19(M), 1922(M), 1924(M), 1926(M), 1928(M), 1930(M), 1933(M).

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22		Nov. 23 to Sept. 30			
4.4	256	3.7	104	6.0	1,060
5.0	471	4.2	212	7.0	1,910
6.0	1,060	5.0	480	8.0	3,110
7.0	1,910				

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	615	367	598	420	860	1,450	756	699	671	929	518	123
2	535	421	560	450	800	1,220	1,090	639	682	874	350	125
3	516	417	537	460	720	1,040	1,370	603	739	776	254	164
4	526	367	490	500	620	920	1,140	594	*660	1,380	254	184
5	620	338	400	480	520	*820	1,090	574	574	1,890	209	174
6	595	321	520	450	440	700	1,630	551	464	2,300	190	181
7	584	305	781	*460	430	620	2,110	528	464	1,590	186	184
8	805	299	1,200	450	420	560	1,540	519	489	1,230	174	176
9	818	292	1,060	420	400	540	1,250	523	436	1,070	a174	a195
10	715	286	920	400	410	480	1,060	608	388	984	a160	a175
11	647	271	856	390	430	380	936	677	349	862	a180	a175
12	574	296	830	380	360	480	895	762	322	727	a175	a170
13	512	a340	830	390	360	600	869	799	294	584	166	172
14	467	a350	780	380	*380	700	849	721	281	460	162	169
15	442	a330	762	370	370	920	799	792	284	377	156	174
16	425	a340	862	360	350	1,500	*818	1,060	278	342	152	199
17	429	590	929	350	340	1,550	962	1,010	252	310	147	260
18	413	610	836	340	340	1,250	1,090	862	224	277	140	248
19	389	489	693	350	340	1,100	1,180	799	376	270	136	240
20	374	389	710	350	320	1,020	1,420	1,470	511	226	*138	241
21	367	578	677	360	290	950	1,820	2,110	368	194	146	218
22	*367	1,510	682	440	300	889	1,890	1,720	265	202	130	247
23	374	1,290	900	1,750	320	895	1,480	1,310	235	243	122	*528
24	378	889	960	2,600	320	922	1,240	962	667	*226	118	560
25	356	774	1,060	2,600	330	875	1,140	811	756	196	114	440
26	342	751	900	1,750	380	849	1,040	1,100	985	176	121	352
27	352	733	840	1,400	980	786	936	1,020	830	174	126	261
28	409	710	780	1,160	1,400	774	943	970	650	223	122	207
29	405	*677	720	1,040	-	799	936	922	771	793	119	218
30	367	639	520	960	------	792	799	849	1,070	866	120	207
31	349	--------	410	920	-------	762	--------	768	------	642	127	------
Total	15,067	15,969	23,603	23,130	13,530	27,143	35,078	27,332	15,335	21,393	5,386	6,967
Mean	486	532	761	746	483	876	1,169	882	511	690	174	232
Cfsm	1.65	1.80	2.58	2.53	1.64	2.97	3.96	2.99	1.73	2.34	0.590	0.786
In.	1.90	2.01	2.98	2.92	1.71	3.42	4.42	3.45	1.93	2.70	0.68	0.88

Calendar year 1956: Max 4,860 Min 148 Mean 701 Cfsm 2.38 In. 32.38
Water year 1956-57: Max 2,600 Min 114 Mean 630 Cfsm 2.14 In. 29.00

Peak discharge (base, 3,900 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 correlation between gage-height record at Forestport feeder dam and discharge at gaging station.

Note.--Stage-discharge relation affected by ice Dec. 4-6, 9, 10, 14, Dec. 23 to Mar. 19 (no gage-height record Dec. 23-30, Jan. 15-17, Feb. 17-23).

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.--October 1911 to September 1957. October 1911 monthly discharge only, published in WSP 1307.

Gage.--Staff gage read twice daily. Datum of gage is 1,690.63 ft above mean sea level, datum of 1929.

Average discharge.--46 years, 105 cfs.

Extremes.--Maximum daily discharge during year, 294 cfs May 21; maximum gage height observed, 3.32 ft July 6; minimum daily discharge, 7.9 cfs May 8-10.

1911-57: Maximum daily discharge, 862 cfs Mar. 23, 1921, from rating curve extended above 450 cfs by logarithmic plotting; minimum daily, 0.1 cfs many times when gates in dam were closed.

Remarks.--Records good except those for periods of backwater from North Branch 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.

Revisions.--WSP 664: Drainage area.

Rating tables, water year 1956-57, except period of backwater from North Branch (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 5

1.7	11	2.5	102
1.9	24	3.0	206
2.2	55	4.0	514

Feb. 6 to Sept. 30

1.6	6.8	2.5	106
1.7	11	3.0	216
1.9	24	3.4	322
2.2	58		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	150	16	54	19	14	8.7	8.0	15	128	21	25
2	56	219	52	95	19	15	8.7	8.0	171	151	21	154
3	56	241	87	d218	19	15	8.7	8.0	185	147	21	283
4	56	228	87	d218	19	96	8.7	8.0	23	154	21	185
5	58	224	97	d218	106	246	8.7	8.0	23	203	21	95
6	59	218	126	d218	218	259	8.7	8.0	23	275	20	146
7	62	211	69	d214	214	*257	8.7	8.0	*24	192	20	246
8	120	204	17	208	214	254	8.7	7.9	24	130	20	241
9	138	199	18	208	214	251	8.7	7.9	24	*128	20	241
10	138	197	18	*211	214	249	8.7	7.9	24	52	20	241
11	138	192	18	211	211	246	8.7	8.7	24	21	20	238
12	116	190	18	208	209	244	8.7	8.7	25	21	21	236
13	56	185	18	208	209	241	8.7	8.7	26	22	20	236
14	56	183	18	206	*209	236	8.7	9.2	66	23	20	234
15	92	181	19	204	216	234	8.7	64	186	22	20	231
16	197	176	19	204	234	234	8.7	90	66	21	20	231
17	194	176	19	201	238	236	*8.7	90	30	21	20	231
18	*192	176	19	199	234	238	8.7	90	30	20	20	231
19	185	172	19	194	231	234	8.7	90	132	20	20	231
20	185	168	19	190	228	206	8.7	181	174	20	20	231
21	183	163	19	190	228	193	8.7	294	171	20	20	228
22	179	65	19	192	228	183	8.6	289	72	20	*20	226
23	174	16	20	147	231	129	8.2	272	33	20	20	231
24	170	16	20	19	228	101	*8.0	106	35	20	14	231
25	163	16	19	19	228	78	8.0	18	103	20	12	*219
26	159	16	19	20	231	8.7	8.0	89	128	20	12	192
27	155	*16	19	20	136	8.7	8.0	128	126	20	12	192
28	155	16	19	20	14	8.7	8.0	126	82	20	12	187
29	155	16	19	20	-	8.7	8.0	126	63	20	12	187
30	153	16	20	19	---	8.7	8.0	66	68	20	12	196
31	150	---	42	19	---	8.7	---	15	---	21	12	---
Total	4,018	4,246	1,008	4,572	4,999	4,741.2	255.5	2,249.0	2,176	1,992	564	6,276
Mean	130	142	32.5	147	179	153	8.52	72.5	72.5	64.3	18.2	209
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 356 Min 0.3 Mean 82.1 Cfsm 1.58 In. 21.47
Water year 1956-57: Max 294 Min 7.9 Mean 102 Cfsm 1.96 In. 26.53

* Discharge measurement made on this day.

d Doubtful gage-height record; discharge computed on basis of discharge measurement, reservoir elevations, and records of gate operation at Old Forge Dam.

Note.--Backwater from North Branch Apr. 22 to May 7. Increase in combined storage in Old Forge and Sixth Lake Reservoirs during calendar year 1956, about 502,300,000 cu ft (equivalent mean discharge, 15.9 cfs; runoff, 4.16 in.); decrease during water year 1957, about 378,800,000 cu ft (equivalent mean discharge, 12.0 cfs; runoff, 3.14 in.). Storage data furnished by Board of Black River Regulating District.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 1,530.29 ft above mean sea level, datum of 1929.

Average discharge.--32 years, 326 cfs.

Extremes.--Maximum discharge during year, 929 cfs May 24 (gage height, 4.88 ft); maximum gage height, 6.69 ft Jan. 23 (backwater from ice); minimum discharge, 48 cfs Aug. 28 (gage height, 2.00 ft).

1925-57: Maximum discharge, 2,100 cfs Apr. 27, 1926 (gage height, 6.6 ft); maximum gage height, 7.35 ft Jan. 25, 1955 (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.

Revisions.--WSP 664: Drainage area.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 23		Jan. 24 to Sept. 30			
2.9	171	2.0	48	3.5	319
3.5	325	2.5	104	4.0	499
4.0	505	3.0	189	5.0	995
5.0	995				

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	256	240	245	240	200	330	207	382	301	225	107	54
2	215	245	230	260	190	300	258	335	307	253	100	55
3	201	322	256	310	180	280	281	301	451	258	99	223
4	194	325	260	420	170	270	281	278	338	301	107	325
5	190	313	260	400	160	450	292	258	240	406	104	205
6	182	304	284	380	290	470	385	238	*221	512	98	156
7	194	295	364	370	340	*459	425	213	228	563	92	217
8	232	287	377	360	330	451	421	165	218	451	87	278
9	295	281	350	*350	320	444	425	163	204	417	84	283
10	313	281	330	350	330	421	407	169	191	378	81	281
11	304	281	310	340	340	410	378	173	173	*281	80	281
12	289	281	300	330	330	425	351	185	165	238	81	278
13	245	281	290	320	320	459	319	177	156	213	85	278
14	201	278	280	310	310	432	292	165	150	181	85	278
15	188	273	270	300	*300	483	269	161	221	138	83	272
16	240	284	260	300	320	576	261	179	261	140	77	292
17	298	292	280	290	320	581	*283	256	175	136	69	295
18	298	292	260	290	320	559	313	269	135	129	68	289
19	287	284	250	290	310	533	335	313	162	121	67	286
20	284	273	245	300	310	516	365	512	286	114	65	286
21	281	306	230	320	300	479	432	684	322	103	64	319
22	273	420	228	380	300	440	491	780	319	99	*62	375
23	262	351	262	760	300	417	590	869	202	95	60	417
24	273	350	281	620	310	361	660	896	152	90	62	389
25	*256	370	301	460	320	338	679	684	128	89	63	365
26	251	*347	290	400	330	286	650	590	185	86	61	*316
27	256	328	280	340	520	243	590	650	196	84	58	289
28	262	338	270	300	390	230	545	590	193	86	54	281
29	254	295	251	260	-	193	491	550	185	128	59	275
30	248	260	225	230	--------	158	429	491	211	127	59	269
31	240	--------	220	210	--------	202	--------	375	--------	118	59	--------
Total	7,762	9,077	8,539	10,790	8,460	12,196	12,105	12,051	6,676	6,560	2,380	8,207
Mean	250	303	275	348	302	393	404	389	223	212	76.8	274
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

	Max		Min		Mean		Cfsm		In.	
Calendar year 1956:	Max	1,340	Min	63	Mean	294	Cfsm	1.99	In.	27.09
Water year 1956-57:	Max	896	Min	54	Mean	287	Cfsm	1.94	In.	26.34

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 24, 25, 30, Dec. 1, 2, 4, 5, 9-20, 26, 27, Dec. 30 to Mar. 6, Mar. 11.

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 confluence of Middle and South Branches.

Drainage area.--365 sq mi.

Records available.--June 1900 to September 1957. Monthly discharge only for some periods, published in WSP 1307. Published as "at Moose River" prior to October 1922.

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.--52 years (1905-57), 828 cfs.

Extremes.--Maximum discharge during year, 3,940 cfs May 21 (gage height, 7.65 ft); maximum gage height, 10.51 ft Jan. 23 (ice jam); minimum discharge, 88 cfs Sept. 2 (gage height, 1.60 ft).

1900-1957: 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 excellent except those for periods of ice effect or no gage-height record, which are fair. Flow regulated to some extent by Fulton Chain of Lakes since about 1880.

Revisions (water years).--WSP 624: 1922(M). WSP 729: Drainage area. WSP 874: 1928.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 21		Apr. 22 to Sept. 30			
2.6	369	1.6	88	4.0	1,010
3.0	526	2.0	180	6.0	2,410
4.0	1,020	2.5	326	7.0	3,290
6.0	2,410	3.0	513	8.0	4,290
7.0	3,290				

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	468	376	460	540	620	900	566	911	654	977	244	96
2	436	388	440	560	540	620	887	772	664	741	213	92
3	448	480	480	620	480	560	1,390	678	928	591	196	262
4	452	518	490	680	440	540	1,130	614	746	787	213	418
5	484	492	500	640	420	700	910	565	565	1,440	196	313
6	484	472	530	600	500	740	1,590	513	*492	2,190	180	241
7	505	452	976	580	580	*740	1,900	464	574	1,520	164	279
8	962	433	2,320	560	560	720	1,340	396	687	1,000	152	333
9	1,020	425	1,730	*520	540	700	1,070	382	565	813	144	329
10	815	421	1,220	520	560	700	915	396	472	*697	142	323
11	677	406	1,060	500	580	680	815	602	407	552	140	326
12	593	410	932	490	560	660	770	808	378	468	164	326
13	509	436	860	470	540	700	682	906	385	407	172	323
14	444	444	840	460	520	740	654	756	367	350	a163	323
15	406	440	780	440	*500	980	602	856	422	285	a158	313
16	440	468	780	440	480	1,850	611	1,370	476	270	a150	336
17	484	649	831	430	480	1,900	795	1,150	364	255	a134	378
18	468	701	760	420	470	1,450	1,190	862	297	235	a120	378
19	448	593	580	430	450	1,160	1,470	777	516	218	a117	357
20	433	522	607	450	440	1,010	1,980	1,920	1,190	204	a114	353
21	425	602	575	480	420	888	3,160	3,500	829	191	a112	382
22	410	2,440	561	560	410	800	3,260	2,210	645	185	*108	509
23	399	1,990	668	2,000	400	780	2,140	1,750	449	196	106	838
24	417	1,100	721	*3,000	420	760	*1,900	1,590	441	191	104	911
25	*402	840	900	2,400	440	740	1,730	1,230	484	180	104	668
26	388	*760	800	1,500	460	682	1,570	1,080	797	167	104	*522
27	391	720	760	1,200	800	602	1,400	1,530	716	159	100	433
28	402	680	682	1,000	1,700	570	1,290	1,380	622	162	96	389
29	402	600	611	900	-	575	1,210	1,150	596	278	104	367
30	391	560	560	800	-------	530	1,040	972	1,110	333	102	350
31	380	-------	520	700	-------	540	-------	777	-------	294	102	-------
Total	15,383	19,818	24,534	24,890	15,310	25,517	39,967	32,867	17,838	16,336	4,418	11,468
Mean	496	661	791	803	547	823	1,332	1,060	595	527	143	382
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 6,120 Min 110 Mean 726 Cfsm 1.99 In. 27.08
Water year 1956-57: Max 3,500 Min 92 Mean 680 Cfsm 1.86 In. 25.31

Peak discharge (base, 5,500 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for upstream stations.

Note.--Stage-discharge relation affected by ice Nov. 24 to Dec. 5, Dec. 10, 11, 13-15, 18, 19, 25-27, Dec. 30 to Mar. 16, Mar. 19, 22-24, 31.

Independence River at Donnattsburg, N. Y.

Location.--Lat 43°44'50", long 75°20'05", on right bank at downstream side of highway bridge at Donnattsburg, Lewis County, 1¼ miles downstream from Chase Lake Outlet, 4¼ miles northeast of Glenfield, and 5 miles upstream from mouth.

Drainage area.--91.7 sq mi.

Records available.--July 1942 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 972.84 ft above mean sea level, datum of 1929. Prior to Sept. 16, 1949, wire-weight gage at same site and datum.

Extremes.--Maximum discharge during year, 1,300 cfs May 21 (gage height, 6.15 ft); maximum gage height, 7.92 ft Jan. 24 (ice jam); minimum discharge, 27 cfs Aug. 29, Sept. 1 (gage height, 2.88 ft).

1942-57: 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, which are fair.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22		Nov. 23 to Sept. 30			
3.2	49	2.8	22	4.5	382
3.5	95	3.1	44	5.0	605
4.0	215	3.5	91	6.0	1,200
4.5	385	3.8	149		
5.0	605				

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	86	66	116	100	145	500	187	144	116	204	70	28
2	91	68	112	98	130	330	259	124	154	142	56	31
3	105	68	108	96	114	225	386	113	250	102	50	54
4	107	71	106	96	108	165	324	109	190	167	49	73
5	105	68	110	94	98	145	263	105	140	557	50	57
6	91	64	127	92	90	*135	512	96	*115	724	47	47
7	109	59	403	90	84	112	615	90	142	337	42	42
8	210	59	970	88	80	105	415	84	165	182	39	38
9	236	59	623	*86	78	113	302	80	128	122	38	36
10	182	60	370	84	82	110	236	81	104	97	38	34
11	144	56	288	82	84	108	198	120	87	84	59	33
12	117	62	239	82	80	111	187	162	78	74	54	35
13	101	72	205	80	76	151	167	175	74	67	51	38
14	93	82	190	78	*74	220	157	154	69	60	47	41
15	88	86	190	76	72	361	140	195	104	56	44	40
16	82	95	198	74	70	697	*152	267	113	51	40	45
17	77	162	226	72	68	671	217	214	81	*47	36	58
18	72	169	205	70	68	440	370	162	67	45	34	58
19	70	135	155	70	68	300	419	138	88	42	33	49
20	66	109	159	74	66	239	520	523	133	*40	*32	52
21	64	135	152	78	64	200	676	1,140	118	39	33	122
22	62	578	162	108	62	175	671	592	85	40	31	131
23	61	596	256	360	65	187	427	374	68	45	30	287
24	*62	320	317	760	64	204	328	306	63	46	30	302
25	62	220	380	620	67	198	292	236	68	43	29	*173
26	62	185	290	440	93	195	288	204	178	40	28	113
27	65	167	250	340	332	178	239	230	152	38	28	87
28	74	140	207	270	540	176	207	226	116	37	28	74
29	77	*130	181	230	-	198	181	198	116	72	28	67
30	71	116	108	190	--------	195	162	167	205	116	28	60
31	70	--------	102	165	--------	183	--------	140	--------	91	28	--------
Total	2,962	4,257	7,505	5,243	3,022	7,327	9,497	6,949	3,567	3,807	1,230	2,305
Mean	95.5	142	242	169	108	236	317	224	119	123	39.7	76.8
Cfsm	1.04	1.55	2.64	1.84	1.18	2.57	3.46	2.44	1.30	1.34	0.433	0.838
In.	1.20	1.73	3.04	2.13	1.23	2.97	3.85	2.82	1.45	1.54	0.50	0.93

	Max	Min	Mean	Cfsm	In.
Calendar year 1956:	1,660	28	183	2.00	27.15
Water year 1956-57:	1,140	28	158	1.72	23.39

Peak discharge (base, 1,200 cfs).--May 21 (6:30 to 7 a.m.) 1,300 cfs (6.15 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 10, 11, 24-26, Nov. 28 to Dec. 5, Dec. 13, 14, 18, 19, 25-27, Dec. 30 to Jan. 24, Jan. 26 to Feb. 22, Feb. 24, Feb. 28 to Mar. 7, Mar. 10, 11, 18, 19, 21, 22.

Stillwater Reservoir near Beaver River, N. Y.

Location.--Lat 43°53'50", long 75°03'05", in gatehouse at Stillwater Dam on Beaver River, 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 1957. Month-end contents only for some periods published in WSP 1307.

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 observed elevation during year, 1,679.36 ft July 13 (contents, 4,730,000,000 cu ft); minimum observed, 1,655.87 ft Feb. 26 (contents, 411,000,000 cu ft).

1925-57: Maximum observed elevation, 1,679.73 ft June 3, 1947 (contents, 4,838,000,000 cu ft); minimum observed since first filling, 1,644.80 ft Mar. 25-27, 1940 (contents, 8,000,000 cu ft).

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. Elevation of gate sill of lowest outlet, 1,642.3 ft. Capacity below elevation 1,650.3 ft, 90,000,000 cu ft, is included in records presented herein, but is not ordinarily available for release. Prior to 1956, contents published as usable contents above elevation 1,650.3 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.

Cooperation.--Record of gate opening and reservoir elevations furnished by Board of Black River Regulating District.

Capacity table, water year 1956-57 (elevation, in feet, and capacity, in millions of cubic feet)

1,655.0	343	1,670.0	2,431
1,660.0	821	1,675.0	3,556
1,665.0	1,518	1,679.4	4,742

Elevation, in feet, at 8 a.m., water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72.92	68.08	65.45	64.88	63.31	57.46	62.35	71.77	76.54	77.79	78.24	75.20
2	72.79	67.88	65.31	64.72	63.15	57.89	62.63	71.89	76.68	77.91	78.25	75.21
3	72.67	67.69	65.16	64.65	63.01	58.22	63.09	71.98	76.80	78.00	78.26	75.18
4	72.55	67.49	65.02	64.39	62.83	58.47	63.50	72.09	76.86	78.22	78.27	75.06
5	72.42	67.29	64.88	64.23	62.65	58.23	63.80	72.18	76.95	78.55	78.28	74.89
6	72.28	67.08	64.73	64.05	62.46	57.94	64.28	72.25	77.02	78.89	78.16	74.76
7	72.16	66.87	64.72	63.88	62.26	57.64	64.93	72.32	77.11	79.09	78.05	74.60
8	72.11	66.67	65.24	63.69	62.16	57.34	65.38	72.37	77.22	79.20	77.94	74.44
9	71.99	66.43	65.71	63.51	61.85	57.48	65.71	72.41	77.30	79.27	77.84	74.28
10	71.91	66.25	65.91	63.34	61.66	57.71	65.97	72.55	77.37	79.33	77.80	74.13
11	71.79	66.02	66.15	63.13	61.45	57.96	66.19	72.70	77.41	79.31	77.69	73.99
12	71.65	65.81	66.29	62.87	61.16	57.85	66.41	72.80	77.45	79.33	77.63	73.86
13	71.52	65.62	66.41	62.63	60.81	57.81	66.61	72.90	77.50	79.36	77.54	73.69
14	71.38	65.42	66.37	62.41	60.48	57.76	66.77	73.01	77.50	79.33	77.43	73.57
15	71.25	65.21	66.29	62.15	60.12	57.79	66.92	73.14	77.56	79.31	77.33	73.42
16	71.11	65.01	66.19	61.94	59.77	58.43	67.06	73.43	77.59	79.29	77.24	73.25
17	70.97	64.88	66.14	61.65	59.38	59.20	67.24	73.61	77.60	79.19	77.14	73.19
18	70.83	64.79	66.09	61.41	59.07	59.73	67.49	73.65	77.52	79.09	77.03	73.04
19	70.68	64.67	65.99	61.13	58.72	60.10	67.68	73.86	77.50	78.99	76.93	72.89
20	70.48	64.39	65.88	60.88	58.34	60.41	68.21	74.17	77.50	78.88	76.83	72.74
21	70.27	64.19	65.77	60.61	57.96	60.58	68.85	74.78	77.40	78.78	76.73	72.66
22	70.08	64.53	65.66	60.38	57.56	60.69	69.52	75.13	77.34	78.69	76.62	72.52
23	69.89	64.94	65.60	60.91	57.15	60.79	69.98	75.38	77.27	78.66	76.45	72.56
24	69.70	65.19	65.53	61.85	56.78	60.91	70.34	75.55	77.39	78.56	76.28	72.49
25	69.49	65.40	65.50	62.53	56.26	61.03	70.64	75.73	77.40	78.46	76.10	72.38
26	69.28	65.57	65.48	63.01	55.87	61.12	70.88	75.88	77.44	78.36	75.96	72.24
27	69.07	65.72	65.42	63.37	55.91	61.29	71.11	76.03	77.43	78.26	75.74	72.08
28	68.89	65.85	65.34	63.65	56.57	61.49	71.27	76.14	77.42	78.16	75.61	71.91
29	68.68	65.73	65.27	63.64	-	61.78	71.48	76.26	77.42	78.19	75.44	71.76
30	68.48	65.61	65.13	63.56		61.94	71.65	76.37	77.58	78.18	75.27	71.62
31	68.28		65.01	63.44		62.14		76.46		78.22	75.20	
(†)	2,068	1,600	1,505	1,264	523	1,112	2,796	3,941	4,266	4,407	3,606	2,746
(‡)	-374	-181	-35.5	-90.0	-306	+220	+650	+427	+125	+52.6	-299	-332

Calendar year 1956.................... ‡ +27.3
Water year 1956-57.................... ‡ -10.3

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† Contents, in millions of cubic feet, at 12 p.m. on last day of month; by interpolation.
‡ Change in contents in cubic feet per second.
Note.--Add 1,600 ft to obtain elevation above mean sea level.

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 1957.

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 June 1, 1924, staff gage at present site and datum. June 1, 1924, to Nov. 14, 1929, staff gage at site 1,000 ft downstream at same datum.

Average discharge.--49 years, 366 cfs (unadjusted).

Extremes.--Maximum daily discharge during year, 737 cfs Feb. 12; minimum daily, 11 cfs Feb. 28, Mar. 1, 9.
1908-57: 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.--WSP 714: Drainage area.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	492	607	570	563	624	11	13	15	17	22	29	16
2	491	607	568	558	621	12	13	15	17	24	29	153
3	488	602	565	558	618	12	13	15	17	27	29	521
4	488	598	563	554	613	372	13	15	17	29	270	519
5	487	596	563	551	612	622	13	15	17	35	391	*518
6	486	591	558	547	607	617	13	15	17	82	388	517
7	484	591	323	547	604	608	14	15	17	47	386	515
8	484	586	210	542	602	416	14	15	17	50	385	514
9	483	584	212	599	596	11	14	15	21	139	384	512
10	483	581	214	624	591	261	14	16	48	161	382	512
11	482	579	214	621	656	389	14	16	71	132	381	510
12	479	575	461	615	737	386	14	16	101	166	520	508
13	479	572	584	612	727	386	14	16	131	198	511	507
14	478	570	584	607	717	385	14	16	141	191	420	506
15	475	567	584	602	712	246	14	16	190	342	382	505
16	475	563	581	599	702	12	14	16	421	419	374	503
17	474	563	579	591	692	12	14	16	512	416	373	503
18	*587	559	579	586	682	12	14	16	453	412	373	501
19	638	558	579	581	675	12	14	16	431	409	373	500
20	636	358	579	575	665	121	14	16	416	407	372	499
21	636	258	575	570	655	205	15	16	352	404	372	498
22	631	260	574	565	643	206	15	16	329	*402	470	497
23	631	149	572	578	633	207	15	16	317	401	604	497
24	626	14	572	276	621	207	15	16	351	399	602	496
25	624	14	572	13	606	208	15	16	363	394	600	496
26	624	14	570	13	593	115	15	16	376	392	600	494
27	619	387	570	13	254	13	15	16	338	391	598	492
28	619	577	568	348	11	13	15	16	243	541	596	492
29	614	574	568	631	-	13	15	16	18	450	596	490
30	612	572	565	629	--------	13	15	16	20	28	451	488
31	612	--------	563	626	--------	13	--------	16	--------	28	16	--------
Total	16,917	14,226	15,939	15,894	17,069	6,116	424	487	5,779	7,538	12,257	14,279
Mean	546	474	514	513	610	197	14.1	15.7	193	243	395	476

Adjusted for change in contents in Stillwater Reservoir

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean	171	294	479	423	303	417	664	443	318	296	96.3	144
Cfsm	0.994	1.71	2.78	2.46	1.76	2.42	3.86	2.58	1.85	1.72	0.560	0.837
In.	1.15	1.90	3.21	2.83	1.84	2.80	4.31	2.97	2.06	1.98	0.65	0.94

	Observed			Adjusted		
Calendar year 1956:	Max 1,780	Min 9	Mean 331	Mean 358	Cfsm 2.08	In. 28.34
Water year 1956-57:	Max 737	Min 11	Mean 348	Mean 337	Cfsm 1.96	In. 26.64

* 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 1957.

Gage.--Water-stage recorder. Datum of gage is 806.20 ft above mean sea level, datum of 1929.

Average discharge.--27 years, 573 cfs.

Extremes.--Maximum discharge during year, 1,340 cfs Jan. 23 (gage height, 3.93 ft); minimum, 33 cfs May 5 (gage height, 0.95 ft); minimum daily, 58 cfs July 14.
1930-57: Maximum discharge, 4,310 cfs May 13, 1943 (gage height, 6.47 ft); minimum, 12 cfs July 24, 1955; minimum daily, 28 cfs July 8, 1956.

Remarks.--Records excellent. Flow almost completely regulated by Stillwater Reservoir (see p. 314). Between Stillwater Dam and this station, flow is further regulated by nine powerplant ponds. Diurnal fluctuation at low and medium flow.

Revisions.--WSP 759: Drainage area.

Rating tables, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 12				Mar. 13 to Sept. 30			
1.4	97	2.5	442	1.1	49	2.5	429
1.6	139	3.0	693	1.3	79	3.0	681
2.0	252	4.0	1,400	1.6	139	4.0	1,400
				2.0	247		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	536	649	342	673	941	937	384	308	266	124	321	86
2	637	691	126	679	871	346	339	335	125	242	421	75
3	732	697	512	696	687	126	346	296	311	448	304	477
4	608	546	748	731	747	340	424	276	372	178	126	572
5	692	417	655	850	671	649	444	77	*505	561	291	630
6	644	660	801	666	662	*748	653	230	640	489	336	623
7	190	733	1,100	533	688	682	487	287	373	425	328	613
8	447	657	1,060	*686	702	735	522	277	305	485	336	154
9	688	715	968	684	414	338	484	275	103	455	287	389
10	729	263	788	761	115	106	480	283	280	456	280	684
11	740	99	680	684	458	320	442	258	280	280	119	668
12	749	441	797	717	773	686	493	110	323	167	321	670
13	625	644	768	218	*820	719	371	279	387	85	428	724
14	216	686	943	541	909	638	110	347	349	58	481	517
15	452	680	579	763	851	715	*307	319	271	216	421	125
16	684	723	202	693	856	692	317	392	112	297	477	589
17	720	347	493	785	190	509	316	318	336	303	284	635
18	650	122	722	759	587	553	329	292	412	302	122	637
19	661	564	806	756	735	659	327	124	289	377	311	561
20	594	896	804	175	760	536	296	465	279	451	377	559
21	574	829	936	515	749	673	111	692	240	145	*307	572
22	519	552	957	928	767	608	316	353	251	404	437	176
23	691	892	814	1,210	534	329	320	317	117	*433	473	473
24	*758	832	703	985	181	125	420	329	260	551	455	668
25	742	209	810	968	573	353	503	342	274	605	116	*650
26	629	464	813	1,040	874	457	490	147	368	503	532	676
27	735	676	844	869	1,130	426	299	431	454	315	592	654
28	552	*747	943	724	971	413	103	499	285	182	597	625
29	512	683	936	802	-	344	229	318	280	356	602	439
30	746	670	765	743	--------	306	324	149	106	377	608	590
31	644	--------	741	698	--------	125	--------	276	--------	310	337	--------
Total	19,096	17,784	23,156	22,532	19,216	15,193	10,986	9,401	8,953	10,580	11,427	15,511
Mean	616	593	747	727	686	490	366	303	298	341	369	517
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956:	Max 1,830	Min 28	Mean 513	Cfsm 1.74	In. 23.75
Water year 1956-57:	Max 1,210	Min 58	Mean 504	Cfsm 1.71	In. 23.26

* Discharge measurement made on this day.

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, 3½ miles upstream from Philomel Creek.

Drainage area.--1,876 sq mi.

Records available.--July 1920 to September 1957.

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.--37 years, 3,910 cfs.

Extremes.--Maximum discharge during year, 11,500 cfs Jan. 23 (gage height, 6.00 ft); minimum, 66 cfs Sept. 8 (gage height, 0.04 ft); minimum daily, 554 cfs Aug. 19.

1920-57: 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 fragmentary or no 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.--WSP 759: Drainage area.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 7		Dec. 8 to Sept. 30	
1.6	1,180	0.9	538
2.0	1,680	1.4	996
3.0	3,350	2.0	1,750
4.0	5,550	3.0	3,510
5.0	8,250	4.0	5,600
		6.0	11,500

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,220	1,940	2,700	2,350	4,480	7,790	3,400	3,690	3,110	3,650	2,420	928
2	2,250	1,940	2,000	2,500	4,240	7,500	4,020	3,200	2,960	3,440	1,950	731
3	2,230	1,990	2,100	2,250	3,770	6,710	5,230	2,870	3,360	3,050	1,670	669
4	2,390	1,980	2,760	2,600	3,380	5,770	5,460	2,620	3,430	3,490	1,360	1,210
5	2,240	2,000	2,540	2,500	3,220	4,920	5,420	2,350	*3,200	4,780	1,130	1,440
6	2,340	1,910	2,820	2,700	2,810	*4,330	6,500	2,060	2,910	5,780	1,330	1,640
7	2,360	2,040	6,160	2,300	2,770	3,800	7,330	2,170	2,680	5,900	1,230	1,470
8	2,660	1,960	9,420	*2,250	2,710	3,600	7,670	2,020	2,470	5,830	1,160	1,380
9	3,770	1,920	8,700	2,450	2,560	3,370	7,560	1,840	2,490	5,220	1,160	1,010
10	3,890	1,800	8,050	2,400	2,240	2,770	6,920	1,840	2,080	4,300	1,130	1,260
11	3,550	1,280	6,890	2,350	2,180	*2,500	5,930	2,070	2,080	3,460	1,040	1,560
12	3,040	1,460	5,950	2,150	2,580	a2,900	5,130	2,490	1,850	2,680	898	1,590
13	2,710	1,630	5,400	2,000	*2,470	a4,300	4,620	3,070	1,720	2,100	1,090	1,550
14	2,220	2,040	4,800	1,700	2,680	*a5,800	4,100	3,550	1,700	1,860	1,210	1,570
15	1,820	1,970	4,500	1,900	2,590	7,760	*3,660	3,480	1,510	1,590	1,210	1,360
16	1,970	2,070	4,400	2,200	2,480	10,200	3,690	3,810	1,480	1,600	1,310	1,110
17	2,020	2,200	5,270	2,200	2,180	11,000	3,890	4,290	1,670	1,450	1,380	f1,600
18	2,020	2,290	5,290	2,150	f1,800	10,400	4,850	4,220	1,640	*1,390	722	f1,700
19	1,990	2,300	4,820	2,100	2,240	9,040	5,220	3,540	1,590	1,280	554	f1,750
20	1,980	2,700	4,150	2,000	2,230	7,560	5,530	3,530	1,820	1,210	818	1,670
21	1,810	2,680	4,200	1,580	2,330	6,170	5,970	7,030	2,690	1,280	*906	1,790
22	1,700	4,530	4,220	2,380	2,140	5,420	6,500	7,560	2,440	996	912	2,020
23	*1,770	6,180	5,560	8,160	2,120	4,910	7,030	7,930	1,890	1,160	1,100	2,130
24	1,930	6,470	6,300	9,100	1,850	4,600	7,250	7,470	1,410	1,280	976	*3,130
25	2,060	5,700	6,610	9,900	1,700	4,410	6,980	6,550	1,690	1,390	934	3,670
26	2,060	4,350	6,170	10,900	3,070	4,310	6,200	5,370	2,200	1,360	848	2,970
27	1,860	*4,040	5,480	10,200	7,750	4,140	5,530	4,590	3,310	1,250	982	2,550
28	1,960	3,860	4,990	8,550	7,870	4,050	4,780	4,850	3,100	990	1,120	2,110
29	1,740	3,630	4,670	7,140	-	3,950	4,210	4,750	2,630	1,330	1,190	1,720
30	2,000	3,190	3,400	6,140	--------	3,850	3,990	4,180	3,010	4,430	1,180	1,600
31	2,050	--------	2,700	5,200	--------	3,540	--------	3,540	--------	3,650	1,110	--------
Total	70,610	84,050	153,020	124,300	84,440	171,370	164,570	122,530	70,120	83,176	36,030	50,888
Mean	2,278	2,802	4,936	4,010	3,016	5,528	5,486	3,953	2,337	2,683	1,162	1,696
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 18,100 Min 845 Mean 3,624 Cfsm 1.93 In. 26.28
Water year 1956-57: Max 11,000 Min 554 Mean 3,329 Cfsm 1.77 In. 24.08

Peak discharge (base, 17,000 cfs).--No peak above base.
* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of powerplant records at Black River.
f Fragmentary gage-height record; discharge computed from partly estimated gage heights and on basis of powerplant records at Black River.
Note.--Stage-discharge relation affected by ice Dec. 1-3, 13-15, Dec. 30 to Jan. 20.

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 1957.

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.--34 years, 291 cfs (unadjusted).

Extremes.--Maximum discharge during year, 962 cfs Sept. 18 (gage height, 6.39 ft); minimum daily, 33 cfs Apr. 17-19.

1923-57: 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 period of 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 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 22		Apr. 23 to Sept. 30	
3.3	31	4.2	128
3.5	45	4.5	191
4.0	99	5.0	325
4.5	185	6.0	740
5.0	316	7.0	1,390
6.0	740		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	192	181	177	183	363	45	64	316	232	189	191	316
2	192	181	177	183	363	45	64	316	232	189	191	340
3	189	181	177	183	360	45	64	316	232	189	191	457
4	189	181	*177	183	*388	45	63	293	232	189	191	603
5	189	181	177	183	406	189	64	189	232	290	191	669
6	189	181	177	183	406	258	64	160	232	360	198	664
7	189	179	179	183	402	207	65	160	235	360	228	655
8	*189	179	179	183	402	207	66	160	235	360	228	650
9	189	179	181	183	399	207	66	160	235	404	228	609
10	189	177	181	183	395	209	66	160	235	514	228	622
11	189	177	181	185	395	209	66	160	*235	509	228	684
12	189	177	183	185	391	270	66	160	235	505	225	586
13	189	*174	183	189	391	310	66	160	235	473	282	731
14	189	174	183	196	388	310	70	160	235	423	310	794
15	189	174	183	198	384	250	*76	194	218	423	310	772
16	187	174	183	200	384	214	42	262	205	303	310	794
17	187	174	183	200	380	214	33	262	205	*221	307	768
18	187	172	183	200	380	217	33	262	201	136	307	845
19	187	172	183	203	377	154	33	262	186	136	313	809
20	187	172	183	203	374	65	34	*262	186	134	331	672
21	187	172	183	205	370	66	76	358	186	134	331	738
22	187	174	183	209	366	65	279	450	186	134	328	794
23	185	174	183	169	363	64	391	518	186	134	328	790
24	185	177	183	59	363	64	391	588	186	134	328	578
25	185	177	183	59	360	64	391	588	186	227	325	635
26	185	177	183	60	360	64	351	476	186	273	325	722
27	185	177	183	61	382	64	313	409	189	168	*322	729
28	183	177	183	199	44	64	313	409	189	168	322	777
29	183	177	183	366	-	64	316	354	189	168	319	794
30	183	177	183	366	--------	64	316	325	189	175	319	612
31	183	--------	183	366	--------	64	--------	267	--------	191	319	--------
Total	5,807	5,299	5,623	5,908	10,336	4,377	4,302	9,116	6,345	8,213	8,554	20,209
Mean	187	177	181	191	369	141	143	294	212	265	276	674
						Adjusted for change in contents in Cranberry Lake						
Mean	92.9	152	250	240	234	288	491	336	234	191	64.3	193
Cfsm	0.645	1.06	1.74	1.67	1.62	2.00	3.41	2.33	1.62	1.33	0.447	1.34
In.	0.74	1.18	2.00	1.92	1.69	2.31	3.80	2.69	1.81	1.53	0.51	1.50

	Observed						Adjusted					
Calendar year 1956:	**Max**	879	**Min**	28	**Mean**	243	**Mean**	249	**Cfsm**	1.73	**In.**	23.50
Water year 1956-57:	**Max**	845	**Min**	33	**Mean**	258	**Mean**	230	**Cfsm**	1.60	**In.**	21.68

* Discharge measurement made on this day.

Note.--No gage-height record June 19 to July 4; discharge estimated on basis of recorded range in stage.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 1,016.52 ft above mean sea level, datum of 1929.

Average discharge.--33 years, 524 cfs.

Extremes.--Maximum discharge during year, 2,440 cfs Jan. 23 (gage height, 5.72 ft); minimum, 3.4 cfs July 21, 22; minimum gage height, 0.66 ft Nov. 11, 12; minimum daily discharge, 3.6 cfs July 21.

1924-57: Maximum discharge, 4,090 cfs Apr. 12, 1947; 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. 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.--WSP 759: Drainage area.

Rating tables, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 23

0.6	3.6	2.0	126
.7	5.8	2.5	240
.8	8.7	3.0	410
1.0	17	3.5	638
1.2	29	4.0	934
1.5	55	5.0	1,710

Jan. 24 to Sept. 30

0.6	2.0	1.2	25.9
.7	3.8	1.5	52
.8	6.4	2.0	124
1.0	14.1	2.5	240

Note.--Same as preceding table above 2.5 ft.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	469	446	151	237	510	804	300	544	612	633	354	4.6
2	369	230	16	416	711	266	527	500	593	628	240	137
3	506	8.1	484	441	563	216	731	471	726	642	43	584
4	395	5.8	*395	340	526	346	455	275	635	324	94	650
5	278	336	440	130	*570	430	577	161	615	742	364	430
6	7.8	315	367	118	576	490	497	320	696	623	368	554
7	78	333	1,090	484	606	453	496	253	689	379	316	562
8	412	509	577	413	341	445	686	221	349	*472	368	338
9	*372	453	401	380	290	290	649	235	270	568	364	659
10	492	6.7	440	368	226	262	350	276	424	589	4.3	592
11	434	5.4	500	491	440	471	502	258	457	830	227	642
12	275	399	548	67	607	554	416	75	398	692	495	619
13	45	414	614	67	542	756	546	401	481	666	525	665
14	53	130	495	592	558	875	464	425	434	514	560	668
15	397	309	163	550	600	1,020	399	735	186	538	681	564
16	330	273	131	501	262	1,210	*276	810	188	572	524	711
17	305	6.4	552	431	235	733	335	534	326	*369	319	1,150
18	418	5.6	577	340	622	611	270	574	229	397	80	978
19	264	307	416	7.8	546	611	259	323	237	333	556	941
20	111	395	384	140	540	582	232	718	297	21	522	881
21	29	377	483	453	602	583	219	*912	346	*3.6	540	764
22	396	497	186	335	513	552	479	877	39	422	523	1,040
23	359	283	262	1,210	267	451	642	675	123	270	510	1,210
24	469	244	479	705	226	592	620	818	464	267	570	1,000
25	324	230	255	771	488	506	666	743	326	356	142	968
26	202	295	503	477	543	394	670	612	432	203	492	969
27	6.4	398	568	335	1,020	297	629	862	435	82	511	937
28	78	477	585	496	836	316	538	586	509	64	442	732
29	414	460	354	684	-	296	684	703	47	355	528	857
30	421	380	192	646		236	646	556	325	443	583	777
31	305		434	738		169		593		412	319	
Total	9,014.2	8,528.0	13,042	13,363.8	14,366	15,817	14,760	16,046	11,888	13,409.6	12,164.3	21,583.6
Mean	291	284	421	431	513	510	492	518	396	433	392	719
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956:	Max 1,890	Min 5.4	Mean	454	Cfsm	1.73	In.	23.52
Water year 1956-57:	Max 1,210	Min 3.6	Mean	449	Cfsm	1.71	In.	23.19

* Discharge measurement made on this day.

West Branch Oswegatchie River near Harrisville, N. Y.

Location.--Lat 44°11'10", long 75°19'55", on right bank just downstream from 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 1957.

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.--41 years, 511 cfs.

Extremes.--Maximum discharge during year, 2,560 cfs Jan. 25 (gage height, 5.58 ft); minimum, 53 cfs Sept. 2 (gage height, 1.14 ft).

1916-57: 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, which are fair. Diurnal fluctuation, principally during low flow caused by pulpmill at Harrisville.

Revisions (water years).--WSP 759: Drainage area. WSP 784: 1934.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 9				Dec. 10 to Sept. 30			
1.4	77	3.5	779	1.1	49	3.0	490
1.9	151	4.0	1,170	1.5	93	3.5	779
2.5	295	5.0	2,020	2.0	174	4.0	1,170
3.0	488			2.5	301	6.0	2,980

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	100	103	250	310	481	1,450	500	389	350	560	223	54
2	86	106	252	300	429	1,200	571	355	485	615	175	54
3	96	109	240	290	386	960	793	323	822	519	143	56
4	103	106	232	280	360	*740	944	304	866	468	119	65
5	100	103	*216	265	*333	540	969	289	669	673	108	74
6	100	108	265	245	301	450	1,110	272	495	994	100	69
7	99	108	621	240	283	380	1,390	250	588	1,140	96	66
8	132	97	1,350	*233	271	350	1,510	236	793	961	86	64
9	*226	93	1,720	226	263	350	1,320	218	766	*681	81	61
10	216	88	1,450	218	280	350	1,070	216	592	463	92	58
11	193	87	1,220	200	280	340	829	256	458	347	150	60
12	162	88	953	195	270	371	681	408	382	274	172	62
13	151	92	720	190	260	564	604	416	330	223	150	64
14	139	*102	640	185	254	815	539	424	280	183	136	64
15	126	104	519	180	246	1,150	486	524	246	155	125	64
16	118	118	514	175	236	1,680	*441	725	218	142	112	69
17	112	144	592	170	226	1,980	445	829	195	132	104	80
18	106	174	620	165	218	1,710	534	752	163	*120	99	83
19	95	183	580	163	213	1,350	633	598	242	110	93	80
20	92	170	539	163	206	1,120	700	615	353	103	85	83
21	95	172	490	161	195	897	829	*928	343	94	79	97
22	90	363	445	253	190	759	1,090	1,150	295	101	79	141
23	85	633	533	1,110	190	706	1,230	1,110	249	110	73	303
24	82	580	739	2,080	185	681	1,050	920	226	118	66	472
25	81	580	882	2,410	195	638	851	719	226	112	63	433
26	79	538	880	1,970	300	604	732	576	240	103	62	347
27	87	470	860	1,590	848	566	644	544	263	97	*61	274
28	97	392	693	1,290	1,400	555	560	510	283	100	59	226
29	104	348	560	977	-	560	481	468	292	177	54	184
30	102	280	350	725	-------	555	429	433	395	304	54	155
31	102	-------	320	566	-------	519	-------	382	-------	271	54	-------
Total	3,556	6,639	20,245	17,525	9,299	24,890	23,965	16,139	12,105	10,450	3,153	3,962
Mean	115	221	653	565	332	803	799	521	404	337	102	132
Cfsm	0.446	0.857	2.53	2.19	1.29	3.11	3.10	2.02	1.57	1.31	0.395	0.512
In.	0.51	0.96	2.92	2.53	1.34	3.59	3.45	2.33	1.74	1.51	0.45	0.57

Calendar year 1956:	Max 3,860	Min 62	Mean 456	Cfsm 1.77	In. 24.09
Water year 1956-57:	Max 2,410	Min 54	Mean 416	Cfsm 1.61	In. 21.90

Peak discharge (base, 3,300 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 24, 25, 30, Dec. 1, 3, 10, 11, 13, 14, 18, 19, 26, 27, Dec. 29 to Jan. 4, Jan. 6, 11-18, Feb. 11, 12, 21-24, Feb. 28 to Mar. 7, Mar. 11, 19.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 288.85 ft above mean sea level, datum of 1929. Prior to Sept. 16, 1916, staff gage at same site and datum.

Average discharge.--41 years, 1,687 cfs.

Extremes.--Maximum discharge during year, 4,710 cfs Mar. 17 (gage height, 4.59 ft); minimum, 171 cfs Sept. 4 (gage height, 0.72 ft).

1916-57: 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.--WSP 759: Drainage area.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 28				Mar. 1 to Sept. 30			
0.8	234	2.5	1,650	0.7	163	2.0	1,090
1.0	329	4.0	3,740	1.0	298	3.0	2,240
1.5	654	5.0	5,450	1.5	632	5.0	5,450

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	327	470	892	860	1,800	3,900	1,230	1,210	1,340	649	691	554
2	279	483	725	900	1,700	3,500	1,330	995	1,290	843	716	474
3	395	530	500	840	1,570	3,000	1,840	1,120	1,550	1,270	585	278
4	544	474	540	760	1,470	2,230	2,150	1,070	1,970	1,340	525	187
5	586	299	*609	860	1,410	*1,670	2,320	852	2,060	1,300	318	412
6	551	284	710	820	*1,340	1,370	3,120	743	1,850	1,210	234	657
7	502	356	930	700	1,260	1,310	3,850	674	1,940	1,540	336	666
8	348	384	1,410	660	1,210	1,320	3,720	649	2,410	1,760	427	473
9	314	396	2,400	*670	1,120	1,300	3,430	691	2,280	*1,560	474	528
10	*444	506	2,580	640	920	1,060	3,180	632	1,850	1,470	461	585
11	544	624	2,270	660	980	1,020	2,730	616	1,550	1,300	503	666
12	702	395	2,100	700	900	1,030	2,210	640	1,380	1,160	318	674
13	670	270	1,990	700	865	2,150	2,020	760	1,230	1,060	229	640
14	550	*319	1,620	580	1,100	3,690	1,910	872	1,080	1,010	549	682
15	341	402	1,240	400	1,150	4,270	1,750	1,110	1,020	886	760	682
16	304	476	1,550	540	1,130	4,610	*1,550	1,640	900	900	769	649
17	408	420	1,230	880	1,010	4,640	1,330	2,040	716	787	743	585
18	450	420	1,180	800	786	4,610	1,240	2,240	518	674	699	843
19	464	319	1,300	720	710	4,250	1,320	1,980	601	585	474	1,100
20	496	340	1,420	680	920	3,690	1,340	1,860	601	510	278	1,020
21	444	483	1,400	530	980	3,300	1,340	*2,230	708	496	449	1,040
22	324	544	1,230	592	960	3,060	1,320	2,920	752	*336	649	1,060
23	274	609	1,120	2,660	960	2,780	1,490	3,080	787	*226	609	1,030
24	362	1,040	1,020	4,000	840	2,340	1,930	2,800	547	365	609	1,300
25	408	1,020	1,420	4,200	760	2,110	1,980	2,450	481	402	577	1,530
26	483	970	1,850	4,100	1,140	2,020	1,860	2,200	640	384	501	1,480
27	509	970	1,610	3,900	2,820	1,870	1,740	1,940	743	342	328	1,370
28	414	910	1,690	3,270	4,100	1,630	1,630	1,820	743	331	547	1,290
29	294	920	1,750	2,610	-	1,500	1,510	1,800	743	283	585	1,190
30	248	940	1,400	2,300	-------	1,400	1,340	1,560	805	278	562	1,010
31	373	-------	960	2,050	-------	1,310	-------	1,490	-------	519	525	-------
Total	13,352	16,573	42,646	44,582	35,911	77,940	59,710	46,684	35,085	25,776	16,030	24,655
Mean	431	552	1,376	1,438	1,283	2,514	1,990	1,506	1,170	831	517	822
Cfsm	0.443	0.567	1.41	1.48	1.32	2.58	2.05	1.55	1.20	0.854	0.531	0.845
In.	0.51	0.63	1.63	1.70	1.37	2.98	2.28	1.78	1.34	0.99	0.61	0.94

Calendar year 1956:	Max	12,900	Min	214	Mean	1,456	Cfsm	1.50	In.	20.36
Water year 1956-57:	Max	4,640	Min	187	Mean	1,203	Cfsm	1.24	In.	16.76

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 3, 4, 18, 19, Dec. 29 to Jan. 8, Jan. 10-20, 24-27, Feb. 1, 2, 10-12, 20-24, 28, Mar. 1, 10, 11.

St. Lawrence River at Ogdensburg, N. Y.

Location.--Lat 44°42'05", long 75°29'40", at Ogdensburg, N. Y.

Drainage area.--295,200 sq mi, including that of Oswegatchie River.

Records available.--June 1860 to September 1957. Monthly discharge only for some periods, published in WSP 1307.

Gage.--Basic gage located at lock 24 and supplementary gages located at lock 24 and below Morrisburg, Ont. Prior to August 1956, basic gage located at lock 25 at Iroquois, Ont., and supplementary gages located at Prescott, Ont., at lock 27 above Cardinal, Ont., at lock 24 between Iroquois and Morrisburg, Ont., and at lock 23 at Morrisburg, Ont. These are gages of the Canadian Hydrographic Service except the supplementary gages in use after August 1956, which are gages of the Hydro-Electric Power Commission of Ontario. The discharge in this reach of river is considered to be the same as the discharge at Ogdensburg, N. Y., which is directly opposite Prescott, Ont.

Average discharge.--97 years (June 1860 to September 1957), 241,000 cfs.

Extremes.--Maximum daily discharge during year, 267,000 cfs Oct. 8, June 29; minimum daily, 220,000 cfs Jan. 25.

1917-57: Maximum daily discharge, 315,000 cfs May 13, 1952; minimum daily, 139,000 cfs Feb. 7, 1936.

1860-1957: Maximum monthly discharge, 314,000 cfs May 1870; minimum monthly, 154,000 cfs February 1936.

Remarks.--Records do not include water diverted from Lake Michigan by Illinois and Michigan Canal during period of its operation prior to 1910 and by Chicago Sanitary and Ship Canal, operation of which began in 1900. They include water diverted into Lake Superior from Hudson Bay drainage by the Long Lake project, operation of which began in July 1939, and by the Ogoki project, operation of which began in July 1943. The diversions into Lake Superior amounted to less than 1 percent of the average St. Lawrence River discharge before July 1943, and since that time have averaged about 5,000 cfs.

Cooperation.--These are the official records of the U. S. Lake Survey, Corps of Engineers, U. S. Army, which have been coordinated with and concurred in by the counterpart Canadian agencies.

Revisions (water years).--WSP 1437: 1870, 1875, 1881, 1883-84, 1890.

Discharge, in thousands of cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	255	237	240	236	226	231	236	241	250	251	244	239
2	255	235	233	238	230	235	233	238	249	248	245	238
3	255	236	233	236	230	235	236	238	247	252	249	244
4	255	240	238	242	231	234	228	241	250	252	245	245
5	250	239	228	232	229	232	230	239	245	259	241	248
6	253	238	238	232	229	229	249	244	244	259	244	240
7	261	242	237	234	231	229	251	248	248	254	244	239
8	267	246	236	234	229	229	236	247	248	250	246	236
9	256	244	233	236	229	232	239	247	247	252	244	234
10	252	238	246	224	232	235	246	240	248	251	242	232
11	249	244	248	234	224	230	244	242	247	252	243	237
12	251	244	246	237	227	236	248	245	248	251	240	232
13	251	237	233	228	229	237	247	246	246	249	240	233
14	250	239	227	228	227	234	246	242	248	250	244	234
15	249	236	230	222	225	236	243	243	248	248	242	231
16	247	246	242	224	228	245	243	242	247	249	243	236
17	247	242	239	229	233	241	242	244	246	248	244	233
18	240	233	235	231	232	238	240	244	246	245	245	230
19	240	236	244	231	231	231	241	240	247	244	244	231
20	245	239	239	232	231	234	244	236	245	245	242	231
21	244	247	239	226	228	238	244	245	245	244	236	229
22	242	248	221	229	228	238	240	247	243	244	238	231
23	242	240	228	229	229	238	243	250	244	241	240	231
24	234	238	236	229	227	236	240	254	244	241	241	234
25	233	234	236	220	229	234	243	252	243	244	239	235
26	240	231	233	231	230	232	243	248	242	244	239	230
27	244	238	239	226	227	231	241	253	242	244	238	228
28	240	238	239	222	226	235	242	253	242	244	235	229
29	239	246	235	227	-	236	244	251	267	245	234	229
30	241	238	234	230	--------	232	242	248	262	244	238	228
31	239	--------	232	229	--------	235	--------	248	--------	244	238	--------
Total	7,666	7,189	7,317	7,138	6,407	7,268	7,244	7,596	7,418	7,688	7,487	7,027
Mean	247	240	236	230	229	234	241	245	247	248	242	234
Cfsm	0.837	0.813	0.799	0.779	0.776	0.793	0.816	0.830	0.837	0.840	0.820	0.793
In.	0.97	0.91	0.92	0.90	0.81	0.92	0.91	0.96	0.93	0.97	0.94	0.89

Calendar year 1956: Max 288 Min 221 Mean 254 Cfsm 0.860 In. 11.73
Water year 1956-57: Max 267 Min 220 Mean 240 Cfsm 0.813 In. 11.03

Note.--All figures of discharge are expressed in thousands of cubic feet per second.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 350.61 ft above mean sea level, datum of 1929.

Average discharge.--33 years, 598 cfs.

Extremes.--Maximum discharge during year, 2,390 cfs Mar. 16 (gage height, 5.91 ft); maximum gage height, 6.84 ft Feb. 28 (backwater from ice); minimum daily discharge, 62 cfs Aug. 25, 27, Sept. 2.

1924-57: 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, which are fair. Diurnal fluctuation at low flow caused by powerplant above station.

Revisions.--WSP 759: Drainage area.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 16				Mar. 17 to Sept. 30			
1.3	112	3.0	740	1.1	62	3.0	730
1.5	162	4.0	1,240	1.5	146	6.0	2,450
2.0	320			2.0	300		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	136	154	210	200	400	1,400	553	518	558	654	265	64
2	139	164	200	190	380	1,100	765	461	911	584	194	62
3	163	166	170	180	370	840	1,180	411	1,290	411	167	80
4	195	160	190	195	350	700	1,070	395	995	330	146	100
5	187	161	*170	190	*320	*560	910	383	668	399	127	107
6	169	149	250	175	310	470	1,320	352	516	540	120	94
7	184	149	580	170	300	410	1,620	322	1,090	407	104	90
8	264	144	1,230	*160	290	370	1,350	293	1,390	300	102	82
9	330	144	1,140	155	280	390	1,050	272	1,050	*245	92	78
10	*284	141	800	150	330	370	870	290	692	204	94	78
11	230	146	623	145	290	300	735	551	509	186	204	78
12	202	141	601	140	250	350	677	658	415	189	194	78
13	185	157	540	135	230	640	654	558	379	175	207	96
14	173	177	500	135	210	1,300	598	562	348	162	184	84
15	165	*187	480	130	200	1,800	558	799	311	149	149	78
16	157	198	490	130	190	2,300	522	1,180	290	139	127	76
17	149	209	549	130	185	2,100	*571	1,140	255	132	113	103
18	139	230	520	135	175	1,490	765	855	221	122	102	129
19	137	211	480	140	170	1,090	835	649	286	*113	92	111
20	137	187	420	150	165	920	835	822	391	107	80	100
21	134	197	417	160	160	820	910	1,510	341	100	80	140
22	134	395	390	330	160	725	985	*1,460	258	111	75	330
23	134	620	400	1,400	180	760	925	1,090	210	158	73	561
24	141	380	499	980	170	775	785	890	213	175	71	654
25	139	340	580	760	190	701	711	725	258	149	62	487
26	144	330	490	660	350	663	716	621	296	124	66	337
27	146	310	500	620	1,300	654	673	790	348	118	62	245
28	159	280	466	540	1,600	677	598	830	282	104	*66	196
29	164	260	400	500	-	701	548	716	255	238	66	162
30	156	235	245	450	--------	658	526	576	426	440	71	149
31	154	--------	215	430	--------	584	--------	496	--------	352	66	--------
Total	5,330	6,722	14,745	9,965	9,505	26,618	24,815	21,175	15,452	7,617	3,621	5,029
Mean	172	224	476	321	339	859	827	683	515	246	117	168
Cfsm	0.513	0.669	1.42	0.958	1.01	2.56	2.47	2.04	1.54	0.734	0.349	0.501
In.	0.59	0.75	1.64	1.11	1.06	2.95	2.75	2.35	1.72	0.85	0.40	0.56

Calendar year 1956:	Max	5,500	Min	91	Mean	532	Cfsm	1.59	In.	21.62
Water year 1956-57:	Max	2,300	Min	62	Mean	413	Cfsm	1.23	In.	16.73

Peak discharge (base, 3,600 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23 to Dec. 7, Dec. 9, 10, 13-16, 18-20, 22, 23, 25-27, Dec. 29 to Mar. 16 (no gage-height record Jan. 14-16, 26-30).

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 1957.

Gage.--Water-stage recorder. Datum of gage is 1,502.12 ft above mean sea level, datum of 1929. Prior to Oct. 22, 1912, staff or chain gage at same site (datum of chain gage lowered 2 ft Jan. 1, 1911, to present datum).

Average discharge.--49 years, 1,280 cfs.

Extremes.--Maximum discharge during year, 2,350 cfs Apr. 27 (gage height, 7.44 ft); minimum, 25 cfs Sept. 26, 27 (gage height, 1.32 ft); minimum daily, 26 cfs Sept. 25-27.

1908-57: 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. Seasonal distribution of flow appreciably modified by natural storage in lakes and ponds above station. Extensive diurnal fluctuation caused by powerplant at Piercefield.

Revisions (water years).--WSP 604: 1924. WSP 759: Drainage area. WSP 1387: 1914(M).

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

1.3	24	4.0	457
1.5	35	5.0	812
2.0	73	6.0	1,300
2.5	128	7.0	1,970
3.0	208	8.0	2,850

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	458	423	673	812	1,460	1,010	1,070	2,200	1,800	1,160	584	136
2	473	277	710	804	1,460	1,120	907	2,110	1,740	1,160	553	30
3	482	296	*776	776	1,410	1,170	867	2,070	1,740	966	553	100
4	523	359	872	725	1,380	*1,160	772	2,030	1,800	1,360	570	96
5	481	289	957	710	1,410	1,240	669	1,940	1,830	1,460	587	112
6	540	213	1,030	718	1,450	1,470	680	1,760	1,760	1,480	553	162
7	591	223	1,120	*706	1,330	1,380	780	1,550	1,800	1,460	550	165
8	*517	257	1,270	691	1,180	1,270	995	1,390	1,800	*1,430	543	344
9	556	244	1,420	688	1,040	1,180	1,200	1,280	1,830	1,360	528	287
10	556	254	1,470	688	952	1,170	1,350	1,150	1,740	1,240	553	532
11	536	430	1,520	684	934	1,140	1,340	1,200	1,700	1,170	543	494
12	556	248	1,560	676	912	1,120	1,370	1,210	1,610	1,140	543	573
13	535	*285	1,650	665	876	1,100	1,380	1,200	1,540	1,080	553	508
14	546	313	1,680	654	877	1,100	1,360	1,200	1,440	1,050	626	492
15	529	335	1,670	654	916	1,150	*1,370	1,260	1,290	*1,000	609	450
16	528	391	1,610	590	912	1,260	1,370	1,290	1,250	943	563	454
17	524	422	1,600	584	885	1,330	1,370	1,350	1,210	885	567	439
18	507	486	1,580	584	841	1,370	1,360	1,370	1,180	820	563	439
19	486	410	1,530	584	812	1,480	1,370	1,390	1,170	749	563	408
20	488	468	1,520	538	780	1,490	1,470	*1,560	1,060	688	424	446
21	498	550	1,510	549	745	1,440	1,590	1,780	957	604	331	598
22	478	563	1,480	586	725	1,420	1,860	1,970	907	577	322	615
23	503	604	1,460	796	703	1,380	2,060	2,060	872	594	274	348
24	475	688	1,370	938	691	1,350	2,170	2,060	876	577	321	62
25	508	662	1,260	1,040	684	1,320	2,290	2,120	902	573	257	26
26	510	673	1,230	1,120	706	1,300	2,300	2,170	912	573	262	26
27	520	733	1,160	1,180	841	1,270	2,310	2,190	920	570	*188	26
28	511	752	1,080	1,230	925	1,250	2,320	2,090	990	567	215	34
29	478	710	1,020	1,310	-	1,240	2,280	2,000	1,120	573	88	49
30	459	699	1,000	1,370	-------	1,210	2,230	1,950	1,180	590	102	56
31	499	-------	946	1,400	-------	1,200	-------	1,900	-------	601	48	-------
Total	15,851	13,257	39,734	25,050	27,837	39,090	44,460	52,800	40,926	29,000	13,536	8,507
Mean	511	442	1,282	808	994	1,261	1,482	1,703	1,364	935	437	284
Cfsm	0.708	0.612	1.78	1.12	1.38	1.75	2.05	2.36	1.89	1.30	0.605	0.393
In.	0.82	0.68	2.05	1.29	1.43	2.01	2.29	2.72	2.11	1.49	0.70	0.44

Calendar year 1956: Max 5,840 Min 139 Mean 1,120 Cfsm 1.55 In. 21.10
Water year 1956-57: Max 2,320 Min 26 Mean 959 Cfsm 1.33 In. 18.03

* Discharge measurement made on this day.

Raquette River at South Colton, N. Y.

Location.--Lat 44°30'40", long 74°53'00", on left bank 300 ft upstream from highway bridge at South Colton, St. Lawrence County, 500 ft downstream from South Colton powerplant, and three-quarters of a mile upstream from Cold Brook.

Drainage area.--939 sq mi.

Records available.--January 1953 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 882.05 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 3,610 cfs June 5, Aug. 22 (gage height, 6.26 ft); minimum, 1.5 cfs Aug. 25 (gage height, 1.50 ft); minimum daily, 7.8 cfs Sept. 8, 15.
1953-57: Maximum discharge, 8,330 cfs Apr. 22, 1954 (gage height, 9.07 ft); minimum, that of Aug. 25, 1957; minimum daily, 4.6 cfs June 2, 1954.

Remarks.--Records good except those for period of fragmentary gage-height record, which are fair. Flow regulated by Carry Falls Reservoir (usable capacity, 5,011,000,000 cu ft) since 1953; considerable natural storage in large lakes above Piercefield.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

1.7	7.2	2.5	180
1.8	15	3.0	409
1.9	26	4.0	1,080
2.0	42	5.0	2,050
2.2	84	7.0	4,700

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,740	1,190	405	1,490	1,640	1,660	1,740	1,420	3,160	1,150	1,310	211
2	1,310	1,200	156	1,550	195	84	1,750	f1,950	3,560	2,220	1,370	216
3	839	170	1,360	1,060	158	48	1,370	f1,950	3,560	1,440	100	1,270
4	1,450	242	1,230	1,870	1,960	2,200	1,420	339	3,000	1,610	254	1,710
5	1,310	734	1,520	683	1,910	2,220	1,260	288	2,320	1,490	1,280	1,120
6	1,170	447	824	525	*2,150	*2,200	421	1,100	1,770	1,600	1,520	1,390
7	136	1,460	*1,060	1,070	1,760	1,680	370	1,680	1,370	1,820	1,200	9.0
8	1,300	1,070	564	1,790	1,850	1,810	1,100	1,310	944	1,600	1,360	7.8
9	1,530	1,020	554	*1,670	817	615	1,340	1,310	1,020	1,820	1,280	1,300
10	*1,320	215	1,300	1,760	284	344	1,390	1,600	1,860	*1,320	860	1,460
11	1,240	312	1,600	1,380	2,140	2,340	1,270	265	1,730	1,580	514	965
12	967	654	1,710	422	1,610	2,190	1,370	271	1,590	1,160	827	1,730
13	1,130	632	1,340	390	2,050	1,450	526	806	1,520	1,330	857	1,250
14	316	296	1,840	1,510	1,560	1,420	437	1,670	1,460	870	700	9.8
15	1,600	384	636	1,660	1,780	1,550	1,690	1,370	1,560	1,440	882	7.8
16	1,180	356	282	954	440	575	1,690	1,470	628	1,740	1,080	1,750
17	*1,400	358	1,410	1,280	237	330	*1,530	1,540	1,700	1,510	308	888
18	1,310	248	2,060	1,580	1,850	2,160	1,460	896	1,750	1,780	247	1,190
19	1,340	346	1,660	421	1,710	1,670	1,040	875	1,580	1,580	1,310	1,360
20	924	405	1,990	316	2,020	1,990	200	1,830	1,540	1,520	1,650	1,400
21	526	635	1,890	882	2,220	1,530	204	2,270	1,650	416	1,470	13
22	1,830	158	192	1,280	1,740	1,700	1,400	*3,070	862	1,900	1,450	13
23	1,670	785	219	1,090	246	262	1,770	2,930	446	1,690	1,210	716
24	977	447	2,060	988	254	628	1,840	2,980	1,220	*1,520	94	1,390
25	1,620	298	828	925	2,100	1,740	1,660	2,270	1,540	1,810	15	1,400
26	1,420	1,140	2,150	280	2,140	1,760	1,380	2,100	1,430	1,510	1,880	1,160
27	614	912	2,310	84	1,600	1,760	402	2,250	1,350	1,480	1,410	1,600
28	376	744	2,140	782	2,060	1,980	278	2,920	1,410	344	1,840	97
29	2,080	822	1,380	1,230	-	1,770	1,440	3,350	165	1,180	1,260	9.8
30	1,580	1,100	1,490	1,260	------	778	1,430	3,120	194	1,160	1,510	998
31	1,140	------	1,340	1,800	------	466	------	2,950	------	1,520	218	------
Total	37,345	18,780	39,500	33,982	40,481	42,910	35,178	54,150	47,889	45,110	31,266	26,641.2
Mean	1,205	626	1,274	1,096	1,446	1,384	1,173	1,747	1,596	1,455	1,009	888
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-
(†)	-538	+15.0	+250	-268	-202	+363	+781	+449	+85.3	-368	-516	-367

Calendar year 1956: Max 5,120 Min 6.8 Mean 1,428 Cfsm 1.52 In. 20.69
Water year 1956-57: Max 3,560 Min 7.8 Mean 1,242 Cfsm 1.32 In. 17.95

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* Discharge measurement made on this day.

† Change in contents, equivalent in cubic feet per second, in Carry Falls Reservoir (furnished by Niagara Mohawk Power Corp.). Equivalent change in contents for calendar year 1956, +35.7 cfs; for water year 1957, -26.5 cfs.

f Fragmentary gage-height record; discharge computed on basis of existing gage heights and powerplant record.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 183.33 ft above mean sea level, datum of 1929.

Average discharge.--13 years (1944-57), 2,007 cfs.

Extremes.--Maximum discharge during year, 4,190 cfs June 4 (gage height, 4.66 ft); maximum gage height, about 6.4 ft sometime in January (backwater from ice); minimum discharge, 8.5 cfs June 25, 30 (gage height, 0.59 ft); minimum daily, 272 cfs Aug. 13.

1943-57: Maximum discharge, 11,000 cfs Apr. 17, 1954 (gage height, 7.60 ft); maximum gage height, 9.24 ft Feb. 22, 1954 (backwater from ice); minimum discharge, 4.4 cfs Oct. 15, 1951; minimum daily, 7.0 cfs Oct. 15, 1951; minimum gage height, 0.42 ft July 13, 1950.

Remarks.--Records good except those for periods of ice effect, which are fair. Flow regulated by Carry Falls Reservoir (usable capacity, 5,011,000,000 cu ft) about 46 miles upstream, since 1953; considerable natural storage in large lakes above Piercefield.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 2				June 3 to Sept. 30			
1.5	255	4.0	2,980	1.5	255	3.0	1,610
2.0	571	5.0	4,870	2.0	571	4.0	3,010
3.0	1,580			2.5	1,030	5.0	4,870

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	958	1,460	800	1,500	1,700	1,650	1,770	1,380	3,330	1,070	1,650	482
2	1,180	1,270	540	1,400	1,650	1,700	1,870	1,320	3,570	1,530	1,500	735
3	1,290	1,300	860	1,650	1,100	1,650	1,940	1,660	3,970	1,600	1,060	1,270
4	1,580	800	1,120	1,600	1,600	1,750	1,850	1,590	3,820	1,630	717	1,210
5	1,210	1,030	1,220	1,700	1,650	*1,750	1,740	733	3,390	1,660	1,100	1,210
6	1,230	998	*1,280	1,600	1,700	1,750	2,220	1,140	2,190	1,600	1,020	1,240
7	1,360	869	1,290	1,300	1,750	1,680	1,110	1,300	1,790	1,650	1,200	780
8	1,250	803	1,520	1,600	1,700	1,700	1,630	1,280	1,860	1,660	1,470	634
9	798	734	1,360	*1,650	1,700	1,750	1,520	1,290	1,830	1,690	1,570	560
10	1,140	294	1,320	1,650	1,550	1,700	1,780	1,270	1,750	*1,780	1,260	1,200
11	*1,350	399	1,710	1,600	1,600	1,600	1,710	852	1,710	1,780	1,440	1,290
12	1,500	535	1,690	460	1,650	1,650	1,680	604	1,700	1,730	348	1,450
13	1,120	548	1,250	450	1,450	1,870	1,720	1,100	1,680	1,740	272	1,390
14	1,180	568	1,700	1,000	1,700	2,590	1,110	1,420	1,690	1,670	1,000	1,000
15	1,200	722	1,650	1,100	1,700	2,860	1,590	2,110	1,670	1,630	795	512
16	1,310	676	1,700	1,400	1,650	2,910	1,770	2,450	1,700	1,730	1,420	763
17	1,190	632	1,400	1,650	1,700	2,280	*1,760	2,180	1,710	1,570	836	1,340
18	*1,330	364	1,700	1,160	1,750	2,040	1,770	1,950	1,680	1,700	748	1,460
19	1,240	692	1,650	680	1,650	1,940	1,750	1,830	1,670	1,560	1,180	1,220
20	1,200	497	1,690	660	1,600	1,900	734	1,870	1,660	1,630	1,210	1,130
21	1,340	588	1,680	1,020	1,750	1,880	648	2,160	1,620	1,700	1,170	1,000
22	1,220	356	1,180	1,300	1,700	1,900	1,270	*3,110	1,270	1,650	1,370	664
23	1,460	690	1,500	1,500	1,650	1,960	1,530	3,190	1,370	1,240	1,460	904
24	1,540	690	1,700	1,750	1,350	1,960	1,580	3,160	1,340	1,690	884	1,230
25	1,680	528	1,700	1,700	1,650	1,870	1,600	3,300	1,210	1,740	668	1,280
26	1,380	538	1,650	1,160	1,800	1,810	1,630	2,490	1,610	1,750	1,120	1,250
27	1,360	680	1,700	600	1,700	1,780	1,410	1,980	1,600	1,710	1,260	1,260
28	862	533	1,700	1,300	1,600	1,840	1,270	2,850	1,390	1,060	1,330	1,180
29	1,510	1,100	1,700	1,020	-	1,830	1,350	3,290	893	1,150	*1,510	745
30	1,420	1,300	1,650	1,060	--------	1,810	1,360	3,460	465	1,260	1,360	497
31	1,300	--------	1,100	1,750	--------	1,800	--------	3,440	--------	1,380	1,140	--------
Total	39,688	22,194	44,710	39,970	45,750	59,160	46,672	61,759	57,138	48,940	35,068	30,886
Mean	1,280	740	1,442	1,289	1,634	1,908	1,556	1,992	1,905	1,579	1,131	1,030
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956:	Max	7,670	Min	178	Mean	1,664	Cfsm	1.47	In. 20.01
Water year 1956-57:	Max	3,970	Min	272	Mean	1,457	Cfsm	1.29	In. 17.48

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 29 to Dec. 5, Dec. 13-15, 18, 19, 22, 23, 25-27, Dec. 29 to Mar. 6, Mar. 10-12 (no gage-height record Jan. 17 to Feb. 7; discharge estimated on basis of weather records and powerplant records).

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 1957.

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. 13, 1920, staff gage at present site and datum.

Average discharge.--45 years, 1,054 cfs.

Extremes.--Maximum discharge during year, 3,510 cfs May 16 (gage height, 8.28 ft); minimum, 129 cfs Sept. 1 (gage height, 5.68 ft); minimum daily, 138 cfs Sept. 2.

1910-17, 1919-57: 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).--WSP 584: Drainage area. WSP 1387: 1910-16, 1917(M).

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 27		Feb. 28 to Sept. 30			
5.9	235	5.7	138	7.0	1,370
6.4	629	6.0	316	8.0	2,970
7.0	1,340	6.4	670	9.0	5,070
8.0	2,950				

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	301	323	330	350	740	1,940	977	1,120	863	764	660	153
2	315	330	320	330	700	1,720	1,430	1,040	1,020	896	630	138
3	449	359	300	320	680	1,370	2,190	908	1,580	819	524	179
4	620	381	350	340	640	1,130	1,860	830	1,370	712	385	189
5	601	323	290	330	600	*908	1,620	797	1,080	640	324	207
6	494	420	400	310	560	786	2,290	764	885	702	302	213
7	485	451	886	300	*600	712	2,580	712	1,190	640	275	207
8	545	323	1,650	280	540	660	2,130	670	1,550	506	275	189
9	649	294	1,340	270	520	590	1,710	561	1,370	427	242	184
10	601	268	1,060	260	560	580	1,440	600	1,040	*393	268	174
11	*494	242	998	*250	480	515	1,240	744	830	362	289	218
12	428	268	1,030	240	420	610	1,170	1,020	533	370	282	179
13	412	330	720	235	380	958	a1,040	1,070	515	393	282	195
14	366	366	580	230	380	1,700	a940	1,620	552	302	275	207
15	344	*373	700	225	360	2,000	a880	2,700	552	324	268	169
16	344	412	862	225	340	2,840	a920	3,270	506	316	248	189
17	373	443	862	225	370	2,510	*a1,000	2,390	496	296	236	207
18	330	443	760	230	340	2,140	1,320	1,840	452	275	224	207
19	323	412	600	230	330	1,710	1,570	1,480	487	268	213	255
20	351	359	700	250	310	1,510	1,770	1,640	552	255	207	218
21	301	379	669	260	300	1,300	2,110	2,590	552	242	189	207
22	294	599	573	640	290	1,200	2,360	2,300	487	347	179	513
23	301	940	488	2,200	320	1,290	2,110	*1,890	418	444	164	830
24	294	740	573	1,550	310	1,290	1,770	1,590	402	*470	164	1,060
25	288	540	700	1,250	370	1,200	1,580	1,330	393	402	169	908
26	288	536	601	1,100	640	1,130	1,480	1,190	436	339	148	744
27	281	555	669	1,000	2,100	1,140	1,380	1,300	515	316	143	561
28	294	460	690	920	2,000	1,170	1,250	1,370	533	331	143	470
29	294	459	560	860	-	1,220	1,160	1,290	542	410	*148	427
30	275	370	430	800	--------	1,160	1,110	1,120	580	600	143	402
31	294	--------	380	780	--------	1,040	--------	942	--------	733	143	--------
Total	12,029	12,698	21,071	16,790	16,180	40,029	46,387	42,688	22,281	14,294	8,142	9,999
Mean	388	423	680	542	578	1,291	1,546	1,377	743	461	263	333
Cfsm	0.630	0.687	1.10	0.880	0.938	2.10	2.51	2.24	1.21	0.748	0.427	0.541
In.	0.73	0.77	1.27	1.01	0.98	2.42	2.80	2.58	1.35	0.86	0.49	0.60

Calendar year 1956:	Max 9,090	Min 217	Mean 913	Cfsm 1.48	In. 20.19
Water year 1956-57:	Max 3,270	Min 138	Mean 719	Cfsm 1.17	In. 15.86

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 and records for Grass River at Pyrites.

Note.--Stage-discharge relation affected by ice Nov. 23-25, Nov. 30 to Dec. 6, Dec. 9, 10, 13-15, 18, 19, Dec. 29 to Feb. 28, Mar. 15.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 1,011.52 ft above mean sea level, datum of 1929.

Average discharge.--32 years, 227 cfs.

Extremes.--Maximum discharge during year, 685 cfs May 21 (gage height, 2.68 ft); minimum, 14 cfs Sept. 27 (gage height, 0.53 ft); minimum daily, 62 cfs Aug. 29, Sept. 1.

1925-57: Maximum discharge, 2,890 cfs Apr. 25, 1926 (gage height, 5.0 ft); minimum, 14 cfs Feb. 12, 1943, Aug. 15, 1952, Sept. 27, 1957; minimum daily, 28 cfs Sept. 4, 1934.

Remarks.--Records good. Seasonal regulation of flow by upstream reservoirs. 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).--WSP 729: 1931(m). WSP 759: Drainage area.

Rating tables, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 20		May 21 to Sept. 30	
1.1	83	1.0	60
1.5	165	1.4	133
2.0	336	1.8	250
3.0	886	2.3	473
		3.0	886

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	148	126	103	147	172	271	219	253	184	177	339	62
2	165	134	117	136	165	206	336	222	234	147	250	67
3	138	126	110	128	148	173	350	207	261	121	182	106
4	136	117	118	132	151	179	273	201	211	143	157	93
5	146	117	104	128	156	216	267	192	184	173	136	80
6	147	112	119	116	146	*236	391	181	172	155	116	79
7	165	115	*172	125	159	217	332	173	293	127	110	77
8	152	103	241	132	138	219	264	152	292	118	105	73
9	139	109	147	108	134	201	246	148	240	115	96	75
10	118	102	130	113	137	169	238	152	181	105	99	68
11	*118	101	141	*103	128	169	230	213	166	*102	104	77
12	129	111	154	117	117	173	219	192	155	105	90	75
13	127	127	136	107	125	171	210	208	147	101	90	81
14	121	120	131	108	121	195	203	294	135	95	78	82
15	117	123	166	107	108	252	207	461	177	117	80	73
16	118	*124	181	104	114	391	232	544	148	105	85	111
17	105	119	170	103	113	323	271	390	121	95	79	153
18	84	109	143	102	107	248	*315	319	116	90	84	150
19	112	96	145	99	110	207	311	271	139	76	78	147
20	110	111	169	102	108	253	345	427	134	83	79	171
21	108	122	158	102	112	253	449	639	120	89	69	180
22	103	172	138	141	104	231	368	467	104	242	70	222
23	107	145	144	266	110	240	294	*366	100	269	72	212
24	113	108	151	249	107	241	294	296	94	169	72	208
25	109	124	175	236	126	221	305	250	124	138	65	167
26	119	130	139	193	193	246	298	230	118	*121	70	177
27	96	127	143	155	291	246	275	278	106	125	76	114
28	111	128	150	151	290	246	256	250	100	179	66	179
29	106	126	143	160	-	239	242	222	109	223	*62	186
30	116	114	85	160	-------	222	294	193	144	246	69	173
31	116	-------	140	184	-------	229	-------	175	-------	556	68	-------
Total	3,799	3,598	4,463	4,314	3,990	7,083	8,534	8,566	4,809	4,707	3,196	3,718
Mean	123	120	144	139	142	228	284	276	160	152	103	124
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max	2,250	Min	67	Mean	205	Cfsm	1.55	In. 21.19
Water year 1956-57: Max	639	Min	62	Mean	167	Cfsm	1.27	In. 17.12

* 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 1957.

Gage.--Water-stage recorder. Datum of gage is 847.04 ft above mean sea level, datum of 1929. September to December 1908 staff gage at site 2¼ miles downstream at different datum.

Average discharge.--31 years (1926-57), 176 cfs.

Extremes.--Maximum discharge during year, 407 cfs May 22 (gage height, 3.18 ft); maximum gage height, 3.33 ft Jan. 23 (ice jam); minimum discharge, 48 cfs Nov. 23 (gage height, 1.20 ft); minimum daily, 54 cfs Sept. 18.

1908, 1926-57: 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 or no gage-height record, which are fair. Flow regulated by Upper and Lower Chateaugay Lakes. Considerable diurnal fluctuation caused by power operations prior to 1953.

Revision.--WSP 759: Drainage area.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 28		Mar. 1 to Sept. 30			
1.4	69	1.2	50	3.0	361
2.0	153	1.5	85	4.0	646
3.0	354	2.0	156		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	97	74	78	98	145	160	175	104	197	85	114	70
2	99	73	82	94	155	150	202	104	125	84	111	69
3	98	73	82	92	150	145	180	104	110	98	111	70
4	97	72	82	94	145	160	177	104	108	100	110	67
5	97	72	82	92	145	180	189	103	107	95	110	67
6	a98	72	84	92	140	*173	191	102	110	93	110	67
7	a96	73	98	104	*145	168	184	89	134	94	108	66
8	a96	72	*85	112	140	163	184	88	114	93	108	66
9	a96	72	84	108	140	146	182	89	111	90	108	66
10	a94	72	82	112	135	145	180	93	110	89	106	62
11	a94	72	84	*110	130	150	159	90	110	89	95	63
12	*a90	73	88	108	125	155	111	76	110	89	95	62
13	86	74	80	106	130	164	110	92	110	85	95	64
14	85	73	78	104	130	177	110	85	108	89	95	60
15	85	73	86	102	125	250	110	177	107	85	95	56
16	85	*78	88	104	130	220	106	290	106	85	95	56
17	85	82	90	104	130	195	110	284	104	85	94	56
18	85	82	90	102	125	187	*107	282	104	85	86	54
19	82	81	92	102	122	186	106	277	106	85	77	56
20	80	81	98	100	120	184	108	340	104	85	77	60
21	80	84	100	102	124	180	110	389	103	89	77	61
22	80	84	102	125	120	182	104	399	103	97	77	90
23	80	64	104	135	116	182	103	*391	104	89	77	76
24	80	78	106	130	109	180	103	356	101	88	75	65
25	80	84	104	125	116	178	107	344	88	85	72	67
26	77	86	102	135	223	178	106	342	*84	*86	73	72
27	72	84	104	130	205	177	104	335	89	90	72	81
28	72	84	106	125	165	177	104	301	85	102	72	81
29	72	82	104	130	-	177	108	212	89	104	72	81
30	72	78	100	130	-------	175	108	210	86	104	*72	81
31	72	-------	94	135	-------	173	-------	214	-------	107	72	-------
Total	2,662	2,302	2,839	3,442	3,885	5,417	4,038	6,466	3,227	2,824	2,811	2,012
Mean	85.9	76.7	91.6	111	139	175	135	209	108	91.1	90.7	67.1
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 1,010 Min 54 Mean 154 Cfsm 1.38 In. 18.68
Water year 1956-57: Max 399 Min 54 Mean 115 Cfsm 1.03 In. 13.91

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage, weather records, and records of elevations of Chateaugay Lake and gate openings at Forge Dam.

Note.--Stage-discharge relation affected by ice Nov. 23, 24, Nov. 30 to Dec. 7, Dec. 9 to Feb. 7, Feb. 9-22, 25, Feb. 27 to Mar. 5, Mar. 11, 12 (no gage-height record Jan. 15-19). Increase in storage in Chateaugay Lakes during calendar year 1956, about 14,600,000 cu ft (equivalent mean discharge, 0.5 cfs; runoff, 0.06 in.); increase in elevation, 0.11 ft. Increase in storage during water year 1957, about 41,100,000 cu ft (equivalent mean discharge, 1.3 cfs; runoff, 0.16 in.); increase in elevation, 0.31 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 1957.

Gage.--Water-stage recorder. Datum of gage is 164.93 ft above mean sea level, datum of 1929.

Average discharge.--29 years, 267 cfs.

Extremes.--Maximum discharge during year, 1,920 cfs May 21 (gage height, 6.02 ft), maximum gage height, 9.09 ft Mar. 16 (ice jam); minimum discharge, 20 cfs Oct. 26 (gage height, 1.77 ft); minimum daily, 23 cfs Dec. 3.

1928-57: Maximum discharge, 6,000 cfs Apr. 7, 1937 (gage height, 9.74 ft); maximum gage height, 11.5 ft Mar. 9, 1946, from floodmark (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 or no gage-height record, which are fair. Diurnal fluctuation caused by sawmill immediately upstream. Slight regulation by Chazy Lake, from which Clinton Prison at Dannemora obtains its water supply.

Revisions (water years).--WSP 714: 1930. WSP 759: Drainage area.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 21-30)

Oct. 1 to May 21				May 22 to Sept. 30			
1.8	22	3.5	419	1.8	22	3.5	434
2.0	40	4.0	633	2.0	42	4.0	643
2.3	85	5.0	1,190	2.3	90	5.0	1,180
2.9	223	6.0	1,900	2.8	205		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	34	25	160	86	370	219	215	130	77	*76	56
2	36	39	26	165	92	240	352	165	145	91	66	64
3	36	41	23	160	100	160	470	145	190	84	48	74
4	40	37	30	150	86	170	310	149	150	173	45	46
5	36	42	30	110	86	190	350	138	130	166	44	34
6	30	32	34	58	76	200	662	132	120	130	41	27
7	34	40	42	130	76	*190	615	123	226	101	49	29
8	40	35	*180	140	*74	190	a450	114	269	98	49	28
9	44	36	140	130	72	185	a360	104	186	85	48	25
10	41	37	120	110	74	170	a320	115	162	81	45	32
11	37	33	130	106	70	180	a290	144	132	74	39	32
12	*37	31	140	*114	66	170	a260	140	*102	74	40	35
13	33	38	130	104	70	175	a260	132	112	69	49	31
14	32	75	130	104	70	240	a235	218	105	70	49	32
15	36	*43	135	100	66	370	a215	596	148	70	46	30
16	36	43	140	96	68	700	a200	1,020	139	66	43	32
17	34	42	140	92	68	640	203	522	100	67	47	38
18	36	41	135	88	66	500	*243	332	89	60	48	40
19	33	42	140	84	66	360	266	248	84	62	49	31
20	31	43	135	84	64	290	329	554	84	59	49	34
21	33	57	130	86	68	270	495	1,570	72	55	45	48
22	40	42	122	130	64	260	401	721	68	65	49	69
23	33	49	114	240	64	290	269	457	59	95	49	117
24	38	34	122	270	62	290	223	*350	59	79	49	98
25	37	29	130	160	70	280	191	274	66	62	41	64
26	33	42	140	140	180	320	212	230	109	60	33	58
27	31	41	135	100	540	320	197	252	86	55	32	76
28	40	38	130	100	520	290	169	200	75	64	39	74
29	42	36	125	106	-	270	154	174	77	140	58	70
30	38	33	110	90		242	197	149	79	136	*63	69
31	37		140	100		223		140		91	56	
Total	1,126	1,205	3,403	3,807	3,064	8,745	9,117	9,823	3,553	2,659	1,484	1,493
Mean	36.3	40.2	110	123	109	282	304	317	118	85.8	47.9	49.8
Cfsm	0.147	0.163	0.445	0.498	0.441	1.14	1.23	1.28	0.478	0.347	0.194	0.202
In.	0.17	0.18	0.51	0.57	0.46	1.32	1.37	1.48	0.53	0.40	0.22	0.22

Calendar year 1956:	Max 2,940	Min 23	Mean 194	Cfsm 0.785	In. 10.67
Water year 1956-57:	Max 1,570	Min 23	Mean 136	Cfsm 0.551	In. 7.43

Peak discharge (base, 2,500 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Salmon River at Chasm Falls and Saranac River at Plattsburg.

Note.--Stage-discharge relation affected by ice Nov. 23, 24, Nov. 30 to Mar. 29, Apr. 3-5.

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 1957. Published as "near Plattsburg" 1903-30.

Gage.--Water-stage recorder. Datum of gage is 155.74 ft above mean sea level, datum of 1929. 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.--41 years, 833 cfs.

Extremes.--Maximum discharge during year, 2,780 cfs May 21 (gage height, 6.14 ft); minimum, 17 cfs Oct. 28 (gage height, 1.48 ft); minimum daily, 69 cfs Aug. 18.

1903-30, 1943-57: Maximum discharge, 11,500 cfs Apr. 8, 1928, from computation of flow over dam and through waste gates and powerplant; minimum daily, 18 cfs June 19, 1949.

Remarks.--Records good except those for periods of ice effect, which are fair. Considerable diurnal fluctuation caused by power and industrial operations. Slight regulation by storage in Lower Saranac Lake and elsewhere. During year, city of Plattsburg diverted about 6 cfs from Saranac River and Mead and West Brooks, tributaries above station, for municipal supply.

Revisions (water years).--WSP 354: Drainage area. WSP 384: 1909-10 (monthly discharge only). WSP 1387: 1907-8. WSP 1437: 1908 (minimum daily only).

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.9	57	4.5	1,110
2.3	118	5.5	2,030
2.8	233	7.0	3,990
3.5	488		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	320	215	355	470	410	1,020	930	591	861	568	534	421
2	228	360	280	500	480	935	992	739	840	531	477	323
3	309	437	317	520	498	733	1,100	513	950	453	*337	438
4	328	362	293	520	478	831	877	641	841	446	484	495
5	332	396	335	540	560	715	855	574	779	500	367	430
6	297	360	447	499	720	736	1,100	729	738	484	422	521
7	174	281	488	407	720	724	1,030	706	794	380	336	432
8	334	409	*723	475	*740	728	919	685	940	313	138	382
9	472	466	518	510	720	717	834	650	688	365	150	337
10	389	409	575	440	580	643	754	741	724	343	527	417
11	387	286	580	540	*490	759	642	958	576	*333	589	347
12	252	339	601	540	680	721	601	827	658	326	582	303
13	284	315	708	*440	740	735	640	855	564	352	555	268
14	76	*592	592	470	664	814	475	1,060	610	301	315	353
15	*319	486	573	460	656	913	663	1,490	560	357	390	245
16	263	426	446	490	674	1,220	575	2,000	509	450	287	235
17	203	416	668	500	542	1,120	519	1,740	772	428	197	314
18	281	210	500	480	662	874	619	1,230	656	426	69	315
19	278	351	520	480	639	892	*706	1,160	459	470	219	300
20	323	412	490	430	640	790	668	1,680	492	328	279	240
21	263	359	527	470	664	803	787	2,480	466	264	181	319
22	360	424	570	540	644	748	800	2,010	403	356	115	456
23	228	374	441	880	662	917	616	1,660	395	496	125	718
24	195	352	448	860	636	866	541	*1,480	445	498	197	582
25	210	251	452	620	677	922	570	1,330	510	468	239	334
26	234	327	548	640	775	812	541	1,110	505	433	299	330
27	79	419	379	350	1,820	863	475	1,090	462	243	409	275
28	160	463	525	360	1,380	931	313	961	470	183	452	187
29	529	469	576	400	-	915	442	904	519	385	456	182
30	342	307	340	360	-------	871	359	861	507	440	*436	226
31	230	-------	370	440	-------	778	-------	856	-------	434	395	-------
Total	8,679	11,273	15,185	15,631	19,551	26,046	20,943	34,311	18,693	12,354	10,558	10,725
Mean	280	376	490	504	698	840	698	1,107	623	399	341	358
Cfsm	0.461	0.618	0.806	0.829	1.15	1.38	1.15	1.82	1.02	0.656	0.561	0.589
In.	0.53	0.69	0.93	0.96	1.20	1.59	1.28	2.10	1.14	0.76	0.65	0.66

Calendar year 1956: Max 6,260 Min 76 Mean 753 Cfsm 1.24 In. 16.86
Water year 1956-57: Max 2,480 Min 69 Mean 559 Cfsm 0.919 In. 12.49

* Discharge measurement made on this day.

Note.--Stage discharge relation affected by ice Dec. 30 to Jan. 5, Jan. 11 to Feb. 2, Feb. 5-13.

West Branch Ausable River near Lake Placid, N. Y.
(Formerly published as West Branch Ausable River near Newman)

Location.--Lat 44°18'40", long 73°55'00", on right bank 4 miles northeast of Lake Placid (formerly referred as 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 1957. Prior to October 1956, published as "near Newman."

Gage.--Water-stage recorder. Datum of gage is 1,620.76 ft above mean sea level, datum of 1929. Prior to July 14, 1927, staff gage at same site and datum.

Average discharge.--38 years (1919-57), 219 cfs.

Extremes.--Maximum discharge during year, 4,240 cfs Jan. 23 (gage height, 8.36 ft); minimum, 23 cfs Nov. 11 (gage height, 2.23 ft); minimum daily, 38 cfs Aug. 25.

1916-17, 1919-57: 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 discharge, 7.2 cfs July 29, 1920.

Remarks.--Records good except those for periods of ice effect or fragmentary or no gage-height record, which are fair. Diurnal fluctuation at low and medium flow caused by mills above station.

Revisions (water years).--WSP 1337: 1921-25.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22

2.5	46	4.0	451
2.9	99	5.0	1,000
3.3	189		

Nov. 22 to Sept. 30

2.4	36	4.0	467
2.7	74	5.0	1,000
3.0	131	6.0	1,700
3.5	272		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	61	67	62	102	240	92	375	248	340	225	42
2	62	60	74	60	94	175	200	304	350	230	134	40
3	96	79	72	58	88	130	256	252	371	172	93	59
4	101	87	70	62	86	118	158	209	249	189	76	57
5	86	66	68	60	82	92	157	181	195	414	66	*56
6	72	61	85	56	74	84	531	161	164	336	57	53
7	102	61	380	54	80	82	348	146	425	212	55	49
8	183	59	560	54	78	*88	214	144	364	160	*53	48
9	129	58	260	58	*70	86	171	153	244	f130	51	43
10	93	60	*159	58	78	89	146	194	184	f114	a52	46
11	77	53	143	56	67	78	134	480	152	103	a70	44
12	70	59	146	56	54	97	130	337	140	*108	a104	44
13	66	63	118	54	64	110	123	296	146	105	a140	40
14	63	63	92	*54	65	140	115	379	130	84	100	42
15	60	64	116	50	63	207	105	593	123	73	*75	39
16	58	*78	116	49	60	561	112	579	106	72	65	51
17	*57	161	124	49	63	332	142	391	95	57	57	87
18	56	103	104	47	61	210	186	304	83	63	53	68
19	55	74	70	49	62	163	259	256	150	56	49	54
20	53	70	101	50	59	147	*722	578	202	52	48	52
21	52	103	96	66	60	129	1,320	723	138	52	45	69
22	53	575	87	120	60	118	718	498	105	78	44	86
23	53	260	87	1,400	64	120	569	371	90	*119	42	362
24	54	145	87	600	58	121	568	322	106	f84	40	217
25	56	102	101	400	67	107	545	*272	145	75	38	130
26	53	108	80	270	123	106	517	239	319	68	42	91
27	56	112	86	200	800	100	467	395	183	62	47	76
28	58	94	91	150	470	99	437	293	159	63	43	67
29	57	86	83	130	-	101	371	237	242	97	44	59
30	50	77	59	120		92	505	193	364	118	42	57
31	52		64	110		86		183		f149	45	
Total	2,196	3,102	3,846	4,662	3,152	4,408	10,318	10,038	5,972	4,035	2,095	2,228
Mean	70.8	103	124	150	113	142	344	324	199	130	67.6	74.3
Cfsm	0.610	0.888	1.07	1.29	0.974	1.22	2.97	2.79	1.72	1.12	0.583	0.641
In.	0.70	0.99	1.23	1.49	1.01	1.41	3.31	3.22	1.91	1.29	0.67	0.71

Calendar year 1956:	Max	3,090	Min	39	Mean	187	Cfsm	1.61	In. 21.97
Water year 1956-57:	Max	1,400	Min	38	Mean	154	Cfsm	1.33	In. 17.94

Peak discharge (base, 2,000 cfs).--Jan. 23 (8 a.m.) 4,240 cfs (8.36 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage and records for other stations in the Ausable River basin.

f Fragmentary gage-height record; discharge estimated on basis of recorded range in stage, and records for other stations in Ausable River basin.

Note.--Stage-discharge relation affected by ice Nov. 19, 20, 23-26, Dec. 7-9, 14, 18, 19, 26, 27, Dec. 31 to Feb. 8, Feb. 12, Feb. 27 to Mar. 7, Mar. 11 (no gage-height record Jan. 24-30; fragmentary gage-height record Jan. 14, 15).

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 1957.

Gage.--Water-stage recorder. Datum of gage is 888.48 ft above mean sea level, datum of 1929. Prior to Oct. 24, 1936, staff gage at same site and datum.

Average discharge.--33 years, 49.6 cfs.

Extremes.--Maximum discharge during year, 175 cfs May 21 (gage height, 3.24 ft); minimum, 3.8 cfs Aug. 19 (gage height, 1.32 ft).

1924-57: 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 or shifting control, which are fair. Appreciable regulation by Fern Lake and Taylor Pond. Prior to October 1937, diurnal fluctuation at low and medium flow caused by powerplant.

Revisions (water years).--WSP 759: Drainage area. WSP 1337: 1925.

Rating tables, water year 1956-57, except periods of ice effect and shifting control (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 21				May 22 to Sept. 30			
1.6	11	3.0	141	1.3	3.4	2.0	33
2.0	34	4.0	311	1.4	5.2	2.5	80
2.5	80			1.6	11	3.0	141

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	34	19	17	20	45	21	34	19	17	24	67
2	33	34	19	17	19	35	28	30	18	13	47	67
3	34	31	17	17	18	27	44	24	20	9.4	47	71
4	29	30	16	19	18	23	38	23	18	9.1	47	39
5	27	29	15	21	17	19	34	22	17	10	46	*10
6	26	28	16	20	16	15	52	19	14	10	*46	7.9
7	26	28	20	19	16	*14	58	18	25	8.4	47	7.0
8	27	28	39	19	*15	13	45	17	31	7.4	73	7.4
9	27	28	*26	20	14	14	38	17	21	7.0	77	6.5
10	27	27	23	19	14	15	32	20	17	6.2	44	10
11	26	27	20	19	13	14	30	51	14	6.2	32	20
12	26	28	18	19	14	13	28	46	12	6.7	32	15
13	26	31	17	18	36	16	27	41	12	6.2	32	7.6
14	27	30	15	18	39	25	27	64	11	5.7	18	6.5
15	26	30	14	*18	42	41	25	52	14	8.8	7	6.2
16	26	*29	16	17	44	66	24	108	12	8.4	5.3	6.3
17	*26	28	18	17	43	66	26	73	9.8	6.7	4.8	7.0
18	26	27	17	16	42	48	32	51	8.8	5.7	4.6	6.8
19	26	27	14	16	42	37	37	40	8.4	5.5	4.0	15
20	26	27	15	16	41	34	*41	74	9.4	4.8	4.1	21
21	26	31	14	17	40	32	53	161	8.0	6.0	3.9	23
22	26	42	13	19	39	30	58	104	7.2	7.7	39	26
23	26	39	13	30	40	35	47	67	7.0	*9.4	66	33
24	27	33	14	40	40	33	38	53	7.0	7.7	67	29
25	27	27	14	35	40	31	34	*42	13	7.0	67	25
26	26	23	15	30	46	31	32	35	17	6.2	68	18
27	27	15	17	27	52	30	31	34	13	5.7	68	8.0
28	27	13	19	24	56	24	30	31	*14	5.7	68	6.5
29	27	13	20	23	-	26	30	26	16	7.0	68	5.7
30	27	14	19	22		24	32	23	19	7.2	68	5.8
31	31		18	21		21		21		7.0	67	
Total	847	831	550	650	876	897	1,072	1,421	432.6	238.8	1,291.7	584.2
Mean	27.3	27.7	17.7	21.0	31.3	28.9	35.7	45.8	14.4	7.70	41.7	19.5
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

	Max	Min	Mean	Cfsm	In.
Calendar year 1956:	422	5.7	46.2	0.935	12.73
Water year 1956-57:	161	3.9	26.6	0.538	7.31

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 24 to Dec. 6, Dec. 9-11, 13-15, 18-20, 22, 23, 25-28, Dec. 30 to Feb. 9, Feb. 11-17, 20-22, 24, Feb. 26 to Mar. 7, Mar. 11, 12, 18, 19, 24, 25, 28. Shifting-control method used Sept. 4-22.

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 1957.

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.--33 years, 309 cfs.

Extremes.--Maximum discharge during year, 3,280 cfs Feb. 27 (gage height, 5.66 ft); maximum gage height, 8.08 ft Jan. 23 (ice jam); minimum discharge, 33 cfs Jan. 18, Aug. 25, Sept. 2, 14, 15.

1924-57: 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.

Revisions.--WSP 759: Drainage area.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 23				Jan. 24 to Sept. 30			
1.1	45	2.4	402	0.9	30	2.5	457
1.4	87	3.0	718	1.2	61	3.0	727
1.8	178	4.0	1,460	1.6	133	4.0	1,460
				2.0	247	5.0	2,450

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	58	60	47	90	360	110	477	330	559	131	34
2	57	63	64	45	84	260	187	343	324	364	112	33
3	70	64	60	43	80	205	314	272	419	244	79	38
4	81	64	58	46	76	160	207	230	302	221	66	*46
5	71	65	56	44	70	130	193	205	227	461	*56	42
6	65	61	72	42	62	112	481	181	187	523	50	38
7	83	60	280	40	66	*102	465	165	494	318	46	36
8	218	58	700	39	62	96	291	157	487	214	42	37
9	173	55	300	41	*58	82	221	160	330	162	40	37
10	129	53	200	41	62	86	181	190	240	133	42	37
11	100	49	*170	40	54	74	165	492	190	116	50	36
12	84	53	150	40	46	86	152	364	*160	110	74	36
13	76	55	125	39	48	125	145	341	147	99	97	35
14	68	55	104	*38	50	250	133	433	131	86	76	33
15	63	*55	114	36	48	302	120	693	120	78	67	33
16	*58	56	108	34	47	764	127	844	110	70	57	35
17	57	93	112	34	49	426	156	517	97	66	52	44
18	55	100	96	33	48	261	237	364	84	61	48	48
19	52	80	70	34	48	190	*341	283	91	57	44	42
20	51	76	86	35	47	179	1,040	873	155	54	42	42
21	52	81	78	37	47	150	1,960	1,130	118	52	38	46
22	51	513	70	60	46	138	1,160	800	99	55	37	52
23	49	302	72	1,300	48	140	837	559	83	*83	35	168
24	49	145	72	749	50	138	800	*447	156	70	34	186
25	49	94	76	428	54	127	745	356	474	64	33	129
26	49	96	66	280	88	129	647	295	1,040	60	36	99
27	50	100	68	210	660	127	619	339	502	55	40	76
28	51	86	70	160	500	118	581	318	472	62	40	62
29	50	76	62	130	-	116	497	261	634	70	37	55
30	51	68	52	112	-------	110	631	217	775	91	37	51
31	52	--------	45	98	-------	102	--------	196	--------	86	37	--------
Total	2,219	2,834	3,716	4,355	2,688	5,645	13,743	12,502	8,978	4,744	1,675	1,686
Mean	71.6	94.5	120	140	96.0	182	458	403	299	153	54.0	56.2
Cfsm	0.362	0.477	0.606	0.707	0.485	0.919	2.31	2.04	1.51	0.773	0.273	0.284
In.	0.42	0.53	0.70	0.82	0.50	1.06	2.58	2.35	1.69	0.89	0.31	0.32

Calendar year 1956:	Max	4,190	Min	33	Mean	247	Cfsm	1.25	In.	16.96
Water year 1956-57:	Max	1,960	Min	33	Mean	177	Cfsm	0.894	In.	12.17

Peak discharge (base, 3,700 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11, 19, 20, Nov. 24 to Jan. 23, Jan. 26 to Mar. 14, Mar. 19.

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 1957. 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.--33 years (1924-57), 678 cfs.

Extremes.--Maximum discharge during year, 8,300 cfs Jan. 23 (gage height, 7.12 ft); maximum gage height, 10.72 ft Jan. 23 (ice jam); minimum discharge, 85 cfs Sept. 15, 16 (gage height, 0.99 ft).

1910-57: 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, which are fair. 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).--WSP 664: Drainage area. WSP 854: 1925(M), 1934 (maximum gage height).

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 23				Jan. 24 to Sept. 30			
1.1	93	3.0	1,120	1.1	108	3.0	1,170
1.5	202	4.0	2,200	1.5	222	4.0	2,210
2.0	416	5.0	3,700	2.0	443	5.0	3,700
2.5	721			2.5	755		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	177	183	155	145	230	808	288	1,060	632	1,000	379	174
2	183	190	186	145	210	593	415	815	669	720	356	177
3	230	193	183	140	205	430	750	651	970	498	*263	193
4	260	227	183	150	220	340	535	581	684	448	229	176
5	234	186	165	145	210	300	498	510	527	850	209	*137
6	206	183	204	135	205	270	1,110	454	448	995	192	127
7	206	177	527	130	215	*250	1,110	412	955	638	189	125
8	459	174	1,380	125	215	245	701	386	1,010	443	202	126
9	391	168	707	140	*210	237	556	386	705	372	206	113
10	302	168	*460	145	200	244	454	473	527	303	181	115
11	256	154	416	145	170	230	433	1,130	433	*279	174	130
12	223	174	401	145	140	271	407	927	377	267	242	127
13	251	177	315	140	170	332	386	830	362	244	343	113
14	196	180	260	*140	175	516	362	1,100	330	226	244	108
15	190	180	276	130	170	651	339	1,580	312	209	192	112
16	*177	180	333	125	170	1,440	339	1,970	279	196	165	110
17	171	283	315	120	175	1,050	396	1,260	259	180	154	127
18	165	289	272	112	170	671	556	910	226	165	140	162
19	163	210	174	114	175	480	713	720	239	165	137	140
20	163	199	235	118	170	460	*1,750	1,690	417	154	130	151
21	163	234	230	135	165	391	3,700	2,550	334	154	125	151
22	163	1,020	200	220	165	372	2,230	1,720	267	159	140	189
23	163	680	185	3,000	170	391	1,580	1,230	229	*224	180	478
24	163	310	225	1,520	180	386	1,560	*1,020	293	206	171	533
25	160	245	235	918	185	353	1,460	*838	603	189	174	348
26	157	250	195	651	290	343	1,310	691	1,410	180	187	252
27	163	264	200	504	1,600	334	1,270	843	786	171	180	202
28	168	230	210	396	1,240	321	1,160	741	691	174	186	162
29	163	223	195	343	-	317	1,040	631	861	196	180	151
30	163	175	155	290	--------	299	1,290	539	1,250	263	183	143
31	160	--------	150	260	--------	283	--------	482	--------	263	180	--------
Total	6,389	7,506	9,327	10,926	7,800	13,608	28,698	29,130	17,085	10,531	6,213	5,352
Mean	206	250	301	352	279	439	957	940	570	340	200	178
Cfsm	0.460	0.558	0.672	0.786	0.623	0.980	2.14	2.10	1.27	0.759	0.446	0.397
In.	0.53	0.62	0.77	0.91	0.65	1.13	2.38	2.42	1.42	0.87	0.52	0.44

Calendar year 1956:	Max 8,920	Min 107	Mean 555	Cfsm 1.24	In. 16.86
Water year 1956-57:	Max 3,700	Min 108	Mean 418	Cfsm 0.933	In. 12.66

Peak discharge (base, 6,200 cfs).--Jan. 23 (12:30 p.m.) 8,300 cfs (7.12 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 19, 24-26, 30, Dec. 1, 10, Dec. 20 to Jan. 23, Jan. 30 to Feb. 27, Mar. 3-8, 11, 19.

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 height and discharge measurements only), August to November 1908, July 1923 to September 1957.

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 present datum.

Average discharge.--34 years (1923-57), 302 cfs.

Extremes.--Maximum discharge during year, 1,200 cfs May 21 (gage height, 4.20 ft); maximum gage height, 7.43 ft Feb. 28 (ice jam); minimum discharge, 8.8 cfs Sept. 20 (gage height, 1.84 ft).

1923-57: Maximum discharge, 11,800 cfs Oct. 1, 1924 (gage height, 10.85 ft), from rating curve extended above 4,600 cfs by logarithmic plotting; minimum, that of Sept. 20, 1957.

Remarks.--Records good except those for period of ice effect, which are fair. Diurnal fluctuation at low flow caused by powerplants above station.

Revisions.--WSP 759: Drainage area.

Rating tables, water year 1956-57, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 27				Feb. 28 to Sept. 30			
2.2	35	3.0	301	1.9	12	2.4	79
2.4	75	3.5	621	2.0	20	2.7	166
2.7	166	4.0	1,020	2.2	43		

Note.--Same as preceding table above 2.7 ft.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	77	64	54	145	400	150	328	184	398	52	25
2	74	86	76	52	135	330	160	271	220	266	53	24
3	73	80	76	52	125	270	296	228	242	190	46	23
4	84	83	76	49	116	210	246	210	210	163	39	*33
5	74	73	76	49	110	170	210	194	182	182	38	31
6	80	74	72	46	104	150	292	178	148	323	30	*30
7	81	66	100	46	100	140	501	159	182	202	35	23
8	114	60	250	46	104	125	340	149	318	156	31	24
9	114	55	170	46	100	108	276	123	224	126	30	20
10	104	57	120	46	*116	120	238	120	182	112	35	22
11	88	51	*125	46	104	104	215	184	149	103	33	25
12	81	58	110	*46	90	150	206	238	132	*92	31	24
13	71	71	110	42	96	200	202	232	123	91	31	20
14	72	73	100	42	96	250	194	301	112	90	31	23
15	68	*77	100	40	90	320	180	353	118	80	31	21
16	*70	71	94	40	90	500	172	555	107	73	31	23
17	74	70	80	40	90	400	184	392	98	63	29	25
18	61	75	72	39	90	300	218	301	83	53	24	23
19	71	72	66	40	90	240	*271	251	93	51	18	12
20	62	66	90	44	90	220	379	373	89	46	25	20
21	70	76	88	49	90	205	818	1,020	81	49	24	38
22	57	140	86	100	90	200	689	674	79	51	20	31
23	72	150	82	600	90	230	422	481	76	55	18	43
24	70	110	82	900	90	235	404	386	163	54	18	74
25	71	100	80	450	100	210	368	*318	161	51	17	73
26	66	100	78	390	130	204	340	266	722	48	17	47
27	64	104	76	300	600	194	328	246	402	45	26	42
28	70	90	76	250	480	182	312	246	440	48	28	36
29	62	80	68	210	-	172	291	220	459	58	30	29
30	68	70	60	190	--------	168	312	186	695	*64	25	27
31	67	--------	54	160	--------	153	--------	170	--------	57	20	--------
Total	2,321	2,415	2,857	4,504	3,751	6,860	9,214	9,353	6,474	3,440	916	911
Mean	74.9	80.5	92.2	145	134	221	307	302	216	111	29.5	30.4
Cfsm	0.272	0.293	0.335	0.527	0.487	0.804	1.12	1.10	0.785	0.404	0.107	0.111
In.	0.31	0.33	0.39	0.61	0.51	0.93	1.25	1.26	0.88	0.47	0.12	0.12

Calendar year 1956: Max 3,300 Min 51 Mean 251 Cfsm 0.913 In. 12.45
Water year 1956-57: Max 1,020 Min 12 Mean 145 Cfsm 0.527 In. 7.18

Peak discharge (base, 2,800 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 20 to Mar. 25 (no gage-height record Feb. 28 to Mar. 7).

Lake George at Rogers Rock, N. Y.

Location.--Lat 43°48'10", long 73°27'25", on west shore about 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 1957.

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, 3.95 ft June 29; minimum, 2.12 ft Dec. 8. 1913-57: 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 Ticonderoga. Lake George has been controlled by a dam at its outlet for more than 100 years.

Mean gage height, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.88	2.47	2.29	2.40	2.56	2.61	3.05	3.52	3.80	3.63	3.32	2.85
2	2.89	2.48	2.25	2.38	2.56	2.64	3.09	3.50	3.76	3.57	3.30	2.86
3	2.86	2.50	2.26	2.37	2.56	2.64	3.12	3.50	3.75	3.60	3.31	2.89
4	2.87	2.47	2.25	2.38	2.55	2.64	3.11	3.49	3.80	3.59	3.25	2.90
5	2.82	2.46	2.25	2.31	2.55	2.63	3.15	3.47	3.71	3.66	3.25	2.91
6	2.84	2.46	2.26	2.33	2.55	2.62	3.26	3.50	3.71	3.65	3.26	2.84
7	2.89	2.48	2.24	2.33	2.54	2.62	3.33	3.51	3.73	3.62	3.23	2.82
8	2.92	2.46	2.22	2.32	2.53	2.61	3.31	3.50	3.73	3.61	3.22	2.78
9	2.85	2.45	2.23	2.33	2.53	2.70	3.35	3.51	3.73	3.61	3.20	2.77
10	2.82	2.42	2.30	2.28	2.55	2.73	3.39	3.44	3.74	3.57	3.18	2.77
11	2.77	2.43	2.33	2.33	2.51	2.70	3.39	3.48	3.73	3.55	3.22	2.77
12	2.79	2.40	2.29	2.32	2.51	2.71	3.40	3.51	3.70	3.52	3.18	2.75
13	2.77	2.36	2.24	2.27	2.51	2.70	3.41	3.51	3.67	3.51	3.16	2.76
14	2.76	2.35	2.24	2.29	2.50	2.70	3.43	3.52	3.69	3.49	3.19	2.75
15	f2.75	2.34	2.29	2.28	2.48	2.74	3.42	3.56	3.70	3.45	f3.09	2.76
16	f2.72	2.35	2.34	2.29	2.48	2.83	3.44	3.51	3.67	3.44	3.09	2.79
17	f2.70	2.32	2.35	2.29	2.50	2.90	3.43	3.55	3.65	3.42	3.09	2.76
18	f2.62	2.28	2.34	2.29	2.48	2.92	3.43	3.55	3.65	3.40	3.07	2.75
19	2.50	2.30	2.36	2.27	2.46	2.93	3.44	3.54	3.66	3.40	3.05	2.76
20	2.63	2.33	2.33	2.27	2.45	2.95	3.48	3.64	3.63	3.38	3.00	2.75
21	2.60	2.36	2.34	2.27	2.42	2.95	3.46	3.73	3.62	3.34	2.93	2.72
22	2.62	2.42	2.27	2.29	2.40	2.96	3.47	3.79	3.60	3.36	2.94	2.74
23	2.56	2.39	2.35	2.42	2.40	2.97	3.49	3.79	3.62	3.30	2.95	2.83
24	2.50	2.36	2.38	2.49	2.38	2.99	3.47	3.81	3.61	3.27	2.94	2.83
25	2.52	2.31	2.39	2.50	2.39	3.00	3.50	3.80	3.62	3.25	2.96	2.82
26	2.55	2.31	2.38	2.52	2.39	3.00	3.51	3.79	3.65	f3.27	2.97	2.77
27	2.52	2.34	2.40	2.55	2.50	3.00	3.51	3.81	3.64	f3.24	f2.93	2.75
28	2.51	2.33	2.41	2.55	2.58	3.01	3.52	3.82	3.67	3.27	f2.90	2.72
29	2.52	2.34	2.37	2.55	-	3.02	3.53	3.79	3.79	3.31	f2.86	2.70
30	2.48	2.29	2.43	2.57	------	3.03	3.52	3.78	3.72	3.29	f2.87	2.69
31	2.47	------	2.40	2.58	------	3.05	------	3.77	------	3.35	2.86	------
Mean	2.69	2.39	2.32	2.37	2.49	2.82	3.38	3.61	3.69	3.45	3.09	2.79

Calendar year 1956: Max 4.18 Min 2.22 Mean 3.12
Water year 1956-57: Max 3.82 Min 2.22 Mean 2.93

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f Fragmentary gage-height record; gage heights partly estimated by interpolation.

Note.--No gage-height record Oct. 19-31, July 28-30, Aug. 2-8, 24-26, Aug. 31 to Sept. 3; gage heights estimated on basis of once-daily tape-gage readings and adjacent gage heights.

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 in powerhouse at "C" Mill dam.

Drainage area.--234 sq mi.

Records available.--August 1904 to December 1905, October 1942 to September 1957.

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 gages at site 2,000 ft upstream at different datum.

Average discharge.--15 years (1942-57), 315 cfs.

Extremes.--Maximum daily discharge during year, 237 cfs May 28; minimum daily, 32 cfs Sept. 2.

1942-57: Maximum daily discharge, 1,290 cfs June 5, 6, 1947; minimum daily, 6.1 cfs July 6, 1952.

Remarks.--Records good except those for period of no gage-height 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. Diurnal fluctuation at low and medium flow caused by three powerplants. Appreciable regulation by Lake George.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	181	144	156	139	194	172	147	158	231	77	114	55
2	181	144	126	143	191	194	165	158	156	96	117	32
3	180	144	152	146	166	164	164	158	205	99	131	69
4	180	123	165	141	154	206	154	158	230	50	77	87
5	180	144	166	139	200	216	145	157	229	113	110	a87
6	180	159	169	124	225	220	118	121	228	128	126	87
7	86	160	169	153	225	222	105	117	228	127	126	87
8	149	160	168	165	224	222	168	172	228	165	126	87
9	167	160	129	162	225	180	185	172	158	200	126	89
10	171	160	143	162	201	158	187	171	205	199	130	89
11	169	137	162	162	198	186	187	171	229	200	90	89
12	180	147	163	162	210	226	187	123	229	199	113	87
13	188	162	151	127	218	228	157	154	227	138	139	87
14	187	158	159	154	224	230	127	169	228	78	140	87
15	187	158	162	165	224	229	168	168	227	83	139	87
16	187	158	128	165	223	152	179	177	158	143	139	87
17	187	158	143	163	225	104	177	178	202	169	139	87
18	188	114	162	163	225	194	177	177	223	165	138	87
19	188	141	164	162	225	223	176	97	218	161	138	87
20	188	167	164	138	224	219	162	147	217	161	138	87
21	145	169	164	151	224	211	81	192	216	78	138	87
22	159	170	164	169	224	211	139	204	216	140	138	87
23	166	168	76	175	223	173	172	218	127	178	138	87
24	167	168	44	165	178	111	157	231	175	178	123	87
25	168	133	44	166	164	155	229	231	198	178	106	87
26	154	150	127	160	211	171	154	153	200	178	105	85
27	143	160	153	122	207	171	153	203	200	95	110	85
28	131	156	156	139	171	171	115	237	200	62	110	85
29	141	157	156	169	-	153	149	235	205	122	110	85
30	144	156	141	181	--------	138	158	235	105	118	110	85
31	143	--------	145	194	--------	111	--------	233	--------	121	110	-------
Total	5,165	4,585	4,471	4,826	5,803	5,721	4,742	5,475	6,098	4,199	3,794	2,501
Mean	167	153	144	156	207	185	158	177	203	135	122	83.4
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1956: Max 941 Min 34 Mean 270 Cfsm 1.15 In. 15.69
Water year 1956-57: Max 237 Min 32 Mean 157 Cfsm 0.671 In. 9.12

a No gage-height record; discharge estimated on basis of reconstructed gage-height graph.

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 3½ miles northwest of Fair Haven, Rutland County.

Drainage area.--187 sq mi.

Records available.--October 1928 to September 1957.

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

Average discharge.--29 years, 245 cfs.

Extremes.--Maximum discharge during year not determined (occurred Jan. 23 during period of ice effect); maximum gage height, 16.70 ft Jan. 23 (backwater from ice); minimum daily discharge, 6.0 cfs June 22.

1928-57: 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 or no gage-height record, which are fair. Flow regulated by powerplant above station and by Lake Bomoseen.

Revisions (water years).--WSP 1114: 1929(M), 1932-35.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 23				Jan. 24 to Sept. 30			
2.2	40	4.0	380	1.6	6.0	3.0	158
2.5	72	6.0	912	1.9	18	4.0	400
3.0	151	9.0	1,750	2.1	31	6.0	914
				2.5	73	7.0	1,190

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	82	*106	127	135	280	300	163	119	117	130	15	8.8
2	82	121	115	210	270	249	248	111	78	97	50	17
3	83	129	118	190	240	199	358	104	125	85	31	26
4	*49	121	104	190	250	190	297	89	*86	83	17	28
5	58	111	102	200	240	215	304	70	81	160	36	24
6	76	121	104	130	230	195	445	99	88	210	28	27
7	155	114	185	150	210	126	452	75	86	127	27	20
8	185	118	254	180	220	173	352	74	76	121	27	8.0
9	145	116	234	180	220	152	338	68	50	114	27	26
10	129	112	202	180	215	126	328	72	75	106	13	22
11	130	116	*193	150	250	145	309	62	67	*83	29	26
12	112	112	274	145	220	210	300	60	53	83	32	21
13	111	132	358	110	160	192	362	82	56	58	31	22
14	111	131	318	125	170	429	312	72	63	46	31	21
15	104	117	278	140	140	527	271	67	68	57	30	8.0
16	106	125	283	140	200	982	252	166	8.5	55	54	13
17	93	66	330	145	180	654	247	133	44	54	6.4	22
18	97	53	301	140	170	460	228	105	45	42	8.0	23
19	87	112	250	110	149	369	211	54	47	40	32	8.0
20	88	131	234	60	*164	339	204	218	25	38	*27	23
21	85	126	225	105	156	300	200	332	39	7.7	25	*9.0
22	84	673	216	110	138	290	186	245	6.0	38	16	24
23	90	397	202	1,500	75	280	173	179	24	33	25	135
24	82	301	221	1,000	78	252	169	170	63	37	7.0	101
25	84	239	313	800	139	239	142	136	45	33	8.0	109
26	83	207	271	600	192	202	147	114	156	34	28	124
27	87	198	246	450	780	*198	130	252	98	12	38	115
28	111	185	228	400	395	200	141	215	247	7.4	36	95
29	96	165	204	350	-	177	151	162	163	43	31	125
30	112	152	179	320		180	*134	140	134	63	17	120
31	110		160	300		145		126		18	7.4	
Total	3,107	4,907	6,829	8,945	6,131	8,695	7,554	3,971	2,313.5	2,115.1	789.8	1,350.8
Mean	100	164	220	289	219	280	252	128	77.1	68.2	25.5	45.0
Cfsm	0.535	0.877	1.18	1.55	1.17	1.50	1.35	0.684	0.412	0.365	0.136	0.241
In.	0.62	0.98	1.36	1.78	1.22	1.73	1.50	0.79	0.46	0.42	0.16	0.27

Calendar year 1956 : Max 2,780 Min 9.0 Mean 217 Cfsm 1.16 In. 15.79
Water year 1956-57 : Max 1,500 Min 6.0 Mean 155 Cfsm 0.829 In. 11.29

Peak discharge (base, 2,600 cfs).--Jan. 23 (time and discharge unknown).

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 25 to Feb. 10, Sept. 7-21; discharge estimated on basis of 1 discharge measurement, weather records, recorded range in stage, powerplant records, and records for Otter Creek at Center Rutland. Stage-discharge relation affected by ice Dec. 31 to Feb. 18, Feb. 23, 24.

East Creek at Rutland, Vt.

Location.--Lat 43°37'40", long 72°59'20", on left bank on grounds of Rutland Country 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 1957.

Gage.--Water-stage recorder. Altitude of gage is 570 ft (from topographic map).

Average discharge.--17 years, 100 cfs (adjusted for diversion and storage).

Extremes.--Maximum discharge during year, 894 cfs Jan. 23; maximum gage height, 3.55 ft Jan. 23 (ice jam); minimum daily discharge, 14 cfs Aug. 18.

1940-57: 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, which are good. Diversion above station from Mendon Brook for municipal supply of Rutland. Flow regulated by powerplants and Chittenden Reservoir (usable capacity, 819,800,000 cu ft); prior to June 3, 1947, also regulated by East Pittsford Reservoir (usable capacity, 150,000,000 cu ft).

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 21, Apr. 3 to Sept. 30				Nov. 22 to Apr. 2			
1.0	12	1.5	75	1.0	14	1.8	170
1.1	18	1.7	124	1.2	34	2.2	320
1.3	40	2.1	257	1.5	S6	2.7	535

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	77	84	45	b51	100	127	65	41	29	52	60	60
2	82	87	36	b112	41	54	179	47	34	32	48	65
3	85	33	93	b98	40	38	91	33	37	27	23	123
4	85	20	74	99	112	108	54	43	*27	93	36	97
5	*97	72	67	56	99	82	68	32	24	236	78	82
6	32	73	110	24	98	82	123	34	29	74	83	81
7	128	76	179	102	103	87	84	28	46	68	73	24
8	64	74	132	96	107	81	82	31	28	18	78	38
9	87	78	74	95	42	42	63	25	23	32	85	87
10	76	35	104	99	37	30	57	35	44	34	38	84
11	84	29	*105	96	102	67	60	30	17	*36	57	82
12	79	76	142	42	100	70	73	25	45	30	114	84
13	21	102	152	51	101	67	84	37	17	38	78	81
14	36	65	122	b100	105	110	52	47	55	33	75	52
15	71	50	76	b104	94	109	68	65	41	40	72	71
16	85	58	81	*b97	37	182	53	46	18	48	73	88
17	85	38	116	b86	33	100	52	45	67	49	44	75
18	82	30	100	b86	101	92	66	29	63	48	14	53
19	78	56	92	79	*89	58	68	24	80	66	74	59
20	34	59	122	42	94	67	82	147	32	26	82	90
21	24	130	113	111	98	59	95	114	45	22	85	*67
22	93	341	61	b109	102	68	78	56	40	68	78	70
23	82	90	55	b500	37	72	61	49	19	42	72	202
24	82	43	127	b130	20	58	68	40	68	44	52	77
25	81	29	94	b119	103	66	58	43	81	43	56	87
26	83	97	128	b66	125	58	66	34	151	36	87	78
27	31	87	109	b59	255	*56	51	52	51	19	87	90
28	26	91	125	b106	129	56	35	45	103	33	74	26
29	82	73	64	114	-	59	69	30	72	162	77	66
30	84	79	39	104	--------	50	*35	33	34	136	90	84
31	82	--------	89	106	--------	33	--------	26	--------	105	39	--------
Total	2,218	2,255	3,026	3,139	2,504	2,288	2,140	1,366	1,420	1,790	2,082	2,323
Mean	71.5	75.2	97.6	101	89.4	73.8	71.3	44.1	47.3	57.7	67.2	77.4
(†)	-19.6	-2.16	+10.2	-5.49	-25.5	+17.9	+48.5	+26.2	+17.0	+16.4	29.2	-34.2

Adjusted for diversion and change in reservoir contents

Mean	51.9	73.0	108	95.8	63.9	91.7	120	70.3	64.3	74.1	38.0	43.3
Cfsm	1.02	1.43	2.11	1.87	1.25	1.79	2.35	1.38	1.26	1.45	0.744	0.847
In.	1.17	1.59	2.43	2.16	1.30	2.07	2.62	1.59	1.40	1.67	0.86	0.94

	Observed						Adjusted						
Calendar year 1956:	Max	743	Min	17	Mean	96.1	Mean	101	Cfsm	1.98	In.	26.81
Water year 1956-57:	Max	500	Min	14	Mean	72.7	Mean	74.6	Cfsm	1.46	In.	19.80

* 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.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 475.80 ft above mean sea level, datum of 1929. Prior to July 22, 1929, chain gage at same site and datum.

Average discharge.--29 years, 551 cfs.

Extremes.--Maximum discharge during year, 3,370 cfs Jan. 23 (gage height, 6.05 ft); minimum daily, 97 cfs Sept. 8.

1928-57: 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 peak flow over dam; minimum daily, 45 cfs Sept. 21, 1947.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by powerplants and Chittenden Reservoir on East Creek (usable capacity, 819,800,000 cu ft); prior to June 3, 1947, also regulated by East Pittsford Reservoir (usable capacity, 150,000,000 cu ft).

Revisions (water years).--WSP 1084: 1929.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.5	92	3.0	935
1.0	179	4.0	1,560
1.5	303	6.0	3,320
2.0	461		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	236	205	260	350	400	586	349	467	370	283	377	114
2	227	224	272	345	375	428	765	400	345	217	260	139
3	244	242	312	300	375	353	1,080	351	403	173	169	276
4	246	222	298	330	450	352	661	346	*323	313	165	252
5	*279	237	255	310	350	280	560	317	275	941	204	190
6	214	223	363	255	325	280	1,030	295	244	1,120	191	168
7	451	216	712	310	300	298	1,370	269	338	606	179	106
8	544	214	1,030	310	300	292	930	253	335	353	165	97
9	376	210	710	305	250	263	719	231	259	292	177	161
10	308	160	570	300	300	246	638	221	246	267	165	153
11	281	142	519	275	280	229	648	234	194	*244	250	149
12	261	198	*805	242	260	288	654	242	194	229	404	155
13	201	325	1,020	250	300	290	822	280	190	210	249	159
14	206	293	968	280	320	514	628	284	186	186	200	115
15	227	261	660	240	250	780	532	420	192	188	182	130
16	234	265	735	*240	220	1,200	499	703	188	180	171	192
17	230	252	930	240	210	1,120	528	430	190	169	119	216
18	220	234	760	240	280	755	632	337	185	152	115	184
19	210	240	548	230	*280	525	705	299	195	169	144	151
20	161	228	592	190	230	492	802	1,110	160	127	157	165
21	153	375	557	255	252	435	974	1,340	156	107	158	*144
22	220	1,860	488	285	230	460	968	800	142	165	152	180
23	219	1,340	447	2,450	190	482	700	581	122	147	143	881
24	218	625	552	1,600	171	470	598	487	211	130	120	445
25	215	405	735	1,100	242	422	529	400	226	145	116	279
26	206	450	655	850	310	407	493	355	998	126	177	220
27	159	441	506	700	1,240	*392	456	1,020	655	116	199	207
28	149	407	522	550	834	382	455	840	449	144	167	134
29	199	368	441	500	-	382	571	547	356	368	155	160
30	196	347	341	450	-------	373	*495	432	359	551	161	177
31	*199	-------	345	425	------	330	------	357	-------	557	123	-------
Total	7,489	11,209	17,908	14,707	9,524	14,106	20,791	14,648	8,686	8,975	5,714	6,099
Mean	242	374	578	474	340	455	693	473	290	290	184	203
Cfsm	0.788	1.22	1.88	1.54	1.11	1.48	2.26	1.54	0.945	0.945	0.599	0.661
In.	0.91	1.36	2.17	1.78	1.15	1.71	2.52	1.77	1.05	1.09	0.69	0.74
(†)	-23.9	-6.37	+6.16	-10.1	-30.1	+13.3	+44.0	+21.7	+11.7	+11.4	-33.8	-38.6

Calendar year 1956: Max 7,170 Min 98 Mean 557 Cfsm 1.81 In. 24.70
Water year 1956-57: Max 2,450 Min 97 Mean 383 Cfsm 1.25 In. 16.94

Peak discharge (base, 3,400 cfs).--No peak above base.

* 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.; for calendar year 1956, -0.09 cfs; for water year 1957, -2.72 cfs.

Note.--No gage-height record Jan. 24 to Feb. 19; discharge estimated on basis of 1 discharge measurement, weather records, and records for Otter Creek at Middlebury. Stage-discharge relation affected by ice Nov. 25, 26, Dec. 5, Dec. 31 to Jan. 11, Jan. 13-23, Feb. 20, 22, 23, Mar. 5, 6, and at times during period of no gage-height record.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 335.75 ft above mean sea level, datum of 1929. Apr. 1, 1903, to Apr. 30, 1907 and 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.--41 years (1903-6, 1910-19, 1928-57), 978 cfs.

Extremes.--Maximum discharge during year, 2,220 cfs Mar. 16 (gage height, 3.95 ft); minimum daily, 188 cfs Sept. 9.

1903-7, 1910-20, 1928-57: 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 or backwater from aquatic vegetation, which are good. Some regulation by Chittenden Reservoir (usable capacity, 819,800,000 cu ft) on East Creek.

Revisions (water years).--WSP 434: 1903-4. WSP 684: 1913(M), drainage area. WSP 1114: 1913. WSP 1207: 1929, 1931.

Rating table, water year 1956-57, except periods of ice effect or backwater from aquatic vegetation (gage height, in feet, and discharge, in cubic feet per second)

1.2	188	3.0	1,300
1.5	281	4.0	2,280
2.0	555		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	334	*349	597	645	1,120	1,680	667	814	646	786	842	220
2	402	354	503	630	970	1,440	895	765	639	653	660	209
3	436	349	442	625	786	1,120	1,380	681	723	490	460	259
4	*454	349	510	611	702	835	1,450	604	716	466	359	402
5	442	349	520	625	751	680	1,240	590	597	818	285	391
6	454	369	562	585	751	610	1,270	522	503	1,540	359	339
7	604	374	872	496	709	618	1,650	478	618	1,540	359	270
8	910	349	1,340	542	702	604	1,760	460	688	1,350	339	230
9	902	344	1,420	597	660	597	1,640	424	611	925	311	188
10	730	329	1,200	605	639	542	1,440	380	472	*695	302	233
11	597	274	*1,000	595	605	470	1,250	430	436	590	307	267
12	496	239	1,060	535	595	522	1,150	436	396	536	436	274
13	460	325	1,340	480	555	597	1,210	430	369	466	555	277
14	391	510	1,470	470	536	851	1,250	562	329	391	*466	249
15	374	510	1,420	480	542	1,540	1,120	660	329	413	369	214
16	385	424	1,290	460	536	2,170	992	807	315	448	329	226
17	391	436	1,380	440	448	2,170	925	970	290	408	281	290
18	413	413	1,430	415	385	2,050	962	800	329	364	233	311
19	380	385	1,240	390	*442	1,790	1,040	625	349	339	230	270
20	349	380	1,040	375	484	1,440	1,150	709	354	311	242	252
21	298	391	1,020	390	478	1,200	1,280	1,460	339	274	256	249
22	277	1,250	978	550	454	1,080	1,390	1,670	270	270	*256	252
23	324	1,790	872	1,550	442	1,070	1,340	1,500	252	374	245	*574
24	354	1,800	842	1,900	410	1,040	1,160	1,170	324	329	236	1,020
25	374	1,480	1,080	1,920	354	955	1,010	895	472	290	223	737
26	364	1,080	1,190	1,980	584	932	918	723	925	277	204	466
27	334	880	1,070	1,980	1,680	880	858	779	1,340	256	285	374
28	274	786	962	1,920	1,800	*850	793	1,240	1,490	252	285	324
29	277	744	918	1,800		814	800	1,160	1,200	303	285	263
30	329	681	785	1,650	--------	772	*872	895	888	674	274	230
31	349	--------	690	1,390	--------	702	--------	758	--------	772	259	--------
Total	13,458	18,293	31,043	27,631	19,120	32,621	34,862	24,397	17,209	17,600	10,532	9,860
Mean	434	610	1,001	891	683	1,052	1,162	787	574	568	340	329
Cfsm	0.691	0.971	1.59	1.42	1.09	1.68	1.85	1.25	0.914	0.904	0.541	0.524
In.	0.80	1.08	1.84	1.64	1.13	1.93	2.06	1.44	1.02	1.04	0.62	0.58
(†)	-23.9	-6.37	+6.16	-10.1	-30.1	+13.3	+44.0	+21.7	+11.7	+11.4	-33.8	-38.6

Calendar year 1956:	Max	4,800	Min	198	Mean	974	Cfsm	1.55	In. 21.10
Water year 1956-57:	Max	2,170	Min	188	Mean	703	Cfsm	1.12	In. 15.18

* 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; for calendar year 1956, -0.09 cfs; for water year 1957, -2.72 cfs.

Note.--Stage-discharge relation affected by ice Dec. 4, 5, Dec. 30 to Jan. 3, Jan. 6, 10-24, Feb. 11, 12, 24, 28, Mar. 4-6, 11. Backwater from aquatic vegetation Oct. 1 to Nov. 23, June 3-26, June 29 to July 5, July 9 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 1957. 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.--27 years, 55.5 cfs (adjusted for storage).

Extremes.--Maximum discharge during year not determined (occurred Jan. 23 during period of no gage-height record); minimum not determined.

1920-23, 1933-57: Maximum discharge, 1,820 cfs 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, Aug. 3, 4, 31, Sept. 1, 3, 1953.

Remarks.--Records good except those below 10 cfs and those for periods of ice effect or no gage-height record, which are fair. Discharge affected by East Barre Detention Reservoir since 1935 (see p.). 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).--WSP 564: 1922. WSP 1034: Drainage area. WSP 1237: 1921(M).

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 23-26)

Oct. 1 to Jan. 22				Jan. 23 to Sept. 30			
-1.2	4.7	0.0	58	-1.85	1.0	-0.5	33
-1.0	7.7	.5	126	-1.8	1.5	0.0	70
-.8	12	1.0	237	-1.3	4.8	.5	128
-.4	28			-1.1	8.6	1.1	265
				-.8	18		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.1	8.5	10	12	17	40	52	64	18	18	22	2.2
2	*8.3	9.4	11	11	16	35	113	49	23	13	12	2.0
3	9.8	7.7	10	12	15	32	123	45	26	9.8	5.2	1.9
4	9.0	7.4	12	13	16	30	68	45	18	18	3.9	2.2
5	8.8	7.2	*11	11	15	25	56	39	14	39	3.7	1.9
6	7.9	*6.5	13	10	14	25	108	34	12	26	3.3	1.7
7	74	6.0	75	11	13	24	121	30	37	13	2.7	1.5
8	65	6.0	159	11	14	23	73	27	26	9.8	2.2	1.3
9	26	6.0	113	10	12	24	65	24	16	*6.2	2.1	1.1
10	16	5.7	106	*9.5	13	22	62	27	13	5.8	2.0	1.0
11	13	6.4	126	9.0	13	21	62	44	10	4.9	5.0	1.1
12	12	7.5	96	9.0	11	21	66	34	9.8	4.4	6.6	1.1
13	11	13	94	8.5	11	24	89	36	10	3.8	*5.2	1.1
14	10	10	76	8.0	*12	29	69	47	8.2	9.5	3.8	1.0
15	9.6	9.8	50	8.0	11	65	55	58	7.9	16	3.2	1.0
16	9.2	9.4	37	8.0	10	130	57	52	6.6	7.3	2.7	1.5
17	8.5	9.2	40	7.5	11	80	80	34	4.9	5.5	2.3	2.5
18	9.0	9.2	25	7.0	11	45	103	30	4.3	4.5	2.0	1.5
19	8.1	8.5	21	6.7	11	40	121	26	10	3.5	2.0	1.3
20	7.5	9.0	17	6.5	10	*37	151	108	8.9	3.1	1.8	1.3
21	7.4	36	16	6.7	10	40	185	199	5.2	7.0	2.0	2.0
22	7.4	187	15	20	9.0	45	171	103	4.1	15	3.0	*3.5
23	7.2	71	15	250	9.5	55	110	58	3.2	13	1.5	29
24	7.5	23	20	120	9.0	60	94	49	8.3	6.4	1.3	10
25	6.8	18	29	45	9.5	54	*84	34	9.7	7.1	1.2	5.3
26	6.5	16	21	32	80	52	76	31	53	5.2	2.0	3.8
27	6.7	19	13	27	220	53	72	35	20	4.2	*2.5	3.2
28	7.0	18	17	24	100	55	68	*29	64	3.5	2.3	2.8
29	6.8	16	15	22	-	56	62	24	35	10	3.3	2.5
30	6.7	13	12	20	---------	55	85	21	24	26	3.0	2.1
31	6.5	--------	10	18	---------	54	--------	20	--------	8.2	2.5	--------
Total	407.3	579.4	1,285	773.4	703.0	1,351	2,701	1,456	510.1	326.7	118.3	94.4
Mean	13.1	19.3	41.5	24.9	25.1	43.6	90.0	47.0	17.0	10.5	3.82	3.15
(†)	+0.02	+0.09	+0.07	+0.04	+0.64	0	+0.28	-0.71	-0.14	-0.21	-0.13	0

Adjusted for change in contents in East Barre Detention Reservoir

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean	13.2	19.4	41.5	25.0	25.7	43.6	90.3	46.3	16.9	10.3	3.68	3.15
Cfsm	0.327	0.480	1.03	0.619	0.636	1.08	2.24	1.15	0.418	0.255	0.091	0.078
In.	0.38	0.54	1.18	0.71	0.66	1.24	2.49	1.32	0.47	0.29	0.11	0.09

	Observed						Adjusted					
Calendar year 1956:	Max	274	Min	1.6	Mean	40.9	Mean	40.9	Cfsm	1.01	In.	13.79
Water year 1956-57:	Max	250	Min	1.0	Mean	28.2	Mean	28.2	Cfsm	0.698	In.	9.48

* Discharge measurement made on this day.

† Change in contents, equivalent in cubic feet per second, in East Barre Detention Reservoir.

Note.--No gage-height record Jan. 14 to Mar. 28, June 17, 18, 21-23, July 10-14, 17-21, 26-29, Aug. 3 to Sept. 22, Sept. 27-30; discharge estimated on basis of 6 discharge measurements, weather records, recorded range in stage when available, and records for East Barre Detention Reservoir, Dog River at Northfield Falls, and North Branch Winooski River at Wrightsville. Stage-discharge relation affected by ice Nov. 19, 24, 25, Nov. 30 to Dec. 7, Dec. 18, 19, Dec. 26 to Mar. 31.

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 1957.

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.--24 years, 131 cfs (adjusted for storage).

Extremes.--Maximum discharge during year, 580 cfs Apr. 22 (gage height, 3.17 ft); maximum gage height, 4.85 ft Jan. 23 (ice jam); minimum daily discharge, 4.3 cfs Aug. 24.

1933-57: 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 peak flow over dam three-quarters of a mile above gage.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. Discharge affected since 1935 by Wrightsville Detention Reservoir (see following page). Diurnal fluctuation at low flow caused by small mill above station.

Revisions (water years).--WSP 1237: 1934-39.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 27

0.6	23	1.5	132
.9	48	2.0	224
1.2	86	3.0	470

Feb. 28 to Sept. 30

0.1	2.4	1.5	143
.3	8.8	2.0	247
.5	16	3.0	520
.7	27	3.5	705
1.0	61		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	48	60	47	80	440	168	136	47	90	25	9.2
2	34	73	64	46	70	382	278	110	69	87	19	7.8
3	*46	67	58	45	63	270	438	95	105	60	17	7.8
4	49	56	58	48	58	150	406	89	76	185	15	8.1
5	46	48	*50	50	54	92	350	81	56	308	14	8.5
6	40	*43	55	42	50	76	322	70	46	390	12	8.1
7	190	40	94	41	47	73	340	64	112	a300	11	7.8
8	320	38	235	40	45	70	316	57	130	a180	9.4	7.2
9	279	36	220	*42	42	68	256	52	89	*a90	8.4	6.7
10	196	36	160	40	40	67	192	52	61	64	8.1	5.8
11	119	34	125	38	39	57	178	84	46	48	8.8	5.9
12	83	36	122	36	37	57	172	82	40	37	11	5.4
13	67	58	121	33	*36	60	210	85	35	32	11	5.7
14	59	69	104	32	35	73	199	138	32	25	11	5.5
15	54	66	90	31	36	108	166	305	32	25	10	5.5
16	48	76	90	29	33	188	158	404	26	25	9.5	6.6
17	45	83	100	28	35	221	218	363	22	22	9.2	7.8
18	43	79	100	27	33	178	306	289	18	19	8.5	8.5
19	39	67	73	26	30	134	384	176	21	16	7.8	7.8
20	37	58	70	25	29	*130	470	202	24	14	7.2	7.5
21	36	71	72	24	28	127	552	350	20	13	6.7	8.1
22	35	303	71	28	29	156	576	335	16	41	6.3	*9.4
23	33	332	68	300	28	201	*558	268	14	86	4.6	43
24	32	277	66	470	27	214	*524	180	21	56	4.3	62
25	32	174	69	420	26	180	485	129	35	35	4.6	43
26	31	126	62	300	35	170	429	100	199	24	6.5	25
27	30	108	54	200	250	190	366	90	158	19	12	17
28	30	96	56	160	460	184	284	*79	139	15	14	13
29	29	85	55	130	-	188	182	66	120	23	14	11
30	29	78	52	110	--------	190	160	56	92	48	13	9.5
31	28	--------	51	95	--------	174	--------	49	--------	36	11	--------
Total	2,172	2,761	2,725	2,983	1,775	4,868	9,643	4,636	1,901	2,413	329.9	384.2
Mean	70.1	92.0	87.9	96.2	63.4	157	321	150	63.4	77.8	10.6	12.8
(†)	+0.19	+1.50	-0.34	-0.67	+24.1	-19.5	-0.39	-2.48	+0.81	-1.72	-0.67	-0.19

Adjusted for change in contents in Wrightsville Detention Reservoir

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean	70.3	93.5	87.6	96.9	87.5	138	321	147	64.1	76.1	9.97	12.6
Cfsm	1.02	1.35	1.27	1.40	1.26	1.99	4.64	2.12	0.926	1.10	0.144	0.182
In.	1.17	1.51	1.46	1.61	1.32	2.29	5.18	2.45	1.03	1.27	0.17	0.20

	Observed			Adjusted		
Calendar year 1956:	Max 629	Min 7.8	Mean 122	Mean 122	Cfsm 1.76	In. 24.04
Water year 1956-57:	Max 576	Min 4.3	Mean 100	Mean 100	Cfsm 1.45	In. 19.66

* Discharge measurement made on this day.

† Change in contents, equivalent in cubic feet per second, in Wrightsville Detention Reservoir.

a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, recorded range in stage, and records for Dog River at Northfield Falls and Winooski River at Montpelier.

Note.--Stage-discharge relation affected by ice Dec. 1, 2, 4-11, 15-20, 26, 27, Dec. 29 to Mar. 1, Mar. 3-7, 10-12, 14, 18, 19.

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 1957. Maximum gage height observed during year, 12.5 ft Jan. 23; minimum observed, 0.2 ft Sept. 9, 10, 12-15. Maximum gage height observed during period 1936, 1938-57, 36.0 ft Mar. 22, 1936; minimum observed, 0.1 ft several days in August and September 1939, Aug. 4, Sept. 1, 4, 5, 1953, Aug. 5, 6, 1955.

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 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 1957. Maximum gage height observed during year, 24.2 ft Apr. 22; minimum observed, 0.9 ft Aug. 23-25. Maximum gage height during period 1936, 1938-57, 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 by employee of State of Vermont Water Conservation Board.

Month-end gage height and contents, water year Ocotber 1956 to September 1957

Date	Gage height (feet)†	Contents (millions of cubic feet)	Change in contents	
			Millions of cubic feet	Equivalent, cubic feet per second
	East Barre Detention Reservoir			
Sept.30	1.0	0.50	-	-
Oct. 31	1.1	.56	+0.06	+0.02
Nov. 30	1.5	.80	+.24	+.09
Dec. 31	1.8	.99	+.19	+.07
Calendar year 1956	-	-	+.59	+.02
Jan. 31	2.0	1.11	+.12	+.04
Feb. 28	3.9	2.65	+1.54	+.64
Mar. 31	3.9	2.65	0	0
Apr. 30	4.6	3.37	+.72	+.28
May 31	2.5	1.48	-1.89	-.71
June 30	2.0	1.11	-.37	-.14
July 31	1.1	.56	-.55	-.21
Aug. 31	.4	.20	-.36	-.13
Sept.30	.4	.20	0	0
Water year 1956-57	-	-	-.30	-.01
	Wrightsville Detention Reservoir			
Sept.30	1.6	3.75	-	-
Oct. 31	1.8	4.25	+0.50	+0.19
Nov. 30	3.2	8.15	+3.90	+1.50
Dec. 31	2.9	7.25	-.90	-.34
Calendar year 1956	-	-	+4.00	+.13
Jan. 31	3.5	9.05	+1.80	+.67
Feb. 28	16.5	67.4	+58.35	+24.1
Mar. 31	5.4	15.2	-52.2	-19.5
Apr. 30	5.1	14.2	-1.00	-.39
May 31	3.0	7.55	-6.65	-2.48
June 30	3.7	9.65	+2.10	+.81
July 31	2.1	5.05	-4.60	-1.72
Aug. 31	1.4	3.25	-1.80	-.67
Sept.30	1.2	2.75	-.50	-.19
Water year 1956-57	-	-	-1.00	-.03

† 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 1957.

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.--38 years (1914-23, 1928-57), 584 cfs (adjusted for storage since October 1935).

Extremes.--Maximum discharge during year, 3,550 cfs Jan. 23 (gage height, 7.72 ft); maximum gage height, 10.71 ft Jan. 23 (ice jam); minimum daily discharge, 36 cfs Sept. 21.

1909-23, 1928-57: Maximum discharge, 17,200 cfs Apr. 7, 1912 (gage height, 17.31 ft, from floodmarks, 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 period of backwater from aquatic vegetation, which are good, and those for periods of ice effect, 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 by East Barre and Wrightsville Detention Reservoirs since 1935 (see preceding page).

Revisions (water years).--WSP 424: 1915. WSP 894: Drainage area. WSP 1437: 1912-13(M), 1915-18, 1919(M), 1920, 1921(M), 1922-23, 1929, 1933, 1934(M), 1936, 1937(M), 1938, 1946(M).

Rating table, water year 1956-57, except periods of ice effect or backwater from aquatic vegetation (gage height, in feet, and discharge, in cubic feet per second)

2.7	27	4.5	670
2.9	51	5.0	1,020
3.1	84	6.0	1,920
3.5	199	7.0	2,900
4.0	394		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	249	164	240	250	410	1,000	574	598	256	298	164	52
2	310	268	250	230	380	800	1,170	495	293	288	163	47
3	*357	248	220	230	330	660	1,410	469	459	248	110	83
4	343	206	320	260	320	550	1,020	453	362	451	79	60
5	340	179	230	230	350	430	908	390	299	754	96	92
6	268	216	*260	200	320	370	1,190	372	266	844	84	108
7	615	*180	510	200	330	340	1,320	362	539	539	98	62
8	960	206	960	250	320	312	990	308	542	399	77	52
9	716	197	683	230	290	304	885	289	349	320	104	62
10	574	190	550	*240	240	341	761	297	282	*289	178	51
11	458	179	600	250	250	310	748	394	308	256	212	41
12	394	154	628	220	*260	360	742	367	250	182	178	50
13	366	272	604	200	260	400	870	403	210	141	146	57
14	220	296	524	180	250	540	735	610	188	141	*123	41
15	246	266	459	210	230	900	646	894	198	211	107	43
16	334	270	443	220	220	1,540	640	1,000	156	220	87	60
17	316	304	495	210	210	1,110	794	748	113	192	82	72
18	321	230	495	190	200	735	1,000	610	163	136	73	71
19	340	202	350	180	230	660	1,160	464	160	114	88	44
20	244	259	385	150	230	*670	1,370	871	149	118	72	48
21	141	376	385	150	240	690	1,640	1,540	134	163	104	36
22	148	1,460	333	280	210	856	1,610	1,000	102	202	94	62
23	230	945	308	2,500	210	945	*1,380	735	118	333	69	*376
24	196	610	316	1,600	200	794	1,240	610	150	218	50	294
25	189	433	354	900	190	670	1,120	459	235	170	51	184
26	158	372	300	800	450	676	1,000	399	684	152	74	147
27	128	438	220	650	2,200	735	878	459	524	122	66	115
28	129	362	306	520	1,500	670	794	*404	660	111	*98	90
29	136	320	289	470	-	683	664	372	459	128	100	56
30	204	306	229	410	--------	652	683	324	328	242	106	78
31	215	--------	200	380	--------	586	--------	297	--------	160	77	--------
Total	9,845	10,108	12,446	12,990	10,830	20,289	29,942	16,993	8,936	8,142	3,210	2,634
Mean	318	337	401	419	387	654	998	548	298	263	104	87.8
(†)	-49.4	-9.16	+2.12	-18.0	+14.2	-30.5	+42.4	+25.8	+6.78	-3.26	-17.4	-7.35

Adjusted for change in reservoir contents

Mean	268	328	404	401	401	624	1,040	574	305	259	86.1	80.4
Cfsm	0.675	0.826	1.02	1.01	1.01	1.57	2.62	1.45	0.768	0.652	0.217	0.203
In.	0.78	0.92	1.17	1.16	1.05	1.81	2.92	1.67	0.86	0.75	0.25	0.23

	Observed			Adjusted		
Calendar year 1956:	Max 4,000	Min 68	Mean 547	Mean 549	Cfsm 1.38	In. 18.82
Water year 1956-57:	Max 2,500	Min 36	Mean 401	Mean 397	Cfsm 1.00	In. 13.57

Peak discharge (base, 3,900 cfs).--No peak above base.

* 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.

Note.--Stage-discharge relation affected by ice Dec. 1-7, 10, 11, 19, 26, 27, Dec. 31 to Mar. 7, Mar. 11-15, 19. Backwater from aquatic vegetation July 13 to Sept. 30.

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 1957.

Gage.--Water-stage recorder. Datum of gage is 603.00 ft above mean sea level (levels by Corps of Engineers).

Average discharge.--23 years, 121 cfs.

Extremes.--Maximum discharge during year, 2,030 cfs Jan. 23 (gage height, 5.16 ft); minimum, 6.1 cfs Sept. 15.

1934-57: Maximum discharge, 9,750 cfs Sept. 21, 1938 (gage height, 11.53 ft), from rating curve extended above 1,500 cfs on basis of computation of flow over dam at gage height 8.49 ft and slope-area determinations at gage heights 8.96 and 11.53 ft; minimum, 4.3 cfs Aug. 31, Sept. 7, 1942.

Remarks.--Records good except those for periods of ice effect, which are fair. Some regulation at low flow by powerplant above station.

Revisions (water years).--WSP 1237: 1935-37.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 23				Jan. 24 to Sept. 30			
0.9	22	2.0	230	0.5	5.1	1.5	106
1.0	30	2.5	420	.6	7.9	2.0	240
1.2	50	3.0	655	.8	16	2.5	420
1.5	98	4.0	1,230	1.0	32	3.0	655
				1.2	54	3.5	930

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	33	39	57	88	165	111	102	64	50	30	7.6
2	*34	35	47	54	82	130	231	91	64	42	22	7.9
3	38	31	42	56	80	110	196	85	62	32	16	11
4	34	29	*46	60	82	88	146	83	55	36	14	12
5	33	28	41	55	70	76	141	78	49	57	14	*9.2
6	28	*27	54	50	61	80	236	71	42	54	13	8.8
7	153	26	253	55	64	76	237	66	87	40	12	7.9
8	114	26	262	*54	65	75	196	62	67	34	11	7.0
9	77	25	159	51	57	78	178	57	54	*29	11	7.9
10	63	25	120	49	64	71	161	65	46	28	14	7.6
11	56	22	100	42	54	64	154	75	37	25	20	7.6
12	50	27	132	44	*44	65	154	64	35	25	16	7.3
13	48	43	141	43	50	75	164	65	34	21	*14	7.0
14	46	36	116	40	54	126	146	60	30	21	13	7.6
15	43	34	109	40	45	192	131	130	28	56	12	6.4
16	41	32	120	40	43	255	131	102	25	39	11	8.8
17	39	30	129	38	48	180	154	79	22	28	10	9.6
18	36	32	113	36	48	138	191	71	20	21	9.6	8.2
19	34	30	80	34	47	121	234	65	26	19	10	7.0
20	34	28	105	33	44	*121	258	199	22	17	9.6	7.0
21	33	50	92	34	42	128	261	250	18	18	9.2	7.6
22	33	290	87	50	37	156	196	151	16	24	8.5	*8.8
23	32	122	85	1,050	41	170	*164	121	15	30	8.5	50
24	32	71	85	290	38	156	146	104	21	20	7.9	25
25	30	65	90	210	41	134	131	83	36	18	7.3	15
26	29	73	70	165	150	131	124	80	97	16	11	12
27	28	69	60	145	772	131	116	87	53	15	12	10
28	28	65	79	125	240	*121	108	*76	87	14	10	9.2
29	28	60	76	115	-	126	102	69	65	22	8.8	8.5
30	27	58	58	105	--------	124	124	61	54	44	8.8	9.2
31	26	--------	50	95	--------	111	--------	58	--------	25	8.5	--------
Total	1,365	1,522	3,040	3,315	2,551	3,774	5,022	2,810	1,331	920	382.7	318.7
Mean	44.0	50.7	98.1	107	91.1	122	167	90.6	44.4	29.7	12.3	10.6
Cfsm	0.578	0.666	1.29	1.41	1.20	1.60	2.19	1.19	0.583	0.390	0.162	0.139
In.	0.67	0.74	1.49	1.62	1.25	1.84	2.45	1.37	0.65	0.45	0.19	0.16

Calendar year 1956:	**Max** 1,310		**Min** 11		**Mean** 105		Cfsm 1.38		In. 18.73
Water year 1956-57:	**Max** 1,050		**Min** 6.4		**Mean** 72.2		Cfsm 0.949		In. 12.88

Peak discharge (base, 1,600 cfs).--Jan. 23 (11 a.m.) 2,030 cfs (5.16 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 24, 25, Dec. 1-6, 10, 11, 19, 26, 27, Dec. 30 to Feb. 3, Feb. 5-7, 9, 11-13, 15, 16, 21-26, Mar. 1-7, 11, 12.

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 1957.

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.--29 years (1928-57), 250 cfs.

Extremes.--Maximum discharge during year, 5,540 cfs Jan. 23 (gage height, 8.75 ft), from rating curve extended above 2,500 cfs as explained below; minimum, 12 cfs Sept. 30; minimum daily, 14 cfs Sept. 15.

1910, 1928-57: Maximum discharge, 18,400 cfs Sept. 22, 1938 (gage height, 16.34 ft, from floodmarks), 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, 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 doubtful gage-height record, which are good, and 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).--WSP 744: Drainage area. WSP 854: 1934(M). WSP 1114: 1929, 1930(M), 1936-37.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-7		Oct. 8 to Sept. 30			
3.2	77	2.8	14	4.0	380
3.4	127	2.9	26	4.5	680
3.7	230	3.0	41	5.0	1,050
4.0	365	3.2	83	6.0	1,970
4.5	660	3.5	164	8.0	4,460
5.0	1,040				

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	88	d105	100	110	145	310	167	268	161	350	214	20
2	86	d115	120	105	140	240	504	221	195	171	126	18
3	*130	d88	105	110	135	200	375	202	178	126	93	37
4	103	79	115	120	135	160	255	195	137	171	76	49
5	93	d76	105	110	130	135	241	184	112	334	69	33
6	82	*72	165	92	115	145	445	161	100	229	59	25
7	665	70	950	92	120	140	439	149	389	149	53	21
8	413	68	681	110	120	140	323	137	221	178	47	18
9	246	66	405	105	105	143	286	126	155	131	41	22
10	181	68	330	100	115	130	255	126	123	*126	48	19
11	d150	57	310	85	96	115	241	161	105	102	65	17
12	d135	77	360	90	78	120	263	143	97	100	74	17
13	d120	143	340	90	*84	145	286	158	90	81	53	18
14	118	106	270	80	94	260	241	174	79	72	*42	17
15	d105	102	255	82	80	460	214	482	81	189	37	14
16	d100	105	281	82	77	715	210	387	68	107	34	18
17	d95	112	285	78	86	418	272	250	53	83	32	47
18	d85	105	240	73	86	281	349	206	47	67	30	33
19	d77	90	155	68	80	230	489	181	81	56	31	24
20	d72	104	220	66	78	225	688	481	68	49	25	20
21	70	195	195	68	71	*221	946	556	49	68	23	21
22	d70	a980	178	200	66	241	570	354	41	161	23	25
23	d68	364	171	3,500	74	259	435	277	39	164	21	*244
24	d68	175	170	600	67	241	*402	246	79	97	20	98
25	d65	150	190	490	82	206	*349	195	132	74	17	59
26	d63	185	150	370	300	202	314	184	348	61	33	41
27	d61	175	120	330	1,400	206	295	241	140	51	48	35
28	63	165	165	270	420	188	277	181	178	61	30	28
29	d61	150	160	220	-	188	241	*155	203	272	24	27
30	d59	140	105	185	--------	184	370	137	174	277	23	32
31	d61	--------	90	155	--------	171	--------	131	--------	134	22	--------
Total	3,853	4,487	7,486	8,236	4,579	7,019	10,742	7,049	3,923	4,291	1,533	1,097
Mean	124	150	241	266	164	226	358	227	131	138	49.5	36.6
Cfsm	0.892	1.08	1.73	1.91	1.18	1.63	2.58	1.63	0.942	0.993	0.356	0.263
In.	1.03	1.20	2.00	2.20	1.23	1.88	2.87	1.89	1.05	1.15	0.41	0.29

Calendar year 1956 :	Max 2,200	Min 18	Mean 227	Cfsm 1.63	In. 22.20
Water year 1956-57 :	Max 3,500	Min 14	Mean 176	Cfsm 1.27	In. 17.20

Peak discharge (base, 3,400 cfs).--Jan. 23 (9:30 a.m.) 5,540 cfs (8.75 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.

d Doubtful gage-height record; discharge computed on basis of recorder graph, weather records, and records for Dog River at Northfield Falls.

Note.--Stage-discharge relation affected by ice Nov. 24, Dec. 5-7, 9-15, 17-21, Dec. 24 to Mar. 7, Mar. 10-16, 19, Apr. 3, 4 (no gage-height record Nov. 25 to Dec. 4, Jan. 10-17).

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 1957.

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, 593.61 ft July 5, 6; minimum, 537.92 ft Mar. 24, 25.

1938-57: 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.

Capacity table, water year 1956-57 (elevation, in feet, and contents, in millions of cubic feet)

530.0	180.8	570.0	891.9
540.0	302.7	580.0	1,168.5
550.0	461.7	590.0	1,505.0
560.0	658.8	600.0	1,913.4

Elevation, in feet, at 12 p.m., water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	577.09	571.20	570.78	574.62	569.97	556.89	545.27	580.72	589.45	591.72	582.12	574.07
2	577.85	570.81	571.09	573.91	569.69	555.60	549.03	580.69	590.08	591.15	581.95	574.14
3	576.67	570.92	570.40	573.16	569.60	554.09	550.33	580.41	590.13	590.79	582.07	573.85
4	576.35	571.14	570.16	572.52	568.95	553.19	551.26	580.87	589.93	591.85	582.25	573.31
5	575.78	570.56	569.63	571.96	568.25	552.02	551.02	581.04	589.74	593.61	581.88	572.60
6	576.01	570.14	569.46	571.80	567.53	550.95	551.73	580.76	589.54	593.36	581.48	572.06
7	578.10	569.59	572.59	571.04	566.75	549.87	552.35	580.62	589.72	592.73	581.13	572.14
8	578.65	568.83	574.50	570.41	565.98	548.72	552.01	580.51	589.74	591.97	580.71	572.23
9	579.01	568.14	575.47	569.76	565.56	547.75	551.69	580.43	590.02	591.14	580.29	572.12
10	579.11	567.79	575.95	569.01	565.51	546.60	551.63	580.52	589.75	590.31	580.42	571.96
11	578.65	567.92	576.16	568.27	564.52	545.37	551.55	581.13	589.48	589.81	580.39	571.70
12	578.47	567.31	576.93	568.12	563.64	544.12	551.70	581.55	589.28	589.25	579.98	571.57
13	578.61	567.20	577.58	568.35	562.70	543.07	552.84	582.07	588.99	588.63	579.50	571.42
14	578.49	567.02	577.93	567.36	561.79	542.40	553.79	582.76	588.70	588.95	579.04	571.50
15	578.31	566.98	578.01	566.35	560.83	542.73	553.89	585.90	588.85	588.46	578.61	571.24
16	577.91	566.75	578.37	565.42	559.87	543.42	554.02	587.12	588.88	587.89	578.17	571.51
17	577.61	567.29	578.45	564.41	559.95	542.67	554.85	587.42	588.54	587.20	578.24	571.66
18	577.13	567.64	578.01	563.37	558.88	541.43	556.25	587.96	588.20	586.51	577.91	571.60
19	576.59	567.21	577.40	563.37	557.78	540.52	559.13	588.42	588.11	585.80	577.49	571.53
20	576.55	566.81	577.04	563.30	556.67	539.67	563.89	588.88	587.89	585.01	577.09	571.46
21	576.09	567.13	576.74	562.30	555.54	539.13	570.81	588.82	587.69	585.25	576.73	571.63
22	575.69	569.76	576.87	562.89	554.22	538.70	572.93	588.78	587.54	586.60	576.31	571.81
23	575.29	570.67	577.18	570.09	553.19	538.52	574.57	588.59	587.74	586.41	575.79	572.96
24	574.86	571.07	577.32	570.74	552.97	538.04	576.05	588.55	587.82	585.89	575.86	573.11
25	574.42	571.46	577.90	570.72	551.75	538.47	576.84	588.66	588.58	585.21	575.88	573.09
26	574.00	571.55	577.36	571.07	552.37	539.57	577.59	588.90	589.55	584.42	575.69	572.98
27	574.03	571.58	576.71	571.53	558.39	540.52	578.76	588.89	589.63	583.74	575.33	572.71
28	573.18	571.28	576.37	571.41	557.97	541.37	579.76	588.88	589.49	583.94	574.88	572.81
29	572.43	571.02	575.91	571.45	-	542.17	580.08	588.91	589.76	583.48	574.37	572.83
30	571.92	570.80	575.72	570.78	-------	543.37	580.57	589.13	590.46	582.60	573.93	572.54
31	571.42	-------	574.90	570.60	-------	544.41	-------	589.21	-------	582.23	574.01	-------
(†)	929.1	912.8	1,021.0	907.6	616.9	368.4	1,186.6	1,477.0	1,522.8	1,239.7	997.6	958.7
(‡)	-60.6	-6.29	+40.4	-42.3	-120	-92.8	+316	+108	+17.7	-106	-90.4	-15.0

Calendar year 1956.................... ‡ +2.23

Water year 1956-57.................... ‡ -4.21

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† Contents, in millions of cubic feet, at end of month.

‡ Change in contents, equivalent in cubic feet per second.

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 1957.

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 at site 2 miles upstream at different datum.

Average discharge.--21 years (1936-57), 229 cfs (adjusted for storage).

Extremes.--Maximum discharge during year, 570 cfs July 22 (gage height, 7.79 ft); minimum daily, 4.7 cfs Sept. 2.

1935-57: Maximum discharge, 6,520 cfs Mar. 18, 1936 (gage height, 19.38 ft); minimum daily, 0.6 cfs several times during summers of 1938-39, 1941, and 1944.

Remarks.--Records excellent except those below 25 cfs and those for period of no gage-height record, which are good. Flow completely regulated by Waterbury Reservoir (see preceding page).

Revisions (water years).--WSP 824: 1936.

Rating table, water year 1956-57 (gage height, in feet, and discharge, in cubic feet per second)

5.0	4.2	6.5	163
5.1	6.8	7.0	287
5.3	14	7.5	450
5.6	34	8.0	665
6.0	77		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	187	236	104	175	287	486	17	169	7.1	415	117	4.9
2	192	243	6.8	308	181	482	67	179	8.3	544	127	4.7
3	*205	67	300	308	131	462	152	248	139	414	10	159
4	206	7.1	167	273	292	318	67	7.7	207	414	6.8	208
5	268	250	231	247	284	323	297	87	175	424	190	249
6	6.8	189	*182	117	285	327	311	232	195	548	190	190
7	16	229	86	a290	298	325	238	174	392	544	164	5.7
8	112	276	21	a255	296	328	321	151	191	544	188	5.2
9	52	259	9.8	*a258	188	311	310	136	7.1	544	191	59
10	101	160	65	269	109	324	229	181	219	505	6.5	72
11	268	29	138	280	312	319	231	7.1	203	345	76	112
12	159	263	11	110	273	305	208	6.8	206	365	190	75
13	43	191	9.5	14	289	320	8.9	96	202	353	198	78
14	150	154	31	330	294	300	8.0	36	199	7.7	*198	5.2
15	154	131	129	317	295	317	162	46	17	330	192	98
16	228	241	63	306	292	446	157	57	48	341	177	116
17	181	5.9	148	318	56	446	155	175	190	347	5.9	66
18	222	17	300	320	310	424	136	8.6	190	346	148	76
19	240	207	300	67	313	309	35	8.3	194	349	171	65
20	78	201	259	79	291	306	11	409	188	350	157	81
21	207	231	231	311	303	*289	11	503	139	8.0	143	5.2
22	188	12	96	229	310	299	139	333	111	331	165	*47
23	195	8.6	25	130	285	283	129	346	24	360	189	72
24	194	29	94	201	113	282	131	221	92	350	5.7	72
25	193	6.5	9.2	248	312	126	151	95	152	357	20	77
26	192	131	280	94	348	45	162	42	439	356	165	90
27	49	141	309	34	374	60	8.0	153	230	341	176	126
28	331	222	232	185	486	75	7.7	154	329	8.0	175	5.2
29	292	203	278	140	-	64	188	*124	301	395	183	30
30	213	177	131	304	--------	8.0	179	6.7	52	473	173	120
31	218	--------	333	162	--------	7.7	--------	108	--------	225	5.4	--------
Total	5,340.8	4,517.1	4,579.3	6,679	7,607	8,716.7	4,226.6	4,500.2	5,046.5	11,233.7	4,103.3	2,374.1
Mean	172	151	148	215	272	281	141	145	168	362	132	79.1
(†)	-60.6	-6.29	+40.4	-42.3	-120	-92.8	+316	+108	+17.7	-106	-90.4	-15.0

Adjusted for change in contents in Waterbury Reservoir

Mean	112	144	188	173	152	188	457	254	186	257	42.0	64.1
Cfsm	1.01	1.30	1.69	1.56	1.37	1.69	4.12	2.29	1.68	2.32	0.378	0.577
In.	1.16	1.45	1.95	1.80	1.42	1.96	4.59	2.63	1.87	2.67	0.44	0.64

	Observed			Adjusted		
Calendar year 1956:	Max 1,040	Min 4.2	Mean 214	Mean 217	Cfsm 1.95	In. 26.56
Water year 1956-57:	Max 548	Min 4.7	Mean 189	Mean 185	Cfsm 1.67	In. 22.58

* 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 1 discharge measurement, weather records, observer's once- or twice-daily tape-gage readings, and records for station at Waterbury Reservoir.

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 1957.

Gage.--Water-stage recorder. Altitude of gage is 185 ft (from topographic map).

Average discharge.--29 years, 1,658 cfs (adjusted for storage since October 1938).

Extremes.--Maximum discharge during year, about 11,400 cfs Jan. 23 (occurred during period of ice effect); maximum gage height, 10.60 ft Jan. 23 (ice jam); minimum daily discharge, 103 cfs Aug. 25.

1928-57: 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 floodmarks), from rating curve extended above 27,000 cfs by method explained above.

Remarks.--Records excellent except those for periods of ice effect, 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. 349), and by East Barre and Wrightsville Detention Reservoirs since 1935 (see p. 345).

Revisions (water years).--WSP 714: 1930(M). WSP 894: Drainage area.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	101	2.5	1,630
.6	180	3.0	2,380
1.0	329	4.0	4,400
1.5	620	6.0	9,230
2.0	1,060		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	622	702	*708	750	1,350	3,500	1,300	1,700	754	1,340	658	173
2	726	*744	449	840	1,250	2,500	1,810	1,430	788	1,630	735	156
3	792	730	740	900	1,200	2,000	3,420	1,290	1,160	1,380	488	438
4	888	430	880	910	980	1,650	2,320	1,260	964	1,580	348	432
5	773	632	850	900	1,120	1,450	2,100	1,010	882	2,340	585	464
6	813	626	934	570	1,080	1,300	2,640	*1,120	716	2,690	524	416
7	1,270	605	2,000	800	1,050	1,250	3,750	773	1,370	1,890	511	161
8	2,360	604	3,620	850	1,020	1,210	2,800	908	1,840	1,750	476	166
9	1,700	734	2,230	870	1,000	1,230	2,380	766	1,260	1,530	*523	266
10	1,390	659	1,490	840	740	1,160	2,130	940	*723	1,440	256	242
11	756	356	1,290	800	850	1,110	1,920	876	856	1,040	308	248
12	1,060	539	1,620	710	980	1,190	1,800	816	790	930	732	238
13	808	726	1,710	410	910	1,320	1,920	912	762	866	598	264
14	572	790	1,450	730	820	1,750	1,700	1,110	734	516	518	136
15	832	648	1,200	770	940	2,500	1,580	2,420	600	720	570	221
16	752	799	1,390	800	760	4,800	1,500	3,080	164	1,020	520	*294
17	806	654	1,360	780	520	4,300	1,660	2,070	662	954	170	383
18	696	504	1,500	700	700	2,900	2,080	1,570	516	760	242	312
19	785	715	1,080	570	900	2,210	2,580	1,220	576	652	479	242
20	684	658	1,090	450	860	2,110	3,360	1,660	685	621	428	274
21	533	990	1,310	700	880	2,000	4,580	4,380	559	478	411	177
22	637	3,490	1,160	1,100	840	2,180	3,910	3,020	373	1,530	385	201
23	576	2,550	906	5,800	780	2,310	3,060	2,210	386	1,650	431	904
24	611	1,660	938	7,000	600	2,200	2,760	1,870	638	1,060	136	944
25	602	1,060	1,070	3,000	700	*1,910	2,470	1,550	760	796	103	578
26	716	1,000	1,170	2,100	1,000	1,620	2,180	1,080	2,230	704	446	499
27	736	1,070	770	1,750	5,000	1,580	1,900	1,180	1,770	760	400	500
28	302	1,040	1,100	1,600	6,000	1,570	1,710	1,240	1,530	546	415	146
29	470	1,010	1,100	1,500	-	1,530	1,630	1,030	1,510	784	464	181
30	646	942	500	1,450	--------	1,490	1,730	790	1,280	1,580	399	427
31	588	--------	800	1,450	--------	1,340	--------	800	--------	1,360	154	--------
Total	25,502	27,667	38,415	42,400	34,830	61,170	70,680	46,081	27,838	36,897	13,413	10,083
Mean	823	922	1,239	1,368	1,244	1,973	2,356	1,486	928	1,190	433	336
(†)	-110	-15.5	+42.5	-60.3	-106	-123	+358	+134	+24.4	-109	-108	-22.4

Adjusted for change in reservoir contents

Mean	713	907	1,282	1,307	1,138	1,850	2,714	1,621	952	1,081	325	314
Cfsm	0.683	0.869	1.23	1.25	1.09	1.77	2.60	1.55	0.912	1.04	0.311	0.301
In.	0.79	0.97	1.42	1.44	1.14	2.04	2.90	1.79	1.02	1.19	0.36	0.34

	Observed			Adjusted		
Calendar year 1956:	Max 12,500	Min 182	Mean 1,594	Mean 1,597	Cfsm 1.53	In. 20.83
Water year 1956-57:	Max 7,000	Min 103	Mean 1,192	Mean 1,184	Cfsm 1.13	In. 15.40

Peak discharge (base, 12,500 cfs).--No peak above base.

* Discharge measurement made on this day.

† Change in contents, equivalent in cubic feet per second, in Peacham Pond, Molly Falls Reservoir, East Barre and Wrightsville Detention Reservoirs, and Waterbury Reservoir. Part of records furnished by State of Vermont Water Conservation Board and Green Mountain Power Corp.

Note.--Stage-discharge relation affected by ice Dec. 3-5, Dec. 27 to Mar. 7, Mar. 15-18.

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 1957.

Gage.--Water-stage recorder. Altitude of gage is 495 ft (from topographic map). Prior to Dec. 31, 1913, chain gage at bridge 0.7 mile downstream at different datum.

Average discharge.--29 years (1928-57), 517 cfs.

Extremes.--Maximum discharge during year, 4,820 cfs Jan. 23 (gage height, 9.97 ft); minimum, 73 cfs June 18; minimum daily, 140 cfs Jan. 15.

1910-13, 1928-57: 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.

Remarks.--Records excellent except those for periods of ice effect, which are fair. Flow regulated by powerplant above station.

Revisions (water years).--WSP 894: Drainage area. WSP 1114: 1933, 1934(M). WSP 1237: 1912(M), 1930, 1932(M).

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.8	137	4.0	1,000
2.0	188	6.0	1,990
3.0	550	8.0	3,280

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	211	280	*205	170	245	955	568	604	418	482	312	195
2	211	*255	235	190	220	690	1,330	486	386	356	245	193
3	229	198	225	200	210	498	1,380	334	512	255	214	231
4	220	176	230	190	225	394	883	363	301	824	220	226
5	185	190	230	220	210	300	734	345	257	1,230	214	212
6	179	214	260	190	195	275	1,040	*319	228	1,130	229	214
7	686	220	735	205	195	265	1,240	284	569	687	217	208
8	739	208	1,040	210	210	251	906	284	410	669	217	179
9	506	214	570	*211	210	261	770	259	291	612	206	179
10	287	203	345	194	200	245	586	300	*284	204	198	185
11	242	191	350	175	205	250	564	595	221	191	245	185
12	236	205	462	175	180	242	622	386	212	201	223	184
13	250	315	466	160	*170	274	793	410	214	223	220	192
14	281	271	325	155	175	334	680	608	191	211	213	185
15	274	229	310	140	190	506	600	1,490	180	311	203	177
16	221	248	337	155	175	1,000	554	1,360	142	245	196	*247
17	201	248	426	165	175	1,080	943	780	190	217	174	356
18	184	245	350	165	185	770	1,220	510	165	195	193	217
19	185	191	245	160	170	546	1,520	446	216	208	190	211
20	187	208	330	155	170	506	2,120	1,060	301	205	188	195
21	159	292	286	195	155	490	3,170	1,730	197	208	187	211
22	180	1,220	275	400	160	680	2,130	906	172	1,410	177	197
23	211	806	245	2,600	175	860	1,360	672	189	1,550	174	767
24	214	434	284	1,300	170	784	1,220	568	345	586	170	422
25	220	240	322	800	160	*618	973	414	331	245	180	239
26	205	301	265	520	350	564	847	348	1,200	315	232	203
27	181	352	210	230	2,000	690	775	482	426	239	293	185
28	185	315	274	360	1,560	662	604	379	434	242	188	180
29	214	312	255	360	-	644	681	341	411	340	165	182
30	198	250	210	330	--------	618	425	301	326	756	208	167
31	214	--------	190	250	--------	514	--------	284	--------	430	198	--------
Total	7,895	9,031	10,492	10,930	8,645	16,766	31,238	17,648	9,719	14,977	6,489	6,924
Mean	255	301	338	353	309	541	1,041	569	324	483	209	231
Cfsm	0.823	0.971	1.09	1.14	0.997	1.75	3.36	1.84	1.05	1.56	0.674	0.745
In.	0.95	1.08	1.26	1.31	1.04	2.01	3.75	2.12	1.17	1.80	0.78	0.83

Calendar year 1956: Max 4,680 Min 144 Mean 485 Cfsm 1.56 In. 21.29
Water year 1956-57: Max 3,170 Min 140 Mean 413 Cfsm 1.33 In. 18.10

Peak discharge (base, 5,400 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 25, Nov. 30 to Dec. 7, Dec. 9-11, 14, 15, 18, 19, 22, 26, 27, Dec. 30 to Jan. 8, Jan. 11 to Feb. 27, Mar. 5-7, 11.

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 1957. 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.--28 years, 1,209 cfs, adjusted to present drainage area.

Extremes.--Maximum discharge during year, about 8,500 cfs Jan. 23; maximum gage height, 16.45 ft Jan. 23 (ice jam); minimum daily discharge, 246 cfs Aug. 18.
1929-57: 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, 16.59 ft Apr. 5, 1956 (ice jam); minimum daily discharge, 91 cfs July 30, 1933.

Remarks.--Records excellent except those for periods of ice effect, which are fair. Low flow regulated by powerplants above station.

Revisions.--WSP 894: Drainage area.

Rating tables, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 22				Jan. 23 to Sept. 30			
2.8	309	4.0	970	2.6	244	5.0	1,910
3.0	383	5.0	1,910	3.0	390	6.0	3,190
3.5	620	6.0	3,190	4.0	990	8.0	7,210

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	436	*386	400	380	530	2,100	1,130	1,240	648	2,490	*758	335
2	592	565	500	430	480	1,500	2,220	1,110	796	1,650	654	344
3	560	430	480	460	460	1,100	3,460	934	1,130	964	512	358
4	532	391	490	440	490	900	1,990	868	796	2,140	488	444
5	444	376	500	500	460	700	1,680	*855	660	2,610	488	385
6	391	375	540	440	420	600	2,310	777	600	2,810	390	382
7	679	372	1,600	470	420	580	3,240	673	1,190	1,370	394	378
8	1,630	382	2,300	480	460	550	2,080	618	1,290	1,510	394	283
9	1,020	372	1,300	490	460	570	1,670	612	*855	1,140	369	322
10	695	373	1,000	*445	450	530	1,400	606	680	970	316	312
11	506	374	950	410	460	540	1,270	1,090	636	654	390	254
12	478	356	900	400	400	530	1,250	962	498	622	382	270
13	516	472	850	360	370	600	1,470	868	524	542	381	339
14	493	614	850	355	380	750	1,360	1,380	495	522	358	278
15	506	474	780	320	410	1,100	1,180	2,900	490	537	345	*266
16	465	496	770	350	380	2,200	1,110	4,060	313	642	324	331
17	399	582	760	370	380	2,400	1,370	2,040	423	518	328	666
18	410	554	720	370	400	1,700	2,290	1,410	380	470	246	606
19	362	492	600	360	370	1,300	2,800	1,110	339	388	334	299
20	372	434	700	350	370	1,150	3,880	1,930	544	360	275	350
21	358	467	650	420	340	1,100	5,860	4,150	540	379	288	360
22	338	2,030	600	900	350	1,500	5,750	2,370	356	2,170	258	431
23	356	1,800	560	6,000	380	2,000	3,240	1,620	316	3,850	280	1,330
24	376	915	600	2,900	370	1,800	2,840	1,310	716	1,680	252	1,340
25	398	670	640	1,800	350	1,400	2,270	1,080	799	784	251	718
26	376	609	560	1,200	750	1,300	1,850	920	3,060	648	274	540
27	346	712	500	520	5,000	1,460	1,680	894	1,660	594	401	405
28	325	759	570	800	3,500	1,440	1,490	969	1,010	534	442	364
29	394	668	550	800	-	1,390	1,340	914	934	596	270	331
30	360	*600	470	730	--------	1,300	1,380	770	1,080	1,700	261	334
31	346	--------	430	540	--------	1,180	--------	692	--------	1,050	305	--------
Total	15,459	18,100	23,120	24,790	19,590	37,270	66,860	41,732	23,758	36,894	11,408	13,355
Mean	499	603	746	800	700	1,202	2,229	1,346	792	1,190	368	445
Cfsm	0.727	0.879	1.09	1.17	1.02	1.75	3.25	1.96	1.15	1.73	0.536	0.649
In.	0.84	0.98	1.25	1.34	1.06	2.02	3.62	2.26	1.29	2.00	0.62	0.72

Calendar year 1956: Max 10,400 Min 234 Mean 1,078 Cfsm 1.57 In. 21.39
Water year 1956-57: Max 6,000 Min 246 Mean 911 Cfsm 1.33 In. 18.00

Peak discharge (base, 10,400 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 24, 25, Nov. 30 to Mar. 26 (no gage-height record Jan. 14 to Feb. 13, Feb. 28 to Mar. 24; discharge estimated on basis of weather records and records for station at Johnson).

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 1957.

Gage.--Water-stage recorder. Altitude of gage is 580 ft (from topographic map).

Average discharge.--26 years, 265 cfs.

Extremes.--Maximum discharge during year, 4,740 cfs Jan. 23 (gage height, 9.88 ft); minimum, 26 cfs Aug. 26; minimum daily, 28 cfs Aug. 25.

1931-57: 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; minimum daily, 11 cfs Aug. 28, 1949, Aug. 30, 1953.

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).--WSP 924: 1940. WSP 1114: 1933(M), 1936-39.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	28	3.0	352
1.6	58	5.0	1,170
2.0	108	7.0	2,350
2.5	213	9.0	3,950

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	68	90	85	115	522	278	349	180	877	*110	31
2	90	92	105	75	110	338	730	255	211	408	90	30
3	125	76	85	77	105	240	776	221	227	215	80	84
4	110	70	100	82	110	180	397	*213	138	847	76	80
5	95	62	88	78	100	155	333	184	113	974	63	44
6	80	62	105	75	90	140	771	161	95	468	59	56
7	140	62	990	78	90	130	704	132	401	244	53	43
8	600	60	1,100	76	90	125	406	136	*255	199	48	39
9	350	56	350	72	85	122	349	116	145	140	47	37
10	200	54	230	69	85	115	292	170	117	124	44	35
11	160	52	200	*58	75	110	298	309	92	119	43	36
12	135	79	270	62	70	111	321	208	97	108	48	39
13	120	168	215	60	64	129	340	190	97	86	49	35
14	105	115	125	47	68	167	262	386	78	81	44	*36
15	95	101	155	55	*70	323	216	1,020	78	82	39	33
16	90	150	210	53	66	778	257	736	80	81	38	72
17	85	238	260	51	65	674	729	359	65	76	37	120
18	80	158	220	49	65	380	832	255	58	64	36	68
19	75	104	120	46	64	270	1,000	208	67	60	35	47
20	70	100	160	45	61	255	1,570	860	71	50	33	53
21	62	187	150	46	58	247	2,500	986	61	50	33	67
22	60	1,020	140	100	56	350	1,330	435	51	418	32	228
23	65	390	115	3,500	56	476	845	315	49	284	31	797
24	60	175	120	1,500	56	406	754	273	55	129	30	348
25	57	135	170	600	60	281	593	208	81	100	28	153
26	55	152	110	230	500	265	495	168	654	80	37	112
27	55	159	90	200	1,580	325	446	278	194	71	35	93
28	60	144	115	170	1,080	346	388	270	270	62	42	74
29	60	120	105	150	-	315	334	226	239	354	38	65
30	57	*120	73	135	--------	290	597	162	291	471	35	60
31	*54	--------	70	125	--------	252	--------	132	--------	168	33	--------
Total	3,520	4,529	6,436	8,049	5,094	8,817	19,143	9,921	4,610	7,490	1,446	3,015
Mean	114	151	208	260	182	284	638	320	154	242	46.6	100
Cfsm	0.870	1.15	1.59	1.98	1.39	2.17	4.87	2.44	1.18	1.85	0.356	0.763
In.	1.00	1.29	1.83	2.29	1.45	2.50	5.43	2.82	1.31	2.13	0.41	0.86

Calendar year 1956:	Max	2,810	Min	29	Mean	224	Cfsm 1.71	In. 23.24
Water year 1956-57:	Max	3,500	Min	28	Mean	225	Cfsm 1.72	In. 23.32

Peak discharge (base, 3,300 cfs).--Jan. 23 (time unknown) 4,740 cfs (9.88 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 1-31, Jan. 15-25, Apr. 2; discharge estimated on basis of 2 discharge measurements, weather records, recorded range in stage when available and records for Missisquoi River near Richford, Black River at Coventry, and Dog River at Northfield Falls. Stage discharge relation affected by ice Nov. 24, 25, Dec. 1-7, Dec. 9 to Feb. 27, Mar. 3-7, 10, 11, 18, 19, 26, 27, 29, 30.

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 3¼ miles downstream from North Branch.

Drainage area.--479 sq mi.

Records available.--July 1911 to September 1923, October 1928 to September 1957.

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 at datum 4.6 ft lower.

Average discharge.--37 years (1911-19, 1928-57), 905 cfs.

Extremes.--Maximum discharge during year, 8,060 cfs Jan. 23 (gage height, 10.81 ft); maximum gage height, 14.54 ft Feb. 27 (ice jam); minimum discharge, 78 cfs Sept. 2.

1911-23, 1928-57: 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.

Remarks.--Records excellent except those for periods of ice effect, which are fair. Slight diurnal fluctuation at low flow; regulation greater prior to 1934.

Revisions (water years).--WSP 784: Drainage area. WSP 1237: 1913-14(M), 1922(M), 1923, 1929-30. WSP 1437: 1912.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.6	74	4.0	700
2.8	120	6.0	2,350
3.0	185	8.0	4,310
3.5	400		

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	196	*171	350	310	460	2,000	1,000	1,220	415	2,000	1,100	94
2	256	290	370	290	430	1,300	2,660	882	505	1,680	672	82
3	362	277	330	300	410	900	3,300	742	630	1,020	637	166
4	321	247	360	300	400	680	2,000	679	505	2,270	511	251
5	273	207	340	290	370	580	1,560	*604	395	2,450	390	204
6	222	204	370	280	350	530	2,790	517	339	2,110	334	175
7	407	196	2,600	290	340	480	3,320	472	734	1,180	295	148
8	1,550	185	3,120	280	330	450	2,230	410	960	1,340	260	126
9	984	175	2,080	270	320	440	1,760	386	610	830	218	115
10	598	168	1,200	260	320	420	1,390	430	415	598	196	104
11	472	158	980	*240	290	400	1,240	651	357	511	182	102
12	395	161	1,050	235	275	400	1,190	644	312	478	175	99
13	343	330	1,050	225	270	460	1,240	517	304	405	171	107
14	304	376	850	215	*265	580	1,050	658	290	381	171	120
15	273	312	700	200	255	1,100	875	1,810	343	371	154	*117
16	260	317	770	210	240	3,000	860	2,830	308	326	142	129
17	243	535	970	205	240	2,800	1,420	1,680	251	290	129	239
18	222	505	850	190	240	2,000	2,230	1,080	192	247	120	256
19	211	371	660	180	235	1,470	2,450	845	307	204	112	182
20	192	308	580	175	230	1,220	3,050	1,570	386	178	104	168
21	182	348	540	180	220	1,140	4,180	2,870	299	161	99	211
22	178	1,450	520	650	210	1,380	4,010	1,810	218	761	94	1,240
23	185	1,530	460	5,600	210	1,770	2,720	1,130	175	1,090	90	2,930
24	168	700	440	3,900	210	*1,700	2,000	920	175	624	88	2,030
25	168	670	570	2,700	220	1,310	1,580	749	210	*430	90	1,040
26	161	705	480	1,300	1,300	1,200	1,360	604	1,320	362	97	665
27	161	500	400	1,000	4,000	1,350	1,210	584	1,040	286	115	553
28	182	466	450	800	2,900	1,450	1,080	749	637	239	107	445
29	175	420	420	650	-	1,320	936	707	792	1,440	99	366
30	171	*380	280	550	--------	1,210	1,320	565	965	2,410	97	304
31	161	--- ---	260	500	--------	1,030	--------	461	--------	1,350	92	--------
Total	9,976	12,662	24,400	22,775	15,540	36,070	58,011	29,776	14,389	28,022	7,141	12,768
Mean	322	422	787	735	555	1,164	1,934	961	480	904	230	426
Cfsm	0.672	0.881	1.64	1.53	1.16	2.43	4.04	2.01	1.00	1.89	0.480	0.889
In.	0.77	0.98	1.89	1.77	1.21	2.80	4.50	2.31	1.12	2.18	0.55	0.99

Calendar year 1956: Max 9,140 Min 88 Mean 728 Cfsm 1.52 In. 20.67
Water year 1956-57: Max 5,600 Min 82 Mean 744 Cfsm 1.55 In. 21.07

Peak discharge (base, 7,600 cfs).--Jan. 23 (9:30 a.m.) 8,060 cfs (10.81 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 24-26, Nov. 29 to Dec. 7, Dec. 9 to Mar. 19, Mar. 21-26, 28-30.

Lake Champlain at Burlington, Vt.

Location.--Lat 44°29'00", long 73°13'30", 50 ft south of Gulf Oil Co. dock at Burlington, Chittenden County, 0.1 mile north of Burlington Water Department pumping station, and 0.6 mile north of railroad station.

Records available.--May 1907 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 92.86 ft above mean sea level, datum of 1929. 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.

Extremes.--Maximum gage height during year, 3.31 ft Apr. 25, affected by seiche; minimum not determined (occurred about Nov. 15 during period of intake lag).

1907-57: Maximum gage height observed, 8.65 ft Mar. 27, 28, 1936; minimum observed, -0.25 ft Dec. 4, 1908.

Revisions (water years).--WSP 684: 1912-29 (datum correction). WSP 1207: 1938 (datum correction).

Mean gage height, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.10	0.83	0.76	1.36	1.97	2.19	2.86	3.14	2.86	2.31	2.07	1.16
2	1.07	.83	.77	1.34	1.96	2.27	2.87	3.12	2.87	2.34	2.05	1.14
3	1.08	.83	.79	1.34	1.94	2.30	2.92	3.07	2.86	2.45	2.04	1.14
4	1.05	.81	.80	1.32	1.94	2.31	2.97	3.02	2.81	2.50	2.01	1.12
5	1.05	.80	.82	1.33	1.93	2.31	2.98	2.99	2.80	2.54	1.95	1.09
6	1.01	.80	.80	1.31	1.92	2.30	3.03	2.94	2.75	2.55	1.89	1.09
7	1.02	.77	.83	1.30	1.91	2.29	3.12	2.88	2.78	2.55	1.86	1.08
8	1.03	.77	.87	1.30	1.91	2.29	3.20	2.82	2.76	2.55	1.84	1.07
9	1.07	.76	.93	1.28	1.89	2.35	3.24	2.77	2.75	2.55	1.82	1.05
10	1.09	.75	.95	1.30	1.90	2.35	3.23	2.77	2.72	2.53	1.84	.98
11	1.09	.68	.97	1.27	1.89	2.32	3.21	2.75	2.68	2.46	1.79	.92
12	1.04	.65	1.06	1.26	1.87	2.30	3.19	2.69	2.64	2.41	1.76	.94
13	1.01	.62	1.14	1.27	1.85	2.29	3.17	2.69	2.61	2.39	1.73	.94
14	1.01	.60	1.17	1.25	1.85	2.31	3.15	2.68	2.56	2.35	1.67	.94
15	1.02	.58	1.15	1.25	1.84	2.34	3.14	2.75	2.53	2.32	1.63	.89
16	1.02	.61	1.17	1.25	1.82	2.53	3.08	2.82	2.49	2.28	1.62	.86
17	1.02	.63	1.21	1.25	1.80	2.72	3.07	2.84	2.49	2.27	1.61	.89
18	1.02	.65	1.26	1.23	1.78	2.84	3.06	2.85	2.45	2.25	1.55	.90
19	1.01	.63	1.23	1.23	1.76	2.92	3.06	2.83	2.40	2.22	1.51	.86
20	.95	.61	1.26	1.20	1.75	2.95	3.01	2.88	2.36	2.19	1.50	.81
21	.93	.60	1.26	1.19	1.73	2.96	3.11	2.98	2.34	2.18	1.47	.84
22	.94	.65	1.31	1.19	1.72	2.96	3.23	3.04	2.31	2.16	1.46	.91
23	.94	.71	1.30	1.35	1.70	2.98	3.23	3.06	2.25	2.15	1.40	.97
24	.95	.70	1.29	1.59	1.68	2.99	3.28	3.07	2.20	2.15	1.31	1.00
25	.93	.74	1.33	1.75	1.64	2.99	3.21	3.05	2.26	2.14	1.27	.99
26	.82	.76	1.35	1.84	1.68	2.99	3.21	3.03	2.33	2.14	1.29	1.00
27	.82	.79	1.31	1.87	1.89	2.98	3.23	3.03	2.38	2.16	1.29	.99
28	.86	.85	1.34	1.91	2.08	2.97	3.21	3.00	2.48	2.18	1.27	.97
29	.83	.82	1.38	1.96	-	2.96	3.18	2.98	2.55	2.14	1.24	.93
30	.81	.84	1.37	1.97	------	2.93	3.17	2.95	2.45	2.08	1.19	.90
31	.79	-----	1.36	1.97	-----	2.90	------	2.92	------	2.08	1.18	------
Mean	0.98	0.72	1.11	1.43	1.84	2.62	3.12	2.92	2.56	2.31	1.62	0.98

Calendar year 1956 : Max 6.48 Min 0.58 Mean 2.36
Water year 1956-57 : Max 3.28 Min 0.58 Mean 1.85

Note.--Gage heights for Nov. 12 to Dec. 10, June 17 to Aug. 7 computed on basis of weather records and records for Richelieu River (Lake Champlain) at Rouses Point, N. Y., adjusted for wind direction and velocity.

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 Railway 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 WSP 97) and March 1871 to September 1957 (daily gage heights; those for 1871-1907 published in WSP 894). January 1875 to September 1916 (monthly discharge) at Chambly, Quebec, published in WSP 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, 4.01 ft Apr. 25; minimum, 0.25 ft Nov. 13.

1871-1957: 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.

Mean gage height, in feet, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.00	0.71	0.76	1.25	1.88	2.11	2.79	2.94	2.92	2.22	1.98	1.07
2	1.15	.71	.67	1.24	1.90	2.19	2.75	2.93	2.77	2.23	1.98	1.09
3	.98	.71	.67	1.26	1.91	2.21	2.79	2.94	2.79	2.41	2.08	1.16
4	1.14	.71	.64	1.27	1.87	2.22	2.86	2.91	2.79	2.34	1.90	1.18
5	.93	.71	.78	1.21	1.86	2.22	2.95	2.88	2.66	2.49	1.84	1.08
6	1.21	.71	.79	1.23	1.86	2.21	2.97	2.86	2.66	2.42	1.80	.99
7	1.07	.79	.68	1.19	1.85	2.20	3.04	2.84	2.65	2.46	1.84	1.01
8	1.09	.73	.75	1.20	1.81	2.17	3.09	2.80	2.65	2.49	1.85	.95
9	.96	.64	.86	1.21	1.84	2.22	3.05	2.71	2.66	2.51	1.78	.91
10	.95	.61	1.04	1.15	1.79	2.22	3.15	2.63	2.67	2.41	1.71	1.11
11	.94	1.11	1.36	1.21	1.77	2.22	3.16	2.68	2.63	2.40	1.74	.99
12	1.07	.64	.95	1.20	1.77	2.23	3.12	2.66	2.57	2.36	1.62	.92
13	1.09	.50	.95	1.11	1.78	2.20	3.09	2.59	2.52	2.34	1.59	.91
14	.98	.70	1.03	1.14	1.74	2.20	3.03	2.60	2.56	2.29	1.74	.85
15	.94	.54	1.22	1.14	1.72	2.32	3.04	2.60	2.53	2.20	1.54	1.01
16	.93	.69	1.19	1.14	1.72	2.46	3.04	2.64	2.46	2.17	1.51	.92
17	.94	.51	1.18	1.15	1.72	2.66	2.98	2.74	2.40	2.18	1.44	.82
18	.79	.45	1.06	1.17	1.69	2.78	2.96	2.74	2.38	2.18	1.50	.81
19	.89	.58	1.37	1.15	1.69	2.83	2.99	2.73	2.41	2.16	1.46	.91
20	1.00	.67	1.17	1.18	1.65	2.86	3.17	2.76	2.27	2.09	1.37	.97
21	.90	.78	1.22	1.13	1.63	2.87	2.98	2.89	2.30	2.05	1.29	.87
22	.87	.57	1.09	1.16	1.61	2.87	3.12	3.09	2.28	2.06	1.28	.89
23	.84	.61	1.25	1.24	1.59	2.87	3.22	3.13	2.32	2.05	1.35	.96
24	.70	.66	1.29	1.54	1.58	2.87	3.16	2.98	2.15	2.05	1.44	.96
25	.79	.70	1.18	1.66	1.60	2.87	3.47	3.02	2.21	2.05	1.28	1.09
26	1.08	.66	1.23	1.78	1.58	2.86	3.21	3.04	2.27	2.09	1.20	.90
27	.85	.69	1.33	1.83	1.74	2.85	3.15	2.98	2.34	2.09	1.13	.82
28	.73	.75	1.29	1.84	1.97	2.83	3.11	2.92	2.45	2.15	1.11	.81
29	.78	.79	1.22	1.85	-	2.81	3.07	2.91	2.65	2.05	1.15	.84
30	.76	.66	1.22	1.90	------	2.79	3.03	2.89	2.39	2.01	1.14	.87
31	.76	------	1.25	1.92	------	2.80	------	2.86	------	2.02	1.07	------
Mean	0.94	0.68	1.05	1.34	1.75	2.52	3.05	2.84	2.51	2.23	1.54	0.96

Calendar year 1956: Max 6.38 Min 0.45 Mean 2.29
Water year 1956-57: Max 3.47 Min 0.45 Mean 1.78

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 1957.

Gage.--Chain gage read once 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, 10.37 ft May 21; minimum observed, 7.48 ft Nov. 14.

1931-57: 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 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.80	7.68	7.88	8.73	9.25	8.36	8.55	10.16	9.94	9.70	9.86	8.44
2	7.75	7.72	7.90	8.75	9.25	8.39	8.54	10.11	10.08	9.67	9.78	8.42
3	7.71	7.71	7.90	8.75	9.25	8.44	8.69	10.04	10.06	9.65	9.70	8.39
4	7.68	7.71	7.91	8.76	9.25	8.42	8.76	10.01	10.03	9.68	9.67	8.37
5	7.66	7.70	7.91	8.77	9.25	8.41	8.82	9.96	10.01	9.72	9.63	8.34
6	7.71	7.68	7.88	8.77	9.25	8.39	8.95	9.88	9.98	9.75	9.59	8.32
7	7.83	7.67	7.97	8.76	9.25	8.38	9.04	9.85	9.99	9.79	9.54	8.30
8	7.92	7.67	8.07	8.76	9.25	8.40	9.04	9.79	9.99	9.77	9.50	8.27
9	8.01	7.66	8.16	8.76	9.25	8.42	9.03	9.73	9.97	9.74	9.44	8.23
10	8.00	7.66	8.17	8.76	9.25	8.43	9.02	9.71	9.95	9.70	9.40	8.18
11	7.99	7.61	8.19	8.76	9.23	8.39	9.04	9.79	9.93	9.65	9.36	8.11
12	7.97	7.55	8.27	8.76	9.22	8.35	9.07	9.81	9.90	9.61	9.32	8.06
13	7.96	7.51	8.34	8.76	9.20	8.30	9.11	9.84	9.88	9.57	9.29	8.05
14	7.94	7.48	8.36	8.76	9.21	8.28	9.11	9.87	9.86	9.56	9.21	8.04
15	7.94	7.49	8.38	8.76	9.20	8.27	9.12	9.92	9.82	9.54	9.14	7.98
16	7.93	7.51	8.41	8.76	9.20	8.34	9.13	10.10	9.79	9.53	9.09	7.96
17	7.91	7.54	8.44	8.76	9.20	8.37	9.21	10.15	9.74	9.52	9.03	7.91
18	7.88	7.57	8.46	8.76	9.18	8.43	9.27	10.18	9.68	9.51	9.00	7.87
19	7.86	7.56	8.49	8.76	9.15	8.50	9.31	10.21	9.64	9.49	8.97	7.84
20	7.84	7.54	8.51	8.76	9.13	8.56	9.57	10.26	9.58	9.47	8.93	7.87
21	7.82	7.51	8.55	8.76	9.13	8.56	9.79	10.37	9.51	9.45	8.89	7.86
22	7.82	7.61	8.61	8.77	9.10	8.56	9.88	10.35	9.49	9.64	8.85	7.85
23	7.82	7.65	8.65	8.78	9.08	8.60	9.92	10.32	9.48	9.75	8.78	7.94
24	7.83	7.71	8.66	8.95	9.06	8.62	10.01	10.30	9.45	9.75	8.70	8.01
25	7.80	7.80	8.67	9.03	9.05	8.61	10.03	10.24	9.43	9.76	8.61	8.12
26	7.77	7.83	8.67	9.03	8.92	8.59	10.15	10.17	9.61	9.76	8.66	8.09
27	7.75	7.86	8.68	9.12	8.14	8.58	10.09	10.14	9.64	9.74	8.72	8.07
28	7.73	7.86	8.68	9.18	8.23	8.57	10.05	10.11	9.70	9.72	8.62	8.04
29	7.71	7.85	8.69	9.25	-	8.56	10.10	10.03	9.74	9.75	8.58	8.06
30	7.69	7.87	8.69	9.25	-------	8.56	10.13	10.07	9.74	9.78	8.51	8.08
31	7.67	-------	8.70	9.25	-------	8.55	-------	9.97	-------	9.82	8.47	-------

Note.--Gage heights for Jan. 2-21, Jan. 25 to Feb. 26 were taken 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 1957.

Gage.--Water-stage recorder. Altitude of gage is 725 ft (from topographic map).

Average discharge.--6 years, 188 cfs.

Extremes.--Maximum discharge during year, 1,530 cfs Jan. 23 (gage height, 5.83 ft); maximum gage height, 6.08 ft Jan. 23 (ice jam); minimum daily discharge, 23 cfs Sept. 15.

1951-57: Maximum discharge, 2,530 cfs Apr. 16, 1955 (gage height, 6.73 ft); minimum daily, 11 cfs Aug. 29 to Sept. 1, 1953.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by mill above station.

Rating table, water year 1956-57, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	21	3.0	205
1.9	32	3.5	324
2.1	48	4.0	490
2.5	105	5.0	960

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	43	70	60	93	450	252	245	123	105	158	26
2	54	59	65	55	87	300	630	192	175	107	89	27
3	71	67	63	53	82	210	626	162	215	78	69	31
4	66	55	64	57	80	160	504	*148	159	224	68	45
5	59	49	59	54	75	135	355	138	105	260	64	44
6	47	47	64	52	70	115	524	122	88	246	55	38
7	200	47	200	54	66	105	587	109	168	158	45	33
8	355	46	390	52	64	100	472	95	*189	109	36	29
9	241	44	300	50	62	95	349	86	129	115	38	26
10	132	31	220	47	60	95	276	97	92	89	38	24
11	95	39	195	45	58	90	267	176	75	75	40	25
12	76	52	165	*42	52	90	298	164	69	69	48	24
13	66	53	170	40	48	95	335	155	65	57	46	25
14	59	70	150	35	50	100	293	247	66	50	42	*24
15	58	65	112	37	*52	195	241	489	53	54	38	23
16	a53	71	129	36	48	430	238	566	52	51	36	30
17	a48	83	150	35	48	399	378	392	53	48	33	48
18	a46	77	160	34	50	300	522	230	49	44	32	67
19	a44	72	130	32	48	250	608	168	44	39	31	41
20	a41	60	110	31	46	230	724	433	76	33	30	36
21	a38	115	95	32	43	200	860	647	87	30	28	34
22	a35	426	88	70	42	291	822	458	55	93	27	52
23	a41	316	80	1,100	42	*402	664	332	42	248	26	206
24	a38	180	82	a600	42	371	532	234	51	270	26	243
25	a35	130	95	a400	45	284	386	185	62	228	24	170
26	a34	95	90	a250	63	281	314	150	248	*112	29	80
27	a34	92	70	a200	700	341	276	161	230	69	38	55
28	a40	94	80	a150	600	352	248	159	203	59	44	46
29	a39	*89	72	130	-	320	227	140	123	85	36	40
30	a37	85	55	115	--------	291	291	118	86	194	31	36
31	*37	--------	50	100	--------	252	--------	104	--------	203	28	--------
Total	2,265	2,752	3,823	4,048	2,816	7,329	13,099	7,102	3,232	3,602	1,373	1,628
Mean	73.1	91.7	123	131	101	236	437	229	108	116	44.3	54.3
Cfsm	0.599	0.752	1.01	1.07	0.828	1.93	3.58	1.88	0.885	0.951	0.363	0.445
In.	0.69	0.84	1.17	1.23	0.86	2.23	3.99	2.16	0.99	1.10	0.42	0.50

Calendar year 1956:	Max 1,610	Min 16	Mean 171	Cfsm 1.40	In. 19.05
Water year 1956-57:	Max 1,100	Min 23	Mean 145	Cfsm 1.19	In. 16.18

Peak discharge (base, 1,700 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Missisquoi River near North Troy.

Note.--Stage-discharge relation affected by ice Nov. 24, 25, Nov. 30 to Dec. 5, Dec. 7-10, 13, 14, Dec. 17 to Mar. 16, Mar. 18-21, 29.

Clyde River at Newport, Vt.

Location.--Lat 44°56'20", long 72°11'25", on right bank in Newport, Orleans County, just downstream from unnamed 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 1957. Prior to November 1928, published as "at West Derby."

Gage.--Water-stage recorder; and, since Mar. 6, 1957, records of power generation. 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.--35 years (1909-19, 1929-35, 1938-57), 246 cfs.

Extremes.--Maximum discharge during year, about 1,000 cfs Apr. 24; minimum daily, 10 cfs Sept. 12.

1909-24, 1928-36, 1938-57: Maximum discharge, 3,900 cfs Mar. 20, 1936 (gage height, 5.76 ft, site and datum then in use), from rating curve extended above 2,800 cfs on basis of computation of peak flow over dam; minimum daily, 2.6 cfs June 18, 1956.

Remarks.--Records good except those for periods of ice effect and those subsequent to Feb. 27, which are fair. Flow regulated by powerplant and reservoirs above station. Diversion around station through penstock of powerplant computed from relation of output and discharge measurements. After Mar. 6, 1957, discharge computed by adding river flow and flow diverted through penstock.

Cooperation.--Records of power generation furnished by Citizens Utilities Co.

Revisions (water years).--WSP 744: 1913(M), drainage area. WSP 924: 1940.

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	181	208	127	31	288	280	362	482	230	194	290	38
2	151	324	27	b195	95	110	405	443	218	187	297	48
3	102	193	211	220	92	200	444	472	293	162	30	147
4	170	70	180	203	133	330	382	*464	281	200	29	54
5	180	190	195	30	124	260	358	337	263	240	251	71
6	64	175	192	b29	107	250	365	241	274	101	213	80
7	25	169	235	133	62	b360	366	257	254	91	222	46
8	209	171	91	37	66	282	361	281	*220	245	162	46
9	313	175	26	132	136	141	276	286	160	271	192	128
10	325	24	299	172	189	222	306	301	293	*292	83	65
11	309	24	317	b145	122	172	360	325	258	212	28	11
12	319	89	213	28	100	111	300	40	183	272	200	10
13	161	104	249	b55	88	224	203	289	102	39	108	15
14	20	127	229	b205	94	368	154	313	87	146	154	*22
15	205	104	157	b170	81	201	300	338	30	75	166	22
16	203	135	60	b170	66	265	251	414	29	115	206	52
17	203	27	211	b130	32	253	329	418	151	49	30	20
18	208	24	205	b105	124	393	335	263	133	*120	28	58
19	208	181	188	b28	58	246	395	405	37	211	168	24
20	21	211	195	b28	82	172	416	367	38	64	143	96
21	20	215	163	155	75	207	438	431	33	116	53	25
22	205	228	229	209	186	372	413	446	29	278	32	78
23	204	238	27	252	175	*446	459	426	29	317	34	252
24	194	263	217	249	44	215	715	434	30	274	35	253
25	175	34	28	333	209	295	687	413	48	322	59	315
26	40	272	199	280	238	334	682	382	59	310	216	221
27	33	320	190	182	151	287	586	287	127	36	219	261
28	50	135	232	250	220	400	508	327	231	83	180	40
29	199	*195	91	286	-	277	495	388	88	261	165	35
30	63	281	b30	269		254	488	205	31	*223	201	189
31	*118		80	252		103		339		295	31	
Total	4,878	4,906	5,093	4,963	3,437	8,030	12,139	10,814	4,239	5,801	4,225	2,722
Mean	157	164	164	160	123	259	405	349	141	187	136	90.7
Cfsm	1.11	1.15	1.15	1.13	0.866	1.82	2.85	2.46	0.993	1.32	0.958	0.639
In.	1.28	1.28	1.33	1.30	0.90	2.10	3.18	2.83	1.11	1.52	1.11	0.71

Calendar year 1956:	Max	1,060	Min	2.6	Mean	213	Cfsm	1.50	In. 20.39
Water year 1956-57:	Max	715	Min	10	Mean	195	Cfsm	1.37	In. 18.65

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* Discharge measurement of river or diversion made on this day.

b Stage-discharge relation affected by ice.

Note.--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, Indiana. 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	*293	953.59	1945-57
Atwood Lake near Wolcottville	Lagrange	1.31	*170	899.99	1947-52
Bass Lake near Angola	Steuben	.60	56	-	1954-57
Bear Lake at Wolflake	Noble	6.12	125	-	1942-57
Big Long Lake near Stroh	Lagrange	4.13	*366	-	1953-57
Big Otter Lake near Fremont	Steuben	19.8	69	965.18	1945-52
Big Turkey Lake at Stroh	Lagrange	34.6	*450	926.61	1945-57
Bixler Lake at Kendallville	Noble	3.63	112	963.65	1945-57
Blackman Lake near Wolcottville	Lagrange	1.4	*67	973.69	1953-57
Bower Lake near Pleasant Lake	Steuben	87.5	24	-	1945-57
Cedar Lake near Ontario	Lagrange	1.66	*120	871.90	1948-51
Cedar Lake near Waterloo	De Kalb	21.8	*28	896.76	1943-55
Clear Lake at Clear Lake	Steuben	7.25	800	1,037.38	1943-57
Cree Lake near Kendallville	Noble	4.90	*58	945.23	1949-57
Crooked Lake at Crooked Lake	Steuben	11.9	*802	988.17	1945-57
Dallas Lake near Wolcottville	Lagrange	39.4	283	897.36	1945-57
DeWart Lake near Leesburg	Kosciusko	7.88	476	867.70	1945-57
Diamond Lake near Wawaka	Noble	2.82	96	-	1945-57
Duley Lake near Cromwell	Noble	11.0	17	-	1952-57
Eagle Lake near Kimmel	Noble	1.77	59	-	1945-48
Emma Lake near Emma	Lagrange	14.8	38	-	1954-57
Engle Lake near Ligonier	Noble	3.22	*21	-	1955-57
Fish Lake near Plato	Lagrange	10.8	*99.5	936.50	1945-57
Fish Lake near Scott	Lagrange	6.44	22	-	1954-57
Fox Lake near Angola	Steuben	1.13	142	1,018.83	1945-52
Golden Lake near Pleasant Lake	Steuben	92.4	115	-	1945-57
Gordy Lake near Cromwell	Noble	.82	27	-	1952-57
Hackenburg Lake near Wolcottville	Lagrange	54.8	*42	897.36	1945-57
Hamilton Lake at Hamilton	Steuben	12.8	*802	898.83	1943-57
Harper Lake near Washington Center	Noble	2.67	11	878.25	1945-57
Heaton Lake near Elkhart	Elkhart	8.78	*87	767.30	1945-52
Hindman Lake near Washington Center	Noble	2.10	12	878.25	1945-57
Hogback Lake near Angola	Steuben	106	121	-	1945-57
Howard Lake near Angola	Steuben	39.4	34	-	1954-57
Hudson Lake at Hudson	La Porte	3.06	432	763.09	1945-57
Hunter Lake near Middlebury	Elkhart	.72	*99	856.90	1945-52
Indian Lake near Corunna	De Kalb	3.50	54	-	1957
Indiana Lake near Bristol	Elkhart	.53	*122	759.73	1954-52
Jimerson Lake at Nevada Mills	Steuben	47.0	*203	964.66	1945-57
Knapp Lake near Washington Center	Noble	*5.64	*88	878.25	1945-57
Lake Gage at Panama	Steuben	17.2	*327	954.25	1945-56
Lake George at Hobart	Lake	*125	282	-	1946-57
Lake George at Jamestown	Steuben	12.3	*509	985.28	1945-57
Lake James at Lake James	Steuben	43.0	*1,318	964.96	1942-49
Lake Pleasant near Nevada Mills	Steuben	2.51	*287	-	1954-57
Lake of the Woods near Helmer	Lagrange	5.62	122	-	1951-57
Latta Lake near Rome City	Noble	4.37	35	-	1954-57
Lime Lake at Panama	Steuben	17.4	-	954.25	1945-57
Little Long Lake at Kendallville	Noble	4.34	*66	-	1954-57
Little Otter Lake near Fremont	Steuben	19.8	*34	965.18	1945-52
Little Turkey Lake at Elmira	Lagrange	56.0	*135	925.72	1945-57
Long Lake at Moonlight	Steuben	70.8	92	-	1945-57
Long Lake near Burr Oak	Noble	11.5	40	-	1954-57
Loon Lake near Angola	Steuben	2.73	129	-	1954-57
Lower Long Lake near Albion	Noble	3.96	*66	889.81	1945-52
Martin Lake near Valentine	Lagrange	5.36	22	899.45	1945-57
Messick Lake near Wolcottville	Lagrange	55.8	68	897.36	1945-57
Moss Lake near Washington Center	Noble	5.90	8	878.25	1945-57
Mud Lake near Orland	Steuben	1.64	25	-	1956-57
Muncie Lake near Burr Oak	Noble	43.4	41	-	1954-57
North Twin Lake near Howe	Lagrange	1.99	*128	-	1953-57
Olin Lake near Valentine	Lagrange	6.12	95	899.45	1945-57
Oliver Lake near Valentine	Lagrange	11.3	*371	899.45	1945-57
Otter Lake near Flint	Steuben	6.82	115	-	1954-57
Pigeon Lake near Angola	Steuben	30.6	53	-	1954-57
Pleasant Lake at Pleasant Lake	Steuben	.94	*53	963.52	1945-57
Pleasant Lake near Wolflake	Noble	.30	-	-	1951-53
Pretty Lake near Stroh	Lagrange	2.91	*184	965.50	1949-52
River Lake near Burr Oak	Noble	18.7	22	-	1954-57
Round Lake at Clear Lake	Steuben	7.25	*30	1,037.38	1943-57
Round Lake at Kendallville	Noble	3.60	99	-	1954-57
Royer Lake near Plato	Lagrange	4.91	*69	936.50	1952-57
Sackrider Lake near Kendallville	Noble	8.42	40	-	1954-57
Sand Lake near Burr Oak	Noble	15.0	*47	893.56	1945-51
Sandford Lake near Cosperville	Noble	104	94	-	1947-57
Saugany Lake near Rolling Prairie	La Porte	.82	74	781.21	1945-50
Shipshewana Lake near Shipshewana	Lagrange	4.00	*202	852.04	1951-57
Silver Lake near Angola	Steuben	3.72	*238	959.40	1945-52
Silver Lake near Rolling Prairie	La Porte	.82	54	795.20	1945-57
Silver Lake near Wolflake	Noble	.32	29	-	1952-57

* Revised.

† Elevation, in feet, above mean sea level.

Lakes in Indiana in the St. Lawrence River basin for which records are available--Continued

Lake	County	Drainage area (square miles)	Surface area (acres)	Established level†	Records available
Simonton Lake near Elkhart	Elkhart	4.37	*282	772.19	1945-57
Skinner Lake near Albion	Noble	13.8	*125	**927.74	1945-57
Snow Lake at Lake James	Steuben	36.3	-	964.96	1942-49
South Twin Lake near Howe	Lagrange	3.13	117	-	1953-57
Sparta Lake at Kimmel	Noble	.26	*31	*888.50	1945-51
Steinbarger Lake near Cosperville	Noble	25.3	65	-	1947-57
Stone Lake near Scott	Lagrange	1.32	*116	-	1954-57
Story Lake near Hudson	De Kalb	2.48	62	-	1946, 1954-57
Sylvan Lake at Rome City	Noble	31.5	*630	916.20	1942-57
Syracuse Lake at Syracuse	Kosciusko	37.3	367	858.87	1943-57
Tamarack Lake near Cosperville	Noble	15.1	40	-	1947-57
Upper Long Lake near Wolflake	Noble	2.03	77	-	1955-57
Village Lake near Cromwell	Noble	11.6	11	-	1952-57
Wabee Lake near Milford	Kosciusko	13.4	180	829.79	1945-52
Waldron Lake near Cosperville	Noble	133	198	-	1947-57
Wall Lake near Orland	Lagrange	1.43	*141	942.25	1953-55
Wawasee Lake near Wawasee	Kosciusko	*36.1	2,620	858.89	1942-57
Westler Lake near Wolcottville	Lagrange	37.3	88	897.36	1945-57
Witmer Lake near Wolcottville	Lagrange	35.8	*204	897.36	1945-57
Wolf Lake near Goshen	Elkhart	.87	100	813.00	1947-56
Wolf Lake at Hammond	Lake	5.72	999	-	1946-48

* Revised.
† Elevation, in feet, above mean sea level.
** Corrected.

Measurements of streamflow made at points other than regular gaging stations in the area covered by this report are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. Measurements believed to have been made under base-flow conditions are identified by an asterisk (*) to the left of the discharge figure. These measurements when correlated with the simultaneous discharge of a nearby stream where continuous records are available will give a picture of the low-flow potentiality of stream. The column headed, "Measured previously" shows the water years in which measurements were made at the same, or practically the same, site.

Determinations of peak flow at points other than regular gaging stations are given in a separate table on page 371.

Discharge measurements made at points other than gaging stations during water year 1957

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
		Streams tributary to Lake Superior				
Lateral Creek.	Sturgeon River.	E½ sec. 9, T. 48 N., R. 32 W., at U. S. Highway 41, 5 miles west of Three Lakes, Mich.	-		Apr. 23	86.0
Tioga River..	....do.......	NW¼ sec. 8, T. 48 N., R. 32 W., at U. S. Highway 41, 10 miles east of Covington, Mich.	18.5		Apr. 22 Apr. 23 May 6	360 282 15.8
Pelkie Creek.	....do.......	SE¼ sec. 34, T. 49 N., R. 33 W., at old U. S. Highway 41, 5 miles southeast of Alberta, Mich.	16.2		Apr. 23 Apr. 25 May 6	190 163 13.2
Sturgeon River.	Portage Lake.	E½ sec. 29, T. 49 N., R. 33 W., at old U. S. Highway 41, 2½ miles southeast of Alberta, Mich.	83.6		Apr. 25 May 6	1,130 85.0
Plumbago Creek.	Sturgeon River.	N½ sec. 18, T. 49 N., R. 33 W., at Alberta, Mich.	1.64		Apr. 22 Apr. 23 May 6	27.3 21.2 2.56
Rock River...	....do.......	NE¼ sec. 12, T. 48 N., R. 34 W., at U. S. Highway 141, 3 miles northeast of Covington, Mich.	40.3		Apr. 22 Apr. 23 May 6	583 748 69.8
Perch River..	....do.......	NE¼ sec. 34, T. 48 N., R. 35 W., at State Highway 28, 2½ miles east of Sidnaw, Mich., at site of former gaging station.	63.1	1913-15‡	Mar. 30 Apr. 23 May 8	56.2 429 69.6
Sidnaw Creek.	....do.......	N½ sec. 19, T. 48 N., R. 35 W., 3 miles north of Sidnaw, Mich.	17.6		Mar. 30 Apr. 23 May 8	16.3 52.2 5.82
Silver Mountain Creek.	....do.......	NW¼ sec. 7, T. 49 N., R. 35 W., 7½ miles south of Alston, Mich.	-		Apr. 22 May 7	48.3 6.32
Clear Creek..	....do.......	Sec. 23, T. 50 N., R. 35 W., 6 miles southeast of Alston, Mich.	12.5		Apr. 23 May 7	11.0 8.98
Mustark Creek	Clear Creek..	NW¼ sec. 24, T. 50 N., R. 35 W., 6½ miles southeast of Alston, Mich.	-		Apr. 23	4.49
Silver River.	Sturgeon River.	NW¼ sec. 4, T. 50 N., R. 35 W., at State Highway 35, 3 miles east of Alston, Mich.	39.0		Mar. 30 Apr. 22 Apr. 25 May 7	55.3 301 157 18.4
West Branch Sturgeon River.	....do.......	On line between sec. 6, T. 50 N., R. 35 W., and sec. 34, T. 51 N., R. 35 W., at State Highway 35, 1 mile east of Alston, Mich.	47.2		Mar. 30 Apr. 22 Apr. 25 May 7	57.3 406 197 33.3
North Branch Otter River	Otter River..	W½ sec. 31, T. 52 N., R. 34 W., 2 miles southwest of Elo, Mich.	93.2		Apr. 18 Apr. 22 Apr. 26 May 7	633 1,380 677 103
Do........	....do.......	S½ sec. 12, T. 51 N., R. 35 W., 2½ miles northwest of Pelkie, Mich.	53.1		Apr. 18 Apr. 22 Apr. 26 May 7	290 562 266 63.3
Sturgeon River.	Portage Lake.	SW¼ sec. 4, T. 53 N., R. 33 W., at bridge on U. S. Highway 41, 1 mile southeast of Chassell, Mich.	726	1945, 1955	Apr. 24	7,510
Snake River..	....do.......	SW¼ sec. 10, T. 53 N., R. 33 W., at bridge on U. S. Highway 41, 3 miles southeast of Chassell, Mich.	-	1955	Apr. 24	560
Iron River...	Lake Superior	SW¼ sec. 13, T. 51 N., R. 27 W., at outlet of Lake Independence near Big Bay, Mich.	-	1945-56	Oct. 4 May 9 July 25	*49.7 *117 *59.4
		Streams tributary to Lake Michigan†				
Gulliver Lake Outlet	Lake Michigan	SW¼ sec. 2, T. 41 N., R. 14 W., 1½ miles southwest of Gulliver, Mich.	-	1945-56	Oct. 17 Jan. 15 May 1 July 15	*3.21 *4.36 *30.9 *.17

* Base flow.
† Includes some discharge measurements made during water year 1955.
‡ Daily discharges published October 1912 to September 1915.

Discharge measurements made at points other than gaging stations during water year 1957--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
		Streams tributary to Lake Michigan†--Continued				
North Manistique Lake Outlet	Manistique Lake.	Sec. 20, T. 45 N., R. 11 W., at bridge on State Highway 98, ¼ mile northeast of Helmer, Mich.	-	1946-56	Oct. 16 Jan. 15 May 3 July 16	*3.74 *10.4 *23.9 *5.68
Big Spring...	Indian Lake..	S½ sec. 25, T. 42 N., R. 17 W., at Palms Book State Park, 7 miles northeast of Manistique, Mich.	-	1950-56	Oct. 15 May 1 July 17	*19.8 *31.9 *30.0
Chicagon Creek.	Paint River..	Chicagon Lake Outlet, SW¼ sec. 24, T. 43 N., R. 34 W., at U. S. Highway 2, 6½ miles east of Iron River, Mich.	17.4	1945-56	Oct. 1 Jan. 2 Apr. 8 July 1	*5.25 *9.36 *11.6 *8.28
Briar Hill Creek a/.	....do.......	Fortune Lake Outlet, SW¼ sec. 24, T. 43 N., R. 33 W., at New Bristol Location near Crystal Falls, Mich.	11.8	1945-56	Oct. 1 Jan. 2 Apr. 8 July 1	*12.8 *10.2 *14.2 *8.64
West Branch Sturgeon River.	Sturgeon River.	NE¼ sec. 30, T. 42 N., R. 29 W., 4 miles northeast of Randville, Mich.	-		Oct. 15	*36.3
North Branch of Little River.	Oconto River.	Lat 45°00'37", long 88°02'43", between secs. 2 and 3, T. 29 N., R. 20 E., at bridge on U. S. Highway 141, 3¾ miles south of Coleman, Wis.	23.3		Sept.17	*3.75
Hunting River	Wolf River...	Lat 45°25'10", long 89°11'15", in N½ sec. 24, T. 34 N., R. 10 E., at culvert on U. S. Highway 45, 1½ miles south of Elcho, Wis.	6.0		Aug. 31	44.8
Mecan River..	Fox River....	NW¼ sec. 8, T. 18 N., R. 9 E., at culvert on farm road, 3 miles northeast of Coloma, Wis.	-		Oct. 3	*15.1
Do........	....do.......	On line between secs. 7 and 8, T. 17 N., R. 10 E., at bridge on town road, 6½ miles west of Neshkoro, Wis.	-		Oct. 3	*59.4
Chaffee Creek	Mecan River..	NW¼ sec. 1, T. 17 N., R. 8 E., at bridge on U. S. Highway 51, ½ mile northeast of Liberty Bluff, Wis.	-		Oct. 3	*10.7
Lunch Creek..	White River..	SE¼ sec. 33, T. 18 N., R. 10 E., at bridge on county-line town road, 6 miles south of Wautoma, Wis.	-		Oct. 3	*11.2
Sucker Creek.	....do.......	NW¼ sec. 6, T. 17 N., R. 12 E., at bridge on county-line town road, 5 miles northeast of Neshkoro, Wis.	-		Oct. 4	*7.62
Pine River...	Lake Poygan..	SE¼ sec. 3, T. 19 N., R. 12 E., at bridge on town road, 1¼ miles southeast of Pine River, Wis.	-		Oct. 4	84.9
Willow Creek.	....do.......	NW¼ sec. 8, T. 18 N., R. 13 E., ½ mile below bridge on State Highway 49 and ½ mile east of Aurorahville, Wis.	-		Oct. 4	71.5
Unnamed tributary.	East River...	Lat 44°18'24", long 88°05'47", in NE¼ sec. 8, T. 21 N., R. 20 E., at box culvert on State Highway 57, ½ mile south of Greenleaf, Wis.	8.0		Sept.16	*.02
Kewaunee River.	Lake Michigan	Lat 44°27'30", long 87°33'23", in SW¼ sec. 14, T. 23 N., R. 24 E., at bridge on County Trunk F, 2.3 miles west of Kewaunee, Wis.	129		Sept.16	*7.96
Watercress Creek.	East Branch Milwaukee River.	Lat 43°42'30", long 88°09'20", in SW¼ sec. 6, T. 14 N., R. 20 E., 500 ft south of bridge on State Highway 67 and 4¼ miles northeast of Dundee, Wis.	-		Nov. 2	*2.82
Cady ditch...	Hart ditch...	Lat 41°32'48", long 87°26'40", at bridge on Kleinman Ave., at Highland, Ind.	-	1955	1954 Oct. 12 Oct. 13 Oct. 14 Oct. 15 Oct. 22	 75.1 74.9 56.8 50.4 15.3
Do........	....do.......	Lat 41°33'00", long 87°28'16", at bridge on U. S. Highway 41, at Highland, Ind.	-		Oct. 12 Oct. 12 Oct. 13 Oct. 14 Oct. 15 Oct. 22	123 119 108 110 89.6 18.6
Unnamed tributary.	Cady ditch...	Lat 41°32'51", long 87°28'16", at first culvert upstream from U. S. Highway 41, near Highland, Ind.	-		Oct. 12 Oct. 13 Oct. 14 Oct. 15 Oct. 22	79.1 73.0 48.7 37.8 6.0

* Base flow.
† Includes some discharge measurements made during water year 1955.
a Published as Fortune Lake Outlet 1945.

Discharge measurements made at points other than gaging stations during water year 1957--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
		Streams tributary to Lake Michigan†--Continued				
Little Calumet River.	Lake Michigan	Lat 41°34'36", long 87°31'19", at bridge on Holman St. between Lansing and Hammond, Ind.	-		1957	
					July 14	141
					July 15	538
St. Joseph River.	....do.......	Sec. 11, T. 37 N., R. 3 E., at footbridge in Eberhart Park at Mishawaka, Ind.	-	1947	1956	
					Nov. 28	1,380
					Nov. 29	2,528
					Nov. 29	3,780
					Nov. 30	6,870
Klinger Lake Outlet	Fawn River...	SE¼ sec. 35, T. 7 S., R. 11 W., 5 miles east of White Pigeon, Mich.	-	1941-56	Oct. 2	*9.10
					1957	
					Mar. 18	20.4
					May 16	16.0
					July 6	*7.42
					Sept. 6	*12.5
Shavehead Lake Outlet	Mud Creek....	NW¼ sec. 30, T. 7 S., R. 13 W., 7½ miles southeast of Vandalia, Mich.	-		Sept.25	6.51
Rice Creek...	Kalamazoo River.	SW¼ sec. 25, T. 2 S., R. 6 W., 0.2 mile above mouth, at Monroe St. in Marshall, Mich.	-		1956	
					Nov. 15	*33.5
					Dec. 3	44.3
					1957	
					Jan. 4	52.8
					Mar. 18	68.4
					Apr. 25	128
					May 22	127
					June 20	53.1
					July 23	54.1
					Aug. 12	*28.6
					Sept.10	36.9
Gun Lake Outlet b/..	Gun River....	NW¼ sec. 6, T. 2 N., R. 10 W., near Shelbyville, Mich.	-	1943-44, 1946-56	1956	
					Oct. 4	*.10
					1957	
					Apr. 8	59.2
					July 5	14.4
Winnewana Lake Outlet	Portage River	NW¼ sec. 32, T. 1 S., R. 3 E., 2 miles southeast of Waterloo, Mich.	-		Mar. 13	6.21
					May 9	*.64
					May 29	1.74
					Aug. 14	.14
Orchard Creek	....do.......	On line between secs. 12 and 13, T. 1 S., R. 1 E., at State Highway 106, 0.5 mile west of Munith, at site of former gaging station.	-	1944-56c	1956	
					Oct. 15	*4.55
Jordan Lake Outlet	Thornapple River.	NW¼ sec. 9, T. 4 N., R. 7 W., 2 miles southwest of Lake Odessa, Mich.	26.2	1946-56	Oct. 17	*1.65
					Dec. 31	*5.59
					1957	
					Mar. 21	15.5
					May 13	77.0
Backus Creek.	Houghton Lake	N½ sec. 5, T. 22 N., R. 2 W., 4 miles northeast of Prudenville, Mich.	-	1944-56	1956	
					Oct. 9	*1.44
					1957	
					Jan. 23	9.64
					Apr. 29	36.0
					July 11	139
West Branch Little Muskegon River	Little Muskegon River.	NE¼ sec. 17, T. 14 N., R. 8 W., 4 miles southwest of Mecosta, Mich.	38		1956	
					Nov. 7	16.9
					1957	
					Feb. 20	25.0
					Apr. 4	24.7
Hess Lake Outlet.	Muskegon River.	NW¼ sec. 33, T. 12 N., R. 12 W., 3 miles southwest of Newaygo, Mich.	-	1945-46, 1948-56	1956	
					Oct. 3	2.08
					1957	
					Jan. 8	0
					Apr. 9	14.8
					July 9	21.6
Portage Creek	Manistee River.	SW¼ sec. 8, T. 26 N., R. 4 W., 5½ miles west of Grayling, Mich.	15.6	1942-56	1956	
					Oct. 4	18.3
					1957	
					Jan. 2	24.5
					Apr. 2	23.1
					July 11	23.4
Fife Lake Outlet.	....do.......	SW¼ sec. 13, T. 25 N., R. 9 W., at Fife Lake, Mich.	11.1	1944-56	1956	
					Oct. 2	3.58
					1957	
					Jan. 17	4.99
					Apr. 30	12.1
					July 25	11.0

* Base flow.
† Includes some discharge measurements made during water year 1955.
b Published as Gun River 1943.
c Daily discharge published March 1944 to September 1956.

Discharge measurements made at points other than gaging stations during water year 1957--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
		Streams tributary to Lake Michigan†--Continued				
Slagle Creek.	Manistee River.	SW¼ sec. 12, T. 22 N., R. 12 W., at Harrietta State fish Hatchery, 1 mile west of Harrietta, Mich.	-	1953-54, 1956	1957	
					Jan. 9	3.28
Betsie River.	Lake Michigan	Sec. 5, T. 25 N., R. 12 W., 1 mile northwest of Karlin, Mich.	44.7	1944-56	Jan. 17	55.8
					Apr. 30	63.6
					July 25	40.3
Tobeco Creek.	P-To-Ba-Go Pond.	NW¼ sec. 5, T. 28 N., R. 9 W., 2 miles south of Elk Rapids Mich.	-	1949-56	1956	
					Oct. 30	*2.23
					1957	
					Jan. 24	4.71
					Apr. 30	6.95
					July 31	*.33
Six Tile Creek.	Jordan River.	Sec. 6, T. 30 N., R. 5 W., near Alba, Mich.	-	1946, 1956	Feb. 14	*9.02
Five Tile Creek.	....do.......	....do........................	-	1946, 1956	Feb. 14	*5.83
Two Tile Creek.	....do.......	....do........................	-	1956	Feb. 14	*.17
Carp River...	Lake Michigan	SE¼ sec. 15, T. 38 N., R. 4 W., at Carp Lake, Mich.	26.3	1944-56	1956	
					Oct. 18	*3.25
					1957	
					Jan. 15	12.6
					Apr. 10	14.3
					July 16	39.3
		Streams tributary to Lake Huron				
Mill Creek...	Lake Huron...	NW¼ sec. 4, T. 38 N., R. 3 W., 5 miles southeast of Mackinaw City, Mich.	-	1954-56	Apr. 10	5.60
					May 15	13.0
					June 11	.61
					July 16	2.79
Little Black River.	....do.......	NE¼ sec. 26, T. 38 N., R. 2 W., ½ mile west of Cheboygan, Mich.	-	1955-56	Oct. 17	*.57
					Nov. 13	1.18
					Dec. 18	4.98
					Jan. 15	3.91
					Feb. 12	1.77
					Mar. 12	13.6
					Apr. 9	38.2
					May 15	124
					June 11	5.44
					July 16	6.48
					Aug. 22	0
					Sept.17	1.04
East Branch Maple River	Maple River..	NW¼ sec. 25, T. 37 N., R. 4 W., 2½ miles northeast of Pellston, Mich.	26.5	1942-56	Oct. 18	*.79
					Jan. 15	1.34
					Apr. 10	6.09
					July 16	19.2
Grand Lake Outlet.	Lake Huron...	SE¼ sec. 15, T. 34 N., R. 7 E., 14 miles southeast of Rogers City, Mich.	34.3	1945-56	Oct. 2	1.16
					Jan. 1	44.1
					Apr. 1	34.8
					Apr. 2	30.8
					July 2	133
East Fish Lake Outlet	Fuller Creek.	NE¼ sec. 34, T. 29 N., R. 2 E., 7 miles east of Lewiston, Mich.	-	1943-56	Oct. 10	1.12
					Jan. 3	1.24
					Apr. 25	3.46
					July 22	1.37
Fuller Creek.	Hunt Creek...	S½NE¼ sec. 35, T. 29 N., R. 2 E., 7½ miles east of Lewiston, Mich.	-	1943-56	Oct. 10	6.34
					Jan. 3	6.56
					Apr. 25	11.0
					July 22	7.77
Hunt Creek...	Thunder Bay River.	Sec. 25, T. 29 N., R. 2 E., 8½ miles east of Lewiston, Mich.	-	1943-56	Oct. 10	20.2
					Jan. 1	20.1
					Apr. 25	36.4
					July 22	25.1
					Sept. 3	*19.3
Lake St. Helen Outlet.	South Branch Au Sable River.	SE¼ sec. 8, T. 33 N., R. 1 W., 2½ miles northwest of St. Helen, Mich.	72.2	1944-56	Oct. 9	*11.3
					Jan. 23	23.2
					Apr. 29	27.9
					July 11	115
South Branch Au Sable River.	Au Sable River.	SE¼ sec. 29, T. 26 N., R. 1 W., 9 miles west of Luzerne, Mich.	-	1951-56	Oct. 5	131
					Jan. 3	167
					Apr. 25	276
					July 18	336
North Branch Au Sable River.	....do.......	SE¼ sec. 16, T. 27 N., R. 1 W., 6 miles south of Lovells, Mich.	-	1951, 1953-56	Oct. 5	146
					Jan. 3	123
					Apr. 19	148
					July 24	132

* Base flow.
† Includes some discharge measurements made during water year 1955.

Discharge measurements made at points other than gaging stations during water year 1957--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Streams tributary to Lake Huron--Continued						
Big Creek....	North Branch Au Sable River.	SW¼ sec. 23, T. 27 N., R. 1 W., 7 miles southeast of Lovells, Mich.	-	1951-56	Oct. 5 Jan. 3 Apr. 19 July 24	55.5 51.0 102 57.8
East Branch Au Gres River.	Lake Huron...	E½ sec. 8, T. 22 N., R. 6 E., 7 miles northeast of Whittemore, Mich.	-	1944-56	Oct. 23 Jan. 15 Apr. 15 July 16	*23.3 18.2 42.5 31.5
Guiley Creek.	East Branch Au Gres River.	W½ sec. 9, T. 22 N., R. 6 E., 7 miles northeast of Whittemore, Mich.	-	1944-56	Oct. 23 Jan. 15 Apr. 15 July 16	*12.5 12.9 14.3 11.5
Spring Bank Creek.	Farmers Creek	NW¼ sec. 28, T. 6 N., R. 9 E., at Jasmond Rd., 5 miles northeast of Ortonville, Mich.	-	1955-56	Oct. 22 Nov. 13	*.26 *.40
Do........	....do.......	NW¼ sec. 20, T. 6 N., R. 9 E., at Hegel Rd., 5 miles northeast of Ortonville, Mich.	-	1955-56	Oct. 15 Oct. 22 Nov. 13	*.71 *.78 *.89
Lime Lake Outlet.	Kearsley Creek.	SE¼ sec. 31, T. 6 N., R. 9 E., 2 miles north of Ortonville, Mich.	-	1955-56	Oct. 15 Oct. 22 Nov. 13	*.40 *.28 *.47
Swartz Creek.	Flint River..	SW¼ sec. 25, T. 5 N., R. 7 E., at Mackey Rd., 2 miles east of Holly, Mich.	-	1955-56	Oct. 15 Oct. 22 Nov. 13	*.40 *.35 *.59
Do........	....do.......	NE¼ sec. 22, T. 5 N., R. 7 E., at Fagan Rd., 2 miles northeast of Holly, Mich.	-	1955-56	Oct. 15 Oct. 22 Nov. 13	*1.30 *1.07 *1.65
Thread Creek.	Swartz Creek.	NE¼ sec. 29, T. 5 N., R. 8 E., at McGinnis Rd., 5 miles east of Holly, Mich.	-	1955-56	Oct. 15 Nov. 13	*1.02 *1.89
Do........	....do.......	SE¼ sec. 18, T. 5 N., R. 8 E., at Groveland Mills, 5½ miles northeast of Holly, Mich.	-	1955-56	Oct. 15 Nov. 13 Dec. 12 Jan. 9 Feb. 20 Mar. 23 Apr. 24 May 29 June 26 July 29 Aug. 26 Sept.13	*2.15 *3.45 *3.14 *3.09 *4.74 5.98 7.92 *6.19 *3.63 *2.97 2.51 3.49
Tittabawassee River.	Shiawassee River.	On line between secs. 16 and 21, T. 13 N., R. 3 E., at highway bridge in Freeland, Mich.	2,530	1903-8, 1923,1925 1931-37d	Sept. 4	370
Streams tributary to St. Clair River						
Black River..	St. Clair River.	SE¼ sec. 8, T. 9 N., R. 16 E., 3½ miles south of Croswell, Mich.	-	1956	Oct. 2 Nov. 6 Dec. 13 Jan. 10 July 19 Aug. 24 Sept.18	11.9 *9.05 18.5 *13.3 30.4 16.4 *13.3
Streams tributary to Lake St. Clair						
Clinton River e/.	Lake St. Clair.	SW¼ sec. 10, T. 3 N., R. 9 E., at Loon Lake Outlet, at Drayton Plains, Mich.	74.7	1943, 1947-56	Oct. 16 Jan. 17 May 28 Sept.23	*16.1 *35.4 107 18.7
Clinton River f/.	....do.......	NE¼ sec. 2, T. 2 N., R. 9 E., at Cass Lake Outlet, at Keego Harbor, Mich.	99.9	1945, 1948-56	Oct. 16 Jan. 17 May 28 Sept.23	*15.9 *41.1 121 37.4
Trout Creek..	Paint Creek..	SE¼ sec. 24, T. 4 N., R. 10 E., at Greenshield Rd., 3 miles southeast of Lake Orion, Mich.	7.83	1955-56	Oct. 15 Nov. 13	*1.76 *1.79
Michigan Fish Division Pond Outlet	Trout Creek..	NW¼ sec. 19, T. 4 N., R. 11 E., ¼ mile above mouth and 3 miles southeast of Lake Orion, Mich.	2.35	1955-56	Oct. 15 Nov. 13	*1.61 *1.19
West Branch Stony Creek	Stony Creek..	SW¼ sec. 5, T. 4 N., R. 11 E., at Harmon Rd., 2 miles east of Lake Orion, Mich.	11.7	1955-56	Oct. 15 Nov. 13	*.72 *2.26

* Base flow.
d Daily discharges published October 1930 to September 1936.
e Published as Loon Lake Outlet 1947-54.
f Published as Cass Lake Outlet 1945, 1948-54.

Discharge measurements made at points other than gaging stations during water year 1957--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Streams tributary to Lake St. Clair--Continued						
West Branch Stony Creek	Stony Creek..	SE¼ sec. 5, T. 4 N., R. 11 E., at Predmore Rd., 2½ miles east of Lake Orion, Mich.	14.8	1955-56	Oct. 15 Nov. 13 Dec. 12 Jan. 8 Feb. 20 Mar. 23 Apr. 24 May 28 June 26 Aug. 1 Aug. 29 Sept.24	*1.19 *2.18 *3.82 *2.90 *4.10 5.60 7.96 7.92 *2.33 *2.63 1.72 *1.64
Do........	....do.......	On line between secs. 14 and 15, T. 4 N., R. 11 E., at State Highway 150, 5 miles north of Rochester, Mich.	18.2		Dec. 12	*8.20
Streams tributary to Lake Erie						
Huron River g/.	Lake Erie....	SE¼ sec. 18, T. 2 N., R. 8 E., at Proud Lake Outlet, 3 miles southwest of Commerce, Mich.	-	1947-56	Oct. 16	*26.6
Mann Creek...	Huron River..	NW¼ sec. 27, T. 2 N., R. 6 E., 3 miles east of Brighton, Mich.	18.4	1955-56	Oct. 1 Dec. 17 Jan. 17 Mar. 6 Apr. 26 June 26 July 15 Aug. 29 Sept.13	*10.2 25.6 5.92 *11.7 18.8 *11.1 33.4 13.3 13.7
South Lake Outlet.	Portage River	NE¼ sec. 9, T. 1 S., R. 3 E., at Boyce Rd., 7 miles northeast of Chelsea, Mich.	-	1955-56	Oct. 15 Nov. 13 Feb. 6	*1.36 *2.26 *4.80
Gosling Lake Outlet.	....do.......	NW¼ sec. 32, T. 1 N., R. 4 E., 3 miles west of Pinckney, Mich.	-	1955-56	Oct. 15 Nov. 13 Feb. 6	0 0 0
Crooked Lake Outlet.	....do.......	SE¼ sec. 32, T. 1 N., R. 4 E., 3½ miles southwest of Pinckney, Mich.	-	1955-56	Oct. 15 Nov. 13 Feb. 6	*.09 *.34 *.78
Unnamed tributary.	....do.......	NW¼ sec. 11, T. 1 S., R. 4 E., at Stinchfield Woods Rd., 3½ miles south of Pinckney, Mich.	-	1955-56	Oct. 15 Nov. 13 Feb. 6	0 0 *.33
North Fork Mill Creek h/	Mill Creek...	SE¼ sec. 2, T. 2 S., R. 3 E., 1½ miles northwest of Chelsea, Mich.	-	1955-56	Oct. 15 Nov. 13 Feb. 6	*.70 *.69 *1.82
Letts Creek..	North Fork Mill Creek.	On line between secs. 1 and 12, T. 2 S., R. 3 E., on State Highway 92, ½ mile north of Chelsea, Mich.	-		Aug. 16 Sept.12	2.20 2.27
North Fork Mill Creek.	Mill Creek...	On line between secs. 9 and 16, T. 2 S., R. 4 E., 1 mile north of Lima, Mich.	-		Aug. 16 Sept.12	4.73 5.14
St. Marys River.	Maumee River.	Lat 41°05'02", long 85°08'10", at Spy Run Avenue Bridge, in Fort Wayne, Ind.	-		Apr. 5 Apr. 7 Apr. 13 Apr. 16	6,230 7,820 4,850 1,940
Maumee River.	Lake Erie....	Lat 41°04'55", long 85°06'53", at Anthony Boulevard Bridge, in Fort Wayne, Ind.	-		Apr. 5 Apr. 8 Apr. 13 Apr. 16 Apr. 17	12,200 12,900 8,420 4,900 3,980
Miami & Erie Canal.	Jennings Creek.	Lat 40°50'45", long 84°20'25", at Third Street Bridge in Delphos, Ohio, at gaging station site 1928-33.	-	1928-35, 1945-56	Oct. 24 Dec. 19 Feb. 5 Mar. 21 May 14 July 17 Aug. 23	.31 7.91 .81 1.50 30.0 7.40 9.25
Tiderishi Creek.	Ottawa Creek.	Lat 40°55'50", long 83°43'40", at bridge on State Highway 698, 2¼ miles north of Janera, Ohio.	4.51	1950-51, 1955	June 28	241
Little Auglaize River.	Auglaize River.	Lat 40°56'50", long 84°20'25", at highway bridge, 1 mile north of Ottoville, Ohio.	100		Sept.17	*.01
Roller Creek.	Town Creek...	Lat 40°46'15", long 84°38'15", at highway bridge, ¾ mile west of Ohio City, Ohio.	4.94	1946-56	Oct. 17 Nov. 21 Feb. 13 Mar. 25 Apr. 4	*0 .01 2.42 .41 137

* Base flow.
g Published as Proud Lake Outlet 1947-54.
h Published as Mill Creek 1955-56.

Discharge measurements made at points other than gaging stations during water year 1957--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Streams tributary to Lake Erie--Continued						
Roller Creek.	Town Creek...	Lat 40°46'15", long 84°38'15", at highway bridge, ¾ mile west of Ohio City, Ohio.	4.94	1946-56	May 7 June 10 June 28 July 25 Sept. 2	0.59 .47 143 1.45 *0
Flatrock Creek.	Auglaize River.	Lat 41°09'45", long 84°30'55", at bridge on State Highway 111, 4 miles northeast of Paulding, Ohio.	200	1955-56	Sept.18	*.54
Yellow Creek.	Beaver Creek.	Lat 41°13'30", long 83°50'30", at bridge on Custer Rd., 3½ miles northeast of Deshler, Ohio.	52	1955-56	July 25 Sept.17	.07 *0
Havens Creek.	Sandusky River.	Lat 41°17'40", long 83°11'55", at bridge on State Highway 12, ¾ mile southwest of Havens.	5.00	1946-56	Oct. 17 Nov. 20 Feb. 14 Mar. 26 May 8 June 10 July 25 Sept. 3	*0 *0 4.15 .84 .19 .35 .05 *0
Mills Creek..	Sandusky Bay.	Lat 41°25'40", long 82°43'55", at bridge on Old Railroad Rd., 3/8 mile southwest of Sandusky city limits.	32.5		June 10 Aug. 2	4.99 *1.25
East Branch HuronRiver.	Huron River..	Lat 41°14'58", long 82°38'52", at highway bridge, 1¼ miles northwest of Norwalk and 1½ miles below mouth of Cole Creek, at gaging station site 1923-35.	84.9	1923-35, 1953-54	Apr. 4	3,040
Walnut Creek.	Lake Erie....	Lat 42°03'09", long 80°10'05", at highway bridge, ½ mile northeast of Weis Library, Pa., and 3.4 mile above Bear Run.	26.9	1944,1946, 1948-49, 1951-55	Nov. 9 Aug. 27	*6.76 *.95
Mill Creek...	....do.......	Lat 42°05'38", long 80°04'20", in Glenwood Park at south edge of Erie, Pa., 1.5 miles above U. S. Highway 20 crossing.	9.20	1944,1946, 1948-49, 1951-55	Nov. 9 Aug. 27	*2.71 *1.73
Eighteenmile Creek.	....do.......	Lat 42°41'04", long 78°46'40", at bridge on Zimmerman St., State Highway 277, at North Boston, N. Y.	37.1		May 8 Sept.18	*20.8 *6.43
Streams tributary to Lake Ontario						
Golden Hill Creek.	Lake Ontario.	Lat 43°21'54", long 78°29'52", at bridge on Lower Lake Rd., 3.8 miles northeast of Barker, N.Y.	20.7		May 23 Sept.19	17.9 *0
Oak Orchard Creek.	....do.......	Lat 43°11'25", long 78°23'14", at bridge on Main St., at Shelby, N. Y.	154		May 8 Sept.17	*71.1 9.57
Sandy Creek..	....do.......	Lat 43°20'22", long 77°54'06", at bridge on State Highway 19, at North Hamlin, N. Y.	87.2		May 24 Sept.19	123 *22.6
Salmon Creek.	....do.......	Lat 43°17'34", long 77°46'33", at bridge at Wilder Rd., 0.9 mile northeast of Hilton, N. Y.	65.5		May 24 Sept.20	50.3 *14.3
Slater Creek.	....do.......	Lat 43°15'36", long 77°38'28", at New York Central RR., bridge, 1.0 mile northeast of Mount Read, N. Y.	4.57		May 24 Sept.20	4.88 *2.78
Van Campen Creek.	Genesee River	Lat 42°12'22", long 78°07'46", at Moss Brook Street Bridge, at Friendship, N. Y.	45.8	1954-55	Dec. 12 Apr. 22 Sept.10	212 85.9 *.91
Angelica Creek.	....do.......	Lat 42°18'38", long 78°02'16", at bridge on State Highway 408, 1.2 miles west of Angelica, N. Y.	61.3	1942, 1954-55	May 2 Sept.10	*36.0 .65
Black Creek..	....do.......	Lat 42°18'08", long 78°09'49", at bridge on State Highway 305, at Rockville, N. Y.	21.3		Apr. 22 Sept.10	25.9 *.17
Wiscoy Creek.	....do.......	Lat 42°33'19", long 78°09'19", at bridge on Allegany Rd., at Pike, N. Y.	43.9		May 2 Sept.10	*63.2 *15.4
Keshegua Creek.	....do.......	Lat 42°40'53", long 77°49'45", at former gaging station, at Craig Colony, Sonyea, N. Y.	69.1	1910-12, 1917-32	May 2 Sept. 9	*36.9 *3.04
Catherine Creek.	Seneca Lake..	Lat 42°19'42", long 76°50'40", at bridge on dirt road, 0.4 mile south of city line of Montour Falls, N. Y.	41.1		May 3 Aug. 27	*32.7 *5.27
Marsh Creek..	....do.......	Lat 42°52'32", long 76°58'35", at bridge on East North St., at Geneva, N. Y.	8.37		May 7 Sept. 9	*.83 *.10
Enfield Creek	Cayuga inlet.	Lat 42°23'54", long 76°32'45", at bridge on State Highway 13, 0.2 mile above mouth and 3.6 miles southwest of Ithaca, N. Y.	27.9	1956	Oct. 22 Apr. 19 July 5 Sept. 6	*4.84 63.9 10.8 *.71
Sixmile Creek	....do.......	Lat 42°24'11", long 76°26'07", at bridge on German Cross Rd., 3.4 miles southeast of city line of Ithaca, N. Y.	39.3	1955-56	Oct. 22 May 3 July 13 Sept. 6	*12.5 *36.7 85.1 *4.94

* Base flow.

Discharge measurements made at points other than gaging stations during water year 1957--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Streams tributary to Lake Ontario--Continued						
Cascadilla Creek.	....do.......	Lat 42°26'33", long 76°28'13", at bridge at entrance to Cornell fish hatchery, 1.9 miles east of Ithaca, N. Y.	12.7	1935, 1955-56	Oct. 22 May 3 July 5	*3.61 *9.38 6.27
Virgil Creek.	Fall Creek...	Lat 42°30'18", long 76°21'01", at bridge on Johnson St., 0.6 mile southwest of Freeville, N. Y.	40.4	1955-56	May 7 July 19 Sept. 6	*23.7 *11.2 *5.86
Salmon Creek.	Cayuga Lake..	Lat 42°32'18", long 76°32'34", at timber bridge, at Myers, N. Y., 0.3 mile above mouth.	89.3	1935,1956	Oct. 24 May 3 July 13 Sept. 6	*26.0 *53.0 71.0 *3.22
Mud Creek....	Ganargua Creek.	Lat 42°58'32", long 77°22'58", at bridge on State Highway 96, at East Victor, N. Y.	64.1		May 7 Sept. 9	*15.1 *.16
Flint Creek..	Canandaigua Outlet.	Lat 42°53'25", long 77°06'05", at bridge on Castle Rd., 0.4 mile northeast of Seneca Castle, N. Y.	82.5		May 7 Sept. 9	*31.5 *.35
Owasco inlet.	Owasco Lake..	Lat 42°43'01", long 76°26'18", at bridge on State Highway 38, West Cayuga St. extension, about 0.8 mile northwest of Moravia, N. Y.	108	1949-50, 1955-56	Oct. 24 Apr. 24 Sept. 9	*82.1 153 17.8
West Branch Fish Creek.	Fish Creek...	Lat 43°16'26", long 75°38'58", at bridge, 0.4 mile southwest of Blossvale, N. Y.	203		July 16 Aug. 13	*129 140
East Branch Fish Creek.	....do.......	Lat 43°27'44", long 75°35'51", at bridge, 0.3 mile east of Swancott Mill, N. Y.	95.7		Aug. 2 Aug. 15	*102 *54.7
Fish Creek...	Oneida Lake..	Lat 43°14'28", long 75°37'56", at Herder Bridge on State Highway 49, 3.4 miles northwest of New London, N. Y.	407		Jan. 23 May 20	4,890 2,950
Onondaga Creek.	Onondaga Lake	Lat 42°54'50", long 76°10'16", at highway bridge on county road, 0.9 mile above Onondaga Reservoir dam and 2.2 miles northwest of Cardiff, N. Y.	40.5	1916-18, 1956	Oct. 29	*15.5
Ley Creek....	....do.......	Lat 43°05'32", long 76°07'02", at highway bridge on town line road at Syracuse, N. Y., 2.3 miles above mouth of Beartrap Creek and 3.5 miles above mouth.	20.4	1956	Oct. 30	*5.90
Butternut Creek.	Limestone Creek.	Lat 42°56'45", long 76°03'41", at Smith Road Bridge, 3.3 miles south of Jamesville, N. Y.	34.7	1955-56	Oct. 29 Apr. 24 July 3	*13.8 45.1 *14.4
Mud Creek....	Oneida River.	Lat 43°11'11", long 76°12'52", at highway bridge on State Highway 31, at Euclid, N. Y.	29.7	1956	Oct. 30	*12.1
West Branch Limestone Creek.	Limestone Creek.	Lat 42°59'49", long 75°59'17", at highway bridge on State Highways 173 and 20N, at Manlius, N. Y.	21.9	1956	Oct. 29	*6.68
North Branch Salmon River.	Salmon River.	Lat 43°32'32", long 75°48'51", at highway bridge on Harvester Mill Rd., 0.7 mile northeast of Redfield, N. Y.	82.5		July 16 Aug. 15	*32.1 *31.3
South Sandy Creek.	Lake Ontario.	Lat 43°45'22", long 76°05'18", at highway bridge, 1.2 miles southwest of Wardell, N. Y.	80.6		July 10 Aug. 15	*64.5 *23.0
Sugar River..	Black River..	Lat 43°32'08", long 75°22'03", at highway bridge on State Highway 12D, 0.3 mile north of Talcottville, N. Y.	41.5	1926-32, 1953	June 28 Aug. 2 Aug. 14	26.0 *20.8 *9.20
Otter Creek..	....do.......	Lat 43°42'59", long 75°22'04", at bridge at Otter Creek, N. Y., 1.8 miles northeast of Glenfield, N. Y.	65.6	1924-33, 1953	Aug. 2 Aug. 14	*46.4 *32.4
Roaring Brook	....do.......	Lat 43°44'00", long 75°28'13", at highway bridge on State Highways 12D and 26, at Martinsburg, N. Y.	21.8	1953	June 28 Aug. 2 Aug. 14	14.5 *12.2 *2.99
Sunday Creek.	Beaver River.	Lat 43°52'19", long 75°07'03", at highway bridge, 3.1 miles east of Number Four, N. Y.	9.07	1954-55	July 20 Sept. 5	*14.2 *8.26
Chaumont River.	Chaumont Bay.	Lat 44°10'30", long 76°00'57", at highway bridge, 3.6 miles northeast of Depauville, N. Y.	18.3	1956	Aug. 1 Aug. 15	1.24 *.32
Brandy Brook.	St. Lawrence River.	Lat 44°50'58", long 75°09'53", at bridge on Franklin Rd., 2.3 miles southeast of Waddington, N. Y., and 2.5 miles above mouth.	29.4	1956	June 26 July 25	*1.21 *0
Plumb Brook..	Grass River..	Lat 44°25'30", long 75°08'03", at highway bridge, 0.15 mile above mouth and 0.8 mile southeast of Russell, N. Y.	35.2		June 27 July 26	*22.8 *10.6

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* Base flow.

Discharge measurements made at points other than gaging stations during water year 1957--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Streams tributary to St. Lawrence River--Continued						
Tanner Creek.	Harrison Creek.	Lat 44°29'04", long 75°15'29", at bridge, 0.6 mile west of Stellaville, N. Y.	32.3		June 28 July 26	*1.92 *.20
Little River.	Grass River..	Lat 44°33'24", long 75°06'56", at bridge at Brick Chapel, 4.0 miles southeast of Canton, N. Y.	42.4		June 27 July 26	*9.22 *2.71
Deer River...	St. Regis River.	Lat 44°53'34", long 74°41'35", at bridge at Brasher Iron Works, N. Y.	189	1912-16, 1955	June 26 July 25	*66.4 *78.1
Little Salmon River.	Salmon River.	Lat 44°56'23", long 74°33'25", at highway bridge, 0.5 mile east of Bombay, N. Y.	93.6	1954-55	June 26 July 25 Aug. 1 Aug. 8 Aug. 28	*32.0 *35.5 61.1 *15.9 *11.5
Trout River..	Chateaugay River.	Lat 44°55'44", long 74°18'03", at highway bridge, 0.2 mile west of State Highway 10, at Constable, N. Y.	48.9	1954-55	June 25 July 25	*12.7 *15.8
English River	....do.......	Lat 44°57'38", long 73°40'27", at highway bridge, 1.7 miles west of Mooers Forks, N. Y.	40.1	1956	June 27 July 25	6.88 *3.10
Little Chazy River.	Lake Champlain.	Lat 44°50'46", long 73°27'24", at bridge, 1.5 miles west of U. S. Highway 9 and 3.2 miles southwest of Chazy, N. Y.	35.4	1956	June 28 July 24	10.5 *4.19
North Branch Saranac River.	Saranac River	Lat 44°35'33", long 73°52'34", at highway bridge, 2.0 miles west of Clayburg, N. Y.	124	1956	July 24	77.7
Salmon River.	Lake Champlain.	Lat 44°38'24", long 73°29'43", at highway bridge on Salmon River Rd., 0.4 mile west of State Highway 22, at South Plattsburg, N. Y.	61.9	1954	June 28 July 24	*15.4 *23.2
Little Ausable River.	....do.......	Lat 44°35'39", long 73°29'48", at bridge at Laphams Mills, 2.8 miles southwest of Valcour, N. Y.	67.8	1956	July 24	*7.97
Chubb River..	West Branch Ausable River.	Lat 44°16'39", long 73°58'58", at highway bridge on State Highway 73, at Lake Placid, N. Y.	38.4		Oct. 30	10.3
East Branch Ausable River.	Ausable River	Lat 44°11'31", long 73°47'08", at highway bridge, 0.1 mile east of State Highways 73 and 86A, at Keene Valley, N. Y.	49.2	1949	Apr. 16 July 23	34.9 *31.7
Bouquet River	Lake Champlain.	Lat 44°09'51", long 73°36'30", at highway bridge, 0.2 mile east of U. S. Highway 9, at New Russia, N. Y.	37.6	1949,1951, 1953-54	Apr. 16 July 22	37.0 *13.0
Hadlock Bay Outlet.	Halfway Creek	Lat 43°24'19", long 73°34'42", at bridge on State Highway 149, 0.6 mile southwest of West Fort Ann, N. Y.	16.5	1953-54	Sept.20	*10.7

* Base flow.

The following table contains determinations of peak discharge made at crest stage by indirect methods or by current meter or computed from rating curve at points other than regular gaging stations.

Determinations of peak discharge at points other than gaging stations during water year 1957

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Pearson Creek	Lake Superior	Lat 46°38'50", long 91°42'55", between secs. 11 and 14, T. 48 N., R. 11 W., at box culvert on State Highway 13, 4 miles north of Maple, Wis.	4.55		July 20	1,030
Smoke Creek..	Lake Erie....	Lat 42°46'12", long 78°42'42", at culvert on U. S. Highway 20A, 1.7 miles east of Orchard Park, N. Y.	3.08	1953	1953 May 26	2,520
Sucker Brook.	Seneca River.	Lat 42°52'48", long 76°48'56", at a culvert on County House Rd., 1.5 miles south southwest of Seneca Falls, N. Y.	8.12	1955	1955 Mar. 1	703
Canaseraga Creek.	Lake Ontario.	Lat 43°02'20", long 75°49'47", at a culvert on Creek Rd., 2.0 miles southeast of Chittenango, N. Y.	11.1		Aug. 3	929
Cowaselon Creek.	Canaseraga Creek.	Lat 43°01'02", long 75°40'11", at a culvert, 0.2 mile southeast of Merrillsville, N. Y.	9.24		Aug. 4	2,740
Clockville Creek.	Cowaselon Creek.	Lat 43°03'19", long 75°42'38", at a culvert, 0.35 mile west of Lenox, N. Y.	11.1		Aug. 4	488
Unnamed tributary.	Chittenango Creek.	Lat 43°02'04", long 75°52'56", at a reach alongside State Highway 173, 1.0 mile southwest of Chittenango, N. Y.	2.96		Aug. 3	170
Mill Creek tributary.	Mill Creek...	Lat 43°37'09", long 75°23'27", at a culvert, 0.8 mile north of Collinsville, N. Y.	1.45		1952 Dec. 11 1953 Mar. 25	110 78.3

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