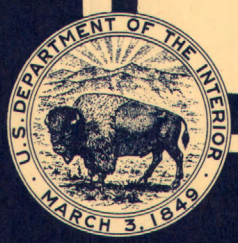
1971

Water Resources Data for Michigan

Part 1. Surface Water Records



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared in cooperation with the State of Michigan
and with other agencies

CALENDAR FOR WATER YEAR 1971

OCTOBER 1970

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
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NOVEMBER 1970

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DECEMBER 1970

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JANUARY 1971

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31						

FEBRUARY 1971

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28						

MARCH 1971

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APRIL 1971

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MAY 1971

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30	31					

JUNE 1971

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JULY 1971

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18	19	20	21	22	23	24
25	26	27	28	29	30	31

AUGUST 1971

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8	9	10	11	12	13	14
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22	23	24	25	26	27	28
29	30	31				

SEPTEMBER 1971

S	M	T	W	T	F	S
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5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

1971

Water Resources Data for Michigan

Part 1. Surface Water Records

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared in cooperation with the State of Michigan and with other agencies

Prepared in cooperation with

Michigan State Department of Natural Resources
Water Resources Commission
Geological Survey Division
Michigan Department of State Highways
Genesee County Drain Commission
Kalamazoo County Board of Supervisors
Macomb County Board of Supervisors
Macomb County Road Commission
Oakland County Department of Public Works
Oakland County Drain Commission
Washtenaw County Planning Commission
Huron-Clinton Metropolitan Authority
York Township
City of Kalamazoo
City of Saline
Village of Imlay City
Village of Milan
Corps of Engineers, U.S. Army
Soil Conservation Service, U.S. Department of Agriculture

Water resources records, 1971, for Michigan are in the following reports of the U.S. Geological Survey:

1. Water Resources Data for Michigan
   Part 1: Surface Water Records

2. Water Resources Data for Michigan
   Part 2: Water Quality Records

Copies of this report may be obtained from
District Chief, Water Resources Division
U.S. Geological Survey
2400 Science Parkway
Okemos, Michigan 48864

1972

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ILLUSTRATIONS

GAGING STATIONS, IN DOWNSTREAM ORDER,
FOR WHICH RECORDS ARE PUBLISHED

WATER RESOURCES DATA FOR MICHIGAN, 1971

PART 1: SURFACE-WATER RECORDS

INTRODUCTION

Surface-water records for the 1971 water year for gaging stations, partial-record stations, and miscellaneous sites within the State of Michigan are given in this report. For convenience there are also included records for a few pertinent gaging stations in bordering States. The records were collected and computed by the Water Resources Division of the U.S. Geological Survey, under the direction of T. R. Cummings, district chief. These data represent that portion of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Michigan.

Records of discharge and stage of streams, and contents and stage of lakes or reservoirs are published in a series of U.S. Geological Survey water-supply papers entitled "Surface Water Supply of the United States." Through September 30, 1960, these water-supply papers were in an annual series and since then are in a 5-year series. Since 1951 there have been 20 volumes in the series; each volume covered an area whose boundaries coincided with those of certain natural drainage areas. The records in Michigan were contained in Part 4 of that series.

Beginning with the 1961 water year, streamflow records and related data have been released by the Geological Survey in annual reports on a State-boundary basis. Distribution of these basic-data reports is limited and primarily for local needs.

COOPERATION

The systematic collection of streamflow records began in 1898 by cooperation with cities, municipalities, and private organizations. Cooperative agreements between the U.S. Geological Survey and organizations of the State of Michigan for the collection of streamflow records began in 1930. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreements with the Survey are:

Michigan State Department of Natural Resources Ralph A. MacMullen, director, Gaylord A. Walker, deputy director -- administration.

Water Resources Commission, Ralph W. Purdy, executive secretary.

Geological Survey Division, Arthur E. Slaughter, chief.

Michigan Department of State Highways, Henrik E. Stafseth, director.

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army, in collecting records for 29 gaging stations published in this report.

Assistance was also furnished by the U.S. Department of Commerce, ESSA, Weather Bureau, and the Soil Conservation Service, U.S. Department of Agriculture.

The following organizations aided in collecting records:

Kalamazoo County Board of Supervisors; Macomb County Board of Supervisors; Macomb County Road Commission; Oakland County Department of Public Works; Oakland County Drain Commission; Genesee County Drain Commission; Washtenaw County Planning Commission; Huron-Clinton Metropolitan Authority; York Township; city of Saline; villages of Imlay City and Milan; Consumers Power Co.; Cleveland-Cliffs Iron Co.; Hanna Coal and Ore Corp.; Michigan Power Co.; Michigan Sugar Co.; Upper Peninsula Power Co.; and Wisconsin-Michigan Power Co.

DEFINITION OF TERMS

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

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or 325,851 gallons.

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, 1.9835 acre-feet, or 646,317 gallons, and represents a runoff of 0.0372 inch from 1 square mile.

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

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, an artificial structure, or a uniform cross section over a long reach of the channel.

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.

Cubic foot per second (cfs) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second, and is equivalent to 7.48 gallons per second or 448.8 gallons per minute.

Discharge is the volume of water (or more broadly, total fluids), that passes a given point within a given period of time.

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

Gage height (GHT) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage", although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is obtained.

Partial-record station is a particular site where limited streamflow data are collected systematically over a period of years for use in hydrologic analyses.

Runoff in inches (IN.) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

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.

WRD is used as an abbreviation for "Water-Resources Data" in the summary REVISIONS paragraph to refer to previously published State annual basic-data reports.

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

SPECIAL NETWORKS AND PROGRAMS

Hydrologic bench-mark station is one that provides hydrologic data for a basin in which the hydrologic regimen will likely be governed solely by natural conditions. Data collected at a bench-mark station may be used to separate effects of natural from man-made changes in other basins which have been developed and in which the physiography, climate, and geology are similar to those in the undeveloped bench-mark basin.

International Hydrological Decade (IHD) River Stations provide a general index of runoff and materials in the water balance (discharge of water, and dissolved and transported solids) of the world. In the United States, IHD Stations provide indices of runoff and of the general distribution of water in the principal river basins of the conterminous United States and Alaska.

DOWNSTREAM ORDER AND STATION NUMBERS

Records are listed in a downstream direction along the main stream, and stations on tributaries are listed between stations on the main stream in the order in which those tributaries enter the main stream. Stations on tributaries entering above all mainstream stations are listed before the first mainstream station. Stations on tributaries to tributaries are listed in a similar manner. In the list of gaging stations in the front of this report the rank of tributaries is indicated by indention, each indention representing one rank.

As an added means of identification, each gaging station and partial-record station has been assigned a station number. These are in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations; therefore, the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Gaps are left in the numbers to allow for new stations that may be established; hence the numbers are not consecutive. The complete 8-digit number for each station, such as 04042500, includes the part number "04" and a 6-digit station number. In this report, the complete number 04042500 appears just to the left of the station name. In this report, the records are listed in downstream order by parts. All records for a drainage basin encompassing more than one State could be arranged in downstream order by assembling pages from the various State reports by station number to include all records in the basin.

EXPLANATION OF DATA

Collection and Computation of Data

The base data collected at gaging stations consist of records of stage and measurements of discharge of streams, and stage, and contents of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relations, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from a water-stage recorder that gives a continuous chart of fluctuations (for digital recorders, a tape punched at 15-, 30-, or 60-minute intervals) or from direct readings on a nonrecording gage. 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 standard textbooks on the measurement of stream discharge. (See also SELECTED REFERENCES.)

For a stream-gaging station, rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, or computation of flow over dams or weirs), 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 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 in effect the shifting-control method.

At some stream-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 required 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. For such stations, the rate of change in stage is used as a factor in determining discharge.

At some stream-gaging stations the stage-discharge relation is affected by ice in 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 hydrologist, and comparable records of discharge for other stations in the same or nearby basins.

For a lake or reservoir station, capacity tables giving the contents for any stage are prepared from stage-area relation curves defined by surveys. The application of the stage to the capacity table gives the contents, from which the daily, monthly, or yearly change in contents is computed.

If the stage-capacity curve is subject to changes because of deposition of sediment in the reservoir, periodic resurveys of the reservoir are necessary to define new stage-capacity curves. During the period between reservoir surveys the computed contents may be increasingly in error due to the gradual accumulation of sediment.

For some gaging stations there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods the daily discharges are estimated on the basis of recorded range in stage, adjoining good record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise daily contents may be estimated on the basis of operator's log, adjoining good record, inflow-outflow studies, and other information.

The data in this report generally comprise a description of the station and tabulations of basic data. For gaging stations on the streams or canals a table showing the daily discharge and monthly and yearly discharge is given. For gaging stations on lakes and reservoirs a monthly summary table of stage and contents is given. Tables of daily mean gage heights are included for some stations. Records are published for the water year, which begins on October 1 and ends on September 30. A calendar for the 1970 water year is shown on the reverse side of the front cover to facilitate finding the day of the week for any date.

The description of the gaging station gives the location, drainage area, period of record, type and history of gages, average discharge, extremes of discharge or contents, and general remarks. 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 or other agencies. Periods for which there are published records for the present station or for stations generally equivalent to the present one are given under "PERIOD OF RECORD." The type of gage currently in use, 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 record are given under "GAGE." In references to datum of gage, the phrase "mean sea level" denotes "Sea Level Datum of 1929" as used by the Topographic Division of the Geological Survey, unless otherwise qualified. The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE"; it is not given for stations having fewer than 5 complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. The maximum discharge (or contents) and the maximum gage height, the minimum discharge if there is little or no regulation (or the minimum contents), and the minimum gage height if it is significant are given under "EXTREMES." The minimum daily discharge is given if there is extensive regulation (also the minimum discharge and gage height if they are abnormally low). In the first paragraph headed "Current year:" the data given are for the complete current water year unless otherwise specified. In the second paragraph under "EXTREMES" headed "Period of record:" the data given are for the period of record given in the PERIOD OF RECORD paragraph. Reliable information concerning major floods that occurred outside the period of record is given in the third or last paragraph under "EXTREMES." Unless otherwise qualified, the maximum discharge (or contents) corresponds to the crest stage obtained by use of a water-stage recorder (graphic or digital), a crest-stage gage, 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 or contents, it is given separately. Information pertaining to the accuracy of the discharge records, to conditions that affect the natural flow at the gaging station, and availability of Water Quality records, is given under "REMARKS"; for reservoir stations information on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir, is also 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 or compilation 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 were revised, 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 stream-gaging stations where they serve a useful purpose and the dates of applicability can be easily identified.

The daily tables for stream-gaging stations give the discharge corresponding to the daily mean gage height unless there are large or rapid changes in the discharge during a day. For days having large or rapid changes, discharge for the day is computed by averaging the mean discharge for several parts of a day. For digital recorders, the daily mean discharge is always the average of the discharges at each punched reading. For stations equipped with nonrecording gages, the daily discharge corresponds to once-daily readings of the gage or to the mean of twice-daily readings; but for periods of rapidly changing stage the discharge is determined from a gage-height graph based on gage readings.

The monthly summary is given below the daily table. For stream-gaging stations the line headed "TOTAL" gives the sum of the daily figures; it is the total cubic feet per second per day for the month. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also may be expressed in cubic feet per second per square mile (line headed "CFSM"), or in inches (line headed "IN."). Figures of cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion, or if the drainage area includes large noncontributing areas.

For reservoir stations the monthly summary gives the elevation (or gage height) at the end of the month and the change in contents during the month. For reservoir stations the yearly summary gives the change in contents for the calendar year and for the water year.

In the yearly summary below the monthly summary, the figures of maximum are the maximum daily discharges for the calendar and water years; likewise, the minimums in this summary are the minimum daily discharges.

Peak discharges and their times of occurrence and corresponding gage heights for many stations are listed below the yearly summary. 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 can be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030 and 1:30 p.m. is 1330.

In a general footnote introduced by the word "NOTE" certain periods are indicated for which the discharge is computed or estimated by special methods because of no gage-height record, backwater from various sources, or other unusual conditions. Period of no gage-height record are indicated if the period is continuous for a month or more or includes the maximum discharge for the year. Periods of backwater from an unusual source, of indefinite stage-discharge relation, or of any other unusual condition at the gage are indicated only if they are a month or more in length and the accuracy of the records is affected. Days on which the stage-discharge relation is affected by ice are not indicated. The methods used in computing discharge for various unusual conditions have been explained in preceding paragraphs. Footnotes to reservoir tables may be used to explain the use of new capacity tables or for other special conditions.

Accuracy of Data

The accuracy of discharge 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 under "REMARKS" states the degree of accuracy of the records. "Excellent" means that about 95 percent of the daily discharges are within 5 percent; "good" within 10 percent; and "fair" within 15 percent. "Poor" means that daily discharges have less than "fair" accuracy.

Figures of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 cfs; to tenths between 1.0 and 10 cfs; to whole numbers between 10 and 1,000 cfs; and to 3 significant figures above 1,000 cfs. The number of significant figures used is based solely on the magnitude of the figure. The same rounding rules apply to discharge figures listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumptive use, regulation, evaporation, or other factors. For such stations, discharge in cubic feet per second per square mile and runoff in inches are not published unless satisfactory adjustments can be made for such effects. 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 if adjustments or unadjusted losses (consumptive use, evaporation, seepage, etc.) are large in comparison with the observed discharge.

Publications

Each volume of the 1960 series of U. S. Geological Survey water-supply papers entitled "Surface Water Supply of the United States" contains a listing of the numbers of all water-supply papers in which records of surface-water data were published for the area covered by the individual volumes. Each volume also contains a list of water-supply papers that give detailed information on major floods for the area. A new series of water-supply papers containing surface-water records for the 5-year period October 1, 1960, to September 30, 1965, also will include lists of annual and special reports published as water-supply papers.

Records through September 1950 for the area covered by this report have been compiled and published in Water-Supply Paper 1307; records for October 1950 to September 1960 have been compiled and published in Water-Supply Paper 1727. These reports contain summaries of monthly and annual discharge and month-end storage 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 yearly summary table for each gaging station lists the numbers of the water-supply papers in which daily records were published for that station.

Special reports on major floods, droughts, lake levels, or of other hydrologic studies for the area have been issued in publications other than water-supply papers. Information relative to these reports may be obtained from the district office.

Other Data Available

Data collected at partial-record stations and at miscellaneous sites are given in three tables at the end of the surface-water records in this report. The first is a table of discharge measurements at low-flow partial-record stations, the second is a table of annual maximum stage and discharge at crest-stage stations, and the third is a table of discharge measurements at miscellaneous sites. Occasionally, a series of discharge measurements are made within a short time period to investigate the seepage gains or losses along a reach of a stream or to determine the low-flow characteristics of an area. Such measurements are given in special tables after the list of measurements at miscellaneous sites.

More detailed information than that published for most of the gaging stations, such as discharge measurements, gage-height records, and rating tables, is on file in the district office. Many gaging-station records in Michigan through 1967 have been analyzed to give several statistical summaries: (1) the number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year.

At or near some gaging stations, water-quality records also are collected. Data are obtained on the chemical quality of the stream water, on the water temperature, and on the sediment. These data are given in Part 2 of this report. Under the "REMARKS" paragraph of the gaging-station description, reference is made to water-quality records collected on a regular basis.

HYDROLOGIC CONDITIONS

Annual runoff during the 1971 water year was considerably above the mean in the upper peninsula and in the northern part of the lower peninsula while in the southern part of the lower peninsula runoff was slightly below the mean.

In the north, monthly discharge was record high for April at many gaging stations with 30 years or more of record. Melting of the record heavy snow mantle was started early in April by warm weather but was tempered by cold nights and lack of precipitation. Though no floods of significance occurred, many streams remained at or near bankful stages for about half the month.

SELECTED REFERENCES

Carter, R. W., and Davidian, Jacob, 1968, General procedure for gaging stream: U.S. Geol. Survey Techniques Water-Resources Inv., book 3, chap. A6, 13 p.

Corbett, D. M., and others, 1943, Stream-gaging procedure, a manual describing methods and practices of the Geological Survey: U.S. Geol. Survey Water-Supply Paper 888, 245 p.

Langbein, W. B., and Iseri, D. T., 1960, General introduction and hydrologic definitions: U.S. Geol. Survey Water-Supply Paper 1541-A, 29 p.

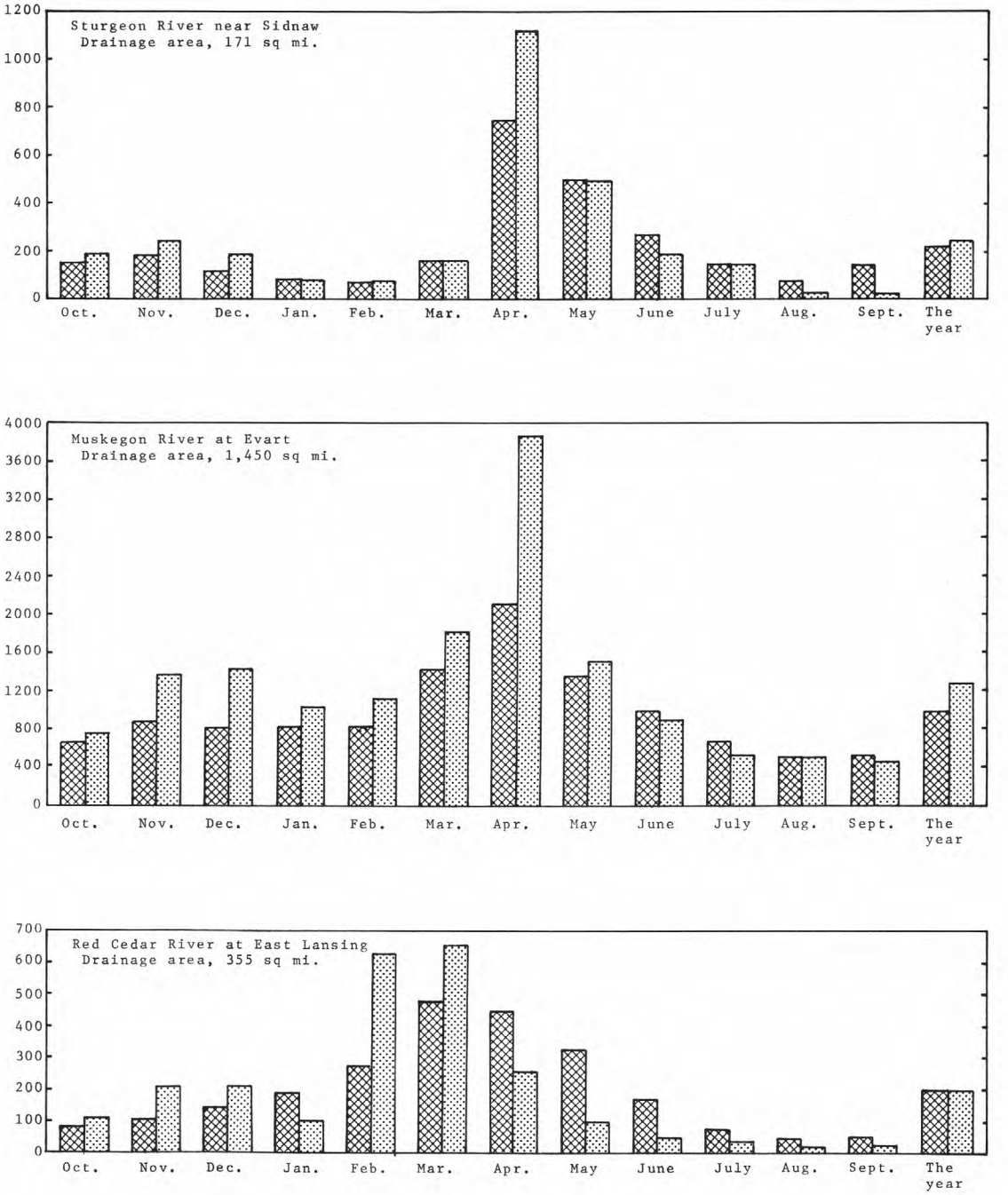

Figure 1.--Comparison of discharge at three long-term representative gaging stations during 1971 water year with mean discharge for period 1931-60.

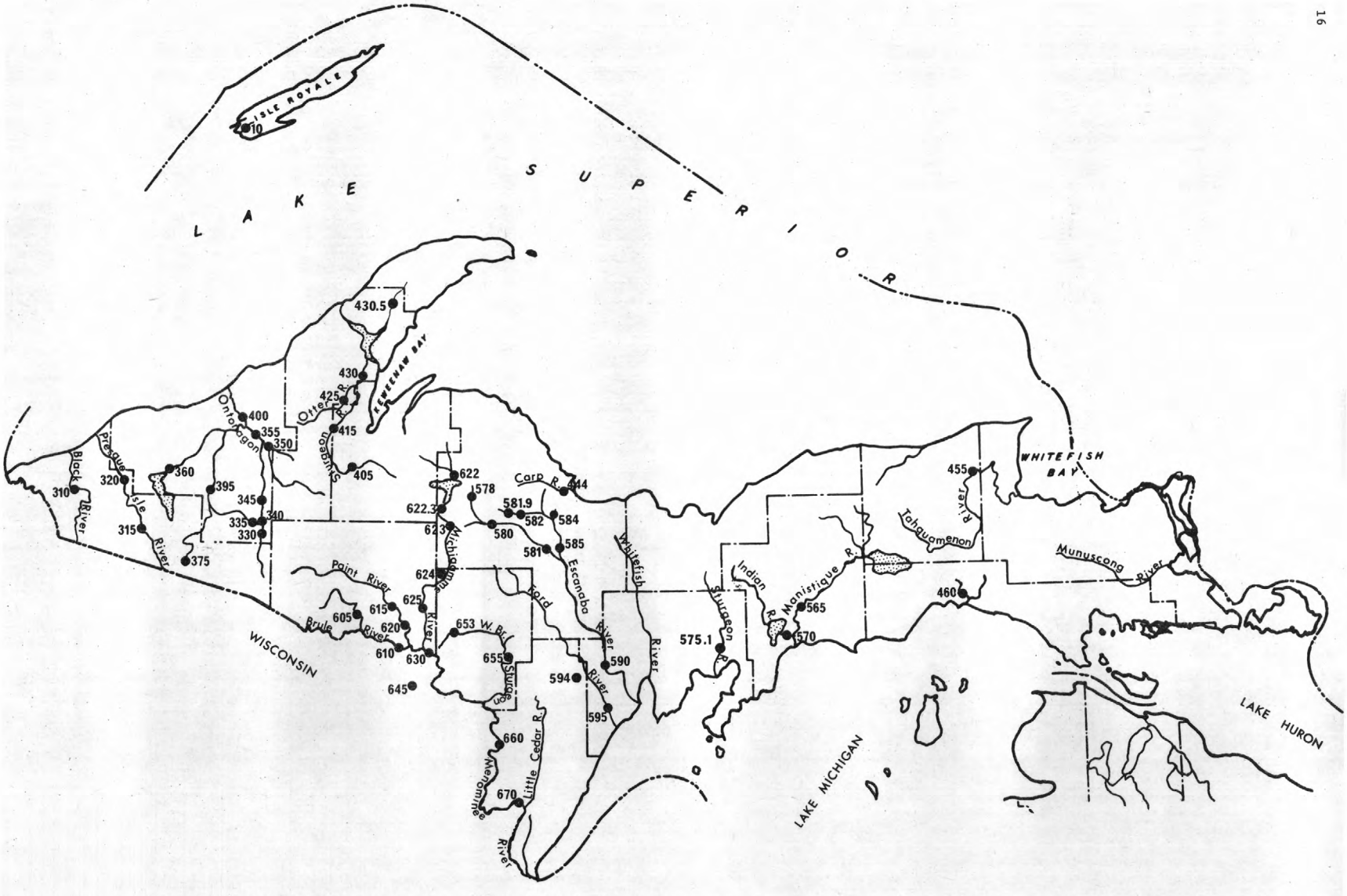

Figure 2.—Map showing identification number and location of gaging stations in Upper Peninsula of Michigan.

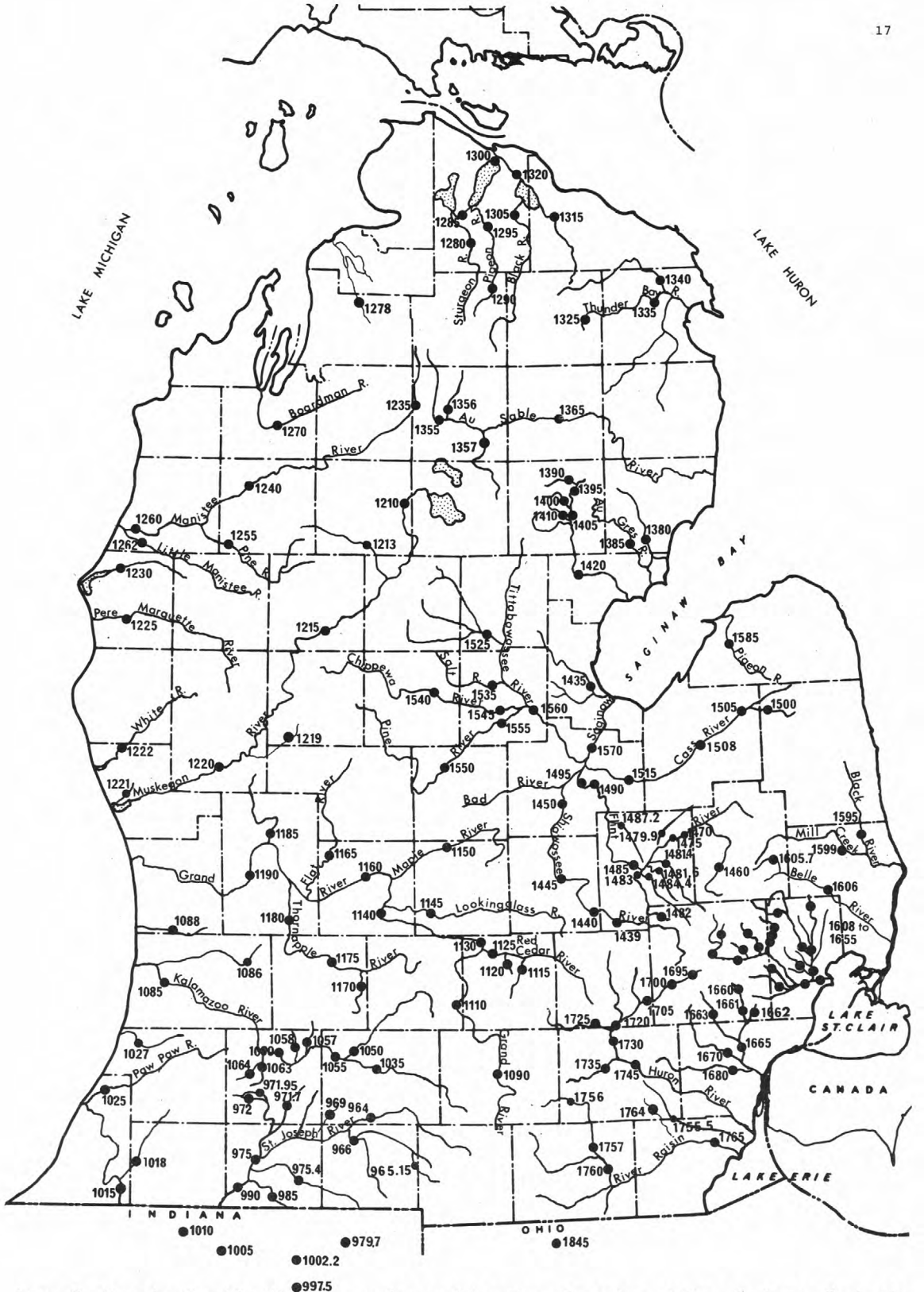

Figure 3.–Map showing identification number and location of gaging stations in Lower Peninsula of Michigan.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04001000 Washington Creek at Windigo, Mich.
(Hydrologic bench-mark station)

LOCATION.--Lat 47°55'23", long 89°08'42", in NW¼ sec.28, T.64 N., R.38 W., Keweenaw County, Isle Royale National Park, on left bank 0.8 mile northeast of Windigo, and 35 miles southwest of Rock Harbor.

DRAINAGE AREA.--13.2 sq mi.

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 605 ft (from topographic map).

AVERAGE DISCHARGE.--7 years, 22.1 cfs (22.74 inches per year).

EXTREMES.--Current year: Maximum discharge, 438 cfs May 24 (gage height, 6.75 ft); minimum, 1.6 cfs Oct. 5, Sept. 22 (gage height, 2.84 ft).
Period of record: Maximum discharge, 462 cfs Apr. 24, 25, 1966, from rating curve extended above 60 cfs based on runoff characteristics of nearby stations; maximum gage height, 6.75 ft May 24, 1971; minimum discharge, 0.57 cfs Aug. 21, 1970 (gage height, 2.57 ft).

REMARKS.--Records fair. Recording rain gage at station and capacity rain gage located near mouth. Records of chemical analyses, water temperatures, and suspended sediment loads for the current year are published in Part 2 of this report. Hydrologic bench mark stations are installed in specially selected areas where water resources have not yet been affected by works of man. Continuous records of natural hydrologic conditions, such as streamflow and water quality, will make possible assessment of changes which occur as a result of the changes in climate and other natural factors. These data will provide a frame of reference against which hydrologic changes wrought by man may be evaluated.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	33	40	7.3	2.4	12	24	60	31	13	5.7	3.1
2	2.4	33	52	6.6	2.3	12	28	69	26	13	5.1	3.0
3	2.2	27	34	6.2	2.3	11	45	67	23	10	4.5	3.0
4	2.0	21	26	5.6	2.2	10	30	64	21	8.4	3.8	2.8
5	1.9	17	22	5.3	2.2	9.0	17	60	24	7.9	3.2	2.7
6	2.1	14	18	5.0	2.2	8.5	20	58	25	6.3	2.5	2.6
7	2.4	12	15	4.7	2.3	8.0	63	57	20	6.6	2.0	2.5
8	6.6	11	14	4.5	2.4	7.5	104	52	18	8.8	2.0	2.4
9	15	11	13	4.4	2.5	7.0	109	45	15	6.4	2.0	2.5
10	14	23	12	4.3	2.6	6.6	135	41	14	5.5	2.7	3.1
11	10	26	12	4.2	3.4	6.5	173	40	30	4.6	3.5	3.4
12	8.5	33	12	4.0	3.4	6.4	241	37	28	5.2	3.0	3.0
13	7.5	25	11	4.0	3.6	6.3	269	34	25	9.9	2.7	2.7
14	6.0	18	10	3.9	3.8	6.8	228	31	21	7.5	2.6	2.5
15	5.5	15	10	3.7	3.7	18	192	30	17	5.6	2.4	2.4
16	5.0	13	9.6	3.6	3.9	40	191	27	14	4.7	2.3	2.3
17	4.3	13	9.2	3.4	3.8	28	267	26	16	3.8	2.7	2.1
18	4.1	22	9.1	3.3	3.5	21	265	37	28	3.3	3.0	2.0
19	3.6	28	8.8	3.1	3.6	16	251	35	25	2.9	3.5	1.9
20	3.5	36	8.6	3.0	3.8	13	216	44	29	2.6	3.2	1.8
21	3.4	35	8.4	2.9	3.6	10	201	39	22	2.5	2.9	1.8
22	3.4	29	8.2	2.8	3.6	8.9	144	33	17	2.5	2.7	1.8
23	3.1	25	8.1	2.8	3.8	8.4	114	32	13	2.4	2.7	2.5
24	5.1	21	8.0	2.7	3.6	8.2	87	224	12	2.4	3.5	3.5
25	8.9	20	8.0	2.7	3.6	7.7	79	349	9.9	2.4	4.0	2.5
26	13	18	8.0	2.6	4.0	7.3	75	186	8.3	3.0	3.5	2.0
27	37	15	7.9	2.6	6.0	7.3	69	98	7.4	3.1	3.0	2.2
28	80	14	7.9	2.5	10	7.3	63	70	6.7	26	2.3	3.5
29	64	13	7.8	2.5	------	10	60	56	6.6	18	2.3	6.0
30	39	12	7.8	2.4	------	9.4	56	45	9.5	10	2.5	15
31	29	------	7.7	2.4	------	9.4	------	36	------	6.9	2.8	------
TOTAL	395.1	633	434.1	119.0	98.1	347.5	3,816	2,082	562.4	215.2	94.6	92.6
MEAN	12.7	21.1	14.0	3.84	3.50	11.2	127	67.2	18.7	6.94	3.05	3.09
MAX	80	36	52	7.3	10	40	269	349	31	26	5.7	15
MIN	1.9	11	7.7	2.4	2.2	6.3	17	26	6.6	2.4	2.0	1.8
CFSM	.96	1.60	1.06	.29	.27	.85	9.62	5.09	1.42	.53	.23	.23
IN.	1.11	1.78	1.22	.34	.28	.98	10.75	5.87	1.58	.61	.27	.26

CAL YR 1970 TOTAL 6,510.70 MEAN 17.8 MAX 252 MIN .62 CFSM 1.35 IN 18.35
WTR YR 1971 TOTAL 8,889.60 MEAN 24.4 MAX 349 MIN 1.8 CFSM 1.85 IN 25.05

PEAK DISCHARGE (BASE, 110 CFS)

DATE	TIME	GHT	DISCHARGE
04-17	2200	6.48	352
05-24	1900	6.75	438

NOTE.--No gage-height record Dec. 23 to Feb. 10.

04031000 Black River near Bessemer, Mich.

LOCATION.--Lat 46°30'41", long 90°04'28", in NE¼ SE¼ sec.32, T.48 N., R.46 W., Gogebic County, on right bank 450 ft downstream from bridge on county highway, 500 ft downstream from Powder Mill Creek, and 2.5 miles northwest of Bessemer.

DRAINAGE AREA.--200 sq mi.

PERIOD OF RECORD.--October 1954 to current year.

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

AVERAGE DISCHARGE.--17 years, 233 cfs (15.82 inches per year).

EXTREMES.--Current year: Maximum discharge, 5,040 cfs Apr. 17 (gage height, 9.55 ft); minimum, 18 cfs Sept. 16-22, minimum gage height, 0.61 ft Sept. 17, 22.
Period of record: Maximum discharge, 14,800 cfs Apr. 24, 1960 (gage height, 14.27 ft, from floodmark), from rating curve extended above 5,300 cfs on basis of slope-area measurement of peak flow; minimum, 7.8 cfs Sept. 9, 1970 (gage height, 0.36 ft).

REMARKS.--Records good except those for winter periods, which are poor. Prior to 1967, some ground water pumped from mines at Bessemer. Records of water temperatures for the current year are published in Part 2 of this report.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	220	160	68	50	61	180	603	226	362	46	44
2	25	193	270	67	50	64	210	582	254	196	40	41
3	24	174	300	65	50	66	225	502	254	129	36	37
4	23	160	300	64	49	67	210	442	223	89	33	34
5	23	143	280	62	49	68	200	421	199	68	29	34
6	23	131	250	60	49	68	300	382	160	56	28	32
7	27	115	230	58	48	67	649	344	138	47	28	30
8	53	103	210	57	48	66	845	309	141	44	27	27
9	73	102	185	55	48	66	1,290	277	110	37	26	25
10	79	120	170	54	48	67	1,580	247	94	32	28	26
11	66	134	155	54	47	68	2,550	225	84	29	26	26
12	62	193	145	54	47	70	3,160	213	76	97	26	24
13	60	180	130	53	48	73	2,920	192	68	403	29	23
14	54	160	125	53	48	80	2,620	170	60	230	36	22
15	49	142	120	52	48	95	2,640	154	52	147	30	20
16	45	128	115	52	48	120	3,650	133	45	113	26	19
17	42	115	105	51	49	160	4,860	121	40	91	25	18
18	39	112	105	51	50	210	4,470	120	41	71	127	19
19	37	119	100	51	50	230	4,170	220	38	61	234	18
20	39	125	98	51	51	220	3,810	252	40	52	210	18
21	38	120	95	51	52	200	3,450	240	36	64	156	19
22	37	120	92	51	53	180	2,490	210	33	482	120	19
23	37	100	90	50	53	170	1,840	187	36	408	92	34
24	44	170	86	50	53	160	1,290	564	45	248	77	29
25	54	200	82	50	54	150	966	839	60	162	73	28
26	60	190	80	50	56	145	784	938	53	118	69	26
27	70	180	78	50	57	140	658	713	45	92	62	25
28	188	160	76	50	59	140	651	527	38	89	55	35
29	265	150	74	50	------	140	651	400	210	74	48	40
30	233	145	73	50	------	145	593	313	714	61	44	47
31	240	------	70	50	------	150	------	258	------	52	42	------
TOTAL	2,134	4,404	4,449	1,684	1,412	3,706	53,912	11,098	3,613	4,204	1,928	839
MEAN	68.8	147	144	54.3	50.4	120	1,797	358	120	136	62.2	28.0
MAX	265	220	300	68	59	230	4,860	938	714	482	234	47
MIN	23	100	70	50	47	61	180	120	33	29	25	18
CFSM	.34	.74	.72	.27	.25	.60	8.99	1.79	.60	.68	.31	.14
IN.	.40	.82	.83	.31	.26	.69	10.03	2.06	.67	.78	.36	.16

CAL YR 1970 TOTAL 64,889.9 MEAN 178 MAX 1,510 MIN 8.4 CFSM .89 IN 12.07
WTR YR 1971 TOTAL 93,383.0 MEAN 256 MAX 4,860 MIN 18 CFSM 1.28 IN 17.37

PEAK DISCHARGE (BASE 1,500 CFS).--Apr. 17 (2200) 5,040 cfs (9.55 ft).

04031500 Presque Isle River at Marenisco, Mich.

LOCATION.—Lat 46°22'20", long 89°41'32", in SE¼ NW¼ sec.21, T.46 N., R.43 W., Gogebic County, on left bank 0.3 mile upstream from highway bridge in Marenisco, and 1.5 miles downstream from confluence of East and West Branches.

DRAINAGE AREA.—171 sq mi.

PERIOD OF RECORD.—February 1945 to current year.

GAGE.—Water-stage recorder. Datum of gage is 1,489.30 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to May 27, 1949, nonrecording gage at site 0.3 mile downstream at different datum.

AVERAGE DISCHARGE.—26 years, 175 cfs (13.90 inches per year).

EXTREMES.—Current year: Maximum discharge, 1,700 cfs Apr. 18 (gage height, 8.52 ft); minimum, 39 cfs Oct. 19; minimum gage height, 3.52 ft Aug. 10.
Period of record: Maximum discharge, 3,520 cfs Apr. 25, 1960 (gage height, 11.25 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 winter periods, which are fair. Occasional regulation for lake or pond level control at several places above station.

REVISIONS (WATER YEARS).—WSP 1707: 1954. WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	172	184	105	89	105	155	592	336	225	71	72
2	44	146	240	105	88	110	160	580	312	182	66	75
3	48	150	270	100	87	110	155	559	301	143	62	70
4	52	142	260	100	87	110	145	522	268	120	59	65
5	47	126	250	100	87	105	140	490	262	105	56	64
6	48	117	230	100	87	105	160	465	238	96	52	72
7	45	122	220	100	88	105	210	430	198	86	48	67
8	61	116	210	100	90	105	320	411	246	84	45	59
9	68	109	200	100	92	105	500	387	249	75	44	55
10	71	147	185	100	93	105	712	357	246	64	47	57
11	59	147	175	100	94	110	941	199	230	75	52	56
12	57	157	165	100	95	110	1,270	242	213	96	53	53
13	60	154	155	100	96	120	1,370	260	203	194	50	50
14	51	150	150	100	97	130	1,290	254	186	156	61	48
15	46	147	140	98	98	150	1,160	245	173	133	58	49
16	44	134	130	98	98	150	1,220	226	158	117	52	47
17	44	128	125	98	97	155	1,500	211	149	103	46	50
18	41	129	120	97	96	155	1,700	208	145	89	121	48
19	42	130	115	96	96	150	1,660	323	150	88	223	46
20	41	136	105	94	95	150	1,560	349	144	86	227	45
21	41	138	100	93	94	150	1,430	311	132	84	186	42
22	49	130	98	92	94	145	1,170	271	121	354	139	42
23	48	110	96	92	95	140	970	250	118	364	112	78
24	55	170	97	91	96	135	880	394	116	217	105	90
25	72	190	98	90	97	130	780	659	130	163	101	75
26	71	180	100	90	98	130	442	776	121	116	96	67
27	83	170	105	90	100	130	317	698	110	103	90	65
28	152	170	105	92	105	125	462	596	92	109	82	81
29	192	170	105	92	------	130	574	505	111	95	75	84
30	190	169	105	92	------	140	586	416	231	83	66	106
31	174	------	105	90	------	150	------	372	------	80	68	------
TOTAL	2,147	4,356	4,743	2,995	2,629	3,950	23,939	12,558	5,689	4,085	2,613	1,878
MEAN	69.3	145	153	96.6	93.9	127	798	405	190	132	84.3	62.6
MAX	192	190	270	105	105	155	1,700	776	336	364	227	106
MIN	41	109	96	90	87	105	140	199	92	64	44	42
CFSM	.41	.85	.89	.56	.55	.74	4.67	2.37	1.11	.77	.49	.37
IN.	.47	.95	1.03	.65	.57	.86	5.21	2.73	1.24	.89	.57	.41

CAL YR 1970 TOTAL 57,158 MEAN 157 MAX 1,560 MIN 18 CFSM .92 IN 12.43
WTR YR 1971 TOTAL 71,582 MEAN 196 MAX 1,700 MIN 41 CFSM 1.15 IN 15.57

NOTE.—No gage-height record Dec. 29 to Feb. 3.

04032000 Presque Isle River near Tula, Mich.

LOCATION.--Lat 46°32'49", long 89°46'38", in NW¼ sec.23, T.48 N., R.44 W., Gogebic County, on downstream handrail of bridge on State Highway 28, 2.0 miles east of Tula, 5.5 miles downstream from Little Presque Isle River, and 7 miles southwest of Merriweather.

DRAINAGE AREA.--261 sq mi.

PERIOD OF RECORD.--February 1945 to current year.

GAGE.--Nonrecording gage and crest-stage gage. Datum of gage is 1,299.66 ft above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--26 years, 273 cfs (14.20 inches per year).

EXTREMES.--Current year: Maximum discharge, 3,490 cfs Apr. 18 (gage height, 12.65 ft); minimum, 41 cfs Oct. 2 (gage height, 4.45 ft).
Period of record: Maximum discharge, 4,640 cfs Apr. 25, 1960 (gage height, 14.04 ft); minimum, 22 cfs Oct. 5, 6, 1948 (gage height, 4.22 ft).

REMARKS.--Records fair. Occasional regulation for lake or pond level control at several places above station at Marenisco.

REVISIONS (WATER YEARS).--WSP 1387: 1945. WSP 1707: 1953-55. WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	300	242	128	105	140	270	928	475	429	94	85
2	41	260	290	128	105	140	290	930	394	318	88	86
3	44	229	338	128	105	145	280	910	360	220	78	85
4	53	210	330	125	105	145	280	858	328	160	72	81
5	60	194	310	125	105	145	280	780	311	130	67	76
6	56	168	285	125	105	145	290	728	275	116	67	80
7	54	152	270	123	108	145	310	666	240	109	61	80
8	62	152	255	122	110	150	370	606	216	100	54	77
9	77	156	245	121	112	150	520	560	273	97	52	68
10	86	154	230	121	114	155	700	505	256	78	55	62
11	78	158	220	121	116	165	1,050	347	247	65	59	64
12	70	164	210	121	118	180	2,100	330	229	67	61	62
13	61	164	200	121	120	200	2,700	321	210	328	60	60
14	73	156	190	121	120	220	2,600	314	190	418	70	58
15	52	150	180	121	120	245	2,500	295	172	293	76	55
16	52	145	170	121	120	265	3,160	265	160	216	70	52
17	52	145	160	120	120	270	3,300	238	152	168	67	49
18	54	130	155	120	120	265	3,470	231	147	135	115	58
19	55	123	145	118	120	260	3,370	328	147	114	194	56
20	54	130	135	118	120	260	3,180	449	145	114	251	55
21	55	141	130	115	120	255	2,950	490	141	134	238	52
22	55	137	125	115	120	250	2,630	440	134	271	150	50
23	55	125	122	112	120	240	2,150	400	130	585	138	64
24	69	118	122	110	120	245	1,720	475	127	638	125	93
25	80	180	122	110	125	230	1,400	900	145	378	115	99
26	89	210	125	110	128	230	1,220	1,400	148	216	106	82
27	99	200	125	110	132	225	1,000	1,380	130	143	86	77
28	220	195	125	108	135	220	795	1,180	113	139	106	83
29	302	190	128	108	------	225	774	935	113	145	95	100
30	306	220	128	108	------	230	858	725	230	116	90	108
31	318	------	128	108	------	250	------	550	------	106	83	------
TOTAL	2,843	5,156	5,940	3,662	3,268	6,390	46,517	19,464	6,338	6,546	3,043	2,157
MEAN	91.7	172	192	118	117	206	1,551	628	211	211	98.2	71.9
MAX	318	300	338	128	135	270	3,470	1,400	475	638	251	108
MIN	41	118	122	108	105	140	270	231	113	65	52	49
CFSM	.35	.66	.74	.45	.45	.79	5.94	2.41	.81	.81	.38	.28
IN.	.41	.73	.85	.52	.47	.91	6.63	2.77	.90	.93	.43	.31

CAL YR 1970 TOTAL 85,610 MEAN 235 MAX 1,680 MIN 29 CFSM .90 IN 12.20
WTR YR 1971 TOTAL 111,324 MEAN 305 MAX 3,470 MIN 41 CFSM 1.17 IN 15.87

04033000 Middle Branch Ontonagon River near Paulding, Mich.

LOCATION.--Lat 46°21'25", long 89°04'38", in SE¼ NE¼ sec.29, T.46 N., R.38 W., Ontonagon County, on right bank, 25 ft downstream from highway bridge, 2.4 miles upstream from Bond Falls Reservoir, and 5.7 miles southeast of Paulding.

DRAINAGE AREA.--164 sq mi.

PERIOD OF RECORD.--June 1942 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 1,485.66 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to Sept. 28, 1942, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--29 years, 172 cfs (14.24 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,240 cfs Apr. 18 (gage height, 8.58 ft); minimum, 65 cfs Nov. 23 (gage height, 3.26 ft, result of freezeup).
Period of record: 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 winter periods, which are fair.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	127	212	207	120	115	130	180	422	267	319	135	114
2	125	192	270	120	110	130	185	421	246	255	130	114
3	126	180	247	120	105	130	185	391	229	215	127	114
4	130	177	217	120	105	130	180	351	211	190	122	110
5	128	168	215	120	105	130	175	327	198	175	117	110
6	130	158	210	120	105	130	180	310	185	164	113	109
7	128	150	210	120	110	130	190	286	191	154	112	108
8	132	143	200	120	110	130	224	272	278	146	114	105
9	135	139	195	120	115	130	281	255	264	147	110	104
10	137	141	185	120	115	130	345	240	218	137	108	104
11	131	141	175	120	115	130	436	232	192	130	114	107
12	129	143	165	120	115	135	653	240	185	129	118	107
13	135	145	160	120	120	150	809	232	190	203	121	106
14	129	150	155	120	120	170	841	212	179	208	125	104
15	123	142	155	120	120	180	817	194	169	175	131	102
16	118	137	150	120	120	190	890	183	158	164	129	100
17	117	130	150	120	120	200	1,070	176	151	157	121	99
18	114	129	150	115	120	200	1,220	173	173	145	118	99
19	113	130	140	115	115	195	1,200	214	226	141	122	98
20	113	142	130	115	115	190	1,100	235	202	139	131	100
21	112	148	120	115	115	180	1,020	216	185	140	136	104
22	113	144	120	115	115	175	907	193	170	183	133	106
23	114	91	120	115	115	170	765	181	165	212	126	113
24	130	150	120	110	115	165	649	260	158	195	118	133
25	160	190	120	110	120	160	565	535	193	168	117	137
26	149	185	120	110	120	155	496	685	195	158	119	129
27	143	175	125	115	125	155	438	669	172	154	120	124
28	210	170	125	115	125	155	426	533	156	158	119	120
29	273	175	125	115	------	155	436	418	181	158	116	120
30	239	190	125	115	------	160	419	333	331	147	114	126
31	231	------	125	115	------	170	------	294	------	138	113	------
TOTAL	4,394	4,667	5,031	3,635	3,225	4,840	17,282	9,683	6,018	5,304	3,749	3,326
MEAN	142	156	162	117	115	156	576	312	201	171	121	111
MAX	273	212	270	120	125	200	1,220	685	331	319	136	137
MIN	112	91	120	110	105	130	175	173	151	129	108	98
CFSM	.87	.95	.99	.71	.70	.95	3.51	1.90	1.23	1.04	.74	.68
IN.	1.00	1.06	1.14	.82	.73	1.10	3.92	2.20	1.37	1.20	.85	.75

CAL YR 1970 TOTAL 60,134 MEAN 165 MAX 907 MIN 89 CFSM 1.01 IN 13.64
WTR YR 1971 TOTAL 71,154 MEAN 195 MAX 1,220 MIN 91 CFSM 1.19 IN 16.14

04033500 Bond Falls Canal near Paulding, Mich.

LOCATION.—Lat 46°23'57", long 89°08'47", in SW¼ NE¼ sec.11, T.46 N., R.39 W., Ontonagon County, on left bank 40 ft upstream from intake to pipeline No. 2, 0.8 mile downstream from Bond Falls Reservoir on Middle Branch Ontonagon River, and 1.6 miles east of Paulding.

PERIOD OF RECORD.—July 1942 to current year.

GAGE.—Water-stage recorder and concrete control. Datum of gage is 1,441.59 ft above mean sea level. Prior to Oct. 1, 1968, nonrecording gage at datum 3.00 ft higher.

AVERAGE DISCHARGE.—29 years, 136 cfs.

EXTREMES.—Current year: Maximum discharge, 336 cfs May 26 (gage height, 5.97 ft); no flow part of May 14; minimum gage height, 1.77 ft May 14 (two drain holes in weir open, water surface below weir crest and canal gate closed).
Period of record: Maximum discharge, 373 cfs Sept. 23, 1960 (gage height, 6.17 ft, present datum); no flow at times each year since 1961; minimum gage height observed, -0.03 ft Apr. 17, 1963, present datum (two drain holes in weir open and canal gate closed).

REMARKS.—Records excellent except those between 0 and 15 cfs, which are fair. Canal diverts water from Bond Falls Reservoir (see sta. 04034000) to South Branch Ontonagon River (see sta. 04039500); water is used for power production at Victoria Dam near Rockland.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	181	3.1	25	68	245	300	29	202	303	149	4.8	4.1
2	180	3.1	4.5	41	273	300	3.8	239	303	13	4.8	4.1
3	179	3.1	4.8	18	310	298	3.4	240	222	13	4.5	3.8
4	178	3.1	4.5	18	313	297	3.1	241	131	12	4.1	3.8
5	178	3.1	4.5	18	311	298	2.7	187	131	87	4.1	3.8
6	178	3.1	4.5	18	309	296	2.7	76	131	180	4.5	3.8
7	177	2.7	18	18	309	293	3.1	4.5	131	237	4.5	3.8
8	177	2.7	37	18	305	295	3.4	4.8	183	290	4.5	4.1
9	177	2.7	37	18	305	306	3.8	4.5	154	312	4.5	4.1
10	176	2.7	30	18	305	303	3.8	4.2	93	311	4.5	4.1
11	176	2.7	25	18	305	301	4.5	4.0	183	309	4.5	4.1
12	174	2.7	25	18	305	300	4.5	3.8	240	310	4.5	4.1
13	145	2.7	25	18	305	300	4.1	3.7	308	309	4.8	4.1
14	109	2.7	24	64	300	297	4.1	28	308	308	4.5	4.1
15	99	2.7	24	109	300	176	4.5	164	307	308	4.1	4.1
16	99	2.7	24	109	300	58	5.2	207	307	307	4.1	4.1
17	99	2.7	24	107	300	58	5.2	207	306	306	4.1	3.8
18	99	2.7	24	121	299	58	4.8	190	305	305	4.1	3.8
19	99	2.7	24	143	301	58	4.5	195	304	225	4.1	4.1
20	99	3.4	24	153	300	58	4.8	117	304	159	3.8	4.1
21	99	3.1	46	171	300	58	5.2	12	303	160	3.8	4.1
22	99	3.4	68	186	298	58	5.2	11	302	80	3.8	4.1
23	98	3.4	68	184	298	58	3.8	11	209	13	4.1	4.5
24	72	3.1	68	183	298	59	1.5	12	108	12	4.1	4.1
25	48	25	68	183	299	59	1.2	155	312	11	4.5	4.1
26	48	45	67	186	300	59	2.7	324	309	11	4.1	4.1
27	28	45	68	220	301	59	5.0	305	308	11	4.1	4.1
28	3.8	45	68	245	301	59	4.9	305	307	8.5	4.1	4.5
29	3.1	45	68	245	------	59	4.7	304	307	5.2	4.1	4.5
30	3.1	46	68	245	------	60	58	303	307	5.2	4.1	4.8
31	3.1	------	68	245	------	60	------	304	------	4.8	4.1	------
TOTAL	3,484.1	321.1	1,137.8	3,406	8,395	5,298	197.2	4,368.5	7,426	4,771.7	132.3	122.8
MEAN	112	10.7	36.7	110	300	171	6.57	141	248	154	4.27	4.09
MAX	181	46	68	245	313	306	58	324	312	312	4.8	4.8
MIN	3.1	2.7	4.5	18	245	58	1.2	3.7	93	4.8	3.8	3.8

CAL YR 1970 TOTAL 47,531.40 MEAN 130 MAX 310 MIN 0
WTR YR 1971 TOTAL 39,060.50 MEAN 107 MAX 324 MIN 1.2

04034000 Bond Falls Reservoir near Paulding, Mich.

LOCATION.--Lat 46°24'29", long 89°07'42", in SW1/4 sec.1, T.46 N., R.39 W., Ontonagon County, at Bond Falls Dam on Middle Branch Ontonagon River, 2.5 miles east of Paulding.

DRAINAGE AREA.--190 sq mi.

PERIOD OF RECORD.--June 1942 to current year. Prior to October 1950, monthend contents only published in WSP 1307.

GAGE.--Nonrecording gage read once daily. Datum of gage is 1,335.59 ft above mean sea level.

EXTREMES.--Current year: Maximum contents, 39,380 acre-ft Sept. 30 (gage height, 140.20 ft); minimum, 3,640 acre-ft Mar. 15 (gage height, 122.40 ft).
1947-1971: Maximum contents observed, 42,880 acre-ft July 3, 1953 (gage height, 141.66 ft), of which 1,610 acre-ft was uncontrolled storage; no usable storage at times during 1961-64, 1967, 1968, 1970; minimum gage height observed, 115.98 ft Mar. 21, 1970.

REMARKS.--Reservoir is formed by earth fill and concrete dam with one taintor gate; dam completed 1937. Usable capacity, 39,720 acre-ft between gage heights of 120 ft (maximum drawdown) and 141 ft (full pond). Dead storage unknown. Water diverted to South Branch Ontonagon River (see sta 04039500); through Bond Falls Canal (see sta 04033500); water used for power production at Victoria Dam near Rockland.

COOPERATION.--Gage-height record furnished by Upper Peninsula Power Co. and converted to acre-feet by Geological Survey.

REVISIONS.--WSP 1911: Drainage area.

MONTHEND GAGE HEIGHT AND CONTENTS AT 0930, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Gage height (feet)	Contents (acre-feet)	Change in contents during month (Acre-feet)	Change in contents during month (Equivalent in cfs)
Sept. 30	125.2	8,560	-	-
Oct. 31	125.4	8,920	+360	+5.9
Nov. 30	129.3	16,270	+7,350	+124
Dec. 31	132.2	21,900	+5,630	+91.6
Calendar year 1970	-	-	+5,630	+7.8
Jan. 31	131.7	20,900	-1,000	-16.3
Feb. 28	125.7	9,460	-11,440	-206
Mar. 31	124.2	6,760	-2,700	-43.9
Apr. 30	137.8	33,840	+27,080	+455
May 31	139.7	38,210	+4,370	+71.1
June 30	137.4	32,920	-5,290	-88.9
July 31	137.0	32,000	-920	-15.0
Aug. 31	138.7	35,910	+3,910	+63.6
Sept. 30	140.2	39,380	+3,470	+58.3
Water year 1970-71	-	-	+30,820	+42.6

04034500 Middle Branch Ontonagon River near Trout Creek, Mich.

LOCATION.—Lat 46°28'40", long 89°05'25", in SW¼ sec.8, T.47 N., R.38 W., Ontonagon County, on right bank 0.1 mile upstream from State Highway 28, 3.8 miles west of village of Trout Creek, and 7.5 miles downstream from Bond Falls Reservoir.

DRAINAGE AREA.—203 sq mi.

PERIOD OF RECORD.—June 1942 to current year.

GAGE.—Water-stage recorder. Datum of gage is 1,132.03 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to Nov. 4, 1942, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.—29 years, 71.7 cfs.

EXTREMES.—Current year: Maximum discharge, 649 cfs Apr. 23-26, 28 (gage height, 3.51 ft); minimum discharge, 31 cfs Mar. 30 (gage height, 1.48 ft); minimum daily discharge, 42 cfs Sept. 14, 15.
Period of record: 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 except those for winter periods, which are fair. Flow regulated by Bond Falls Reservoir (see sta 04034000). Diversion to South Branch Ontonagon River (see sta 04039500) by Bond Falls Canal (see sta 04033500).

REVISIONS.—WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	46	58	45	45	45	49	129	45	57	52	67
2	47	46	55	45	45	45	48	128	44	54	52	67
3	48	46	54	45	45	76	47	125	46	52	51	67
4	46	46	52	45	45	79	48	124	53	52	51	68
5	46	45	48	45	45	46	47	123	53	51	51	68
6	46	45	47	45	45	45	47	122	53	51	51	68
7	47	45	47	45	45	44	52	144	59	51	51	68
8	47	45	48	46	45	44	61	179	58	51	51	68
9	47	45	48	46	45	44	72	178	54	50	51	69
10	46	45	47	45	45	44	73	162	53	50	54	70
11	46	45	46	45	44	44	99	148	53	51	52	69
12	46	46	46	46	44	44	117	174	54	64	52	69
13	45	45	47	45	44	46	103	141	54	72	54	60
14	45	45	46	45	44	49	86	77	53	55	53	42
15	45	45	46	45	45	52	88	44	53	52	51	42
16	45	45	47	46	44	48	113	43	53	53	51	43
17	45	45	46	45	44	47	132	43	53	51	50	43
18	45	45	46	45	44	47	105	51	57	51	53	43
19	45	45	46	45	44	47	95	67	55	51	54	44
20	45	49	46	45	46	47	90	54	55	50	51	43
21	45	46	46	45	44	47	148	48	53	52	51	43
22	45	47	46	45	44	46	429	46	53	70	52	43
23	45	47	46	45	45	46	584	46	53	56	52	51
24	51	47	46	45	44	45	647	70	55	53	52	45
25	48	47	46	45	45	45	644	101	56	52	53	44
26	46	48	46	45	45	46	643	197	54	52	58	44
27	47	48	46	45	45	45	641	463	53	52	67	44
28	60	48	46	45	45	48	644	412	52	53	67	53
29	52	49	46	45	------	46	583	250	65	52	67	71
30	50	48	46	45	------	47	416	93	74	52	67	74
31	48	------	45	45	------	47	------	46	------	51	67	------
TOTAL	1,455	1,384	1,471	1,399	1,250	1,491	6,951	4,028	1,626	1,664	1,689	1,690
MEAN	46.9	46.1	47.5	45.1	44.6	48.1	232	130	54.2	53.7	54.5	56.3
MAX	60	49	58	46	46	79	647	463	74	72	67	74
MIN	45	45	45	45	44	44	47	43	44	50	50	42

CAL YR 1970 TOTAL 18,623 MEAN 51.0 MAX 104 MIN 42
WTR YR 1971 TOTAL 26,098 MEAN 71.5 MAX 647 MIN 42

04035000 East Branch Ontonagon River near Mass, Mich.

LOCATION.--Lat 46°41'24", long 89°04'24", in SW¼ NW¼ sec.33, T.50 N., R.38 W., Ontonagon County, on right bank 700 ft downstream from abandoned highway bridge, 1,000 ft downstream from Adventure Creek, 5.0 miles south of Mass, and 7.5 miles upstream from mouth.

DRAINAGE AREA.--272 sq mi.

PERIOD OF RECORD.--July 1942 to current year.

GAGE.--Water-stage recorder. Datum of gage is 873.55 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to Oct. 1, 1949, nonrecording gage at site 700 ft upstream at same datum.

AVERAGE DISCHARGE.--29 years, 258 cfs (12.88 inches per year).

EXTREMES.--Current year: Maximum discharge, 3,030 cfs Apr. 11 (gage height, 9.15 ft); minimum, 100 cfs Nov. 23 (gage height, 3.40 ft, result of freezeup).
Period of record: Maximum discharge, 4,590 cfs July 1, 1953 (gage height, 10.57 ft); maximum gage height, 10.65 ft Apr. 24, 1960; minimum discharge, 60 cfs Aug. 25, 1948 (gage height, 3.55 ft, site then in use).

REMARKS.--Records good except those for winter periods, which are fair.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	153	375	280	165	140	160	280	637	276	586	130	122
2	143	296	390	165	140	165	320	668	252	410	128	124
3	145	251	330	165	135	165	300	588	233	277	128	120
4	161	218	300	165	135	165	280	497	216	218	126	116
5	157	197	280	165	130	165	270	448	203	195	123	114
6	148	181	270	165	130	165	320	407	198	175	120	114
7	138	169	260	165	135	165	400	371	198	162	118	111
8	142	160	250	160	135	165	500	333	306	162	118	108
9	149	156	240	160	140	160	900	320	287	156	116	108
10	155	158	230	160	140	160	1,400	298	228	144	123	118
11	154	164	225	160	140	165	2,180	284	203	139	134	124
12	144	193	210	160	140	175	2,640	289	196	135	130	121
13	138	193	200	155	145	185	1,880	325	248	415	130	118
14	133	171	195	155	145	210	1,470	301	232	438	156	114
15	129	157	195	155	140	230	1,530	268	199	296	152	111
16	126	150	195	155	140	240	2,150	245	181	250	135	110
17	124	149	190	150	140	260	2,690	228	166	303	127	110
18	123	147	180	150	140	270	2,350	288	163	220	129	109
19	121	149	170	150	135	270	2,030	775	213	184	153	111
20	120	190	160	150	135	270	1,890	601	236	164	152	119
21	122	293	155	145	140	265	1,750	424	209	153	140	123
22	125	247	150	145	140	260	1,300	324	191	162	130	120
23	125	132	150	145	145	255	1,040	290	174	221	126	169
24	184	197	150	145	145	255	797	892	166	192	135	186
25	270	250	150	145	150	250	690	1,800	177	167	135	156
26	236	250	155	140	155	245	641	1,340	187	154	140	141
27	216	245	155	140	155	240	577	828	174	146	134	174
28	459	235	160	140	160	240	579	581	163	151	128	151
29	710	235	160	140	------	240	627	424	169	149	125	140
30	469	250	165	140	------	240	578	331	660	141	122	148
31	471	------	165	140	------	245	------	299	------	134	122	------
TOTAL	6,190	6,158	6,465	4,740	3,950	6,645	34,359	15,704	6,704	6,799	4,065	3,810
MEAN	200	205	209	153	141	214	1,145	507	223	219	131	127
MAX	710	375	390	165	160	270	2,690	1,800	660	586	156	186
MIN	120	132	150	140	130	160	270	228	163	134	116	108
CFSM	.74	.75	.77	.56	.52	.79	4.21	1.86	.82	.81	.48	.47
IN.	.85	.84	.88	.65	.54	.91	4.70	2.15	.92	.93	.56	.52

CAL YR 1970 TOTAL 84,038 MEAN 230 MAX 1,240 MIN 95 CFSM .85 IN 11.49
WTR YR 1971 TOTAL 105,589 MEAN 289 MAX 2,690 MIN 108 CFSM 1.06 IN 14.44

PEAK DISCHARGE (BASE, 1,400 CFS).--Apr. 11 (2300) 3,030 cfs (9.15 ft); May 25 (1000) 2000 cfs (7.77 ft).

04035500 Middle Branch Ontonagon River near Rockland, Mich.

LOCATION.—Lat 46°41'57", long 89°09'36", in SE¼ sec.27, T.50 N., R.39 W., Ontonagon County, on left bank 10 ft upstream from bridge on U.S. Highway 45, 700 ft downstream from East Branch and 2.8 miles southeast of Rockland.

DRAINAGE AREA.—671 sq mi.

PERIOD OF RECORD.—July 1942 to current year.

GAGE.—Water-stage recorder. Datum of gage is 661.1 ft above mean sea level. Prior to Apr. 1, 1959, nonrecording gage at site 400 ft upstream at same datum. Apr. 1, 1959 to Oct. 21, 1968, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.—29 years, 524 cfs.

EXTREMES.—Current year: Maximum discharge, 11,200 cfs Apr. 12 (gage height, 12.66 ft); minimum, 208 cfs Sept. 15-17 (gage height, 4.04 ft).
Period of record: 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 measurement of peak flow; minimum observed, 142 cfs Dec. 3, 1963 (discharge measurement).

REMARKS.—Records good except those for winter periods, which are fair. Flow regulated by Bond Falls Reservoir (see sta. 04034000). Diversion to South Branch Ontonagon River (see sta. 04039500) by Bond Falls Canal (see sta 04033500).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	237	651	560	300	250	290	500	1,390	532	1,060	241	240
2	226	524	750	300	250	295	600	1,440	409	669	240	240
3	229	452	670	300	245	300	550	1,310	378	448	241	239
4	242	396	580	295	240	300	520	1,100	353	349	235	234
5	242	353	540	290	240	295	490	977	338	320	233	235
6	234	328	520	285	240	290	800	899	319	286	231	237
7	224	308	500	280	240	290	1,160	831	323	282	228	235
8	229	291	480	280	245	290	1,950	825	509	280	228	229
9	236	287	460	275	250	295	3,560	776	447	265	225	228
10	240	289	440	275	250	300	5,100	735	364	248	235	240
11	242	299	420	270	250	305	6,930	669	326	242	248	251
12	234	358	400	270	255	320	8,320	731	309	244	245	245
13	227	390	380	270	255	350	4,910	785	361	836	246	239
14	222	346	360	270	255	380	3,360	649	345	709	277	223
15	219	312	350	270	250	410	3,460	550	301	460	266	210
16	219	290	345	270	250	440	5,090	499	279	414	244	208
17	218	285	335	265	245	460	6,600	455	270	477	236	209
18	218	281	325	265	245	480	5,030	589	281	350	245	210
19	216	282	310	265	245	490	3,920	2,330	336	303	280	212
20	216	328	295	260	245	480	3,790	1,440	359	278	272	220
21	219	535	280	260	245	480	3,280	974	319	267	251	225
22	222	450	270	255	250	470	2,620	735	295	310	240	223
23	221	250	265	255	255	465	2,350	637	281	380	234	284
24	282	350	265	255	260	460	2,080	2,410	277	317	250	299
25	429	450	265	250	265	450	1,920	5,490	302	278	248	262
26	375	480	270	250	270	440	1,800	3,190	306	261	254	242
27	346	470	275	250	275	440	1,700	1,960	285	259	257	288
28	802	460	280	250	280	430	1,730	1,490	273	270	247	260
29	1,350	450	285	250	------	430	1,840	1,130	305	263	242	259
30	772	490	290	250	------	430	1,620	777	1,590	251	240	277
31	752	------	295	250	------	450	------	624	------	244	238	------
TOTAL	10,340	11,435	12,060	8,330	7,045	12,005	87,580	38,397	11,372	11,620	7,597	7,203
MEAN	334	381	389	269	252	387	2,919	1,239	379	375	245	240
MAX	1,350	651	750	300	280	490	8,320	5,490	1,590	1,060	280	299
MIN	216	250	265	250	240	290	490	455	270	242	225	208

CAL YR 1970 TOTAL 162,524 MEAN 445 MAX 3,690 MIN 200
WTR YR 1971 TOTAL 224,984 MEAN 616 MAX 8,320 MIN 208

04036000 West Branch Ontonagon River near Bergland, Mich.

LOCATION.—Lat 46°35'15", long 89°32'30", in SW¼ NE¼ sec.3, T.48 N., R.42 W., Ontonagon County, on right bank 0.4 mile downstream from dam at outlet of Gogebic Lake and 1.5 miles east of Bergland.

DRAINAGE AREA.—162 sq mi.

PERIOD OF RECORD.—July 1942 to current year.

GAGE.—Water-stage recorder. Datum of gage is 1,290.81 ft above mean sea level. Prior to Nov. 5, 1942, nonrecording gage 0.4 mile upstream at different datum.

AVERAGE DISCHARGE.—29 years, 174 cfs (14.59 inches per year).

EXTREMES.—Current year: Maximum discharge, 1,150 cfs Apr. 23 (gage height, 5.38 ft); minimum daily, 2.3 cfs Oct. 31.
Period of record: Maximum discharge, 1,400 cfs Apr. 26, 1960 (gage height 5.98 ft); minimum daily, 0.70 cfs Sept. 26 to Oct. 19, 1963; minimum gage height observed, 0.13 ft Oct. 2, 1963.

REMARKS.—Records good except those below 20 cfs, which are poor. Flow regulated by Gogebic Lake (usable capacity, 35,200 acre-ft).

REVISIONS.— WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	33	251	273	149	165	184	943	196	291	4.0	4.0
2	3.1	49	99	263	216	164	189	914	102	291	4.0	4.0
3	3.1	48	84	261	210	162	194	900	164	331	4.0	4.0
4	3.1	48	163	265	210	158	196	872	203	331	4.0	4.0
5	3.1	48	227	259	218	158	194	832	296	334	4.0	4.0
6	3.1	55	222	252	222	157	197	808	326	331	4.0	4.0
7	3.1	55	255	245	218	156	202	776	278	246	4.0	4.0
8	3.1	101	271	238	212	155	208	724	269	143	4.0	4.0
9	3.1	131	267	236	206	152	224	704	157	130	4.0	4.0
10	3.1	135	257	237	203	150	250	680	140	52	4.0	4.0
11	3.1	139	267	203	200	148	292	636	170	15	4.0	4.0
12	2.9	139	329	117	197	147	357	435	163	17	4.0	4.0
13	2.9	169	353	107	192	143	430	273	152	125	4.0	4.0
14	38	200	363	108	189	148	494	273	142	174	4.0	4.0
15	65	207	354	105	186	154	554	111	133	178	4.0	4.0
16	69	217	341	101	182	164	641	45	132	168	4.0	4.0
17	69	227	376	99	181	163	773	62	142	188	4.0	3.3
18	60	279	394	96	176	163	893	35	128	244	4.0	3.3
19	63	319	383	97	175	164	994	38	122	192	4.0	3.3
20	62	328	370	95	180	167	1,070	46	112	136	4.0	3.3
21	61	317	349	97	178	167	1,120	27	104	139	4.0	3.3
22	64	293	342	95	172	172	1,140	21	100	141	4.0	3.3
23	61	310	340	92	170	170	1,130	21	135	163	4.0	3.3
24	67	345	329	89	167	171	1,120	190	142	55	4.0	3.3
25	73	306	316	89	164	172	1,080	657	170	11	4.0	3.3
26	71	289	311	96	162	173	1,050	828	180	10	4.0	3.3
27	69	287	305	98	169	173	1,020	840	239	10	4.0	3.3
28	103	313	296	101	156	179	997	824	266	4.0	4.0	3.3
29	98	330	288	98	------	180	983	820	257	3.3	4.0	3.3
30	33	333	281	109	------	178	964	704	304	4.0	4.0	3.4
31	2.3	------	275	108	------	177	------	464	------	4.0	4.0	------
TOTAL	1,168.2	6,050	9,058	4,729	5,260	5,050	19,140	15,503	5,424	4,461.3	124.0	110.3
MEAN	37.7	202	292	153	188	163	638	500	181	144	4.00	3.68
MAX	103	345	394	273	222	180	1,140	943	326	334	4.0	4.0
MIN	2.3	33	84	89	149	143	184	21	100	3.3	4.0	3.3

CAL YR 1970 TOTAL 58,271.6 MEAN 160 MAX 841 MIN 2.3 CFSM .99 IN 13.44
WTR YR 1971 TOTAL 76,077.8 MEAN 208 MAX 1,140 MIN 2.3 CFSM 1.28 IN 17.38

Note.--No gage-height record July 24 to Sept. 30.

04037500 Cisco Branch Ontonagon River at Cisco Lake Outlet, Mich.

LOCATION.—Lat 46°15'12", long 89°27'05", in E½ sec.32, T.45 N., R.41 W., Gogebic County, on right bank 80 ft downstream from Cisco Lake Dam, 2.5 miles upstream from Langford Creek, 5.0 miles upstream from U.S. Highway 2, and 13 miles west of Watersmeet.

DRAINAGE AREA.—50.7 sq mi.

PERIOD OF RECORD.—October 1944 to current year.

GAGE.—Water-stage recorder. Datum of gage is 1,672.69 ft above mean sea level. Prior to Oct. 1, 1968, nonrecording gage at same site at datum 4.0 ft higher.

AVERAGE DISCHARGE.—27 years, 46.5 cfs (12.46 inches per year).

EXTREMES.—Current year: Maximum discharge, 190 cfs July 22 (gage height, 5.60 ft); minimum daily, 0.22 cfs Oct. 16-19; minimum gage height, 3.83 ft Oct. 16-22.
Period of record: Maximum discharge, 288 cfs May 1-4, 1951 (gage height, 6.10 ft, present datum); minimum daily, 0.13 cfs Aug. 4-7, Aug. 22 to Sept. 5, 1970.

REMARKS.—Records fair. Flow regulated by Cisco Lake (usable capacity, 15,600 acre-ft).

REVISIONS.—WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.31	155	74	39	55	55	53	43	96	106	30	2.1
2	.24	149	86	40	54	54	53	66	87	104	30	17
3	.27	144	73	40	52	54	53	94	77	101	17	30
4	.28	140	68	55	52	53	53	107	121	98	5.8	44
5	8.4	138	80	73	57	53	52	111	172	51	4.7	58
6	23	134	88	71	57	52	52	108	165	3.7	4.3	56
7	46	130	87	70	57	53	52	84	144	2.5	4.1	38
8	94	127	85	69	56	52	53	55	106	2.0	3.8	13
9	133	124	84	61	56	52	68	30	93	1.9	2.9	.40
10	142	120	78	53	54	40	83	24	92	1.9	19	.40
11	123	118	66	43	53	31	85	19	67	1.7	30	.40
12	45	115	49	32	52	32	89	30	25	1.4	30	.37
13	8.8	111	39	33	52	32	93	34	25	1.4	30	.37
14	4.1	105	39	33	51	34	97	36	16	1.4	30	.37
15	.25	103	39	33	32	54	100	31	6.3	1.3	30	.40
16	.22	100	39	33	22	76	105	25	6.7	19	30	.37
17	.22	99	38	33	22	82	112	31	3.3	33	30	.37
18	.22	97	38	33	22	80	119	38	23	33	44	.37
19	.22	94	38	33	24	79	123	77	50	33	82	.37
20	.25	94	38	34	40	78	125	103	50	33	93	.37
21	.25	94	38	34	57	77	97	106	49	35	91	.37
22	.30	90	38	34	56	66	97	116	49	116	88	.37
23	45	92	39	34	55	50	102	110	48	179	48	.55
24	81	91	40	34	55	50	63	116	48	173	29	23
25	81	90	39	35	54	49	14	143	48	163	17	43
26	79	89	40	36	54	34	15	160	48	88	2.9	42
27	104	88	40	47	56	22	17	149	47	32	2.7	41
28	152	86	40	56	56	24	18	135	32	32	2.6	42
29	167	86	39	56	------	37	20	121	32	33	2.1	40
30	163	72	40	56	------	53	21	104	84	31	1.9	53
31	160	------	39	55	------	52	------	100	------	31	1.9	------
TOTAL	1,662.33	3,275	1,658	1,388	1,363	1,610	2,084	2,506	1,910.3	1,543.2	837.7	547.95
MEAN	53.6	109	53.5	44.8	48.7	51.9	69.5	80.8	63.7	49.8	27.0	18.3
MAX	167	155	88	73	57	82	125	160	172	179	93	58
MIN	.22	72	38	32	22	22	14	19	3.3	1.3	1.9	.37

CAL YR 1970 TOTAL 15,356.28 MEAN 42.1 MAX 221 MIN .13 CFSM .83 IN 11.27
WTR YR 1971 TOTAL 20,385.48 MEAN 55.9 MAX 179 MIN .22 CFSM 1.10 IN 14.93

04039500 South Branch Ontonagon River at Ewen, Mich.

LOCATION.--Lat 46°31'58", long 89°16'37", in NW¼ sec.26, T.48 N., R.40 W., Ontonagon County, on left bank on piers of Old State Highway 28 bridge in Ewen, 150 feet upstream from railroad bridge, and 800 feet upstream from State Highway 28 bridge.

DRAINAGE AREA.--348 sq mi.

PERIOD OF RECORD.--Water years 1939-42 (annual maximums only published in WSP 1307), April 1942 to September 1971 (discontinued as continuous-record station; converted to a crest-stage partial-record station).

GAGE.--Nonrecording gage and crest-stage gage. Datum of gage is 1,113.04 ft above mean sea level. Prior to Jan. 16, 1943, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--29 years, 497 cfs.

EXTREMES.--Current year: Maximum discharge, 6,700 cfs Apr. 12 (gage height, 18.50 ft); minimum, 66 cfs Sept. 17 (gage height, 0.62 ft).
Period of record: Maximum discharge, 13,500 cfs Apr. 24, 1960 (gage height, 22.07 ft, from floodmark), from rating curve extended above 6,400 cfs on basis of contracted-opening measurement of peak flow; minimum discharge, 66 cfs Sept. 17, 1971; minimum gage height, 0.55 ft. July 26, 27, 1963.

REMARKS.--Records fair. Some diversion from Middle Branch Ontonagon River by Bond Falls Canal (see sta 04033500). Some regulation at medium and low flows by Cisco Lake (usable capacity, 15,600 acre-ft).

REVISIONS (WATER YEARS).--WSP 1307: 1942(M). WSP 1707: 1954. WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	309	604	470	315	430	550	724	904	853	1,330	160	95
2	303	528	520	315	440	550	812	922	801	684	153	93
3	296	492	500	300	450	550	900	919	763	426	146	91
4	299	451	470	280	480	550	800	875	560	355	136	93
5	307	415	450	280	500	550	650	840	498	312	130	115
6	303	385	430	280	500	550	610	719	508	401	119	130
7	303	355	410	280	500	550	684	562	526	394	102	139
8	328	342	390	285	500	550	982	488	719	401	95	138
9	361	332	360	290	500	550	1,590	419	798	424	93	126
10	395	326	340	290	500	550	2,340	374	492	408	95	110
11	428	324	330	290	500	550	3,750	323	540	395	103	98
12	440	342	310	280	500	550	6,160	310	524	399	96	90
13	417	369	300	280	500	550	5,880	302	640	1,020	113	82
14	297	355	290	270	500	550	4,450	293	586	1,030	135	79
15	241	318	290	300	500	550	3,460	342	534	653	134	78
16	213	310	280	310	490	550	3,280	428	496	562	120	68
17	201	297	280	320	490	550	4,060	406	475	528	113	67
18	200	283	280	330	490	540	4,670	406	466	485	118	75
19	198	282	280	340	490	530	3,820	1,070	512	478	141	74
20	198	296	280	350	480	510	3,010	1,410	532	340	169	76
21	198	296	280	350	480	500	2,490	1,090	522	326	177	75
22	198	293	290	360	480	500	2,090	728	506	794	195	73
23	198	250	300	370	480	490	1,540	580	494	915	195	88
24	205	200	310	370	490	490	1,220	827	307	576	193	121
25	216	270	310	370	500	490	917	2,620	492	442	176	101
26	260	350	310	370	510	500	816	4,580	534	379	152	93
27	262	350	310	370	530	510	666	3,500	502	340	135	125
28	332	360	310	380	540	550	647	2,210	492	281	116	128
29	809	400	315	400	------	580	792	1,370	510	220	100	144
30	632	430	315	420	------	630	761	1,140	1,010	194	94	148
31	649	------	315	430	------	682	------	922	------	171	92	------
TOTAL	9,996	10,605	10,625	10,175	13,750	16,852	64,571	31,879	17,192	15,663	4,096	3,013
MEAN	322	354	343	328	491	544	2,152	1,028	573	505	132	100
MAX	809	604	520	430	540	682	6,160	4,580	1,010	1,330	195	148
MIN	198	200	280	270	430	490	610	293	307	171	92	67

CAL YR 1970 TOTAL 163,895 MEAN 449 MAX 2,730 MIN 193
WTR YR 1971 TOTAL 208,417 MEAN 571 MAX 6,160 MIN 67
PEAK DISCHARGE (BASE, 2,000 CFS).--Apr. 12 (2000) 6,700 cfs (18.50 ft); May 26 (1400) 4,780 cfs (16.26 ft).

04040000 Ontonagon River near Rockland, Mich.

LOCATION.—Lat 46°43'15", long 89°12'25", in NE¼ sec.20, T.50 N., R.29 W., Ontonagon County, on left bank, 50 ft downstream from bridge on highway between Rockland and Victoria, 1.8 miles southwest of Rockland and 2.4 miles downstream from confluence of Middle and West Branches.

DRAINAGE AREA.—1,340 sq mi.

PERIOD OF RECORD.—June 1942 to current year.

GAGE.—Water-stage recorder. Datum of gage is 638.72 ft above mean sea level. Prior to Nov. 23, 1943, nonrecording gage and Nov. 23, 1943 to Oct. 17, 1967, water-stage recorder at site 50 ft upstream at same datum.

AVERAGE DISCHARGE.—29 years, 1,400 cfs (14.19 inches per year).

EXTREMES.—Current year: Maximum discharge, 20,000 cfs Apr. 12 (gage height, 17.59 ft); minimum, 284 cfs Nov. 24 (gage height, 5.28 ft); minimum daily, 331 cfs Sept. 18.
Period of record: 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 measurement of peak flow; minimum daily, 192 cfs July 28, 29, 1963.

REMARKS.—Records good except those for winter periods, which are fair. Flow regulated by Victoria powerplant on West Branch 5 miles above station, by Bond Falls Reservoir (usuable capacity, 39,700 acre-ft), and by Gogebic and Cisco Lakes (combined usable capacity, 50,800 acre-ft).

REVISIONS (WATER YEARS).—WSP 1387: 1943, 1946-47. WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	552	1,240	1,360	680	930	1,050	1,350	3,560	1,770	2,870	609	383
2	750	1,090	1,500	850	720	1,050	1,550	3,580	1,540	2,130	442	383
3	629	1,130	1,400	800	680	1,050	1,500	3,520	1,300	1,460	426	381
4	544	761	1,250	720	900	1,050	1,450	3,160	1,300	1,240	417	379
5	570	947	1,300	720	830	1,050	1,400	2,830	1,240	1,210	409	380
6	551	613	1,200	720	800	1,050	1,700	2,710	1,220	1,180	396	387
7	540	905	1,100	730	880	1,050	2,100	2,550	1,190	1,160	383	413
8	581	710	1,100	730	870	1,050	3,500	2,290	1,370	1,160	353	414
9	625	628	1,200	730	910	1,050	6,000	2,120	1,410	1,140	371	411
10	722	704	1,100	720	850	1,050	8,500	1,920	1,290	1,110	369	414
11	595	803	1,050	720	800	1,050	13,000	1,760	1,140	1,090	384	414
12	671	946	900	720	840	1,050	18,100	1,690	1,210	835	384	394
13	660	873	950	720	860	1,050	14,700	1,610	873	1,280	389	383
14	793	820	1,000	720	820	1,100	11,100	1,390	1,110	1,500	429	358
15	634	839	1,050	710	830	1,200	9,410	1,170	1,200	1,300	438	344
16	529	768	1,000	630	840	1,450	11,500	940	1,180	1,240	418	336
17	543	867	970	680	800	1,450	14,800	834	757	1,270	397	336
18	558	762	960	700	870	1,500	13,500	865	969	1,200	406	331
19	385	801	1,000	710	820	1,500	11,600	2,980	826	1,140	452	334
20	473	961	750	700	830	1,500	10,100	3,290	896	1,100	463	347
21	514	1,120	780	690	750	1,400	9,090	2,200	1,110	943	458	348
22	578	1,050	750	690	810	1,300	7,150	1,620	924	909	459	352
23	541	718	780	700	800	1,250	6,020	1,430	872	1,150	464	416
24	544	484	850	700	830	1,250	5,020	3,410	1,020	1,160	493	438
25	810	751	720	700	820	1,200	4,380	10,700	697	1,120	486	442
26	689	1,010	870	690	950	1,200	3,950	10,400	1,050	1,010	465	410
27	701	958	750	690	1,100	1,150	3,680	7,880	982	776	448	451
28	1,180	942	900	690	1,050	1,150	3,680	5,370	1,060	795	427	445
29	1,720	1,140	700	690	------	1,150	3,870	3,960	1,200	772	404	450
30	1,540	1,110	700	700	------	1,150	3,670	2,830	2,320	739	391	474
31	1,400	------	820	750	------	1,200	------	2,230	------	690	381	------
TOTAL	22,122	26,451	30,760	22,100	23,790	36,750	207,370	96,799	35,026	36,679	13,211	11,748
MEAN	714	882	992	713	850	1,185	6,912	3,123	1,168	1,183	426	392
MAX	1,720	1,240	1,500	850	1,100	1,500	18,100	10,700	2,320	2,870	609	474
MIN	385	484	700	630	680	1,050	1,350	834	697	690	353	331

CAL YR 1970 TOTAL 435,715 MEAN 1,194 MAX 7,490 MIN 377 CFSM .89 IN 12.08
WTR YR 1971 TOTAL 562,806 MEAN 1,542 MAX 18,100 MIN 331 CFSM 1.15 IN 15.61

PEAK DISCHARGE (BASE, 9,000 CFS).—Apr. 12 (0500) 20,000 cfs (17.59 ft); May 25 (1400) 12,000 cfs (14.18 ft).

04040500 Sturgeon River near Sidnaw, Mich.

LOCATION.--Lat 46°35'03", long 88°34'33", in NE1/4SE1/4 sec.5, T.48 N., R.34 W., Baraga County, on right bank 30 ft downstream from highway bridge, 3.0 miles downstream from Rock River, 3.5 miles northwest of Covington 6.5 miles upstream from Perch River, 8.5 miles northeast of Sidnaw, and at mile 71.

DRAINAGE AREA.--171 sq mi.

PERIOD OF RECORD.--October 1912 to September 1915, April 1943 to current year. 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. October 1912 to September 1915, nonrecording gage at site 200 ft upstream at different datum. Apr. 2, 1943, to Oct. 1, 1946, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.--31 years, 210 cfs (16.68 inches per year).

EXTREMES.--Current year: Maximum discharge, 2,500 cfs Apr. 19 (gage height, 8.80 ft); minimum 15 cfs Sept. 9, 10 (gage height, 3.53 ft).
Period of record: Maximum discharge, 4,630 cfs Apr. 24, 1960 (gage height, 11.63 ft); minimum, 4.6 cfs Oct. 8, 1948; minimum gage height, 3.42 ft Aug. 30, 1969.

REMARKS.--Records good except those for winter periods, which are fair.

REVISIONS.--WSP 1507: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	161	554	256	119	64	84	250	720	286	482	58	22
2	143	466	410	105	64	86	310	735	250	458	51	21
3	143	396	358	95	63	85	300	705	222	350	45	20
4	157	340	328	90	63	85	290	626	195	250	42	20
5	155	301	301	85	63	84	270	586	173	198	37	18
6	145	262	274	80	63	83	270	554	161	169	35	18
7	133	232	245	75	63	82	320	522	175	137	33	17
8	139	208	225	72	63	81	450	482	274	121	29	16
9	143	192	215	70	62	81	634	450	268	103	27	15
10	143	188	190	70	62	80	790	410	218	88	27	16
11	139	188	180	68	62	83	1,020	368	178	75	27	18
12	133	195	170	68	62	88	1,310	358	173	71	26	20
13	124	195	160	68	62	95	1,400	375	173	165	27	20
14	117	180	155	66	62	115	1,420	382	149	192	33	19
15	108	163	149	66	62	130	1,500	354	130	169	33	18
16	102	151	147	66	63	170	1,770	316	112	155	30	22
17	96	143	143	66	65	240	2,060	271	100	145	26	20
18	91	141	139	66	67	300	2,330	253	190	130	26	18
19	86	141	135	66	69	310	2,430	414	313	112	28	16
20	82	200	135	65	70	290	2,350	450	286	98	30	17
21	81	289	130	65	71	270	2,320	400	230	90	28	18
22	84	274	130	65	72	250	2,060	334	190	94	27	16
23	90	175	130	65	73	220	1,740	286	159	96	25	26
24	122	220	130	65	74	210	1,450	414	169	86	26	33
25	205	250	130	65	75	200	1,150	800	167	77	32	34
26	225	230	130	65	76	190	920	956	145	66	33	33
27	212	220	130	64	79	190	790	820	117	64	34	47
28	403	210	126	64	81	180	730	638	100	70	31	63
29	626	192	124	64	------	190	725	498	103	72	28	70
30	638	182	124	64	------	190	685	382	358	67	27	75
31	680	------	121	64	------	200	------	331	------	63	24	------
TOTAL	5,906	7,078	5,720	2,236	1,875	4,942	34,044	15,190	5,764	4,513	985	786
MEAN	191	236	185	72.1	67.0	159	1,135	490	192	146	31.8	26.2
MAX	680	554	410	119	81	310	2,430	956	358	482	58	75
MIN	81	141	121	64	62	80	250	253	100	63	24	15
CFSM	1.12	1.38	1.08	.42	.39	.93	6.64	2.87	1.12	.85	.19	.15
IN.	1.28	1.54	1.24	.49	.41	1.08	7.41	3.30	1.25	.98	.21	.17

CAL YR 1970 TOTAL 68,241 MEAN 187 MAX 915 MIN 13 CFSM 1.09 IN 14.85
WTR YR 1971 TOTAL 89,039 MEAN 244 MAX 2,430 MIN 15 CFSM 1.43 IN 19.37

04041500 Sturgeon River near Alston, Mich.

LOCATION.—Lat 46°43'35", long 88°39'43", in SE¼ sec.15, T.50 N., R.35 W., Baraga County, on right bank in powerhouse of Upper Peninsula Power Co. at Prickett Dam, 4.0 miles upstream from Clear Creek, 5.0 miles southeast of Alston, and at mile 45.

DRAINAGE AREA.—346 sq mi.

PERIOD OF RECORD.—February 1932 to June 1941, October 1942 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.—Water-stage recorder. Datum of gage is 710.3 ft above mean tide at New York City (levels by Corps of Engineers). Prior to Oct. 1, 1963, at datum 40.00 ft lower.

AVERAGE DISCHARGE.—37 years (1932-40, 1942-71), 418 cfs (16.41 inches per year).

EXTREMES.—Current year: Maximum discharge, 3,980 cfs Apr. 18 (gage height, 9.18 ft); minimum, 6.2 cfs Mar. 21, 22 (gage height, 2.63 ft); minimum daily, 7.5 cfs Feb. 28.
Period of record: Maximum discharge, 7,360 cfs Apr. 24, 1960 (gage height, 13.09 ft, present datum); minimum daily, 1 cfs Aug. 14-19, 1960.

REMARKS.—Records good except those below 15 cfs, which are fair. Flow regulated by powerplant at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	281	844	418	7.9	243	318	432	1,160	577	597	193	189
2	292	762	641	268	220	340	525	1,210	591	610	182	186
3	335	612	640	268	227	340	555	1,030	592	668	195	175
4	8.6	613	641	266	233	341	490	830	596	609	163	13
5	293	611	642	266	261	363	400	782	428	607	175	12
6	280	606	645	258	264	361	401	788	21	594	177	12
7	277	524	526	263	10	358	507	816	390	383	11	187
8	278	304	279	261	215	357	622	835	397	390	11	187
9	285	355	346	261	210	354	1,150	721	445	330	173	184
10	298	289	400	7.9	205	351	1,620	636	445	331	175	163
11	284	401	411	266	205	354	2,100	634	629	11	173	12
12	290	520	398	270	205	348	3,270	637	419	243	174	11
13	297	310	339	267	210	351	2,570	639	404	229	179	184
14	307	311	321	268	11	388	2,130	643	409	229	13	112
15	223	302	314	266	215	563	2,240	639	408	315	11	109
16	229	302	316	266	210	559	2,820	638	373	366	180	111
17	236	301	317	8.3	210	567	3,690	640	343	368	178	112
18	9.0	300	266	247	210	569	3,900	637	341	176	186	11
19	231	306	262	243	202	572	3,820	641	342	394	181	11
20	237	304	265	242	202	564	3,640	619	345	517	179	188
21	276	359	264	241	8.4	531	3,430	612	342	254	153	186
22	276	404	263	241	202	389	3,120	608	446	287	13	188
23	270	624	268	243	201	564	2,420	612	427	233	184	182
24	273	557	267	8.2	199	528	2,050	601	416	228	177	185
25	9.6	316	8.3	218	199	224	1,080	1,240	382	10	184	11
26	381	318	267	219	319	485	1,410	1,410	335	243	184	11
27	518	315	264	211	314	414	1,060	1,350	329	233	184	188
28	401	315	267	220	7.5	355	1,200	964	277	194	11	191
29	839	318	265	216	------	384	1,070	865	277	151	11	188
30	808	328	269	216	------	398	1,230	593	408	182	177	178
31	1,180	------	253	8.4	------	396	------	595	------	184	187	------
TOTAL	10,202.2	12,731	11,042.3	6,511.7	5,417.9	12,986	54,952	24,625	12,134	10,166	4,374	3,677
MEAN	329	424	356	210	193	419	1,832	794	404	328	141	123
MAX	1,180	844	645	270	319	572	3,900	1,410	629	668	195	191
MIN	8.6	289	8.3	7.9	7.5	224	400	593	21	10	11	11
CFSM	.95	1.23	1.03	.61	.56	1.21	5.29	2.29	1.17	.95	.41	.36
IN.	1.10	1.37	1.19	.70	.58	1.40	5.91	2.65	1.30	1.09	.47	.40

CAL YR 1970 TOTAL 129,116.1 MEAN 354 MAX 1,330 MIN 8.3 CFSM 1.02 IN 13.88
WTR YR 1971 TOTAL 168,819.1 MEAN 463 MAX 3,900 MIN 7.5 CFSM 1.34 IN 18.15

04042500 Otter River near Elo, Mich.

LOCATION.--Lat 46°50'09", long 88°38'12", in NE¼ NE¼ sec.8, T.51 N., R.34 W., Houghton County, on right bank 50 ft upstream from highway bridge, 1.6 miles north of Pelkie, 2.5 miles south of Elo, and 5.5 miles upstream from Otter Lake.

DRAINAGE AREA.--162 sq mi.

PERIOD OF RECORD.--October 1942 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 631.02 ft above mean sea level. Prior to Nov. 1, 1962, nonrecording gage at site 2.5 miles downstream at datum 617.88 ft above mean sea level. Nov. 1, 1962, to Nov. 7, 1965, nonrecording gage at site 50 ft downstream at present datum.

AVERAGE DISCHARGE.--29 years, 216 cfs (18.11 inches per year).

EXTREMES.--Current year: Maximum discharge, 3,250 cfs Apr. 18 (gage height, 9.42 ft); minimum, 85 cfs Aug. 8-10, Sept. 8-10 (gage height, 0.84 ft).
Period of record: Maximum discharge, 4,540 cfs Apr. 19, 1952 (gage height, 13.52 ft, site and datum then in use); minimum observed, 68 cfs Nov. 18, 1947 (discharge measurement, site then in use).

REMARKS.--Records good except those for winter periods, which are fair.

REVISIONS.--WSP 1911: Drainage area at former site.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	95	153	195	120	110	135	185	1,120	240	217	89	89
2	96	140	270	120	110	135	215	1,100	217	162	89	88
3	99	131	240	120	110	140	220	998	197	130	88	87
4	100	123	220	115	110	140	206	1,000	179	116	87	86
5	97	117	210	115	110	150	184	902	178	112	87	86
6	96	113	200	115	115	150	187	780	186	103	86	86
7	95	110	190	115	115	150	247	793	170	98	86	86
8	96	107	180	115	115	150	361	765	157	122	85	86
9	96	106	170	115	120	150	666	622	142	121	86	85
10	95	107	165	115	120	150	1,030	511	134	102	88	87
11	94	107	160	115	120	155	1,550	474	131	96	91	90
12	95	117	160	115	120	155	2,220	427	128	95	88	88
13	95	116	155	115	125	160	1,930	462	126	106	88	88
14	94	109	150	115	125	170	1,560	405	119	98	100	87
15	94	106	150	110	125	185	1,540	346	114	94	92	86
16	95	106	140	110	125	205	1,810	304	110	99	89	86
17	95	105	140	110	125	225	2,580	261	107	97	87	87
18	94	105	130	110	120	235	2,860	258	126	93	88	88
19	93	108	125	110	120	240	2,560	484	141	93	91	88
20	93	135	120	110	120	230	2,080	448	126	92	91	89
21	96	190	115	110	120	225	2,540	360	116	91	88	88
22	97	163	115	110	120	220	2,160	276	127	91	88	88
23	98	135	110	110	125	210	1,890	258	129	89	87	116
24	124	216	110	110	125	205	1,320	683	115	88	89	103
25	158	236	110	110	125	195	1,070	1,740	121	88	94	93
26	132	218	115	110	130	190	1,070	1,440	113	88	93	91
27	128	200	115	110	130	190	1,090	833	106	92	90	110
28	215	190	115	110	130	185	989	510	101	98	88	109
29	280	187	115	110	------	180	954	389	108	95	87	99
30	188	177	120	110	------	180	1,040	310	290	90	89	98
31	177	------	120	110	------	180	------	265	------	90	89	------
TOTAL	3,600	4,233	4,730	3,495	3,365	5,570	38,314	19,524	4,354	3,246	2,758	2,738
MEAN	116	141	153	113	120	180	1,277	630	145	105	89.0	91.3
MAX	280	236	270	120	130	240	2,860	1,740	290	217	100	116
MIN	93	105	110	110	110	135	184	258	101	88	85	85
CFSM	.72	.87	.94	.70	.74	1.11	7.88	3.89	.90	.65	.55	.56
IN.	.83	.97	1.09	.80	.77	1.28	8.80	4.48	1.00	.75	.63	.63

CAL YR 1970 TOTAL 69,424 MEAN 190 MAX 1,660 MIN 83 CFSM 1.17 IN 15.94
WTR YR 1971 TOTAL 95,927 MEAN 263 MAX 2,860 MIN 85 CFSM 1.62 IN 22.03

PEAK DISCHARGE.--(BASE, 1,300 CFS).--Apr. 18 (0200) 3,250 cfs (9.42 ft); May 25 (0400) 1,930 cfs (6.83 ft).

04043000 Sturgeon River near Arnheim, Mich.

LOCATION.--Lat 46°55'42", long 88°33'23", in NE¼ SE¼ sec.1, T.52 N., R.34 W., Houghton County, on right bank 0.2 mile downstream from Otter Lake, 3.5 miles west of Arnheim, 8.5 miles northeast of Pelkie, and at mile 11.

DRAINAGE AREA.--705 sq mi.

PERIOD OF RECORD.--October 1942 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 605.98 ft above mean tide at New York City (Corps of Engineers bench mark).

AVERAGE DISCHARGE.--29 years, 815 cfs (15.70 inches per year).

EXTREMES.--Current year: Maximum discharge, 9,160 cfs Apr. 18, 19 (gage height, 13.99 ft); minimum, 203 cfs Sept. 8 (gage height, 0.01 ft).
Period of record: Maximum discharge, 15,500 cfs Apr. 20, 1952 (gage height, 14.57 ft, from graph based on gage readings); minimum, 157 cfs July 30, 31, 1963 (gage height, 0.20 ft); minimum gage height, 0.01 ft Sept. 1, 1970, Sept. 8, 1971.

REMARKS.--Records good. Occasional slight regulation caused by Prickett Dam at mile 45.

REVISIONS (WATER YEARS).--WSP 1387: 1943-45 (M), 1950-52. WSP 1507: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	566	1,380	600	465	390	590	972	2,840	1,410	959	352	289
2	509	1,320	760	430	400	541	1,030	2,880	1,270	1,120	353	312
3	476	1,200	1,030	389	420	618	1,110	2,880	1,170	1,100	352	321
4	468	1,060	1,050	429	430	665	1,160	2,710	1,100	1,070	352	325
5	401	968	1,030	449	460	701	1,160	2,460	1,050	1,010	350	298
6	399	916	948	465	470	740	1,100	2,240	952	945	349	249
7	403	881	935	476	480	766	1,090	2,080	766	877	348	218
8	419	832	896	486	460	779	1,230	1,990	688	768	319	224
9	426	696	764	488	420	771	1,630	1,900	694	728	272	264
10	428	625	684	494	440	770	2,580	1,700	697	674	270	296
11	421	583	642	458	460	768	3,490	1,520	717	614	304	308
12	423	583	633	408	470	764	4,930	1,420	782	491	325	289
13	425	664	598	436	470	761	7,490	1,360	743	445	331	245
14	425	608	606	459	470	766	7,610	1,320	698	442	347	243
15	424	565	581	476	440	886	6,560	1,340	666	438	325	270
16	409	537	565	485	400	1,090	6,150	1,550	643	453	274	264
17	408	520	575	491	420	1,200	6,840	1,500	622	493	266	262
18	390	513	579	448	430	1,290	8,850	1,450	608	526	298	262
19	345	508	572	395	450	1,370	8,890	1,450	602	491	323	241
20	326	526	542	417	480	1,430	7,550	1,850	602	520	339	218
21	352	583	488	433	460	1,430	7,580	1,950	586	606	343	228
22	380	657	468	449	430	1,430	7,270	1,840	579	528	340	270
23	395	690	477	463	417	1,370	6,500	1,580	594	513	306	314
24	403	744	488	467	436	1,240	5,660	1,400	621	474	285	340
25	454	786	486	428	452	1,180	4,860	2,330	632	445	314	347
26	420	715	443	391	462	1,020	3,950	3,360	618	364	331	316
27	430	641	387	390	517	1,010	3,470	3,580	594	353	339	272
28	604	611	418	390	611	999	3,150	3,240	564	386	339	293
29	725	610	441	400	------	938	2,980	2,610	545	386	308	329
30	1,010	599	453	420	------	915	2,840	2,110	640	360	262	343
31	1,200	------	454	420	------	914	------	1,670	------	350	256	------
TOTAL	14,864	22,121	19,593	13,695	12,645	29,712	129,682	64,110	22,453	18,929	9,872	8,450
MEAN	479	737	632	442	452	958	4,323	2,068	748	611	318	282
MAX	1,200	1,380	1,050	494	611	1,430	8,890	3,580	1,410	1,120	353	347
MIN	326	508	387	389	390	541	972	1,320	545	350	256	218
CFSM	.68	1.05	.90	.63	.64	1.36	6.13	2.93	1.06	.87	.45	.40
IN.	.78	1.17	1.03	.72	.67	1.57	6.84	3.38	1.18	1.00	.52	.45

CAL YR 1970 TOTAL 262,153 MEAN 718 MAX 3,160 MIN 224 CFSM 1.02 IN 13.83
WTR YR 1971 TOTAL 366,126 MEAN 1,003 MAX 8,890 MIN 218 CFSM 1.42 IN 19.32

04043050 Trap Rock River near Lake Linden, Mich.

LOCATION.--Lat 47°13'43", long 88°23'07", in SE¼ SE¼ sec.20, T.56 N., R.32 W., Houghton County, on right bank, 20 ft upstream from bridge on county highway, 2.0 miles northeast of Lake Linden, and 3.0 miles upstream from mouth.

DRAINAGE AREA.--28.0 sq mi.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1964 and 1966. October 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 621.7 ft above mean sea level.

AVERAGE DISCHARGE.--5 years, 43.8 cfs (21.24 inches per year).

EXTREMES.--Current year: Maximum discharge, 756 cfs Apr. 17 (gage height, 8.23 ft); minimum, 7.0 cfs Sept. 17 (gage height, 3.86 ft).
Period of record: Maximum discharge, 865 cfs June 11, 1968 (gage height, 8.35 ft); maximum gage height, 8.47 ft Apr. 13, 1969; minimum discharge, 7.0 cfs Sept. 17, 1971 (gage height, 3.86 ft).

REMARKS.--Records good except those for winter periods, which are fair. Small diversions for sprinkler irrigation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	23	27	17	16	23	30	121	41	43	14	9.8
2	12	21	61	17	16	24	36	129	37	47	13	9.8
3	12	19	156	17	15	25	36	110	33	32	13	9.5
4	12	17	101	17	15	26	33	106	30	25	13	9.5
5	11	16	22	18	15	26	34	96	109	22	12	9.5
6	11	15	21	17	15	25	28	86	87	19	11	9.5
7	10	14	20	17	14	24	42	78	53	17	11	9.3
8	11	14	19	17	15	26	60	71	41	36	11	9.1
9	11	14	19	18	15	24	93	65	34	24	11	8.7
10	11	15	18	19	15	24	141	57	30	19	12	9.8
11	11	16	18	18	15	24	247	52	36	17	11	11
12	11	17	17	18	15	23	447	56	36	16	11	10
13	11	17	17	18	15	22	438	80	32	20	11	9.8
14	10	16	17	18	15	22	304	68	28	17	11	9.3
15	10	14	17	18	15	28	301	54	25	16	11	9.2
16	10	14	17	17	14	35	400	47	23	16	10	10
17	9.5	14	17	17	14	38	605	42	22	15	10	10
18	9.9	15	18	17	14	37	576	41	33	14	10	9.5
19	9.5	19	18	16	14	34	453	46	32	14	12	9.5
20	9.5	33	18	16	14	33	387	52	36	13	13	9.5
21	10	52	17	16	14	53	367	51	33	13	11	9.5
22	10	40	17	16	14	42	301	42	27	13	11	9.7
23	10	34	17	16	14	29	249	41	24	12	10	14
24	14	30	17	16	15	33	144	205	23	12	11	13
25	24	27	17	16	16	35	130	573	23	12	12	11
26	20	24	17	16	17	46	127	291	20	14	12	11
27	21	20	17	16	18	24	125	114	19	17	11	11
28	37	19	16	16	20	24	116	80	18	19	10	11
29	58	19	17	16	------	25	110	64	25	18	10	11
30	36	20	16	15	------	25	113	53	54	16	10	11
31	26	------	17	16	------	25	------	46	------	15	9.8	------
TOTAL	480.4	628	823	522	424	904	6,473	3,017	1,064	603	348.8	304.5
MEAN	15.5	20.9	26.5	16.8	15.1	29.2	216	97.3	35.5	19.5	11.3	10.2
MAX	58	52	156	19	20	53	605	573	109	47	14	14
MIN	9.5	14	16	15	14	22	28	41	18	12	9.8	8.7
CFSM	.55	.75	.95	.60	.54	1.04	7.71	3.48	1.27	.70	.40	.36
IN.	.64	.83	1.09	.69	.56	1.20	8.60	4.01	1.41	.80	.46	.40

CAL YR 1970 TOTAL 12,615.9 MEAN 34.6 MAX 501 MIN 8.9 CFSM 1.24 IN 16.76
WTR YR 1971 TOTAL 15,591.7 MEAN 42.7 MAX 605 MIN 8.7 CFSM 1.53 IN 20.71

PEAK DISCHARGE (BASE, 380 CFS).--Apr. 17 (2200) 756 cfs (8.23 ft); May 25 (0900) 594 cfs (7.34 ft).

04044400 Carp River near Negaunee, Mich.

LOCATION.—Lat 46°31'29", long 87°34'25", in SE¼ sec.29, T.48 N., R.26 W., Marquette County, on right bank 30 ft downstream from bridge on U. S. Highway 41 and 2.0 miles northeast of Negaunee.

DRAINAGE AREA.—51.4 sq mi.

PERIOD OF RECORD.—July 1961 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 1,320 ft (from topographic map). Prior to Aug. 24, 1961, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.—10 years, 55.8 cfs.

EXTREMES.—Current year: Maximum discharge, 243 cfs Mar. 16 (gage height, 4.14 ft); maximum gage height, 4.42 ft Feb. 21 (backwater from ice); minimum discharge, 16 cfs Dec. 3, 4 (gage height, 2.34 ft); minimum daily, 22 cfs Nov. 29, 30, Dec. 10.
Period of record: Maximum discharge, 351 cfs June 27, 28, 1968 (gage height, 4.68 ft); maximum gage height, 5.01 ft Feb. 4, 1970 (backwater from ice); minimum discharge, 3.7 cfs July 29, 1965; minimum gage height, 1.94 ft Aug. 1, 1962; minimum daily discharge, 3.9 cfs July 29, 30, 1965.

REMARKS.—Records good except those for winter periods, which are fair. Flow regulated by Deer Lake storage reservoir (capacity 22,500 acre-feet) 5 miles above station. The city of Ishpeming diverted an average of 2.8 cfs into the basin as waste effluent.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77	62	34	40	67	120	114	54	32	74	60	62
2	77	58	56	40	67	120	119	51	36	70	61	63
3	78	55	31	40	67	119	119	44	53	66	61	63
4	78	54	27	40	67	135	115	45	51	65	60	62
5	77	53	30	40	67	127	111	58	95	64	60	61
6	76	51	26	39	68	116	109	55	88	62	60	61
7	67	35	25	39	69	115	117	53	75	62	59	61
8	58	26	23	38	69	126	113	51	86	62	59	61
9	58	24	23	38	70	133	65	47	65	60	59	61
10	59	25	22	38	70	130	73	43	58	60	62	68
11	58	25	25	38	70	124	110	42	57	60	63	69
12	57	26	46	38	71	111	153	43	57	60	63	65
13	56	26	48	38	71	111	146	48	56	80	64	63
14	56	24	48	38	71	116	116	44	52	75	64	62
15	50	24	49	60	71	135	102	38	51	66	64	60
16	49	24	49	70	71	197	123	34	52	64	64	61
17	48	24	51	70	71	135	176	31	51	64	63	60
18	48	25	52	70	71	124	180	32	66	62	62	60
19	48	26	48	70	70	117	139	57	70	61	63	62
20	48	45	45	70	70	118	146	48	58	59	63	68
21	49	50	42	70	72	118	130	37	56	59	63	67
22	49	33	40	70	95	118	83	32	61	61	63	64
23	49	23	39	70	120	112	71	31	61	61	64	69
24	54	33	38	69	127	117	56	55	61	59	65	69
25	56	28	37	69	129	117	45	74	63	58	68	64
26	52	26	36	69	145	112	41	78	67	58	71	63
27	51	24	36	68	124	107	41	51	66	58	67	66
28	72	23	35	68	120	108	49	40	64	62	64	71
29	102	22	35	68	------	106	60	35	73	63	62	69
30	73	22	35	67	------	110	52	33	78	61	62	70
31	63	------	35	67	------	106	------	33	------	61	62	------
TOTAL	1,893	996	1,166	1,709	2,320	3,760	3,074	1,417	1,859	1,957	1,945	1,925
MEAN	61.1	33.2	37.6	55.1	82.9	121	102	45.7	62.0	63.1	62.7	64.2
MAX	102	62	56	70	145	197	180	78	95	80	71	71
MIN	48	22	22	38	67	106	41	31	32	58	59	60

CAL YR 1970 TOTAL 19,195.9 MEAN 52.6 MAX 140 MIN 7.9
WTR YR 1971 TOTAL 24,021.0 MEAN 65.8 MAX 197 MIN 22

04045500 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., Luce County, 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.

PERIOD OF RECORD.—August 1953 to current year.

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

AVERAGE DISCHARGE.—18 years, 913 cfs (15.69 inches per year).

EXTREMES.—Current year: Maximum discharge, 5,980 cfs Apr. 23 (gage height, 9.59 ft); minimum, 381 cfs Sept. 10 (gage height, 3.58 ft). Period of record: Maximum discharge, 6,990 cfs May 10, 1960 (gage height, 10.26 ft); minimum, 157 cfs July 26, 1955; minimum gage height, 2.86 ft July 7, 1963.

REMARKS.—Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3,270	1,560	1,530	602	514	635	1,110	4,960	2,380	522	684	531
2	3,070	1,700	1,830	594	523	648	1,170	4,830	2,170	512	631	511
3	2,880	1,780	2,010	585	525	661	1,200	4,690	1,990	497	602	488
4	2,690	1,810	2,180	583	530	678	1,210	4,550	1,780	471	567	469
5	2,500	1,780	2,170	577	540	694	1,220	4,380	1,650	458	537	446
6	2,310	1,730	2,110	572	541	706	1,230	4,170	1,560	460	505	432
7	2,120	1,640	2,160	568	536	720	1,270	3,990	1,440	454	481	416
8	1,930	1,560	2,060	568	538	736	1,370	3,750	1,330	442	459	401
9	1,770	1,460	1,990	568	539	737	1,500	3,530	1,260	432	443	393
10	1,680	1,390	1,900	568	542	737	1,620	3,320	1,170	419	426	395
11	1,590	1,330	1,810	564	544	737	1,840	3,080	1,060	408	485	408
12	1,540	1,280	1,720	564	546	737	2,230	2,880	948	412	558	430
13	1,490	1,220	1,600	560	554	737	2,660	2,720	844	500	584	436
14	1,430	1,180	1,470	561	568	743	3,030	2,570	762	613	605	435
15	1,380	1,140	1,350	557	561	840	3,490	2,410	696	650	611	423
16	1,320	1,100	1,240	555	562	946	3,960	2,190	643	669	590	411
17	1,250	1,040	1,150	550	564	999	4,510	2,040	598	679	562	412
18	1,180	984	1,070	545	561	1,030	5,010	1,870	547	668	533	431
19	1,120	932	1,000	544	561	1,070	5,390	1,960	534	632	500	448
20	1,050	906	952	544	568	1,100	5,680	2,120	546	605	490	493
21	995	1,020	891	539	569	1,110	5,800	2,130	576	582	484	547
22	963	1,150	837	535	565	1,130	5,900	2,150	593	583	486	560
23	924	1,260	793	531	572	1,130	5,960	2,110	603	675	522	601
24	893	1,310	756	532	570	1,140	5,830	2,070	596	709	543	693
25	876	1,360	729	532	564	1,150	5,780	2,270	629	712	574	758
26	853	1,370	706	533	562	1,160	5,640	2,610	666	656	608	788
27	829	1,410	686	515	593	1,160	5,510	2,820	662	640	616	796
28	822	1,430	668	507	620	1,160	5,360	2,910	633	690	612	827
29	975	1,450	651	503	------	1,150	5,230	2,880	589	729	600	830
30	1,200	1,470	636	503	------	1,120	5,100	2,710	547	737	563	839
31	1,390	------	618	510	------	1,100	------	2,560	------	723	551	------
TOTAL	48,290	40,752	41,273	17,069	15,532	28,401	106,810	93,230	30,002	17,939	17,012	16,048
MEAN	1,558	1,358	1,331	551	555	916	3,560	3,007	1,000	579	549	535
MAX	3,270	1,810	2,180	602	620	1,160	5,960	4,960	2,380	737	684	839
MIN	822	906	618	503	514	635	1,110	1,870	534	408	426	393
CFSM	1.97	1.72	1.68	.70	.70	1.16	4.51	3.81	1.27	.73	.69	.68
IN.	2.27	1.92	1.94	.80	.73	1.34	5.03	4.39	1.41	.84	.80	.76

CAL YR 1970 TOTAL 403,327 MEAN 1,105 MAX 3,760 MIN 259 CFSM 1.40 IN 18.99
WTR YR 1971 TOTAL 472,358 MEAN 1,294 MAX 5,960 MIN 393 CFSM 1.64 IN 22.24

04046000 Black River near Garnet, Mich.

LOCATION.--Lat 46°07'05", long 85°21'55", in SE¼ sec.13, T.43 N., R.9 W., Mackinac County, on right bank 10 ft upstream from highway bridge, 15 ft downstream from Peters Creek entering from right, 3.5 miles upstream from Lake Michigan, and 4 miles southwest of Garnet.

DRAINAGE AREA.—28 sq mi, approximately.

PERIOD OF RECORD.--September 1951 to current year.

GAGE.—Water-stage recorder. Datum of gage is 629.7 ft above mean sea level.

AVERAGE DISCHARGE.—20 years, 28.2 cfs (13.68 inches per year).

EXTREMES.--Current year: Maximum discharge, 507 cfs Apr. 17 (gage height, 6.76 ft); minimum, 15 cfs Aug. 8, 9, 10, Sept. 16; minimum gage height, 2.51 ft Aug. 9, 10.
Period of record: Maximum discharge, 860 cfs May 7, 1960 (gage height, 8.55 ft), from rating curve extended above 400 cfs; minimum, 4.9 cfs Mar. 11, 1956 (gage height, 2.10 ft).

REMARKS.--Records fair. Records of water temperatures for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).—WSP 1707: 1959.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60	90	98	28	22	25	42	130	57	26	19	20
2	56	77	169	28	22	25	54	137	52	23	19	18
3	52	68	144	27	21	25	50	122	48	22	18	19
4	50	61	109	27	21	25	49	108	44	21	18	19
5	45	55	107	27	21	25	48	98	51	23	17	19
6	42	49	90	27	20	24	49	90	53	23	16	19
7	42	44	82	27	20	23	56	82	48	21	16	18
8	42	41	74	26	19	23	69	74	75	21	15	18
9	45	39	72	26	19	23	78	68	57	21	15	17
10	58	49	69	26	19	23	84	63	47	19	20	19
11	48	50	63	25	19	23	99	58	41	19	32	18
12	58	46	57	24	19	22	134	67	39	18	27	17
13	54	43	54	24	18	21	174	63	36	27	27	16
14	49	40	49	24	18	23	199	56	35	22	25	16
15	46	36	46	23	18	46	275	51	36	20	22	16
16	42	35	45	23	18	43	316	48	31	22	20	16
17	39	34	43	23	18	43	419	44	29	23	19	19
18	37	34	43	23	18	43	402	53	27	20	18	18
19	35	34	43	23	18	43	336	83	28	19	19	17
20	34	58	40	22	18	42	308	84	32	19	24	22
21	33	68	38	22	17	41	275	72	30	20	23	19
22	32	89	37	22	17	40	242	62	28	22	22	21
23	30	92	36	22	18	39	217	55	28	23	25	36
24	29	82	35	22	17	39	190	107	27	21	22	38
25	29	70	34	22	17	38	168	198	38	19	23	32
26	28	68	33	22	18	36	149	218	31	19	24	29
27	28	67	32	22	26	35	138	150	27	22	22	26
28	34	66	31	22	25	34	144	108	26	30	20	36
29	78	64	30	22	------	33	147	86	25	27	20	34
30	87	62	29	22	------	32	134	74	24	23	21	29
31	80	------	29	22	------	33	------	64	------	21	20	------
TOTAL	1,422	1,711	1,861	745	541	990	5,045	2,773	1,150	676	648	661
MEAN	45.9	57.0	60.0	24.0	19.3	31.9	168	89.5	38.3	21.8	20.9	22.0
MAX	87	92	169	28	26	46	419	218	75	30	32	38
MIN	28	34	29	22	17	21	42	44	24	18	15	16
CFSM	1.64	2.04	2.14	.86	.69	1.14	6.00	3.20	1.37	.78	.75	.79
IN.	1.89	2.27	2.47	.99	.72	1.32	6.70	3.68	1.53	.90	.86	.88

CAL YR 1970 TOTAL 13,438.9 MEAN 36.8 MAX 350 MIN 8.9 CFSM 1.31 IN 17.85
WTR YR 1971 TOTAL 18,223.0 MEAN 49.9 MAX 419 MIN 15 CFSM 1.78 IN 24.21

PEAK DISCHARGE (BASE, 120 CFS)

DATE	TIME	GHT	DISCHARGE
12-02	0200	4.43	172
04-17	2200	6.76	507
05-26	0200	5.02	239

04056500 Manistique River near Manistique, Mich.

LOCATION.—Lat 46°01'50", long 86°09'40", in SE¼ sec.15, T.42 N., R.15 W., Schoolcraft County, on left bank 1.0 mile downstream from West Branch, 6.0 miles notheast of Manistique, and at mile 19.5.

DRAINAGE AREA.—1,100 sq mi, approximately.

PERIOD OF RECORD.—March 1938 to current year.

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

AVERAGE DISCHARGE.—33 years, 1,391 cfs (17.17 inches per year).

EXTREMES.—Current year: Maximum discharge, 10,800 cfs Apr. 19 (gage height, 11.67 ft); minimum, 541 cfs Sept. 10 (gage height, 2.57 ft). Period of record: Maximum discharge, 16,900 cfs May 11, 1960 (gage height, 12.85 ft); minimum, 288 cfs Oct. 4, 1948; minimum gage height, 1.01 ft Aug. 23, 1941.

REMARKS.—Records good except those for winter periods and those for period of no gage-height record, which are fair. Since July 1948, slight regulation by dam on outlet of Manistique Lake.

REVISIONS (WATER YEARS).—WSP 1387: 1940-42 (M), 1943, 1945. WSP 1627, 1727: 1938, 1939.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2,100	4,200	2,540	1,300	1,050	1,200	2,050	4,450	3,360	1,440	766	670
2	1,900	3,900	2,730	1,250	1,050	1,200	2,100	4,280	3,000	1,420	744	659
3	1,800	3,700	3,060	1,250	1,050	1,250	2,100	4,150	2,690	1,350	740	642
4	1,600	3,500	3,030	1,250	1,050	1,250	2,100	4,050	2,420	1,290	739	624
5	1,500	3,300	2,820	1,200	1,050	1,300	2,150	3,900	2,290	1,260	733	611
6	1,400	3,100	2,700	1,200	1,050	1,300	2,200	3,710	2,360	1,250	692	599
7	1,400	2,950	2,600	1,200	1,050	1,350	2,350	3,490	2,450	1,240	646	591
8	1,500	2,800	2,500	1,200	1,050	1,350	2,450	3,290	2,490	1,150	626	582
9	1,650	2,650	2,400	1,200	1,050	1,350	2,800	3,110	2,500	1,090	606	555
10	1,750	2,500	2,300	1,200	1,050	1,350	3,350	2,950	2,400	1,090	600	545
11	1,800	2,400	2,200	1,150	1,050	1,350	5,030	2,790	2,230	1,060	646	555
12	1,800	2,250	2,150	1,150	1,050	1,350	6,100	2,630	2,110	1,010	706	580
13	1,800	2,150	2,100	1,150	1,050	1,350	8,320	2,490	2,030	1,000	759	657
14	1,750	2,050	2,000	1,150	1,100	1,400	9,820	2,410	1,930	1,040	795	664
15	1,700	2,000	1,950	1,150	1,100	1,450	10,100	2,330	1,850	1,110	780	653
16	1,600	1,900	1,900	1,150	1,100	1,600	10,200	2,270	1,780	1,160	744	639
17	1,550	1,850	1,850	1,100	1,100	1,750	10,400	2,200	1,680	1,170	728	627
18	1,450	1,800	1,800	1,100	1,100	1,850	10,700	2,160	1,590	1,150	689	617
19	1,350	1,790	1,750	1,100	1,100	1,900	10,800	2,330	1,560	1,100	664	611
20	1,300	1,780	1,700	1,100	1,100	1,950	10,400	2,760	1,580	1,050	675	630
21	1,250	1,900	1,650	1,100	1,100	2,000	9,760	3,100	1,670	978	709	652
22	1,200	2,060	1,600	1,100	1,100	2,000	9,000	3,260	1,660	870	726	669
23	1,150	2,290	1,550	1,100	1,100	2,000	8,220	3,310	1,610	847	719	699
24	1,150	2,360	1,550	1,100	1,100	2,050	7,340	3,330	1,580	864	736	732
25	1,200	2,360	1,500	1,100	1,100	2,050	6,590	3,500	1,600	859	746	763
26	1,300	2,440	1,450	1,100	1,100	2,050	6,010	3,850	1,620	833	719	778
27	1,700	2,440	1,450	1,050	1,100	2,100	5,530	4,170	1,570	800	716	763
28	3,000	2,330	1,400	1,050	1,150	2,100	5,170	4,340	1,510	806	724	754
29	4,200	2,290	1,400	1,000	------	2,050	4,860	4,300	1,440	834	713	761
30	4,400	2,480	1,350	1,000	------	2,000	4,630	4,090	1,400	843	694	770
31	4,300	------	1,350	1,000	------	2,000	------	3,760	------	806	680	------
TOTAL	57,550	75,520	62,330	35,250	30,200	51,250	182,630	102,760	59,960	32,770	21,960	19,652
MEAN	1,856	2,517	2,011	1,137	1,079	1,653	6,088	3,315	1,999	1,057	708	655
MAX	4,400	4,200	3,060	1,300	1,150	2,100	10,800	4,450	3,360	1,440	795	778
MIN	1,150	1,780	1,350	1,000	1,050	1,200	2,050	2,160	1,400	800	600	545
CFSM	1.69	2.29	1.83	1.03	.98	1.50	5.53	3.01	1.82	.96	.64	.60
IN.	1.95	2.55	2.11	1.19	1.02	1.73	6.18	3.48	2.03	1.11	.74	.66

CAL YR 1970 TOTAL 232,802 MEAN 638 MAX 4,400 MIN 516 CFSM .58 IN 7.87
WTR YR 1971 TOTAL 731,832 MEAN 2,005 MAX 10,800 MIN 545 CFSM 1.82 IN 24.75

NOTE.—No gage-height record Oct. 1 to Nov. 18.

04057000 Indian River near Manistique, Mich.

LOCATION.—Lat 45°59'30", long 86°17'15", in NE¼ sec.34, T.42 N., R.16 W., Schoolcraft County, on shore of Indian Lake just upstream from highway bridge over outlet of Indian Lake, and 2 miles northwest of Manistique.

DRAINAGE AREA.—302 sq mi.

PERIOD OF RECORD.—March 1938 to September 1971 (discontinued as a continuous record station; converted to a crest-stage partial-record station).

GAGE.—Water-stage recorder. Datum of gage is 608.66 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to July 9, 1942, nonrecording gage at same site and datum. Auxiliary water-stage recorder 1.5 miles downstream from base gage at same datum. Prior to Nov. 9, 1967 auxiliary nonrecording gage at same site and datum.

AVERAGE DISCHARGE.—33 years, 382 cfs (17.18 inches per year).

EXTREMES.—Current year: Maximum daily discharge, 1,000 cfs Apr. 22-24; maximum gage height, 5.87 ft Apr. 23, 24; minimum daily discharge, 271 cfs Sept. 17; minimum gage height, 3.69 ft Feb. 15, 16, 18, 19.

Period of record: Maximum daily discharge, 2,030 cfs May 12, 1960; maximum gage height, 7.79 ft June 24, 1943; minimum daily discharge, 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 fair. Indian Lake regulated by two vertical lift gates in concrete and earth-fill dam 1.5 miles below base gage.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	601	629	670	491	381	376	472	933	710	357	300	313
2	595	653	662	493	374	377	481	928	700	363	293	314
3	590	677	677	486	370	378	485	911	691	368	292	314
4	570	695	707	497	373	379	489	894	680	367	293	312
5	555	704	698	499	374	380	492	881	685	368	292	307
6	547	705	690	489	380	382	498	867	686	368	290	309
7	544	714	680	482	376	390	504	848	687	371	292	303
8	535	735	674	476	372	390	510	833	690	367	294	299
9	528	722	677	471	369	387	525	811	681	365	294	296
10	544	726	674	465	366	387	551	792	672	362	314	297
11	519	712	673	461	365	385	580	778	662	363	290	289
12	514	703	669	455	363	386	639	767	654	367	304	292
13	507	685	663	449	361	385	711	749	647	360	309	292
14	500	672	656	444	361	389	775	727	635	349	302	286
15	490	661	646	441	358	410	825	714	624	348	304	284
16	478	650	636	435	357	422	859	699	610	351	307	283
17	471	631	624	431	360	424	900	684	599	393	303	271
18	460	619	615	427	357	427	932	679	586	503	303	281
19	451	612	613	423	360	437	962	698	580	500	302	285
20	444	620	600	418	363	446	986	699	579	492	304	285
21	438	614	585	420	361	448	999	695	570	488	303	292
22	432	646	568	415	360	451	1,000	696	561	481	304	287
23	425	676	557	412	372	458	1,000	690	553	479	302	296
24	417	690	547	408	370	460	1,000	699	549	472	305	297
25	415	692	539	406	368	461	991	729	529	467	306	300
26	408	699	527	411	368	461	979	736	338	462	309	299
27	404	697	523	409	378	461	959	739	341	447	305	299
28	446	683	514	403	379	475	961	740	346	456	303	312
29	507	674	507	396	------	475	955	739	351	441	306	306
30	534	665	499	397	------	470	939	734	352	434	309	310
31	587	------	496	389	------	468	------	720	------	400	314	------
TOTAL	15,456	20,261	19,066	13,699	10,296	13,025	22,959	23,809	17,548	12,709	9,348	8,910
MEAN	499	675	615	442	368	420	765	768	585	410	302	297
MAX	601	735	707	499	381	475	1,000	933	710	503	314	314
MIN	404	612	496	389	357	376	472	679	338	348	290	271

CAL YR 1970 TOTAL 159,956 MEAN 438 MAX 758 MIN 192
WTR YR 1971 TOTAL 187,086 MEAN 513 MAX 1,000 MIN 271

04057510 Sturgeon River near Nahma Junction, Mich.

LOCATION.—Lat 45°56'35", long 86°42'20", in SW¼ SE¼ sec.17, T.41 N., R.19 W., Delta County, Hiawatha National Forest, on left bank, 30 ft upstream from U.S.F.S. 2231 bridge, 500 ft downstream from Mormon Creek, 0.1 mile east of Federal Forest Highway 13, and 3.2 miles north of Nahma Junction.

DRAINAGE AREA.—183 sq mi.

PERIOD OF RECORD.—October 1966 to current year.

GAGE.—Water-stage recorder. Datum of gage is 611.0 ft above mean sea level.

AVERAGE DISCHARGE.—5 years, 214 cfs (15.88 inches per year).

EXTREMES.—Current year: Maximum discharge, 1,580 cfs Apr. 18 (gage height, 9.85 ft); minimum, 59 cfs Sept. 16-19 (gage height, 3.91 ft). Period of record: Maximum discharge, 1,580 cfs Apr. 18, 1971 (gage height, 9.85 ft); minimum, 39 cfs Sept. 20, 1967 (gage height, 3.71 ft).

REMARKS.—Records good except those for winter periods, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	152	872	397	150	110	180	260	619	301	279	95	90
2	139	789	613	150	110	185	265	608	277	255	97	84
3	129	672	574	145	110	190	275	547	261	203	92	79
4	121	577	664	145	110	185	280	501	235	173	87	76
5	115	488	748	140	110	185	300	469	289	167	82	74
6	110	421	725	140	110	180	320	443	369	151	78	71
7	109	368	692	135	110	180	350	425	331	138	74	69
8	107	327	691	130	110	180	400	356	359	137	71	67
9	135	299	664	130	110	180	480	325	319	164	69	65
10	171	309	552	130	110	180	580	299	274	148	73	65
11	170	307	465	125	110	180	753	273	241	133	95	67
12	161	287	412	125	110	180	926	272	219	123	89	68
13	153	266	381	120	110	180	1,090	300	238	135	82	67
14	143	247	350	120	110	180	1,090	291	221	142	81	65
15	133	228	320	120	110	250	1,180	267	221	143	77	63
16	124	213	290	120	115	300	1,250	250	192	138	71	61
17	118	203	270	120	115	305	1,410	235	173	148	68	60
18	113	194	240	120	120	310	1,560	259	163	132	66	61
19	109	199	230	115	125	310	1,510	557	181	126	73	62
20	105	254	220	115	130	300	1,400	678	213	117	94	84
21	103	372	210	115	130	295	1,340	566	213	113	99	81
22	102	390	200	110	135	290	1,190	494	181	110	85	76
23	100	383	190	110	135	285	1,010	437	179	123	91	94
24	106	363	185	105	140	280	849	478	177	114	94	104
25	117	363	175	105	140	270	780	642	258	106	102	94
26	117	346	170	105	140	260	713	628	232	107	114	88
27	123	323	170	105	160	250	632	545	189	101	117	84
28	520	303	165	105	170	250	620	479	165	113	109	95
29	1,240	350	160	105	------	250	652	421	157	114	98	100
30	1,130	327	155	105	------	250	634	369	167	105	96	100
31	907	------	150	110	------	250	------	329	------	100	96	------
TOTAL	7,182	11,040	11,428	3,775	3,405	7,250	24,099	13,362	6,995	4,358	2,715	2,314
MEAN	232	368	369	122	122	234	803	431	233	141	87.6	77.1
MAX	1,240	872	748	150	170	310	1,560	678	369	279	117	104
MIN	100	194	150	105	110	180	260	235	157	100	66	60
CFSM	1.27	2.01	2.02	.67	.67	1.28	4.39	2.36	1.27	.77	.48	.42
IN.	1.46	2.24	2.32	.77	.69	1.47	4.90	2.72	1.42	.89	.55	.47

CAL YR 1970 TOTAL 78,418 MEAN 215 MAX 1,240 MIN 52 CFSM 1.17 IN 15.94
WTR YR 1971 TOTAL 97,923 MEAN 268 MAX 1,560 MIN 60 CFSM 1.46 IN 19.91

04057800 Middle Branch Escanaba River at Humboldt, Mich.

LOCATION.—Lat 46°29'57", long 87°53'11", in SW¼ sec.1, T.47 N., R.29 W., Marquette County, on left bank 15 ft upstream from county highway, 0.3 mile north of Humboldt, and 1.5 miles downstream from Halfway Creek.

DRAINAGE AREA.—46.0 sq mi.

PERIOD OF RECORD.—June 1959 to current year.

GAGE.—Water-stage recorder. V-notch sharp-crested weir since Oct. 3, 1960. Datum of gage is 1,521.20 ft above mean sea level (Cleveland-Cliffs Iron Co. bench mark). Prior to Sept. 1, 1960, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.—12 years, 58.8 cfs (17.36 inches per year), adjusted for diversion.

EXTREMES.—Current year: Maximum discharge, 752 cfs Apr. 21 (gage height, 6.12 ft); minimum, 6.3 cfs Sept. 16 (gage height, 1.55 ft). Period of record: Maximum discharge, 1,640 cfs Apr. 24, 1960 (gage height, 8.30 ft, from floodmark); minimum, 4.5 cfs Aug. 18, 1961, Aug. 11, 1962; minimum gage height, 1.07 ft Aug. 24, 1960.

REMARKS.—Records good except those for winter periods, which are fair. Since July 1960, some diversion 100 ft above station by industry for iron ore processing. Flow is returned to the basin through the Black River; figures of runoff adjusted.

REVISIONS.—WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	91	61	30	21	45	64	206	70	110	19	8.0
2	16	77	113	29	21	44	72	214	62	86	20	8.5
3	16	68	99	29	21	43	78	202	58	52	17	7.7
4	16	60	94	29	20	41	78	177	53	40	14	7.6
5	16	53	86	28	20	40	76	170	57	34	13	7.7
6	14	47	76	27	20	39	74	169	60	29	12	7.7
7	14	43	68	26	20	38	72	155	60	24	12	7.9
8	16	37	62	26	20	38	78	142	71	25	11	7.9
9	19	35	58	25	20	37	86	132	57	21	15	7.6
10	23	37	55	24	20	37	100	115	49	18	17	10
11	19	37	52	24	20	37	120	103	45	17	18	11
12	17	41	50	24	20	37	160	103	43	19	15	11
13	17	40	49	24	20	37	210	116	39	93	16	9.4
14	15	36	48	24	20	40	280	111	35	64	17	8.8
15	14	33	46	24	20	50	370	97	31	41	14	8.3
16	13	31	43	24	20	54	485	85	29	36	12	8.5
17	12	30	41	24	20	58	560	74	28	33	11	7.7
18	12	31	40	24	20	60	683	70	40	27	10	7.7
19	12	33	39	24	20	62	699	98	50	23	13	8.7
20	12	59	38	24	20	62	659	102	42	20	12	11
21	12	97	37	23	20	62	718	86	36	19	10	10
22	11	81	37	23	20	60	591	72	32	36	11	9.3
23	13	73	36	23	20	58	451	64	28	36	12	16
24	25	131	35	23	20	56	373	92	28	27	12	14
25	41	106	34	22	21	54	311	186	31	22	14	11
26	35	79	33	22	25	52	262	239	26	19	15	10
27	34	67	32	22	35	52	227	210	22	18	12	14
28	91	56	32	22	42	52	214	140	20	36	10	47
29	204	51	31	22	------	52	222	102	45	37	9.0	79
30	199	48	31	22	------	52	205	84	123	28	8.5	72
31	119	------	30	22	------	56	------	78	------	23	8.2	------
TOTAL	1,093	1,708	1,586	759	606	1,505	8,578	3,994	1,370	1,113	409.7	455.0
MEAN	35.3	56.9	51.2	24.5	21.6	48.5	286	129	45.7	35.9	13.2	15.2
MAX	204	131	113	30	42	62	718	239	123	110	20	79
MIN	11	30	30	22	20	37	64	64	20	17	8.2	7.6
MEAN+	36.6	58.3	52.2	24.9	22.5	49.6	288	132	47.4	37.7	15.1	15.7
CFSM+	.80	1.27	1.13	.54	.49	1.08	6.26	2.87	1.03	.82	.33	.34
IN+	.92	1.42	1.30	.62	.51	1.24	6.98	3.31	1.15	.95	.38	.38

CAL YR 1970 TOTAL 16,771.0 MEAN 45.9 MAX 445 MIN 5.8 MEAN+ 47.1 CFSM+ 1.02 IN+ 13.94
WTR YR 1971 TOTAL 23,176.7 MEAN 63.5 MAX 718 MIN 7.6 MEAN+ 65.0 CFSM+ 1.41 IN+ 19.16

+Adjusted for diversion.

04058000 Middle Branch Escanaba River near Ishpeming, Mich.

LOCATION.—Lat 46°23'40", long 87°45'30", in NW¼ SW¼ sec.12, T.46 N., R.28 W., Marquette County, on left bank 0.5 mile downstream from County Highway 581, 6 miles southwest of Ishpeming, and 10 miles east of Republic.

DRAINAGE AREA.—128 sq mi.

PERIOD OF RECORD.—June 1954 to current year:

GAGE.—Water-stage recorder. Datum of gage is 1,389.02 ft above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.—17 years, 137 cfs (14.53 inches per year).

EXTREMES.—Current year: Maximum discharge, 1,450 cfs Apr. 19 (gage height, 9.41 ft); minimum, 23 cfs Sept. 17 (gage-height, 1.46 ft). Period of record: Maximum discharge, 2,680 cfs Apr. 25, 1960 (gage height, 12.55 ft); minimum, 12 cfs Aug. 21-23, 1957; minimum gage height, 1.17 ft Aug. 22, 23, 1957.

REMARKS.—Records good except those for winter period, which are fair. Some flow diverted and returned above station by iron ore processing plant. Records of water temperatures for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	347	141	74	54	105	170	495	212	308	71	33
2	62	280	216	74	54	110	190	493	185	260	67	31
3	61	230	269	74	54	110	200	483	159	197	64	32
4	67	198	233	74	54	105	200	444	143	146	61	31
5	56	167	210	74	54	100	200	399	184	118	57	30
6	48	145	195	72	54	100	190	385	210	102	52	28
7	45	131	180	70	54	100	180	363	181	90	49	28
8	43	116	165	68	54	98	210	328	211	82	46	26
9	45	106	155	68	54	96	230	298	190	79	43	27
10	51	103	145	66	54	96	260	280	150	70	49	35
11	55	102	135	66	54	96	320	245	130	62	54	37
12	52	104	125	64	54	94	400	227	131	63	50	35
13	50	113	120	64	54	94	560	244	122	226	49	32
14	47	106	110	62	54	110	850	242	111	300	52	30
15	45	94	105	62	54	130	1,000	217	109	189	55	28
16	43	88	100	62	54	140	1,240	189	97	135	51	25
17	42	85	96	62	54	150	1,230	167	108	124	48	24
18	41	86	94	62	54	155	1,360	155	130	101	43	26
19	40	90	92	62	54	160	1,440	189	226	90	43	28
20	39	120	90	62	54	155	1,410	239	184	81	43	32
21	41	221	90	62	54	155	1,350	217	145	77	38	33
22	42	232	88	60	54	150	1,320	185	124	123	38	33
23	43	137	86	60	54	150	1,130	158	108	131	39	39
24	56	158	84	60	54	145	918	193	105	104	43	46
25	99	202	82	60	54	140	780	357	117	83	56	41
26	103	185	80	58	56	135	671	480	99	75	57	37
27	93	170	78	58	70	135	582	501	86	70	51	80
28	197	157	78	58	100	135	529	416	78	83	45	130
29	427	140	76	56	------	135	525	305	113	111	39	189
30	539	131	76	56	------	135	518	256	250	93	34	307
31	467	------	74	56	------	150	------	220	------	80	34	------
TOTAL	3,105	4,544	3,868	1,986	1,576	3,869	20,163	9,370	4,398	3,853	1,521	1,533
MEAN	100	151	125	64.1	56.3	125	672	302	147	124	49.1	51.1
MAX	539	347	269	74	100	160	1,440	501	250	308	71	307
MIN	39	85	74	56	54	94	170	155	78	62	34	24
CFSM	.78	1.18	.98	.50	.44	.98	5.25	2.36	1.15	.97	.38	.40
IN.	.90	1.32	1.12	.58	.46	1.12	5.86	2.72	1.28	1.12	.44	.45

CAL YR 1970 TOTAL 41,302 MEAN 113 MAX 1,200 MIN 16 CFSM .88 IN 12.00
WTR YR 1971 TOTAL 59,786 MEAN 164 MAX 1,440 MIN 24 CFSM 1.28 IN 17.38

04058100 Middle Branch Escanaba River near Princeton, Mich.

LOCATION.--Lat 46°19'02", long 87°30'07", in NW¼ sec.12, T.45 N., R.26 W., Marquette County, on right bank 400 ft downstream from powerplant, 0.3 mile upstream from Green Creek, and 2.2 miles northwest of Princeton.

DRAINAGE AREA.--210 sq mi.

PERIOD OF RECORD.--July 1961 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,100 ft (from topographic map).

AVERAGE DISCHARGE.--10 years, 208 cfs (13.45 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,990 cfs Apr. 14 (gage height, 7.00 ft); minimum, 5.4 cfs Feb. 4, 5, Mar. 28, 29 (gage height, 0.44 ft); minimum daily, 6.3 cfs Sept. 8.
Period of record: Maximum discharge, 1,990 cfs Apr. 14, 1971 (gage height, 7.00 ft); maximum gage height, 7.44 ft Jan. 23, 1967 (backwater from ice); minimum discharge recorded, 2.2 cfs Oct. 5, 1964 (gage height, 0.45 ft); minimum daily, 4.1 cfs Feb. 4, 1967.

REMARKS.--Records good. Flow regulated by powerplant above station. Some flow diverted and returned above station by iron ore processing plant.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	172	619	354	145	110	225	270	715	407	349	158	93
2	124	502	145	145	115	270	180	688	395	452	159	95
3	125	447	223	145	145	145	180	675	277	399	114	95
4	125	409	366	145	145	195	180	649	241	386	94	93
5	96	300	254	115	110	195	280	599	245	379	92	92
6	104	298	274	115	115	195	380	559	353	121	91	89
7	110	296	280	115	115	195	320	536	419	236	99	87
8	80	292	366	125	110	145	320	504	408	138	98	6.3
9	81	145	250	130	115	155	300	464	405	111	84	79
10	81	81	218	130	115	170	450	435	394	105	95	81
11	81	82	200	180	110	180	550	412	352	110	91	82
12	81	246	189	180	100	100	700	398	241	161	97	82
13	141	256	147	140	85	100	900	395	236	241	84	82
14	141	262	187	145	85	145	1,100	393	228	285	99	92
15	139	257	172	115	160	280	1,370	390	169	389	99	91
16	94	98	185	115	195	180	1,530	386	229	385	121	121
17	65	50	184	115	100	210	1,670	282	172	376	127	95
18	65	52	113	115	100	265	1,670	272	183	215	98	79
19	65	159	125	115	115	210	1,770	277	193	66	98	76
20	80	188	135	185	115	210	1,830	288	199	144	97	79
21	80	194	195	195	115	210	1,730	389	315	176	98	80
22	80	313	195	125	115	270	1,610	275	385	226	98	76
23	80	303	130	85	130	270	1,520	286	248	127	100	108
24	81	296	145	85	145	210	1,300	289	175	132	94	97
25	81	377	145	85	90	225	1,090	428	185	132	97	76
26	182	267	145	145	85	270	949	579	191	265	137	82
27	207	247	145	140	85	260	839	659	194	187	110	114
28	252	230	145	145	85	190	770	634	193	133	96	139
29	399	232	145	110	------	100	743	529	207	138	97	116
30	650	230	145	115	------	215	728	432	212	148	97	113
31	705	------	145	115	------	170	------	404	------	154	90	------
TOTAL	4,847	7,728	6,047	4,060	3,210	6,160	27,229	14,221	8,051	6,866	3,209	2,690.3
MEAN	156	258	195	131	115	199	908	459	268	221	104	89.7
MAX	705	619	366	195	195	280	1,830	715	419	452	159	139
MIN	65	50	113	85	85	100	180	272	169	66	84	6.3
CFSM	.74	1.23	.93	.62	.55	.95	4.32	2.19	1.28	1.05	.50	.43
IN.	.86	1.37	1.07	.72	.57	1.09	4.82	2.52	1.43	1.22	.57	.48

CAL YR 1970 TOTAL 69,739.2 MEAN 191 MAX 1,710 MIN 5.8 CFSM .91 IN 12.35
WTR YR 1971 TOTAL 94,318.3 MEAN 258 MAX 1,830 MIN 6.3 CFSM 1.23 IN 16.71

04058190 Schweitzer Reservoir near Palmer, Mich.

LOCATION.--Lat 46°25'00", long 87°38'48", in SE1/4NW1/4 sec.2, T.46 N., R.27 W., Marquette County, on left bank 120 ft upstream from dam on Schweitzer Creek, and 3.0 miles southwest of Palmer.

DRAINAGE AREA.--23.1 sq mi.

PERIOD OF RECORD.--January 1963 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is 1,300.00 ft above mean sea level. Gage readings have been converted to elevations above mean sea level. Prior to Oct. 25, 1967, nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum contents, 5,580 acre-ft Apr. 12-14, 17-19 (elevation, 1,338.7 ft); minimum, 3,930 acre-ft Oct. 22-24 (elevation, 1,333.6 ft).
Period of record: Maximum contents recorded, 5,900 acre-ft May 31, 1970 (elevation, 1,339.5 ft); minimum recorded, 3,050 acre-ft Apr. 7, 1970 (elevation, 1,330.2 ft).

REMARKS.--Records good. Reservoir is formed by an earth-fill dam with fixed crest concrete spillway completed in 1963. Capacity of reservoir is 5,300 acre-ft at spillway elevation 1,338.00 ft. The dam includes a discharge pipe equipped with valve to control released flow to Schweitzer Creek. (See sta 04058200.) An average of 10.2 cfs was diverted from reservoir for iron ore processing and returned to the Middle Branch Escanaba River basin by Green Creek.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Elevation (feet)	Contents (acre-feet)	Change in contents during month (Acre-feet)	Change in contents during month (Equivalent in cfs)
Sept. 30	1,334.6	4,230	--	--
Oct. 31	1,335.9	4,620	+390	+6.3
Nov. 30	1,337.2	5,020	+400	+6.7
Dec. 31	1,337.9	5,260	+240	+3.9
Calendar year 1970	--	--	+880	+1.2
Jan. 31	1,337.6	5,160	-100	-1.6
Feb. 28	1,336.8	4,890	-270	-4.9
Mar. 31	1,337.4	5,090	+200	+3.3
Apr. 30	1,338.2	5,380	+290	+4.9
May 31	1,338.1	5,340	-40	-.7
June 30	1,337.8*	5,230	-110	-1.8
July 31	1,337.6	5,160	-70	-1.1
Aug. 31	1,335.8	4,590	-570	-9.3
Sept. 30	1,334.2	4,110	-480	-8.1
Water year 1970-71	--	--	-120	-.2

* Estimated

04058200 Schweitzer Creek near Palmer, Mich.

LOCATION.--Lat 46°24'40", long 87°37'27", in SW¼ sec.1, T.46 N., R.27 W., Marquette County, on right bank 10 ft upstream from highway bridge, 2.5 miles southwest of Palmer.

DRAINAGE AREA.--23.6 sq mi.

PERIOD OF RECORD.--October 1960 to current year.

GAGE --Water-stage recorder. Concrete control since Oct. 1, 1963. Altitude of gage is 1,270 ft (from topographic map). Prior to Aug. 21, 1961, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--11 years, 16.9 cfs.

EXTREMES.--Current year: Maximum discharge, 253 cfs Apr. 18 (gage height, 4.69 ft); minimum, 3.6 cfs Oct. 3-5, 17-24 (gage height, 2.80 ft); minimum daily, 3.7 cfs Oct. 18.
Period of record: Maximum discharge, 860 cfs May 31, 1970 (gage height, 6.50 ft); minimum, 0.4 cfs Sept. 6, 1962 (gage height, 1.22 ft); minimum daily, 1.0 cfs Apr. 9-18, May 5, 6, 1963.

REMARKS.--Records good. Since August 1962, flow completely regulated by Schweitzer Reservoir (see sta 04058190), 1 mile above station. An average of 2.8 cfs was diverted from headwaters of basin by the city of Ishpeming for municipal supply and the effluent discharged to the Carp River basin. An average of 10.2 cfs was diverted from basin 1 mile above station by industry for iron ore processing and returned to the Middle Branch Escanaba River basin. Records of water temperatures for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	4.6	5.8	4.0	4.3	8.4	9.2	70	15	45	5.1	4.7
2	4.0	4.4	5.8	4.0	4.4	8.3	9.2	68	13	36	5.1	4.7
3	3.9	4.4	4.7	4.0	4.4	8.3	8.8	58	12	23	5.0	4.6
4	3.9	4.2	5.3	4.0	4.4	8.2	8.7	49	9.4	13	5.0	4.7
5	3.9	4.2	6.5	4.0	4.4	8.1	8.7	45	29	9.3	5.0	4.7
6	3.9	4.2	12	4.0	4.4	8.1	9.2	41	51	6.9	4.9	4.7
7	4.0	4.1	12	4.0	4.4	8.0	9.9	36	40	5.6	4.9	4.7
8	4.4	4.1	11	4.0	4.4	8.0	15	33	48	5.6	4.9	4.6
9	4.1	4.1	11	4.0	4.4	8.0	49	29	37	5.6	4.9	4.7
10	3.9	4.2	9.3	4.0	4.4	8.0	81	23	24	5.6	5.2	5.2
11	3.9	4.1	8.5	4.0	4.4	8.0	134	21	17	5.6	4.9	4.7
12	3.9	4.1	7.9	4.0	4.4	8.0	216	23	17	7.7	5.0	4.7
13	3.9	4.1	6.9	4.0	4.4	8.0	235	23	14	19	5.0	4.6
14	3.8	4.0	6.3	4.0	4.4	8.5	194	22	11	37	5.0	4.6
15	3.8	4.0	5.9	4.0	4.4	9.5	174	19	8.2	23	4.9	4.7
16	3.9	4.0	5.8	4.0	4.4	9.3	180	16	7.3	19	4.9	4.7
17	3.8	4.0	5.5	4.0	6.0	9.2	215	12	9.0	13	4.9	4.7
18	3.7	4.1	5.6	4.0	7.8	9.0	241	12	22	8.0	4.8	4.7
19	3.8	4.1	5.9	4.0	8.0	8.8	219	23	56	6.3	4.9	4.9
20	3.8	6.2	5.1	4.0	8.0	8.6	205	32	42	5.5	4.8	4.9
21	3.8	5.3	4.7	4.0	8.0	8.5	198	26	24	5.5	4.7	4.7
22	3.9	4.9	4.3	4.0	8.0	8.4	153	19	14	5.6	4.8	4.7
23	3.8	4.7	4.0	4.0	8.0	8.4	121	16	10	5.4	4.7	4.9
24	4.4	4.4	4.0	4.0	8.0	8.3	98	32	9.1	5.3	5.0	4.7
25	4.0	4.4	4.0	4.0	8.0	8.3	80	75	10	5.3	4.8	4.7
26	4.0	4.3	4.0	4.0	8.0	8.3	68	77	8.7	5.3	4.7	4.7
27	4.1	4.2	4.0	4.0	8.0	8.3	61	56	6.7	5.2	4.6	4.7
28	7.9	4.2	4.0	4.1	8.0	8.3	66	38	5.9	5.5	4.6	4.7
29	6.3	4.2	4.0	4.1	------	8.3	73	28	20	5.2	4.6	4.4
30	4.9	4.2	4.0	4.2	------	8.4	69	21	54	5.1	4.7	5.1
31	4.8	------	4.0	4.2	------	8.8	------	17	------	5.1	4.6	------
TOTAL	130.2	130.0	191.8	124.6	164.1	260.6	3,208.7	1,060	644.3	358.2	150.9	141.8
MEAN	4.20	4.33	6.19	4.02	5.86	8.41	107	34.2	21.5	11.6	4.87	4.73
MAX	7.9	6.2	12	4.2	8.0	9.5	241	77	56	45	5.2	5.2
MIN	3.7	4.0	4.0	4.0	4.3	8.0	8.7	12	5.9	5.1	4.6	4.4

CAL YR 1970 TOTAL 3,857.2 MEAN 10.6 MAX 677 MIN 3.1
WTR YR 1971 TOTAL 6,565.2 MEAN 18.0 MAX 241 MIN 3.7

04058400 Goose Lake Outlet near Sands Station, Mich.

LOCATION.—Lat 46°23'36", long 87°29'40", in SE¼ SE¼ sec.12, T.46 N., R.26 W., Marquette County, on left bank 0.8 mile upstream from mouth, and 3 miles west of Sands Station.

DRAINAGE AREA.—37.5 sq mi.

PERIOD OF RECORD.—October 1965 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 1,160 ft (from topographic map).

AVERAGE DISCHARGE.—6 years, 32.3 cfs (11.70 inches per year).

EXTREMES.—Current year: Maximum discharge, 457 cfs Apr. 14 (gage height, 5.88 ft); minimum, 6.6 cfs Sept. 6, 9 (gage height, 1.47 ft). Period of record: Maximum discharge, 458 cfs May 31, 1970 (gage height, 5.89 ft); minimum, 6.2 cfs Oct. 12, 13, 1966, Oct. 6, 7, 1967; minimum gage height, 1.45 ft Oct. 12, 13, 1966.

REMARKS.—Records good except those for winter periods and those for period of no gage-height record, which are fair. Some mine water pumped into basin at headwaters.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	37	30	17	15	18	28	96	42	31	14	9.0
2	16	32	33	17	15	19	29	94	40	29	14	8.7
3	15	30	32	17	15	18	29	89	38	27	13	8.5
4	15	27	31	16	15	19	29	83	36	25	13	8.4
5	14	25	29	15	15	19	30	78	54	24	12	8.9
6	14	24	34	15	16	19	33	72	48	22	12	7.2
7	13	22	34	15	16	19	41	67	52	21	12	7.6
8	13	21	34	15	16	19	50	62	54	20	11	7.5
9	13	21	33	15	16	20	65	58	49	19	11	7.3
10	12	21	31	16	16	20	79	54	44	18	12	9.8
11	12	20	29	16	16	20	114	50	44	17	11	8.6
12	11	20	28	16	16	20	214	51	47	19	11	8.4
13	11	20	26	16	16	20	332	49	42	41	11	7.9
14	11	19	26	16	16	20	382	46	37	28	11	8.4
15	11	19	26	16	16	22	341	44	35	27	10	7.6
16	11	19	25	16	16	22	317	42	33	29	10	7.4
17	11	18	25	16	16	21	335	40	32	26	9.6	7.2
18	11	19	24	16	16	21	350	39	37	23	9.6	7.3
19	11	19	24	16	16	21	319	48	37	22	9.9	7.7
20	11	28	22	16	16	21	285	44	34	21	9.6	10
21	11	27	21	16	16	22	265	43	33	20	9.3	8.4
22	11	30	21	16	16	22	230	41	31	21	9.3	8.0
23	11	24	20	16	16	23	191	39	30	19	9.4	9.4
24	13	26	19	16	16	24	161	48	29	18	10	8.4
25	13	27	19	16	16	26	134	53	31	17	11	8.0
26	12	26	18	15	17	24	116	58	28	17	11	8.0
27	13	25	18	15	19	24	103	59	25	16	10	9.0
28	27	23	18	15	18	25	99	56	24	17	9.6	8.4
29	28	23	17	15	------	25	101	51	29	16	9.3	8.0
30	28	23	17	15	------	25	97	47	31	15	9.2	12
31	36	------	17	15	------	25	------	45	------	14	9.1	------
TOTAL	454	715	781	488	449	663	4,899	1,746	1,126	679	333.9	250.0
MEAN	14.6	23.8	25.2	15.7	16.0	21.4	163	56.3	37.5	21.9	10.8	8.33
MAX	36	37	34	17	19	26	382	96	54	41	14	12
MIN	11	18	17	15	15	18	28	39	24	14	9.1	7.2
CFSM	.39	.63	.67	.42	.43	.57	4.35	1.50	1.00	.58	.29	.22
IN.	.45	.71	.77	.48	.45	.66	4.86	1.73	1.12	.67	.33	.25

CAL YR 1970 TOTAL 10,818.9 MEAN 29.6 MAX 347 MIN 9.0 CFSM .79 IN 10.73
WTR YR 1971 TOTAL 12,583.9 MEAN 34.5 MAX 382 MIN 7.2 CFSM .92 IN 12.48

NOTE.—No gage-height record Jan. 8 to Feb. 25.

04058500 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., Marquette County, on right bank in county park at Gwinn, 1 mile upstream from mouth.

DRAINAGE AREA.—124 sq mi.

PERIOD OF RECORD.—October 1954 to current year.

GAGE.—Water-stage recorder. Datum of gage is 1,079.2 ft above mean sea level.

AVERAGE DISCHARGE.—17 years, 102 cfs (11.17 inches per year).

EXTREMES.—Current year: Maximum discharge, 1,200 cfs Apr. 18 (gage height, 12.34 ft); minimum, 31 cfs Sept. 9 (gage height, 6.66 ft).
Period of record: Maximum discharge, 2,390 cfs June 1, 1970 (gage height, 14.97 ft); minimum, 19 cfs July 30, Oct. 11, 1963 (gage height, 6.48 ft).

REMARKS.—Records good except those for winter periods, which are fair. Since August, 1962, flow partly regulated by Schweitzer Reservoir (usable capacity, 231,000,000 cu ft). Water diverted from basin for municipal supply and for iron ore processing (see sta 04058200).

REVISIONS.—WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	141	85	56	44	65	107	332	123	187	45	36
2	47	116	162	54	44	66	127	320	113	157	45	36
3	47	101	165	54	44	67	133	300	111	127	44	35
4	45	92	127	54	44	66	128	266	102	99	43	34
5	43	83	135	54	44	65	119	245	196	86	42	34
6	42	77	134	54	44	63	123	229	302	74	40	35
7	41	71	134	52	44	62	146	206	239	65	40	33
8	41	67	122	52	44	61	187	188	274	60	39	34
9	42	63	103	50	44	60	257	175	224	61	38	32
10	44	67	97	50	44	59	356	161	174	53	39	45
11	41	65	90	50	44	59	515	147	144	50	42	47
12	40	63	87	50	44	59	796	147	140	49	40	41
13	39	63	83	50	43	60	1,060	154	134	175	39	39
14	39	61	79	50	43	62	1,050	142	116	176	41	37
15	39	58	77	50	43	70	978	130	101	136	40	36
16	37	55	75	50	43	90	961	120	93	107	38	34
17	37	54	75	50	43	96	1,060	111	87	104	37	34
18	37	57	74	50	43	100	1,180	106	90	82	36	33
19	36	63	73	50	43	100	1,090	152	147	72	37	34
20	36	95	72	50	45	100	951	176	150	65	38	44
21	37	158	70	50	50	100	886	157	122	60	37	44
22	37	139	68	49	49	100	760	135	100	70	37	39
23	37	111	67	48	48	100	604	120	91	71	37	41
24	42	100	66	48	47	100	494	143	87	62	37	45
25	54	94	64	47	47	98	416	256	94	56	42	41
26	49	88	61	47	50	96	362	291	86	53	43	40
27	47	83	60	46	60	94	323	261	77	51	41	39
28	97	80	58	45	64	94	317	203	69	53	38	40
29	239	74	56	45	------	93	359	168	74	54	36	41
30	181	74	56	45	------	90	348	146	158	50	35	53
31	144	------	56	44	------	94	------	133	------	47	36	------
TOTAL	1,784	2,513	2,731	1,544	1,289	2,489	16,193	5,820	4,018	2,612	1,222	1,156
MEAN	57.5	83.8	88.1	49.8	46.0	80.3	540	188	134	84.3	39.4	38.5
MAX	239	158	165	56	64	100	1,180	332	302	187	45	53
MIN	36	54	56	44	43	59	107	106	69	47	35	32
CFSM	.46	.68	.71	.40	.37	.65	4.35	1.52	1.08	.68	.32	.31
IN.	.54	.75	.82	.46	.39	.75	4.86	1.75	1.21	.78	.37	.35

CAL YR 1970 TOTAL 34,823 MEAN 95.4 MAX 1,910 MIN 28 CFSM .77 IN 10.45
WTR YR 1971 TOTAL 43,371 MEAN 119 MAX 1,180 MIN 32 CFSM .96 IN 13.01

04059000 Escanaba River at Cornell, Mich.

LOCATION.--Lat 45°54'31", long 87°12'49", in NW¼ sec.32, T.41 N., R.23 W., Delta County, on right bank 50 ft downstream from highway bridge, 0.4 mile downstream from Bobs Creek, 0.7 mile northeast of Cornell,and 16 miles upstream from mouth.

DRAINAGE AREA.--870 sq mi.

PERIOD OF RECORD.--August 1903 to December 1912, January 1913 to November 1915 (gage heights only), October 1950 to current year. 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 (levels by Michigan Department of Natural Resources). August 1903 to November 1915, nonrecording gage at site 10 miles downstream at different datum.

AVERAGE DISCHARGE.--30 years (1903-12, 1950-70), 895 cfs (13.97 inches per year).

EXTREMES.--Current year: Maximum discharge, 8,430 cfs Apr. 14 (gage height, 4.57 ft); maximum gage height, 6.40 ft Apr. 9 (backwater from ice); minimum discharge, 185 cfs Sept. 10 (gage height, 1.33 ft).
Period of record: Maximum discharge, 10,500 cfs May 7, 1960 (gage height, 4.90 ft); maximum gage height, 6.40 ft Apr. 9, 1971 (backwater from ice); minimum discharge observed, 90 cfs July 5, 1910 (gage height,1.5 ft,site and datum then in use), but may have been less during extended periods of no gage-height record during winter seasons of 1903-12, or during periods of ice effect in 1959.

REMARKS.--Records good except those for winter periods, which are fair. Diurnal fluctuation and occasional slight regulation caused by Boney Falls powerplant, 7 miles above station, since 1950. Since August 1962, some regulation by Schweitzer Reservoir (capacity 231,000,000 cu ft), at headwaters (see sta 04058190).

REVISIONS (WATER YEARS).--WSP 1387: 1904.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	475	2,610	1,200	640	440	640	840	2,490	1,080	1,140	397	264
2	397	2,200	1,400	600	440	680	840	2,330	1,030	1,300	388	299
3	405	1,880	1,500	580	440	720	820	2,260	940	1,250	354	279
4	329	1,620	1,100	560	440	680	820	2,090	824	940	329	270
5	329	1,420	1,300	540	470	640	940	1,920	1,160	798	346	305
6	329	1,230	1,350	480	500	680	1,100	1,800	2,090	746	320	277
7	329	1,110	1,300	500	450	660	1,250	1,660	2,150	565	286	226
8	305	955	1,250	490	460	640	1,700	1,550	1,960	465	283	223
9	253	895	1,350	480	470	640	2,000	1,490	1,880	425	298	225
10	320	785	1,100	480	470	620	2,500	1,330	1,590	354	271	220
11	305	640	1,000	490	460	600	3,190	1,160	1,330	371	268	266
12	346	746	850	520	450	600	4,700	1,100	1,110	354	401	424
13	329	837	750	500	440	580	6,120	1,140	1,030	495	362	320
14	346	759	800	480	430	600	6,780	1,130	940	970	362	246
15	329	746	850	470	430	620	6,570	1,020	910	925	299	246
16	329	674	700	470	430	680	6,440	1,000	720	925	307	282
17	305	495	1,000	430	480	800	7,170	880	746	746	347	289
18	260	505	733	430	480	840	7,210	880	720	746	261	277
19	239	495	674	410	450	860	6,990	1,300	575	565	350	240
20	239	709	555	420	450	880	6,820	1,620	811	445	359	261
21	233	1,310	388	440	460	880	6,520	1,610	733	380	308	372
22	313	1,350	640	440	480	860	5,640	1,380	824	388	265	350
23	305	1,470	640	440	520	860	4,870	1,160	798	565	247	314
24	380	1,000	560	410	520	860	4,250	1,180	697	465	328	382
25	505	1,150	540	400	560	840	3,540	1,640	746	346	333	358
26	465	1,350	570	420	600	820	3,030	1,960	811	405	261	353
27	475	1,050	600	420	620	840	2,700	2,070	733	495	357	355
28	1,160	1,000	540	440	580	860	2,560	1,900	640	465	348	337
29	2,350	1,150	600	460	------	840	2,540	1,590	686	397	260	418
30	2,730	1,050	600	450	------	780	2,540	1,260	837	397	241	455
31	2,800	------	600	430	------	800	------	1,080	------	397	238	------
TOTAL	18,214	33,191	27,040	14,720	13,420	22,900	112,990	46,980	31,101	19,225	9,774	9,133
MEAN	588	1,106	872	475	479	739	3,766	1,515	1,037	620	315	304
MAX	2,800	2,610	1,500	640	620	880	7,210	2,490	2,150	1,300	401	455
MIN	233	495	388	400	430	580	820	880	575	346	238	220
CFSM	.68	1.27	1.00	.55	.55	.85	4.33	1.74	1.19	.71	.36	.35
IN.	.78	1.42	1.16	.63	.57	.98	4.83	2.01	1.33	.82	.42	.39

CAL YR 1970 TOTAL 263,303 MEAN 721 MAX 4,820 MIN 177 CFSM .83 IN 11.26
WTR YR 1971 TOTAL 358,688 MEAN 983 MAX 7,210 MIN 220 CFSM 1.13 IN 15.34

04059400 Tenmile Creek at Perronville, Mich.

LOCATION.--Lat 45°48'38", long 87°22'00", in NE1/4NE1/4 sec.3, T.39 N., R.25 W., Menominee County, on left bank, 10 ft downstream from county bridge, 700 ft upstream from County Road 569 and 1.0 mile northwest of Perronville.

DRAINAGE AREA.--38.4 sq mi.

PERIOD OF RECORD.--April to September 1971.

GAGE.--Nonrecording gage. Altitude of gage is 810 ft (from topographic map).

EXTREMES.--Maximum discharge, 445 cfs Apr. 16 (gage height, 4.50 ft); minimum, 0.18 cfs Sept. 18 (gage height, 1.98 ft).

REMARKS.--Records fair.
Discharge measurements (in cubic feet per second) made prior to period of record are as follows:

May 26, 1969	32.4
July 22, 1969	7.51
Aug. 25, 1970	.09

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							40	130	32	62	3.8	1.4
2							41	125	28	53	4.3	1.1
3							42	115	27	42	3.8	.80
4							44	110	24	24	2.7	.50
5							46	100	90	21	1.7	.50
6							52	92	108	20	1.7	.50
7							60	82	94	16	1.4	.50
8							75	72	90	22	1.4	.50
9							100	62	62	20	1.7	.35
10							140	54	53	16	2.7	.80
11							170	50	42	14	2.2	1.1
12							220	45	37	10	1.7	1.1
13							310	37	32	11	4.3	.80
14							374	30	30	10	6.6	.50
15							420	27	24	8.9	4.3	.50
16							445	24	22	10	3.8	.20
17							410	21	21	8.9	3.3	.19
18							410	32	21	10	2.7	.18
19							410	149	20	11	3.8	1.0
20							390	141	21	11	5.4	1.7
21							350	122	18	8.9	3.8	2.2
22							315	97	20	8.9	2.7	2.0
23							280	101	30	10	2.7	2.5
24							250	108	28	9.0	2.2	3.0
25							220	115	50	7.7	1.7	3.0
26							200	122	42	6.6	2.2	3.3
27							170	108	37	4.3	1.7	3.8
28							160	86	30	5.4	1.4	11
29					------		150	83	45	6.6	1.1	15
30					------		140	69	69	6.6	1.4	17
31		------			------		------	42	------	5.4	1.7	------
TOTAL							6,434	2,551	1,247	480.2	85.9	77.02
MEAN							214	82.3	41.6	15.5	2.77	2.57
MAX							445	149	108	62	6.6	17
MIN							40	21	18	4.3	1.1	.18
CFSM							5.57	2.14	1.08	.40	.07	.07
IN.							6.23	2.47	1.21	.47	.08	.07

04059500 Ford River near Hyde, Mich.

LOCATION.—Lat 45°45'20", long 87°12'05", in SW¼ sec.19, T.39 N., R.23 W., Delta County, on right bank 40 ft downstream from county highway bridge, 1.4 miles downstream from Tenmile Creek, and 1.5 miles north of Hyde.

DRAINAGE AREA.—450 sq mi.

PERIOD OF RECORD.—October 1954 to current year.

GAGE.—Water-stage recorder. Datum of gage is 677.9 ft above mean sea level.

AVERAGE DISCHARGE.—17 years, 356 cfs (10.74 inches per year).

EXTREMES.—Current year: Maximum discharge, 4,900 cfs Apr. 14 (gage height, 7.09 ft); minimum, 34 cfs Sept. 8-10; minimum gage height, 1.49 ft Sept. 7-10.
Period of record: Maximum discharge, 7,590 cfs May 7, 1960 (gage height, 8.27 ft); minimum, 21 cfs Sept. 1, 2, 1970 (gage height, 1.34 ft).

REMARKS.—Records good except those for winter periods, which are fair. Records of water temperatures for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	108	1,420	542	215	140	300	430	1,200	484	641	83	43
2	96	1,370	767	210	140	310	440	1,140	421	616	77	42
3	87	1,290	756	200	140	310	450	1,050	379	537	72	41
4	83	1,140	375	190	140	310	470	958	335	438	68	41
5	82	977	643	180	140	310	500	879	564	369	65	40
6	81	821	670	175	140	310	600	802	829	304	61	39
7	80	677	680	165	140	310	800	711	868	257	56	36
8	78	571	680	160	140	310	1,100	632	917	234	53	34
9	81	501	651	155	140	300	1,420	561	829	214	50	34
10	83	494	596	155	140	300	1,810	498	723	178	53	35
11	81	474	529	155	140	295	2,490	449	638	150	59	37
12	82	444	497	150	145	290	3,280	424	538	130	58	39
13	82	418	414	150	145	290	3,820	401	465	130	80	54
14	84	388	400	150	145	300	4,270	371	388	148	87	61
15	80	354	390	150	145	330	4,380	343	366	186	80	57
16	78	325	370	150	150	370	3,920	315	315	191	73	50
17	74	302	356	150	150	390	3,730	287	278	171	68	45
18	71	290	350	145	155	410	3,840	312	251	163	64	43
19	69	284	334	145	155	415	3,740	805	242	161	63	47
20	68	376	311	145	160	420	3,580	1,030	257	145	61	50
21	76	581	300	145	165	425	3,390	957	258	132	64	47
22	85	719	280	140	170	430	3,070	846	239	121	61	64
23	88	720	270	140	175	430	2,700	719	245	118	58	82
24	104	430	260	140	180	425	2,370	715	251	107	54	80
25	143	428	250	140	190	420	2,050	910	409	99	52	81
26	169	438	250	140	220	420	1,770	1,000	563	92	52	81
27	199	395	240	140	260	420	1,540	1,010	591	83	50	80
28	645	411	235	140	290	420	1,460	974	587	87	49	90
29	1,590	406	230	140	------	420	1,380	891	557	83	49	90
30	1,530	418	225	140	------	420	1,260	757	608	85	50	124
31	1,430	------	220	140	------	420	------	589	------	85	46	------
TOTAL	7,687	17,862	13,071	4,840	4,540	11,230	66,060	22,536	14,395	6,455	1,916	1,687
MEAN	248	595	422	156	162	362	2,202	727	480	208	61.8	56.2
MAX	1,590	1,420	767	215	290	430	4,380	1,200	917	641	87	124
MIN	68	284	220	140	140	290	430	287	239	83	46	34
CFSM	.55	1.32	.94	.35	.36	.80	4.89	1.62	1.07	.46	.14	.12
IN.	.64	1.48	1.08	.40	.38	.93	5.46	1.86	1.19	.53	.16	.14

CAL YR 1970 TOTAL 118,839 MEAN 326 MAX 2,770 MIN 23 CFSM .72 IN 9.82
WTR YR 1971 TOTAL 172,279 MEAN 472 MAX 4,380 MIN 34 CFSM 1.05 IN 14.24

04060500 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., Iron County, on right bank 10 ft downstream from bridge on County Highway 424 in Caspian, 5.0 miles upstream from mouth.

DRAINAGE AREA.--92.1 sq mi.

PERIOD OF RECORD.--March 1948 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,438.78 ft above mean sea level. Prior to Sept. 25, 1969, nonrecording gage at site 10 ft upstream at same datum.

AVERAGE DISCHARGE.--23 years, 83.5 cfs.

EXTREMES.--Current year: Maximum discharge, 698 cfs Apr. 11 (gage height, 8.36 ft); minimum, 54 cfs Dec. 20 (gage height, 3.84 ft, result of freezeup.
Period of record: Maximum discharge, 1,430 cfs July 2, 1953 (gage height, 10.20 ft); minimum, 25 cfs Mar. 29, 1969 (gage height, 3.30 ft, result of freezeup).

REMARKS.--Records good except those for winter periods, which are fair. The average flow includes mine pumpage and sewage plant effluent. Pumpage rates have diminished over the years due to the closing of most mines. Remaining mine pumpage averages about 25 cfs.

REVISIONS.--WSP 1911: Drainage area.

IRON RIVER AT CASPIAN, MICH. NUMBER 04060500
DRAINAGE AREA 92.100 SQ MI

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69	143	108	73	72	74	83	182	95	88	66	67
2	71	124	150	74	70	73	84	172	91	83	65	65
3	71	124	123	76	68	73	82	156	91	80	64	63
4	70	116	91	76	66	72	80	146	86	78	62	62
5	67	106	124	77	66	71	79	140	86	77	61	62
6	66	99	116	77	66	69	85	133	84	76	61	60
7	67	93	107	76	68	68	104	126	92	72	61	59
8	74	89	96	76	71	68	140	120	115	74	60	58
9	74	91	94	76	74	68	234	116	96	71	60	58
10	73	97	90	76	75	67	383	111	87	69	67	74
11	69	92	87	76	76	67	518	107	83	69	69	68
12	66	92	84	76	76	66	675	107	91	73	64	63
13	64	88	82	76	76	68	639	105	104	114	66	61
14	63	83	80	75	76	73	568	100	92	88	78	60
15	63	80	80	76	76	78	490	97	85	78	67	59
16	61	80	78	76	75	80	483	93	81	77	63	58
17	61	79	79	76	69	80	511	93	78	76	60	58
18	61	81	79	75	69	80	504	94	90	75	60	59
19	60	82	78	75	67	81	424	108	105	85	67	61
20	60	103	80	74	68	79	355	104	91	75	65	68
21	62	114	80	73	68	78	317	95	85	72	62	65
22	62	108	81	72	69	77	278	88	81	78	64	62
23	63	84	76	72	69	77	240	86	79	75	63	74
24	103	108	76	72	70	76	213	111	82	70	62	73
25	106	96	76	72	71	77	193	159	145	68	64	66
26	87	90	75	72	71	75	178	165	121	67	65	65
27	95	88	74	71	72	74	166	137	97	66	62	65
28	217	84	74	71	74	76	175	115	86	85	61	76
29	256	81	73	72	------	74	178	104	86	75	60	101
30	192	80	75	72	------	73	167	99	93	69	75	123
31	172	------	73	72	------	77	------	98	------	67	71	------
TOTAL	2,745	2,875	2,739	2,303	1,988	2,289	8,626	3,667	2,778	2,370	1,995	2,013
MEAN	88.5	95.8	88.4	74.3	71.0	73.8	288	118	92.6	76.5	64.4	67.1
MAX	256	143	150	77	76	81	675	182	145	114	78	123
MIN	60	79	73	71	66	66	79	86	78	66	60	58

CAL YR 1970 TOTAL 33,002 MEAN 90.4 MAX 676 MIN 52
WTR YR 1971 TOTAL 36,388 MEAN 99.7 MAX 675 MIN 58

04061000 Brule River near Florence, Wis.

LOCATION.--Lat 45°57'31", long 88°15'57", in SE¼ SE¼ sec.11, T.41 N., R.32 W., Michigan meridian, Iron County, on left bank 40 ft upstream from highway bridge, 1 mile upstream from Paint River, 2.5 miles north of Florence, and 5.0 miles upstream from confluence with Michigamme River.

DRAINAGE AREA.--389 sq mi.

PERIOD OF RECORD.--January 1914 to February 1916, June 1944 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,210 ft (from topographic map). Prior to Aug. 29, 1944, nonrecording gage at bridge 40 ft downstream at same datum.

AVERAGE DISCHARGE.--28 years (1914-15, 1944-71), 352 cfs (12.29 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,960 cfs Apr. 14 (gage height, 4.32 ft); maximum gage height, 5.89 ft Feb. 27 (backwater from ice); minimum discharge, 216 cfs Aug. 9, 10 (gage height, 1.99 ft).
Period of record: Maximum discharge, 4,700 cfs July 2, 1953 (gage height, 6.57 ft); maximum gage height, 8.27 ft Dec. 26, 1969 (backwater from ice); minimum discharge, 118 cfs Dec. 2, 1963 (discharge measurement); minimum gage height, 1.79 ft July 24, 1964.

REMARKS.--Records excellent except those for winter periods, which are fair. Discharge includes some mine pumpage (see sta 04060500).

REVISIONS (WATER YEARS).--WSP 1387: 1914-16. WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	289	625	430	310	270	340	430	686	409	362	245	300
2	287	555	500	310	270	330	425	682	388	329	241	275
3	278	548	580	300	275	325	410	615	380	310	241	256
4	279	551	550	290	280	320	400	560	370	297	237	246
5	283	493	530	290	270	315	400	529	424	290	230	248
6	272	443	500	280	255	310	410	507	418	287	225	244
7	268	409	480	280	280	305	430	478	426	284	222	247
8	275	379	470	280	305	300	500	451	578	283	221	231
9	287	370	450	280	310	300	662	437	515	274	219	227
10	290	394	440	280	310	300	888	428	439	262	233	333
11	281	394	410	285	315	305	1,180	405	401	258	260	323
12	269	377	400	285	320	310	1,710	401	386	256	246	283
13	267	364	380	285	320	325	1,940	394	440	324	239	258
14	261	344	370	285	320	350	1,930	380	452	317	279	252
15	256	326	360	285	320	370	1,780	366	409	281	274	240
16	252	326	350	280	315	380	1,690	356	372	272	249	234
17	248	319	350	280	310	390	1,790	350	351	270	236	230
18	248	315	350	280	310	400	1,900	364	349	269	228	231
19	245	320	350	280	310	400	1,800	432	432	327	249	245
20	242	392	340	280	310	400	1,510	433	432	301	258	268
21	245	477	340	270	315	390	1,270	399	394	277	244	264
22	245	441	330	270	315	380	1,100	374	362	274	247	255
23	249	280	330	270	320	340	938	356	340	288	242	270
24	346	350	320	270	325	310	815	432	333	272	235	287
25	501	400	320	270	330	310	729	604	376	259	254	270
26	441	400	320	280	335	315	662	707	384	245	255	259
27	402	390	320	290	340	320	612	602	345	242	245	264
28	719	380	320	290	345	340	632	510	326	266	235	280
29	959	380	320	285	------	380	655	456	333	279	226	330
30	813	390	320	280	------	420	618	426	399	262	278	400
31	747	------	320	275	------	430	------	418	------	251	324	------
TOTAL	11,044	12,132	12,150	8,775	8,600	10,710	30,216	14,538	11,963	8,768	7,617	8,050
MEAN	356	404	392	283	307	345	1,007	469	399	283	246	268
MAX	959	625	580	310	345	430	1,940	707	578	362	324	400
MIN	242	280	320	270	255	300	400	350	326	242	219	227
CFSM	.92	1.04	1.01	.73	.79	.89	2.59	1.21	1.03	.73	.63	.69
IN.	1.06	1.16	1.16	.84	.82	1.02	2.89	1.39	1.14	.84	.73	.77

CAL YR 1970 TOTAL 128,999 MEAN 353 MAX 1,550 MIN 210 CFSM .91 IN 12.34
WTR YR 1971 TOTAL 144,563 MEAN 396 MAX 1,940 MIN 219 CFSM 1.02 IN 13.82

04061500 Paint River at Crystal Falls, Mich.

LOCATION.--Lat 46°06'21", long 88°20'05", in SE¼ sec.20, T.43 N., R.32 W., Iron County, on right bank 150 ft downstream from municipal powerplant at Crystall Falls, and 14.5 miles upstream from mouth.

DRAINAGE AREA.--597 sq mi.

PERIOD OF RECORD.--August 1944 to current year.

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

AVERAGE DISCHARGE.--27 years, 580 cfs (13.19 inches per year).

EXTREMES.--Current year: Maximum discharge, 5,700 cfs Apr. 18 (gage height, 7.01 ft); minimum, 111 cfs Sept. 4 (gage height, 1.78 ft); minimum daily, 208 cfs Sept. 18.
Period of record: Maximum discharge, 10,900 cfs Apr. 25, 1960 (gage height, 9.82 ft); minimum 7.7 cfs Sept. 17, 1950 (gage height, 0.89 ft); minimum daily, 81 cfs Nov. 1, 1947.

REMARKS.--Records good. Diurnal fluctuation caused by powerplant immediately above station.

REVISIONS (Water YEARS).--WSP 1174: 1947-48(m). WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	479	1,560	646	396	330	431	579	1,510	799	976	337	241
2	462	1,510	773	394	331	435	597	1,530	736	913	327	248
3	433	1,300	875	381	352	435	586	1,440	687	853	317	247
4	430	1,120	766	389	353	434	575	1,240	638	770	307	216
5	423	985	752	368	346	425	571	1,130	587	671	291	229
6	401	866	755	388	302	424	576	1,070	570	584	274	236
7	390	793	730	395	324	415	628	987	567	530	255	223
8	399	736	692	397	360	415	777	910	681	484	282	215
9	446	695	698	391	360	415	1,170	843	733	455	279	211
10	460	675	674	390	360	415	1,700	796	679	426	276	279
11	445	664	622	392	365	415	2,330	757	587	398	289	271
12	429	632	559	396	370	415	3,630	728	554	385	292	259
13	410	621	496	394	375	415	4,490	718	561	529	296	246
14	391	589	542	383	375	414	4,560	706	536	736	305	240
15	369	565	487	385	375	424	4,340	666	494	684	335	230
16	356	524	494	374	375	430	4,390	632	462	614	308	217
17	351	512	494	373	371	425	5,010	576	427	571	284	211
18	332	489	477	387	380	431	5,530	554	444	532	271	208
19	319	481	484	364	417	435	5,390	620	550	500	283	209
20	332	554	430	377	361	436	4,880	674	595	467	309	243
21	349	684	392	342	359	440	4,410	671	556	437	298	253
22	323	736	380	359	382	440	3,860	643	515	428	278	247
23	336	482	375	342	368	440	3,200	600	478	425	286	273
24	396	430	375	345	388	440	2,620	633	460	420	290	319
25	621	625	380	350	385	440	2,200	959	701	402	267	312
26	657	641	385	335	395	445	1,870	1,630	733	378	284	295
27	633	580	397	330	404	445	1,660	1,650	629	363	278	294
28	867	585	402	340	421	498	1,570	1,450	504	388	271	312
29	1,690	580	406	340	------	555	1,580	1,150	466	407	259	396
30	1,630	580	410	340	------	577	1,530	1,020	650	371	264	470
31	1,600	------	388	335	------	558	------	888	------	360	246	------
TOTAL	17,159	21,794	16,736	11,472	10,284	13,762	76,809	29,381	17,579	16,457	8,938	7,850
MEAN	554	726	540	370	367	444	2,560	948	586	531	288	262
MAX	1,690	1,560	875	397	421	577	5,530	1,650	799	976	337	470
MIN	319	430	375	330	302	414	571	554	427	360	246	208
CFSM	.93	1.22	.90	.62	.61	.74	4.29	1.59	.98	.89	.48	.44
IN.	1.07	1.36	1.04	.71	.64	.86	4.79	1.83	1.10	1.03	.56	.49

CAL YR 1970 TOTAL 214,729 MEAN 588 MAX 5,560 MIN 186 CFSM .98 IN 13.38
WTR YR 1971 TOTAL 248,221 MEAN 680 MAX 5,530 MIN 208 CFSM 1.14 IN 15.47

04062000 Paint River near Alpha, Mich.

LOCATION.--Lat 46°00'40", long 88°15'30", in NW¼ NW¼ sec.25, T.42 N., R.32 W., Iron County, on right bank 0.6 mile downstream from Lower Paint Dam, 5.5 miles upstream from Brule River, and 6.0 miles southeast of Alpha.

DRAINAGE AREA.--631 sq mi.

PERIOD OF RECORD.--June 1952 to current year. Monthly discharge only for period October 1953 to September 1960, published in WSP 1727.

GAGE.--Water-stage recorder. Altitude of gage is 1,260 ft (from topographic map).

AVERAGE DISCHARGE.--19 years, 164 cfs.

EXTREMES.--Current year: Maximum discharge, 4,200 cfs Apr. 18 (gage height, 8.08 ft); minimum daily, 84 cfs Oct. 3-5, 7, 8, 11-23; minimum gage height 2.73 ft Aug. 17.
Period of record: Maximum discharge, 8,050 cfs July 2, 1953 (gage height, 10.50 ft); minimum daily, 62 cfs Mar. 22, 1963.

REMARKS.--Records good except those for winter periods, which are fair. Flow completely regulated by powerplant and Lower Paint Dam 0.6 mile above station. Records not adjusted for diversion to Michigamme River by Paint River diversion canal.

REVISIONS.--WSP 1727: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	86	88	95	95	90	94	92	410	90	92	95	93
2	85	88	95	95	90	94	92	686	88	93	94	93
3	84	88	95	95	90	94	92	680	89	93	95	93
4	84	90	95	95	90	94	92	842	91	93	95	93
5	84	90	95	95	90	94	92	1,090	93	93	95	93
6	85	93	95	92	90	94	95	1,160	91	93	95	92
7	84	93	95	90	90	94	95	919	91	93	95	90
8	84	93	95	90	90	94	100	636	92	93	95	90
9	85	93	95	90	92	94	114	636	92	93	95	90
10	86	93	95	90	92	94	118	334	91	93	95	91
11	84	93	95	90	92	94	119	93	91	93	95	90
12	84	93	95	90	92	94	1,010	92	91	93	95	90
13	84	93	95	90	92	94	2,100	92	89	93	95	90
14	84	93	95	90	92	94	2,150	93	90	93	93	90
15	84	93	95	90	92	94	1,980	92	90	94	95	90
16	84	93	95	90	92	94	1,910	91	90	94	88	90
17	84	93	95	90	92	94	2,400	93	90	94	91	90
18	84	93	95	90	92	94	3,430	92	90	94	95	90
19	84	93	95	90	92	94	3,790	93	90	94	94	90
20	84	94	95	90	94	94	3,270	93	90	95	93	89
21	84	95	95	90	94	94	2,310	92	90	95	93	88
22	84	95	95	90	94	94	1,620	90	91	95	93	88
23	84	95	95	90	94	92	1,070	90	89	95	93	88
24	86	95	95	90	94	92	831	91	90	95	93	88
25	86	95	95	90	94	92	857	93	90	95	93	88
26	86	95	95	90	94	92	814	185	90	95	93	88
27	86	95	95	90	94	92	807	93	91	93	93	88
28	88	95	95	90	94	92	794	93	92	91	93	88
29	88	95	95	90	------	92	575	93	93	97	93	88
30	88	95	95	90	------	92	100	317	92	95	93	89
31	88	------	95	90	------	92	------	352	------	95	93	------
TOTAL	2,635	2,790	2,945	2,817	2,578	2,896	32,919	9,906	2,717	2,907	2,906	2,698
MEAN	85.0	93.0	95.0	90.9	92.1	93.4	1,097	320	90.6	93.8	93.7	89.9
MAX	88	95	95	95	94	94	3,790	1,160	93	97	95	93
MIN	84	88	95	90	90	92	92	90	88	91	88	88

CAL YR 1970 TOTAL 48,656 MEAN 133 MAX 4,180 MIN 78
WTR YR 1971 TOTAL 70,714 MEAN 194 MAX 3,790 MIN 84

04062200 Peshekee River near Champion, Mich.

LOCATION.--Lat 46°33'25", long 88°00'09", in NW1/4 sec.13, T.48 N., R.30 W., Marquette County, on left bank 10 ft downstream from bridge on county highway, 0.6 mile downstream from West Branch, and 3.5 miles northwest of Champion.

DRAINAGE AREA.--133 sq mi.

PERIOD OF RECORD.--July 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,557.49 ft (corrected) above mean sea level. Prior to Aug. 15, 1961, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--10 years, 215 cfs (21.95 inches per year).

EXTREMES.--Current year: Maximum discharge, 2,560 cfs Apr. 21 (gage height, 6.62 ft); maximum gage height, 6.94 ft Apr. 14 (ice backwater); minimum discharge, 8.4 cfs on Sept. 9 (gage height, 1.31 ft).
Period of record: Maximum discharge, 3,610 cfs May 8, 1965 (gage height, 8.01 ft); minimum, 4.2 cfs Sept. 10, 1961 (gage height, 1.24 ft); minimum gage height, 1.23 ft Sept. 7, 1969.

REMARKS.--Records good except those for winter periods which are fair. Records of water temperatures for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	147	489	210	90	64	94	180	770	251	416	44	16
2	130	404	330	86	64	100	200	818	218	333	38	15
3	125	346	350	84	64	100	220	795	196	248	34	14
4	126	300	320	80	64	100	215	771	176	184	30	13
5	121	255	290	78	64	100	210	799	215	146	27	12
6	110	221	265	76	64	100	210	806	289	120	24	11
7	100	196	240	74	64	100	220	818	296	98	21	10
8	98	173	225	72	64	100	235	873	362	85	20	9.3
9	104	160	205	72	64	100	260	867	315	72	19	9.3
10	124	160	190	70	64	100	290	772	252	61	20	15
11	128	160	175	70	64	100	350	702	204	53	22	16
12	121	175	165	70	64	100	500	650	180	50	22	16
13	111	178	160	70	64	100	800	592	169	112	22	15
14	98	163	150	70	64	120	1,100	595	142	99	26	14
15	88	147	145	70	64	140	1,800	573	120	79	24	12
16	80	137	140	68	64	160	1,710	529	102	71	22	11
17	74	129	135	68	66	170	1,970	457	88	67	20	10
18	70	128	130	68	68	175	2,290	393	141	58	18	9.6
19	66	132	125	68	70	180	2,450	429	269	52	20	9.7
20	62	199	120	66	70	180	2,420	492	257	46	22	11
21	63	309	120	66	72	175	2,470	469	209	44	21	11
22	71	292	115	64	72	170	2,230	383	170	86	21	11
23	103	185	115	64	74	170	1,880	318	149	81	21	18
24	139	301	110	64	74	165	1,530	348	138	63	22	25
25	195	270	110	64	76	155	1,190	541	136	52	24	25
26	202	250	105	64	80	150	949	728	120	46	29	21
27	200	235	105	64	84	150	823	745	98	48	28	38
28	346	215	100	64	90	150	784	581	82	62	25	97
29	632	200	98	64	------	150	754	431	122	68	20	113
30	662	190	96	64	------	155	716	341	400	60	18	110
31	603	------	94	64	------	160	------	289	------	51	17	------
TOTAL	5,299	6,699	5,238	2,176	1,920	4,169	30,956	18,675	5,866	3,111	741	717.9
MEAN	171	223	169	70.2	68.6	134	1,032	602	196	100	23.9	23.9
MAX	662	489	350	90	90	180	2,470	873	400	416	44	113
MIN	62	128	94	64	64	94	180	289	82	44	17	9.3
CFSM	1.29	1.68	1.27	.53	.52	1.01	7.76	4.53	1.47	.75	.18	.18
IN.	1.48	1.87	1.47	.61	.54	1.17	8.66	5.22	1.64	.87	.21	.20

CAL YR 1970 TOTAL 68,870.40 MEAN 189 MAX 662 MIN 0 CFSM 1.42 IN 19.26
WTR YR 1971 TOTAL 85,567.90 MEAN 234 MAX 2,470 MIN 9.3 CFSM 1.76 IN 23.93

PEAK DISCHARGE (BASE, 600 CFS)

DATE	TIME	GHT	DISHCARGE
10-30	0400	3.95	665
04-21	0300	6.62	2,560
05-27	0300	4.17	784

04062230 Michigamme River near Michigammē, Mich.

LOCATION.--Lat 46°28'00", long 88°04'28", in SW1/4SW1/4 sec.16, T.47 N., R.30 W., Marquette County, on right bank 20 ft upstream from Northern Natural Gas Co. pipeline, 0.6 mile upstream from mouth of Spruce River, 1.2 miles downstream from Lake Michigamme, and 5.0 miles southeast of Michigamme.

DRAINAGE AREA.--194 sq mi.

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,520 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 2,500 cfs Apr. 22 (gage height, 7.36 ft); minimum, 38 cfs Sept. 22 (gage height, 2.44 ft).
Period of record: Maximum discharge, 2,500 cfs Apr. 22, 1971 (gage height, 7.36 ft); maximum gage height, 7.54 ft Apr. 23, 1969; minimum discharge, 36 cfs Sept. 14, 1969 (gage height, 2.39 ft).

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	173	443	327	179	130	133	242	1,300	576	307	118	56
2	175	462	339	178	130	131	247	1,260	531	320	113	54
3	175	474	360	175	130	132	252	1,210	488	323	110	53
4	171	462	384	179	130	135	254	1,160	452	319	106	53
5	170	449	385	180	130	139	255	1,130	428	309	101	52
6	169	436	389	176	130	140	255	1,110	418	295	97	52
7	168	418	382	174	130	143	257	1,080	426	278	95	50
8	171	401	376	170	125	142	266	1,070	429	266	91	50
9	172	385	370	168	125	142	287	1,060	428	248	87	47
10	172	373	360	167	125	142	313	1,040	415	231	87	50
11	171	358	349	166	125	142	355	1,010	402	212	86	50
12	169	350	337	164	125	142	445	983	385	197	81	48
13	169	339	325	161	125	141	611	946	371	219	80	47
14	167	325	314	159	123	145	806	901	351	213	81	46
15	161	308	303	157	121	164	981	873	333	203	78	45
16	157	295	291	154	119	175	1,190	838	313	197	76	44
17	151	284	280	151	119	178	1,420	790	294	186	74	42
18	149	271	270	148	118	181	1,710	757	289	175	72	41
19	144	261	261	147	123	192	2,010	718	291	168	71	41
20	142	278	249	145	127	206	2,230	694	296	160	71	41
21	140	291	240	146	125	209	2,400	686	295	151	69	40
22	138	314	234	143	122	214	2,480	650	289	158	68	39
23	137	329	227	141	120	223	2,460	613	281	156	66	42
24	143	319	224	142	120	226	2,350	601	273	150	66	41
25	151	321	218	139	119	229	2,190	635	266	141	66	40
26	158	333	212	135	121	230	1,990	688	255	137	65	40
27	170	337	208	135	127	234	1,790	735	242	131	63	41
28	211	336	202	130	131	243	1,640	755	231	132	61	48
29	288	331	196	130	------	246	1,500	725	234	129	60	52
30	358	327	189	130	------	246	1,380	687	277	126	59	59
31	411	------	185	130	------	242	------	626	------	122	58	------
TOTAL	5,601	10,610	8,986	4,799	3,495	5,587	34,566	27,331	10,559	6,359	2,476	1,404
MEAN	181	354	290	155	125	180	1,152	882	352	205	79.9	46.8
MAX	411	474	389	180	131	246	2,480	1,300	576	323	118	59
MIN	137	261	185	130	118	131	242	601	231	122	58	39
CFSM	.93	1.82	1.49	.80	.64	.93	5.94	4.55	1.81	1.06	.41	.24
IN.	1.07	2.03	1.72	.92	.67	1.07	6.63	5.24	2.02	1.22	.47	.27

CAL YR 1970 TOTAL 92,528 MEAN 254 MAX 1,350 MIN 51 CFSM 1.31 IN 17.74
WTR YR 1971 TOTAL 121,773 MEAN 334 MAX 2,480 MIN 39 CFSM 1.72 IN 23.35

04062300 Michigamme River at Republic, Mich.

LOCATION.--Lat 46°23'03", long 87°58'48", in SE¼ sec.18, T.46 N., R.29 W., Marquette County, on left bank 400 feet upstream from county highway bridge, 0.3 mile upstream from Trout Falls Creek, and 0.6 mile south of Republic.

DRAINAGE AREA.--240 sq mi.

PERIOD OF RECORD.--July 1961 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,480 ft (from topographic map).

AVERAGE DISCHARGE.--10 years, 317 cfs.

EXTREMES.--Current year: Maximum discharge, 3,070 cfs Apr. 22 (gage height, 6.92 ft); minimum, 9.1 cfs Sept. 20, 21 (gage height, 0.25 ft); minimum daily, 9.7 cfs Sept. 21.
Period of record: Maximum discharge, 3,950 cfs May 10, 1965 (gage height, 8.17 ft); minimum, 7.0 cfs Mar. 26-28, 1964 (gage height, 0.14 ft); minimum daily, 7.7 cfs Mar. 26-29, 1964.

REMARKS.--Records good except those for winter periods, which are fair. Prior to June 1, 1963, diurnal fluctuation caused by powerplant 0.4 mile above station; powerplant abandoned and only occasional regulation since. Since June 1, 1963, water diverted 0.5 mile above station for industrial use and returned to river by Gambles Creek, 5 miles downstream. Records are not adjusted for diversion.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	189	530	350	175	130	168	309	1,540	629	359	107	60
2	187	518	375	170	130	179	296	1,470	540	456	108	59
3	186	512	410	170	130	179	261	1,390	500	377	108	59
4	185	505	420	170	130	178	264	1,310	487	367	108	60
5	184	496	429	170	130	173	280	1,250	476	306	108	60
6	171	485	437	170	130	161	317	1,230	427	305	107	59
7	157	458	427	165	130	154	315	1,160	424	305	107	59
8	157	410	413	165	130	155	322	1,140	434	303	106	51
9	160	379	403	160	130	157	367	1,160	435	283	87	39
10	159	380	400	155	130	155	424	1,110	430	242	66	40
11	162	380	371	150	130	154	528	1,070	425	213	83	37
12	161	368	344	150	130	153	720	1,070	421	187	102	35
13	162	356	341	150	130	151	899	1,060	417	204	101	58
14	161	353	336	150	130	150	1,040	997	399	288	84	73
15	160	329	310	150	130	181	1,230	931	354	308	67	64
16	165	286	290	145	130	203	1,410	894	280	294	67	38
17	170	271	291	145	130	218	1,720	849	250	263	63	20
18	168	272	290	140	130	251	2,130	809	281	201	44	16
19	154	274	280	140	135	253	2,440	763	333	168	80	11
20	122	296	261	140	140	253	2,690	715	361	159	118	9.8
21	122	332	247	140	140	250	2,950	727	342	160	99	9.7
22	122	350	221	135	135	248	3,050	714	266	160	78	13
23	123	387	220	135	135	247	3,030	671	276	162	78	42
24	128	420	215	135	135	248	2,900	650	305	161	64	64
25	137	392	210	135	135	249	2,680	685	303	182	49	63
26	154	344	205	135	134	247	2,410	767	283	203	49	51
27	199	316	200	135	134	248	2,140	822	242	145	81	39
28	289	333	195	135	149	257	1,930	825	222	106	97	38
29	438	351	190	135	------	272	1,770	804	233	113	74	37
30	548	348	185	130	------	271	1,620	787	261	150	59	38
31	557	------	180	130	------	282	------	709	------	127	59	------
TOTAL	6,137	11,431	9,446	4,610	3,712	6,445	42,442	30,079	11,036	7,257	2,608	1,302.5
MEAN	198	381	305	149	133	208	1,415	970	368	234	84.1	43.4
MAX	557	530	437	175	149	282	3,050	1,540	629	456	118	73
MIN	122	271	180	130	130	150	261	650	222	106	44	9.7

CAL YR 1970 TOTAL 102,097.0 MEAN 280 MAX 1,540 MIN 19
WTR YR 1971 TOTAL 136,505.5 MEAN 374 MAX 3,050 MIN 9.7

04062400 Michigamme River near Witch Lake, Mich.

LOCATION.--Lat 46°14'48", long 88°00'45", in NW¼ NW¼ sec. 1, T.44 N., R.30 W., Dickinson County, on left bank 20 ft upstream from bridge on county highway, 0.4 miles upstream from Witch Lake Outlet, and 2.0 miles south of Witch Lake.

DRAINAGE AREA.--316 sq mi.

PERIOD OF RECORD.--August 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1384.25 ft above mean sea level.

AVERAGE DISCHARGE.--7 years, 448 cfs (19.25 inches per year).

EXTREMES.--Current year: Maximum discharge, 3,410 cfs Apr. 23 (gage height, 10.02 ft); minimum, 44 cfs Sept. 22, 23 (gage height, 2.13 ft).
Period of record: Maximum discharge, 4,360 cfs May 11, 1965 (gage height, 11.60 ft); minimum, 44 cfs Sept. 22, 23, 1971 (gage height 2.13 ft).

REMARKS.--Records good except those for winter periods, which are fair. Occasional regulation caused by dam 14 miles above station. Some flow diverted and returned above station by iron ore processing plant.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	249	789	493	265	200	240	450	1,720	824	443	174	89
2	261	751	557	260	200	245	450	1,640	736	636	168	89
3	255	730	659	255	200	245	410	1,570	652	520	166	89
4	252	708	641	255	195	245	400	1,490	636	500	162	88
5	247	689	700	255	195	240	420	1,420	680	418	156	89
6	242	666	720	255	195	230	460	1,390	632	390	150	88
7	219	637	720	250	195	225	480	1,350	596	383	146	86
8	215	583	700	250	195	225	490	1,260	608	380	144	88
9	220	510	679	245	190	220	564	1,290	600	366	142	78
10	225	512	652	240	190	220	723	1,270	588	320	118	76
11	225	508	616	240	190	220	830	1,200	576	267	112	76
12	227	504	559	235	190	220	1,040	1,200	572	261	134	71
13	225	472	520	235	190	220	1,170	1,190	580	348	142	69
14	226	460	490	235	190	220	1,290	1,140	560	415	144	96
15	224	445	450	230	190	235	1,460	1,060	512	432	115	108
16	223	384	427	230	190	270	1,610	1,020	425	411	105	95
17	232	344	413	230	195	300	1,870	980	348	387	103	69
18	228	347	407	225	200	330	2,240	948	373	310	93	53
19	221	351	397	220	200	360	2,580	948	436	253	86	51
20	189	398	390	220	205	365	2,870	896	480	238	134	50
21	177	470	370	215	200	360	3,140	888	464	235	152	47
22	174	490	350	210	200	360	3,360	884	394	225	124	44
23	176	489	333	210	200	360	3,390	844	362	215	113	54
24	201	561	325	210	200	360	3,260	852	418	208	112	100
25	233	611	320	205	200	360	3,030	904	408	205	96	115
26	240	519	310	205	200	360	2,720	956	394	245	86	112
27	280	486	305	205	200	370	2,420	1,000	341	223	86	93
28	471	460	300	200	220	380	2,180	992	299	174	128	93
29	698	470	290	200	------	390	2,020	968	338	162	126	93
30	827	486	280	200	------	400	1,840	944	401	188	103	120
31	842	------	270	200	------	410	------	892	------	210	91	------
TOTAL	8,924	15,830	14,643	7,090	5,515	9,185	49,167	35,106	15,233	9,968	3,911	2,469
MEAN	288	528	472	229	197	296	1,639	1,132	508	322	126	82.3
MAX	842	789	720	265	220	410	3,390	1,720	824	636	174	120
MIN	174	344	270	200	190	220	400	844	299	162	86	44
CFSM	.91	1.67	1.49	.72	.62	.94	5.19	3.58	1.61	1.02	.40	.26
IN.	1.05	1.86	1.72	.83	.65	1.08	5.79	4.13	1.79	1.17	.46	.29

CAL YR 1970 TOTAL 137,014 MEAN 375 MAX 1,700 MIN 69 CFSM 1.19 IN 16.13
WTR YR 1971 TOTAL 177,041 MEAN 485 MAX 3,390 MIN 44 CFSM 1.53 IN 20.84

NOTE.--No gage-height record Jan. 12 to Mar. 3.

04062500 Michigamme River near Crystal Falls, Mich.

LOCATION.--Lat 46°06'50", long 88°12'57", in NW¼ sec.20, T.43 N., R.31 W., Iron County, on right bank 400 ft upstream from highway bridge, 5.0 miles downstream from Michigamme Reservoir, 6.0 miles east of Crystal Falls, and 15 miles upstream from confluence with Brule River.

DRAINAGE AREA.--656 sq mi.

PERIOD OF RECORD.--August 1944 to current year.

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

AVERAGE DISCHARGE.--27 years, 692 cfs.

EXTREMES.--Current year: Maximum discharge, 2,400 cfs May 5 (gage height, 6.58 ft); minimum, 98 cfs Sept. 5 (gage height, 1.42 ft); minimum daily, 131 cfs Oct. 24.
Period of record: Maximum discharge, 7,260 cfs Apr. 28, 1960 (gage height, 10.73 ft); minimum daily, 71 cfs Nov. 26, 1950.

REMARKS.--Records excellent. Flow regulated by powerplant and by Michigamme Reservoir (capacity, 119,950 acre-ft) 5 miles above station.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	134	152	947	988	1,220	1,070	767	1,740	1,210	668	637	603
2	136	394	1,180	1,070	1,000	1,060	818	1,700	1,200	660	636	603
3	134	683	1,180	1,120	660	1,040	779	1,700	1,200	656	636	600
4	134	677	1,170	1,120	660	1,030	771	1,830	1,200	653	643	599
5	134	671	1,170	1,130	660	1,010	740	2,140	1,200	650	635	279
6	134	667	932	1,140	650	972	767	2,320	925	648	636	142
7	134	665	744	931	650	918	884	2,300	863	650	637	451
8	133	663	745	1,150	900	513	983	2,270	994	647	637	597
9	134	664	744	1,190	1,100	917	1,170	2,270	746	645	636	597
10	134	716	741	1,230	800	888	1,290	2,020	739	645	641	603
11	133	699	880	1,230	670	886	1,310	1,460	736	642	637	362
12	442	662	982	1,230	660	898	1,210	1,190	737	650	636	164
13	625	661	887	1,230	650	1,000	1,230	1,190	736	654	636	434
14	622	658	907	1,230	640	711	1,250	1,200	735	652	635	593
15	621	657	976	1,230	850	719	1,240	1,200	733	647	633	590
16	621	657	975	1,230	1,050	744	1,280	1,190	732	646	632	589
17	621	656	972	1,230	1,100	747	1,280	1,190	730	645	620	587
18	619	656	971	1,230	1,130	761	1,290	1,200	735	646	624	313
19	619	658	971	1,230	1,140	788	1,240	1,200	736	644	627	152
20	620	676	970	1,240	1,130	773	1,240	1,200	684	647	623	394
21	619	679	970	1,250	1,120	768	1,230	1,200	648	645	622	582
22	619	677	970	1,250	1,120	766	1,220	1,190	647	646	624	295
23	474	666	970	1,240	1,130	754	2,300	1,190	558	644	619	590
24	131	667	970	1,230	1,130	737	1,830	1,210	740	642	620	446
25	140	666	970	1,240	1,110	720	1,200	1,230	676	643	620	145
26	138	664	962	1,240	1,110	707	1,190	1,240	678	640	609	150
27	140	662	964	1,230	1,100	694	1,200	1,230	664	642	437	151
28	168	661	971	1,230	1,080	685	1,480	1,220	655	643	151	154
29	180	661	973	1,220	------	681	1,760	1,220	667	638	158	145
30	170	660	973	1,220	------	700	1,770	1,210	677	637	467	157
31	157	------	980	1,220	------	719	------	1,210	------	638	605	------
TOTAL	9,820	19,255	29,717	36,949	26,220	25,376	36,719	45,860	24,181	20,053	18,209	12,067
MEAN	317	642	959	1,192	936	819	1,224	1,479	806	647	587	402
MAX	625	716	1,180	1,250	1,220	1,070	2,300	2,320	1,210	668	643	603
MIN	131	152	741	931	640	513	740	1,190	558	637	151	142

CAL YR 1970 TOTAL 232,543 MEAN 637 MAX 3,260 MIN 97
WTR YR 1971 TOTAL 304,426 MEAN 834 MAX 2,320 MIN 131

04063000 Menominee River near Florence, Wis.

LOCATION.--Lat 45°57'04", long 88°11'13", in NE¼ sec.16, T.41 N., R.31 W., Michigan meridian, Iron County, on left bank 0.5 mile downstream from confluence of Brule and Michigamme Rivers, 3.5 miles northeast of Florence, and at mile 117.

DRAINAGE AREA.--1,780 sq mi.

PERIOD OF RECORD.--January 1914 to current year. Published as "at Twin Falls near Iron Mountain, Mich." 1914-57. Records published for both sites July 1950 to September 1957.

GAGE.--Water-stage recorder. Altitude of gage is 1,120 ft (from topographic map). Prior to July 1950, headwater and tailwater gages and generation data entered hourly in daily log sheets by company employees at the Twin Falls Powerplant of Wisconsin-Michigan Power Co., 10.4 miles downstream.

AVERAGE DISCHARGE.--57 years, 1,783 cfs.

EXTREMES.--Current year: Maximum discharge, 10,200 cfs Apr. 18 (gage height, 9.79 ft); minimum, 202 cfs Oct. 4 (gage height, 1.87 ft); minimum daily, 484 cfs Sept. 11.
Period of record: Maximum discharge, 19,500 cfs Apr. 26, 1960 (gage height, 14.15 ft); minimum, 38 cfs Aug. 21, 1962; minimum gage height, 1.18 ft Aug. 21, 1962, Nov. 4 1965; minimum daily discharge, 154 cfs Aug. 9, 1925.

REMARKS.--Records good. Prior to July 1950 discharge determined from powerplant records computed on basis of load-discharge rating of hydroelectric units and rating for tailwater gage during periods of spill. Rating 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) on Michigamme River, and by many smaller reservoirs above station.

REVISIONS (WATER YEARS).--WSP 1707: 1953 (M). WSP 1911: Drainage area of former site.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,150	3,080	2,370	1,870	2,100	2,250	2,330	3,260	2,790	1,790	1,020	1,160
2	922	2,470	2,660	2,080	1,750	2,170	2,260	3,910	2,380	1,890	1,210	1,420
3	747	2,830	2,300	1,870	1,740	2,160	1,760	3,740	2,420	2,030	1,580	1,810
4	857	2,780	2,210	1,840	1,660	2,210	1,730	3,880	2,470	2,000	1,230	586
5	955	2,710	2,250	1,940	1,560	2,290	2,030	4,050	2,110	1,640	1,620	737
6	989	2,280	2,190	1,990	1,290	2,110	1,960	3,990	1,750	1,630	1,390	640
7	986	1,610	2,110	2,020	1,280	1,910	2,260	3,850	2,150	1,890	922	1,530
8	1,090	1,770	2,100	1,930	1,740	1,740	2,530	3,270	2,110	1,700	897	1,320
9	1,120	1,950	2,070	1,820	1,670	1,850	2,880	3,580	2,060	1,730	1,710	1,000
10	1,090	2,670	2,040	1,860	1,110	1,700	2,900	3,340	2,020	1,120	1,510	1,190
11	954	2,540	1,970	2,130	1,290	1,800	3,340	2,820	1,970	1,190	1,280	484
12	1,080	1,890	2,110	1,900	1,610	2,010	4,070	2,480	1,820	1,740	1,340	537
13	1,210	1,800	2,120	2,040	1,280	2,000	5,980	2,530	1,480	1,620	1,270	1,240
14	1,400	1,290	1,880	2,020	1,170	2,090	6,360	2,380	1,580	1,720	956	1,050
15	1,170	1,170	1,850	2,020	1,660	2,290	6,220	1,930	1,720	1,840	841	953
16	1,140	1,620	1,780	1,790	1,680	2,300	6,000	1,750	1,570	1,810	1,350	996
17	914	1,460	1,870	2,000	1,810	2,500	7,260	2,160	1,810	1,460	1,320	942
18	869	1,780	1,880	2,140	2,140	2,400	9,280	2,180	1,610	1,220	1,360	536
19	1,080	1,750	1,910	2,010	2,170	2,360	9,920	2,380	1,470	1,730	1,270	827
20	1,120	1,730	1,760	2,050	2,230	2,270	8,620	2,180	1,270	1,710	1,430	1,130
21	1,100	1,980	1,630	1,860	2,410	2,130	6,920	2,350	2,080	1,640	949	1,220
22	1,120	1,980	1,630	1,920	2,160	2,150	6,360	2,360	1,810	1,610	878	1,120
23	1,040	1,900	1,840	1,760	2,130	1,680	5,410	2,350	1,780	1,600	1,340	998
24	1,090	1,560	1,860	1,780	2,060	1,820	4,440	2,690	1,730	1,020	1,360	898
25	1,280	1,420	1,480	1,910	2,220	1,900	4,160	3,010	1,800	950	1,210	734
26	1,300	1,380	1,550	2,090	2,160	1,680	3,740	3,400	1,870	1,500	1,300	738
27	1,430	1,830	1,820	2,040	2,280	2,180	3,750	3,130	1,550	1,480	1,160	1,200
28	2,180	1,500	1,860	1,950	2,160	2,040	3,730	3,040	1,860	1,450	758	1,180
29	2,640	1,600	2,190	2,220	------	2,200	3,780	2,850	1,740	1,510	834	1,070
30	2,450	1,990	1,910	1,870	------	2,360	3,060	3,070	1,930	1,500	1,410	1,330
31	3,070	------	1,740	1,620	------	2,370	------	3,300	------	1,100	1,280	------
TOTAL	39,543	58,320	60,940	60,340	50,520	64,920	134,980	91,210	56,710	48,820	37,985	30,576
MEAN	1,276	1,944	1,966	1,946	1,804	2,094	4,499	2,942	1,890	1,575	1,225	1,019
MAX	3,070	3,080	2,660	2,220	2,410	2,500	9,920	4,050	2,790	2,030	1,710	1,810
MIN	747	1,170	1,480	1,620	1,110	1,680	1,730	1,750	1,270	950	758	484

CAL YR 1970 TOTAL 614,471 MEAN 1,683 MAX 10,600 MIN 574
WTR YR 1971 TOTAL 734,864 MEAN 2,013 MAX 9,920 MIN 484

04064500 Pine River below Pine River Powerplant, near Florence, Wis.

LOCATION.--Lat 45°50'16", long 88°13'31", in SW 1/4 sec.22, T.39 N., R.18 E., Florence County, on left bank 60 ft upstream from bridge on County Trunk N, 1.9 miles downstream from powerplant of Wisconsin-Michigan Power Co., 6.0 miles south of Florence, and 7.0 miles downstream from Popple River.

DRAINAGE AREA.--528 sq mi.

PERIOD OF RECORD.--October 1923 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,098.84 ft above mean sea level. Prior to October 1968, record obtained from Pine River powerplant 1.9 miles upstream with a drainage area of 528 sq mi.

AVERAGE DISCHARGE.--48 years, 425 cfs (10.93 inches per year).

EXTREMES.--Current year: Maximum discharge, 2,780 cfs Apr. 19 (gage height, 7.13 ft); minimum daily, 124 cfs Aug. 6.
Period of record: Maximum daily discharge, 4,380 cfs Apr. 9, 1929; no flow at times during 1924, 1926-27, 1930-31, 1933, 1940.

REMARKS.--Records good except those for winter months, which are fair. Flow regulated by Pine River powerplant 1.9 miles upstream; pondage is small and monthly discharge is very nearly natural flow.

REVISIONS.--WSP 1237: Drainage area.

Rating table (gage height, in feet, and discharge, in cubic feet per second).
(Stage-discharge relation affected by ice Dec. 4-8, Dec. 10 to Apr. 8.)

1.7	107	4.0	885
2.2	224	6.0	2,000
3.0	470	7.2	2,840

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY - WATER RESOURCES DIVISION

PINE R BELOW PINE R POWERPLANT, NR FLORENCE, WI NUMBER 04064500
DRAINAGE AREA 528.000 SQ MI

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	335	1,240	468	340	240	310	360	1,100	500	285	199	196
2	344	1,100	641	330	240	330	370	1,060	489	250	235	266
3	326	1,160	656	300	240	330	390	1,040	392	193	173	286
4	317	1,170	640	250	260	330	400	926	457	251	187	167
5	306	1,120	660	310	250	310	420	908	392	254	180	192
6	203	973	680	270	200	320	500	850	347	292	124	174
7	311	860	640	280	200	310	540	760	436	186	176	243
8	208	772	600	310	230	310	640	673	435	226	158	208
9	303	756	521	280	240	310	925	638	539	254	191	190
10	257	681	560	320	240	290	1,270	577	558	199	200	220
11	201	630	500	300	240	310	1,700	546	428	206	187	344
12	255	633	450	280	240	260	2,300	517	355	263	191	311
13	253	629	380	310	240	310	2,480	542	471	258	159	289
14	262	570	350	290	240	280	2,440	446	508	231	202	370
15	239	477	380	300	240	320	2,160	430	604	201	204	202
16	181	461	370	310	240	350	2,160	412	467	204	263	277
17	196	335	360	260	220	360	2,260	434	380	202	238	172
18	196	398	390	280	230	390	2,480	427	344	204	186	199
19	260	422	400	310	240	370	2,440	503	452	218	192	199
20	214	471	350	240	240	310	2,440	649	608	222	161	255
21	207	550	290	290	240	340	2,340	649	709	261	220	264
22	214	582	240	270	240	370	2,200	561	635	278	205	230
23	202	436	300	260	240	390	2,010	528	522	223	262	246
24	281	289	340	260	240	350	1,700	574	428	221	244	188
25	464	465	320	270	240	310	1,460	820	448	192	184	235
26	554	492	290	260	260	320	1,310	1,200	330	235	196	255
27	625	526	330	220	280	350	1,220	1,100	300	190	199	267
28	864	389	310	210	290	370	1,160	880	336	192	196	312
29	1,360	432	290	260	------	350	1,160	800	329	184	194	277
30	1,370	497	320	250	------	340	1,060	680	363	230	284	581
31	1,410	------	340	220	------	340	------	600	------	202	249	------
TOTAL	12,718	19,516	13,366	8,640	6,740	10,240	44,295	21,830	13,562	7,007	6,239	7,615
MEAN	410	651	431	279	241	330	1,477	704	452	226	201	254
MAX	1,410	1,240	680	340	290	390	2,480	1,200	709	292	284	581
MIN	181	289	240	210	200	260	360	412	300	184	124	167
CFSM	.78	1.23	.82	.53	.46	.63	2.80	1.33	.86	.43	.38	.48
IN.	.90	1.37	.94	.61	.47	.72	3.12	1.54	.96	.49	.44	.54

CAL YR 1970 TOTAL 145,918 MEAN 400 MAX 1,870 MIN 66 CFSM .76 IN 10.28
WTR YR 1971 TOTAL 171,768 MEAN 471 MAX 2,480 MIN 124 CFSM .89 IN 12.10

04065300 West Branch Sturgeon River near Randville, Mich.

LOCATION.--Lat 46°00'45", long 87°58'41", in NE¼ sec.30, T.42 N., R.29 W., Dickinson County, on right bank 500 ft downstream from county highway bridge, 3.0 miles downstream from Tom Kings Creek, and 4.0 miles northeast of Randville.

DRAINAGE AREA.--56.1 sq mi.

PERIOD OF RECORD.--August 1958 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,170 ft (from topographic map).

AVERAGE DISCHARGE.--13 years, 41.4 cfs (10.02 inches per year), adjusted for diversion.

EXTREMES.--Current year: Maximum discharge, 372 cfs Apr. 13 (gage height, 5.59 ft); minimum, 5.5 cfs Sept. 9 (gage height, 1.51 ft); minimum daily, 8.5 cfs Oct. 8, Sept. 8, 9.
Period of record: Maximum discharge, 570 cfs May 7, 1960 (gage height, 6.40 ft); minimum, 1.5 cfs July 22, 1964 (gage height, 1.35 ft).

REMARKS.--Records fair. Since December 1958, diversion above station for industrial use; figures of runoff adjusted thereafter. Small diversions for sprinkler irrigation.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	115	37	17	15	26	45	91	35	55	17	12
2	10	85	85	17	15	26	45	95	32	36	16	12
3	10	69	86	17	14	26	45	83	33	28	15	11
4	9.5	62	71	17	14	25	45	67	28	23	13	10
5	9.5	49	70	17	14	25	45	59	40	21	12	10
6	9.0	40	62	17	14	25	48	53	47	20	11	10
7	9.0	33	54	16	14	24	60	47	37	19	12	9.0
8	8.5	29	48	16	14	24	80	42	41	19	10	8.5
9	9.0	26	44	16	14	24	110	38	40	16	11	8.5
10	10	29	40	16	15	23	160	37	31	15	15	21
11	12	30	37	16	15	23	220	34	26	14	12	28
12	15	28	34	16	15	23	300	35	26	13	12	20
13	20	26	31	16	15	23	367	34	27	35	11	15
14	19	23	29	16	15	25	336	32	23	37	17	13
15	15	20	27	16	15	27	284	31	22	28	16	12
16	12	20	25	16	16	29	270	29	20	22	14	11
17	10	19	23	15	16	31	279	28	20	22	14	10
18	10	20	22	15	17	33	289	33	21	19	12	10
19	10	21	20	15	18	34	268	58	23	23	12	12
20	10	45	19	15	18	34	234	74	24	21	13	34
21	12	73	18	15	19	35	208	57	22	17	14	30
22	13	69	18	15	20	35	180	43	19	17	15	26
23	17	58	17	15	21	35	150	36	18	22	15	24
24	40	56	17	15	22	34	122	55	20	19	15	25
25	59	45	17	15	23	34	104	129	61	18	15	20
26	44	34	17	15	24	35	88	155	85	16	14	18
27	38	32	17	15	25	37	75	120	52	16	13	24
28	113	29	17	15	25	39	81	79	32	17	12	41
29	203	28	17	15	------	41	95	51	59	17	12	40
30	222	26	17	15	------	42	90	40	70	17	*11	52
31	165	------	17	15	------	44	------	37	------	17	11	------
TOTAL	1,154.5	1,239	1,053	487	482	941	4,723	1,802	1,034	679	412	577.0
MEAN	37.2	41.3	34.0	15.7	17.2	30.4	157	58.1	34.5	21.9	13.3	19.2
MAX	222	115	86	17	25	44	367	155	85	55	17	52
MIN	8.5	19	17	15	14	23	45	28	18	13	10	8.5
+	5.9	6.2	6.1	6.0	5.5	4.5	5.5	3.9	6.1	5.6	5.7	4.5
MEAN‡	43.1	47.5	40.1	21.7	22.7	34.9	162	62.0	40.6	27.5	19.0	23.7
CFSM‡	.77	.85	.71	.39	.40	.62	2.89	1.11	.72	.49	.34	.42
IN‡	.89	.95	.82	.45	.42	.72	3.22	1.28	.80	.56	.39	.47

CAL YR 1970 TOTAL 10,636.2 MEAN 29.1 MAX 260 MIN 3.6 MEAN‡ 34.2 CFSM‡ 0.61 IN‡ 8.27
WTR YR 1971 TOTAL 14,583.5 MEAN 40.0 MAX 367 MIN 8.5 MEAN‡ 45.4 CFSM‡ 0.81 IN‡ 10.97

+ Average monthly diversion, equivalent in cubic feet per second, for industrial use; furnished by Hanna Mining Co.
‡ Adjusted for diversion.

04065500 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., Dickinson County, on left bank 30 ft downstream from bridge on County Highway 569, 1.8 miles downstream from confluence of East and West Branch, and 4.0 miles south of Foster City.

DRAINAGE AREA.--237 sq mi.

PERIOD OF RECORD.--October 1954 to current year.

GAGE.--Water-stage recorder. Datum of gage is 966.6 ft above mean sea level.

AVERAGE DISCHARGE.--17 years, 176 cfs (10.08 inches per year), adjusted for diversion.

EXTREMES.--Current year: Maximum discharge, 1,790 cfs Apr. 13, 14 (gage height, 9.25 ft); minimum, 27 cfs Sept 9, 10 (gage height 2.15 ft).
Period of record: Maximum discharge, 2,570 cfs May 8, 1960 (gage height, 10.35 ft); minimum, 15 cfs July 24, 1964; minimum gage height, 1.96 ft Aug. 21, 1970.

REMARKS.--Records good except those for winter periods, which are fair. Since December 1958, diversion above station for industrial use, figures of runoff adjusted thereafter. Small diversions for sprinkler irrigation. Records of water temperatures for the current year are published in Part 2 of this report.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	623	193	94	72	140	210	433	235	367	61	41
2	44	552	258	92	72	145	230	426	206	334	57	40
3	39	454	391	92	72	150	250	410	185	294	51	37
4	37	383	500	90	70	150	250	383	167	239	45	33
5	38	322	450	90	70	150	250	354	218	191	44	32
6	37	262	400	88	70	145	260	325	276	145	43	33
7	36	214	370	88	70	145	300	293	288	118	38	38
8	34	180	330	86	70	140	400	254	313	104	36	33
9	35	166	300	86	72	140	600	243	309	84	30	29
10	41	167	270	86	72	140	850	221	272	83	43	34
11	39	164	240	84	72	140	1,200	200	231	73	64	43
12	53	156	210	84	72	135	1,660	188	191	66	57	54
13	59	145	190	84	72	140	1,750	183	166	72	53	55
14	53	132	175	82	72	150	1,770	174	150	89	51	50
15	46	120	160	80	74	155	1,660	162	136	110	50	43
16	41	111	150	80	76	165	1,530	152	124	105	49	37
17	37	109	140	78	78	175	1,440	145	111	91	45	33
18	41	107	130	78	80	185	1,400	173	106	86	40	31
19	38	105	125	78	82	190	1,380	300	110	88	42	31
20	35	130	120	76	84	195	1,330	388	121	87	48	53
21	37	213	115	76	88	190	1,250	389	122	78	50	76
22	39	254	110	76	94	190	1,130	351	106	72	51	79
23	41	230	105	76	100	190	986	301	106	72	50	82
24	54	210	105	76	110	185	853	303	103	71	50	83
25	90	190	100	74	115	185	715	461	167	66	48	80
26	124	180	100	74	125	180	599	559	285	59	45	75
27	132	170	100	74	130	180	509	571	318	55	43	69
28	218	160	98	74	135	180	468	547	299	59	41	126
29	437	155	96	72	------	180	459	459	301	62	38	163
30	544	150	96	72	------	185	436	375	370	62	38	173
31	594	------	96	72	------	190	------	295	------	60	39	------
TOTAL	3,142	6,514	6,223	2,512	2,369	5,110	26,125	10,018	6,092	3,542	1,440	1,786
MEAN	101	217	201	81.0	84.6	165	871	323	203	114	46.5	59.5
MAX	594	623	500	94	135	195	1,770	571	370	367	64	173
MIN	34	105	96	72	70	135	210	145	103	55	30	29
+	5.9	6.2	6.1	6.0	5.5	4.5	5.5	3.9	6.1	5.6	5.7	4.5
MEAN‡	107	223	207	87.0	90.1	170	876	327	209	120	52.2	64.0
CFSM‡	.45	.94	.87	.37	.38	.72	3.70	1.38	.88	.51	.22	.27
IN‡	.52	1.05	1.00	.43	.40	.83	4.13	1.59	.98	.59	.25	.30

CAL YR 1970 TOTAL 50,549 MEAN 138 MAX 1,310 MIN 19 MEAN‡ 144 CFSM‡ 0.61 IN‡ 8.21
WTR YR 1971 TOTAL 74,873 MEAN 205 MAX 1,770 MIN 29 MEAN‡ 211 CFSM‡ 0.89 IN‡ 12.07

\+ Average monthly diversion, equivalent in cubic feet per second, for industrial use; furnished by Hanna Mining Co.
‡ Adjusted for diversion.
NOTE.--No gage-height record Jan. 10 to Feb. 9.

04066000 Menominee River near Pembine, Wis.

LOCATION.--Lat 45°35'24", long 87°46'34", in sec.21, T.37 N., R.28 W., Michigan meridian, Menominee County, Mich., on left bank 0.1 mile upstream from Pemene Creek, 4.0 miles west of Nathan, Mich., 15 miles southeast of Pembine, and at mile 65.3.

DRAINAGE AREA.--3,240 sq mi, approximately.

PERIOD OF RECORD.--October 1949 to current year. 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.--22 years, 2,942 cfs.

EXTREMES.--Current year: Maximum discharge, 15,800 cfs Apr. 19 (gage height, 10.20 ft); minimum, 877 cfs Sept. 13 (gage height, 1.83 ft).
Period of record: Maximum discharge, 26,900 cfs May 8, 1960 (gage height, 13.90 ft); minimum, 694 cfs Sept. 3, 1969 (gage height, 1.66 ft).

REMARKS.--Records good except those for winter months, which are poor. Flow regulated by powerplants and by Michigamme Reservoir (capacity, 119,950 acre-ft) and Peavy Pond (capacity, 33,860 acre-ft) on the Michigamme River, and by many smaller reservoirs above station.

REVISIONS (WATER YEARS).--WSP 1277: 1952.

Rating table (gage height, in feet, and discharge, in cubic feet per second).
(Shifting-control method used Oct. 1-29; stage-discharge relation affected by ice Nov. 26-28, Dec. 3 to Apr. 12.)

1.8	855	6.0	6,470
2.5	1,500	8.0	10,400
4.0	3,330	10.5	16,700

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,840	5,960	3,160	2,500	1,900	2,400	3,400	5,190	4,550	2,800	1,390	1,780
2	1,660	5,480	4,420	2,000	2,000	2,400	3,200	6,080	4,020	2,400	1,480	1,800
3	1,550	5,080	4,000	2,100	2,000	2,500	3,300	6,160	3,470	2,960	1,590	1,640
4	1,320	5,470	3,500	2,200	1,900	2,500	2,900	5,730	3,360	2,650	1,740	2,030
5	1,420	4,880	3,300	2,300	1,800	2,600	3,100	6,160	3,300	2,910	1,730	1,300
6	1,520	4,760	3,500	2,200	1,800	2,500	3,500	5,550	3,230	2,570	1,610	1,130
7	1,460	3,880	3,700	2,100	1,800	2,500	4,000	5,850	2,830	2,520	1,470	1,340
8	1,560	3,240	4,000	2,100	1,700	2,200	5,000	4,880	3,380	2,440	1,260	1,440
9	1,580	3,120	4,100	2,300	1,600	2,200	6,000	4,700	3,620	2,180	1,430	1,330
10	1,490	3,980	4,000	2,300	1,800	2,100	9,000	4,980	3,520	2,150	1,880	1,480
11	1,490	3,990	3,600	2,200	1,800	2,100	11,000	4,310	3,190	1,590	1,850	1,370
12	1,360	3,240	3,300	2,300	1,800	2,300	12,000	4,100	3,150	1,730	1,770	1,130
13	1,610	3,080	3,100	2,400	1,600	2,400	12,400	3,710	3,000	2,060	1,580	1,170
14	1,590	2,780	2,800	2,400	1,600	2,500	14,100	3,610	2,610	2,070	1,430	1,270
15	1,760	2,500	2,700	2,300	1,700	3,300	13,200	3,310	2,390	2,180	1,220	1,460
16	1,890	2,100	2,600	2,200	1,800	3,200	12,500	3,020	2,920	2,240	1,300	1,450
17	1,600	2,270	2,600	2,100	2,000	3,200	12,100	2,700	2,920	2,320	1,810	1,400
18	1,130	2,310	2,700	2,100	2,000	3,100	13,500	3,040	2,370	1,990	1,410	1,240
19	1,320	2,670	2,500	2,200	2,100	2,900	15,600	3,910	2,310	1,710	1,850	1,140
20	1,670	2,850	2,100	2,300	2,200	3,200	15,000	4,460	2,900	2,170	1,840	1,280
21	1,680	3,220	2,100	2,200	2,300	3,100	13,000	4,650	2,800	2,220	1,520	1,350
22	1,600	3,390	2,100	2,200	2,200	3,000	11,400	4,160	2,800	2,090	1,190	1,650
23	1,540	3,380	2,300	2,200	2,100	2,900	10,300	3,930	2,900	2,340	1,330	1,510
24	1,750	3,180	2,300	2,100	2,400	2,800	8,730	4,050	2,800	2,050	1,630	1,570
25	1,740	2,550	2,000	2,000	2,300	2,500	7,430	5,180	2,500	1,380	1,820	1,410
26	2,100	2,200	1,900	2,000	2,400	2,300	6,910	5,730	2,400	1,540	1,770	1,190
27	2,540	2,400	2,000	2,100	2,300	2,600	6,130	6,220	2,300	1,900	1,420	1,280
28	3,380	3,300	2,300	2,200	2,300	2,800	6,630	5,830	2,200	1,960	1,330	1,820
29	4,940	3,070	2,700	2,100	------	3,000	6,080	4,920	2,500	2,010	1,170	2,000
30	5,360	2,990	2,500	2,000	------	3,200	6,310	4,720	3,000	1,810	1,360	1,870
31	5,670	------	2,600	2,000	------	3,400	------	4,660	------	1,820	1,510	------
TOTAL	63,120	103,320	90,480	67,700	55,200	83,700	257,720	145,500	89,240	66,760	47,690	43,830
MEAN	2,036	3,444	2,919	2,184	1,971	2,700	8,591	4,694	2,975	2,154	1,538	1,461
MAX	5,670	5,960	4,420	2,500	2,400	3,400	15,600	6,220	4,550	2,960	1,880	2,030
MIN	1,130	2,100	1,900	2,000	1,600	2,100	2,900	2,700	2,200	1,380	1,170	1,130

CAL YR 1970 TOTAL 953,570 MEAN 2,613 MAX 16,200 MIN 1,120
WTR YR 1971 TOTAL 1,114,260 MEAN 3,053 MAX 15,600 MIN 1,130

04067000 Menominee River below Koss, Mich.

LOCATION.--Lat 45°21'16", long 87°38'55", in sec.9, T.34 N., R.27 W., Michigan meridian, Menominee County, 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.

PERIOD OF RECORD.--July 1907 to March 1909 (published as "at Koss"), July 1913 to current year.

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.--59 years (1907-8, 1913-71), 3,119 cfs.

EXTREMES.--Current year: Maximum daily discharge, 17,000 cfs Apr. 20; minimum daily, 1,300 cfs Sept. 13. Period of record: Maximum daily discharge, 33,000 cfs May 10, 1960; 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 Michigamme Reservoir (capacity, 119,950 acre-ft) and Peavy Pond (capacity, 33,860 acre-ft) on Michigamme River, and by many smaller reservoirs above station.

COOPERATION.--Records of daily discharge furnished by Wisconsin Public Service Corp. since 1913.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2,210	6,980	4,390	3,000	2,300	2,760	4,020	7,740	4,680	3,360	1,940	1,780
2	2,030	6,820	4,860	2,880	2,180	2,880	4,020	7,030	4,750	3,340	1,620	2,120
3	1,760	6,120	5,470	2,230	2,380	2,880	3,780	7,460	4,030	2,720	1,700	2,120
4	1,600	6,200	4,470	2,300	2,380	2,880	3,820	6,850	3,720	2,850	1,870	2,160
5	1,470	6,430	3,970	2,590	2,110	3,000	3,300	6,890	3,720	2,760	2,080	1,440
6	1,680	5,890	3,760	2,640	2,110	3,000	3,630	6,920	3,300	2,880	1,830	1,540
7	1,670	5,540	3,910	2,470	2,140	3,000	4,190	7,000	3,360	2,570	1,870	1,440
8	1,680	4,220	4,200	2,500	2,030	2,880	5,110	6,500	3,360	2,520	1,510	1,900
9	1,580	4,450	4,700	2,450	1,940	2,600	6,250	5,530	3,370	2,420	1,590	1,540
10	1,680	4,660	4,780	2,660	1,980	2,640	7,680	5,540	3,760	2,250	1,840	1,520
11	1,570	5,050	4,580	2,580	2,080	2,480	11,500	5,840	3,970	2,180	2,020	1,730
12	1,480	4,850	4,060	2,590	2,110	2,450	14,700	5,060	3,400	1,610	2,090	1,430
13	1,710	3,850	3,880	2,700	1,990	2,710	14,300	4,760	3,300	1,860	2,020	1,300
14	1,900	3,950	3,430	2,910	1,870	2,760	15,400	4,570	3,200	2,260	2,020	1,790
15	1,900	3,640	3,010	2,760	1,880	3,060	16,400	4,320	3,120	2,350	1,450	1,340
16	1,940	2,960	3,090	2,690	1,920	3,940	16,000	3,620	2,760	2,220	1,540	1,440
17	1,730	2,500	3,000	2,450	2,000	3,700	15,200	3,070	3,120	2,320	1,710	1,650
18	1,660	2,690	3,000	2,500	2,390	3,780	14,200	3,290	3,000	2,400	1,940	1,760
19	1,340	2,690	3,120	2,500	2,390	3,630	15,200	3,360	2,370	2,400	1,870	1,360
20	1,550	3,650	2,740	2,660	2,440	3,420	17,000	4,800	2,760	2,020	1,980	1,340
21	1,660	4,100	2,400	2,730	2,640	3,820	16,300	5,170	3,360	2,470	2,040	1,450
22	1,820	4,490	2,400	2,520	2,760	3,660	13,500	5,290	3,120	2,450	1,650	1,550
23	1,600	4,570	2,500	2,560	2,420	3,420	12,500	4,780	3,240	2,420	1,580	1,660
24	1,870	3,820	2,640	2,560	2,550	3,550	11,300	4,470	3,240	2,520	1,730	1,480
25	1,880	2,950	2,630	2,360	2,810	3,240	10,100	4,520	3,120	2,290	1,870	1,710
26	2,020	3,220	2,260	2,300	2,640	2,880	9,040	6,750	2,880	1,710	2,090	1,620
27	2,560	2,300	2,240	2,300	2,760	2,760	8,590	6,840	2,760	1,790	1,940	1,490
28	3,860	2,800	2,410	2,480	2,760	3,240	7,630	6,340	2,640	2,300	1,720	1,940
29	5,690	3,850	2,840	2,580	------	3,240	8,160	5,420	2,580	2,260	1,320	1,970
30	6,390	3,500	3,120	2,420	------	3,550	7,490	4,720	2,810	2,260	1,560	2,340
31	6,600	------	2,880	2,300	------	3,970	------	4,740	------	2,120	1,810	------
TOTAL	70,090	128,740	106,740	79,170	63,960	97,780	300,310	169,190	98,800	73,880	55,800	49,810
MEAN	2,261	4,291	3,443	2,554	2,284	3,154	10,010	5,458	3,293	2,383	1,800	1,660
MAX	6,600	6,980	5,470	3,000	2,810	3,970	17,000	7,740	4,750	3,360	2,090	2,340
MIN	1,340	2,300	2,240	2,230	1,870	2,450	3,300	3,070	2,370	1,610	1,320	1,300

CAL YR 1970 TOTAL 1,061,280 MEAN 2,908 MAX 20,000 MIN 1,200
WTR YR 1971 TOTAL 1,294,270 MEAN 3,546 MAX 17,000 MIN 1,300

04096400 St. Joseph River near Burlington, Mich.

LOCATION.--Lat 42°06'10", long 85°02'25", in SW¼ SW¼ sec.20, T.4 S., R.6 W., Calhoun County, on right bank 10 ft upstream from bridge on 13 Mile Rd., 2.0 miles east of Burlington, 4.0 miles downstream from Tekonsha Creek, and at mile 164.

DRAINAGE AREA.--201 sq mi.

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 930 ft (from topographic map).

AVERAGE DISCHARGE.--9 years, 142 cfs (9.59 inches per year).

EXTREMES.--Current year: Maximum discharge, 725 cfs Feb. 28 (gage height, 4.95 ft); minimum, 25 cfs Sept. 18 (gage height, 1.88 ft). Period of record: Maximum discharge, 1,000 cfs Feb. 5, 1968 (gage height, 5.51 ft); minimum, 8.0 cfs Aug. 9, 10, 11, 1964; minimum gage height, 1.71 ft Aug. 8, 9, 10, 11, 1964.

REMARKS.--Records good except those for the winter period, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	98	141	275	150	90	556	205	105	75	52	49	28
2	93	139	274	150	90	561	206	105	74	50	48	29
3	88	144	267	150	90	517	200	103	74	49	47	31
4	83	145	262	150	90	508	191	102	75	48	46	48
5	80	143	250	150	110	454	186	101	75	72	44	49
6	76	139	233	150	150	417	179	113	86	93	41	47
7	73	130	215	150	200	386	175	115	112	84	39	44
8	70	123	208	140	250	335	169	118	132	83	37	40
9	82	118	196	140	260	316	164	117	143	85	36	37
10	130	133	188	130	260	325	157	111	143	75	36	35
11	140	138	199	130	260	287	152	107	135	67	43	34
12	141	138	216	120	250	278	146	104	124	61	43	34
13	134	140	214	120	250	270	146	101	114	55	40	34
14	178	144	209	120	240	280	144	96	109	50	44	34
15	258	142	199	120	230	354	141	94	108	58	46	32
16	238	135	190	120	210	391	134	91	106	72	43	31
17	232	128	200	120	200	360	131	90	99	73	40	32
18	214	124	189	120	200	351	128	87	90	72	37	31
19	190	125	198	110	250	360	127	87	83	107	34	30
20	171	140	212	110	300	371	125	89	78	103	34	40
21	167	153	207	110	400	357	123	89	82	84	32	43
22	158	155	200	110	469	360	120	85	84	73	32	39
23	151	159	198	110	485	346	116	81	83	65	31	39
24	144	155	203	110	516	319	113	82	82	61	30	36
25	138	135	222	110	602	290	110	88	74	57	30	36
26	132	152	151	100	679	273	107	93	67	59	29	44
27	128	168	153	100	695	254	104	96	62	60	29	55
28	125	248	170	95	626	241	106	92	58	58	30	56
29	140	273	170	95	------	231	106	87	54	57	30	52
30	149	274	160	95	------	221	106	82	51	55	28	48
31	146	------	160	90	------	209	------	78	------	52	28	------
TOTAL	4,347	4,581	6,388	3,775	8,452	10,778	4,317	2,989	2,732	2,090	1,156	1,168
MEAN	140	153	206	122	302	348	144	96.4	91.1	67.4	37.3	38.9
MAX	258	274	275	150	695	561	206	118	143	107	49	56
MIN	70	118	151	90	90	209	104	78	51	48	28	28
CFSM	.70	.76	1.02	.61	1.50	1.73	.72	.48	.45	.34	.19	.19
IN.	.80	.85	1.18	.70	1.56	1.99	.80	.55	.51	.39	.21	.22

CAL YR 1970 TOTAL 61,834 MEAN 169 MAX 503 MIN 51 CFSM .84 IN 11.44
WTR YR 1971 TOTAL 52,773 MEAN 145 MAX 695 MIN 28 CFSM .72 IN 9.77

04096515 Hog Creek near Allen, Mich.

LOCATION.--Lat 41°56'55", long 84°49'40", in NE¼ SE¼ sec.13, T.6 S., R.5 W., Branch County, on left bank 12 ft downstream from bridge on U. S. Highway 12, 1.0 mile downstream from Little Hog Creek, and 3.1 miles west of Allen.

DRAINAGE AREA.--48.7 sq mi.

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Water-stage recorder. Altitude of gage 1,010 ft (from topographic map). Prior to May 23, 1970. nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum discharge, 180 cfs Feb. 22, based on correlation with nearby stations; maximum gage height, 5.73 ft Feb. 20 (backwater from ice); minimum discharge, 1.2 cfs Aug. 20, 21 (gage height, 1.35 ft).
Period of record: Maximum discharge, 180 cfs Feb. 22, 1971, based on correlation with nearby stations; maximum gage height, 5.73 ft Feb. 20, 1971 (backwater from ice); minimum discharge, 1.2 cfs Aug. 20, 21, 1971 (gage height, 1.35 ft).

REMARKS.--Records good except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	26	77	32	20	95	51	21	11	8.4	5.3	2.3
2	14	26	70	34	20	90	63	21	16	7.3	4.8	3.8
3	12	31	63	32	20	85	55	22	15	6.6	4.6	5.7
4	11	31	62	32	20	80	49	21	13	6.2	4.6	3.9
5	10	29	61	31	25	75	46	21	13	7.1	4.1	3.6
6	9.4	27	57	31	40	67	43	33	27	8.9	3.8	3.6
7	9.0	25	52	30	50	66	41	37	38	7.3	3.3	3.8
8	9.1	23	44	30	60	66	39	32	31	7.5	2.9	3.6
9	12	23	43	29	70	64	38	28	22	8.2	2.5	3.4
10	28	30	41	28	65	60	39	26	17	7.1	2.5	3.3
11	29	33	46	27	60	57	35	25	15	6.6	3.6	3.6
12	23	32	52	26	56	54	33	23	18	6.2	3.0	3.4
13	20	30	52	26	54	56	33	22	25	5.8	2.5	3.4
14	35	28	51	25	52	70	37	21	28	4.9	2.2	3.4
15	53	27	47	25	50	107	36	19	23	4.7	2.1	3.3
16	46	25	46	24	50	126	34	19	18	14	1.8	3.3
17	35	24	42	24	50	118	33	18	15	11	1.7	3.7
18	29	23	41	24	50	105	32	17	13	7.9	1.5	3.7
19	26	23	46	23	60	97	31	16	11	8.8	1.4	3.8
20	24	31	54	23	80	94	29	16	11	10	1.3	5.4
21	27	40	58	23	100	89	27	15	17	8.3	1.3	6.0
22	26	37	47	22	170	84	26	14	18	7.0	1.5	4.7
23	24	33	44	22	160	78	25	13	16	6.4	1.5	4.2
24	23	30	43	22	150	71	23	14	14	6.5	1.5	4.0
25	22	30	46	22	130	64	22	21	12	6.4	1.6	4.0
26	21	29	38	21	120	59	22	19	11	8.5	1.7	3.9
27	20	37	40	21	110	57	21	16	10	8.7	1.9	4.2
28	20	66	37	21	100	59	21	15	8.8	7.0	2.2	4.4
29	25	81	38	20	------	56	22	14	8.1	6.9	2.3	4.0
30	31	81	32	20	------	53	22	12	7.7	6.1	2.2	4.0
31	29	------	36	20	------	50	------	11	------	5.8	2.2	------
TOTAL	717.5	1,011	1,506	790	1,992	2,352	1,028	622	502.6	232.1	79.4	117.4
MEAN	23.1	33.7	48.6	25.5	71.1	75.9	34.3	20.1	16.8	7.49	2.56	3.91
MAX	53	81	77	34	170	126	63	37	38	14	5.3	6.0
MIN	9.0	23	32	20	20	50	21	11	7.7	4.7	1.3	2.3
CFSM	.47	.69	1.00	.52	1.46	1.56	.70	.41	.35	.15	.05	.08
IN.	.55	.77	1.15	.60	1.52	1.80	.79	.48	.38	.18	.06	.09

CAL YR 1970 TOTAL 14,157.0 MEAN 38.8 MAX 124 MIN 4.7 CFSM .80 IN 10.81
WTR YR 1971 TOTAL 10,950.0 MEAN 30.0 MAX 170 MIN 1.3 CFSM .62 IN 8.36

04096600 Coldwater River near Hodunk, Mich.

LOCATION.--Lat 42°01'45", long 85°06'25", in NW¼ NE¼ sec.22, T.5 S., R.7 W., Branch County, on upstream side of bridge on Girard Rd., 2.5 miles northwest of Hodunk, and 3.5 miles upstream from mouth.

DRAINAGE AREA.--293 sq mi.

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 900 ft (from topographic map). Prior to July 26, 1963, nonrecording gage and crest-stage gage at same site and datum.

AVERAGE DISCHARGE.--9 years, 207 cfs (9.59 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,060 cfs Feb. 21 (gage height, 6.96 ft); minimum, 29 cfs Aug. 29; minimum gage height, 2.67 ft Sept. 2, 3.
Period of record: Maximum discharge, 1,420 cfs Feb. 4, 1968 (gage height, 7.3 ft); minimum, 6.2 cfs Sept. 26, 1964; minimum gage height, 2.28 ft Oct. 4-14, 1964.

REMARKS.--Records fair except those for the winter period and those for period of no gage-height record, which are poor. Diurnal fluctuation caused by mills above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	146	263	400	230	130	754	350	86	109	49	90	34
2	136	256	400	230	130	676	340	89	110	49	73	33
3	130	254	390	230	130	986	340	101	110	49	49	34
4	124	256	380	230	140	552	330	101	110	54	48	48
5	121	249	370	220	170	538	330	99	110	80	45	51
6	116	243	350	220	240	530	320	115	110	105	43	52
7	113	231	330	210	320	499	310	125	141	95	42	52
8	109	216	320	200	360	474	300	127	147	91	40	52
9	121	212	310	200	380	463	290	139	141	89	39	51
10	144	223	300	190	390	474	290	131	125	76	41	51
11	141	231	300	180	380	452	280	123	111	66	45	54
12	139	242	300	180	370	430	270	117	107	52	49	53
13	125	235	300	180	360	417	270	117	103	46	46	51
14	244	223	300	170	350	410	270	115	107	45	47	46
15	524	208	300	170	330	428	272	103	107	54	44	42
16	538	204	300	170	310	461	261	99	101	75	42	40
17	492	200	300	170	300	535	246	103	111	78	40	46
18	440	194	300	160	340	649	239	99	109	66	39	46
19	396	188	300	160	450	620	229	95	105	67	38	46
20	362	200	300	160	800	597	162	93	99	78	42	51
21	341	220	300	160	979	575	99	91	95	81	39	53
22	327	230	300	160	934	541	97	93	97	73	38	52
23	313	230	300	160	909	513	76	95	97	70	37	46
24	300	220	290	150	839	482	73	101	103	67	36	43
25	284	210	280	150	766	459	75	109	91	66	34	40
26	267	220	270	150	769	441	75	117	86	73	35	39
27	259	240	260	150	790	434	75	115	82	124	32	45
28	249	320	250	140	811	420	78	111	75	119	32	48
29	257	380	240	140	------	400	82	111	71	112	30	47
30	269	400	230	140	------	380	84	111	52	105	31	42
31	274	------	230	140	------	360	------	113	------	97	33	------
TOTAL	7,801	7,198	9,500	5,500	13,177	15,950	6,513	3,344	3,122	2,351	1,319	1,388
MEAN	252	240	306	177	471	515	217	108	104	75.8	42.5	46.3
MAX	538	400	400	230	979	986	350	139	147	124	90	54
MIN	109	188	230	140	130	360	73	86	52	45	30	33
CFSM	.86	.82	1.04	.60	1.61	1.76	.74	.37	.35	.26	.15	.16
IN.	.99	.91	1.21	.70	1.67	2.03	.83	.42	.40	.30	.17	.18

CAL YR 1970 TOTAL 89,916 MEAN 246 MAX 816 MIN 56 CFSM .84 IN 11.42
WTR YR 1971 TOTAL 77,163 MEAN 211 MAX 986 MIN 30 CFSM .72 IN 9.80

NOTE.--No gage-height record Nov. 20 to Feb. 18.

04096900 Nottawa Creek near Athens, Mich

LOCATION.--Lat 42°03'20", long 85°18'30" in NW¼ sec.12, T.5 S., R.9 W., St. Joseph County, on right bank at downstream side of bridge on Shorts Road, 4.2 miles southwest of Athens, and 5.0 miles downstream from Pine Creek.

DRAINAGE AREA.--162 sq mi.

PERIOD OF RECORD.--October 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 850 ft (from topographic map).

AVERAGE DISCHARGE.--5 years, 135 cfs (11.32 inches per year).

EXTREMES.--Current year: Maximum discharge, 554 cfs Feb. 22 (gage height, 4.50 ft); minimum daily, 28 cfs Aug. 24, 25; minimum gage height, 0.55 ft Sept. 30.
Period of record: Maximum discharge, 554 cfs Feb. 22, 1971 (gage height, 4.50 ft); maximum gage height, 4.66 ft Feb. 3, 1968; minimum daily discharge, 28 cfs Aug. 24, 25, 1971; minimum gage height, 0.55 ft Sept. 30, 1971.

REMARKS.--Records fair except those for winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	90	126	267	122	75	360	151	97	79	72	65	33
2	90	125	255	123	75	331	156	98	79	70	61	36
3	89	126	234	123	72	301	160	97	79	69	57	38
4	88	128	226	129	72	294	154	95	76	65	56	41
5	85	133	225	132	100	240	143	94	75	64	56	43
6	83	135	229	114	170	215	134	100	76	68	54	58
7	80	131	212	126	220	218	128	101	81	71	51	84
8	78	123	196	119	259	212	123	99	81	71	48	68
9	80	114	178	108	264	224	123	96	79	74	45	57
10	92	120	165	105	245	212	119	93	75	72	46	51
11	96	124	171	100	223	193	115	92	74	67	52	49
12	107	131	189	100	229	193	113	93	76	60	52	45
13	111	131	215	100	224	190	133	96	74	55	50	43
14	134	124	230	100	199	215	132	96	71	50	49	42
15	156	116	240	95	184	285	130	94	69	52	47	40
16	181	108	218	95	194	348	124	93	69	61	45	39
17	210	102	188	95	199	375	119	90	69	63	44	38
18	213	99	171	90	222	365	113	89	69	56	42	38
19	193	97	171	90	299	335	109	88	69	60	39	38
20	166	109	178	90	410	303	106	92	71	74	38	47
21	141	122	200	90	500	277	104	83	83	76	37	50
22	125	135	181	90	546	262	101	83	77	73	35	48
23	115	142	162	90	520	247	100	82	76	66	31	47
24	107	143	199	90	461	226	98	84	78	60	28	45
25	100	119	150	85	406	202	96	87	77	57	28	44
26	94	129	137	85	358	188	94	89	75	58	32	44
27	90	135	148	80	353	176	93	88	72	68	33	48
28	90	180	137	80	386	167	95	86	70	77	35	54
29	103	219	137	80	------	165	97	85	71	78	36	53
30	109	259	128	75	------	163	97	82	70	76	36	50
31	121	------	126	75	------	156	------	81	------	71	33	------
TOTAL	3,617	3,985	5,863	3,076	7,465	7,638	3,560	2,823	2,240	2,054	1,361	1,411
MEAN	117	133	189	99.2	267	246	119	91.1	74.7	66.3	43.9	47.0
MAX	213	259	267	132	546	375	160	101	83	78	65	84
MIN	78	97	126	75	72	156	93	81	69	50	28	33
CFSM	.72	.82	1.17	.61	1.65	1.52	.73	.56	.46	.41	.27	.29
IN.	.83	.92	1.35	.71	1.71	1.75	.82	.65	.51	.47	.31	.32

CAL YR 1970 TOTAL 53,134 MEAN 146 MAX 396 MIN 67 CFSM .90 IN 12.20
WTR YR 1971 TOTAL 45,093 MEAN 124 MAX 546 MIN 28 CFSM .77 IN 10.35

04097170 Portage River near Vicksburg, Mich.

LOCATION.--Lat 42°06'53", long 85°29'08", in SW¼ sec.16, T.4 S., R.10 W., Kalamazoo County, on right bank 15 ft upstream from bridge on W Avenue, 2.4 miles east of Vicksburg.

DRAINAGE AREA.--68.2 sq mi.

PERIOD OF RECORD.--March 1946 to September 1951, October 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 839.94 ft above mean sea level. Mar. 13, 1946, to Sept. 30, 1951, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--12 years, 60.2 cfs (11.99 inches per year).

EXTREMES.--Current year: Maximum discharge, 200 cfs Feb. 22, based on correlation with nearby stations; minimum, 15 cfs Aug. 24, 25; minimum gage height, 3.18 ft July 3, 4.
Period of record: Maximum discharge, 356 cfs Apr. 7, 1947 (gage height, 5.66 ft); minimum, 10 cfs on many days during July and August, 1965; minimum gage height, 3.08 ft July 17, 1946, Aug. 14, 1946, July 30, 31, 1965.

REMARKS.--Records fair except those for winter period and those for period of no gage-height record, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	62	87	70	37	130	94	55	30	19	21	18
2	37	64	87	64	37	125	95	54	30	18	20	25
3	37	69	87	63	38	120	95	53	29	17	20	29
4	37	70	90	63	42	120	94	52	28	17	20	25
5	36	71	87	61	47	115	92	51	28	18	19	25
6	36	68	85	58	54	110	90	53	27	18	19	39
7	36	66	81	56	60	110	86	52	27	17	18	47
8	37	64	77	54	65	110	82	51	27	18	18	39
9	43	62	76	50	74	110	80	49	26	19	18	35
10	56	65	74	47	84	105	79	47	25	19	19	34
11	54	66	84	49	90	100	75	47	24	18	20	33
12	53	65	93	52	94	100	73	48	24	18	19	32
13	53	63	91	54	92	100	77	46	24	17	19	32
14	75	62	89	52	88	100	79	43	24	17	19	31
15	90	60	90	52	84	120	77	41	23	19	18	29
16	81	57	84	50	78	150	74	41	22	19	18	29
17	77	55	83	49	80	170	74	40	22	19	18	28
18	74	55	81	49	90	170	72	39	21	19	18	27
19	71	54	83	48	120	170	70	38	21	22	17	28
20	69	61	86	47	150	160	69	38	22	22	17	30
21	68	69	82	46	180	150	68	37	24	20	17	29
22	65	66	79	47	180	140	66	36	22	20	17	28
23	63	65	77	47	170	135	64	34	22	19	16	28
24	60	64	68	48	160	126	64	34	21	20	15	28
25	58	63	90	48	150	120	61	34	21	20	16	27
26	57	62	76	47	140	114	60	34	21	26	16	28
27	55	70	74	45	135	110	57	33	20	25	17	29
28	56	88	73	42	130	107	56	32	20	23	17	29
29	68	90	70	40	------	106	57	31	19	25	17	30
30	68	90	74	37	------	102	56	30	19	23	17	29
31	65	------	66	37	------	97	------	29	------	22	18	------
TOTAL	1,772	1,986	2,524	1,572	2,749	3,802	2,236	1,302	713	613	558	900
MEAN	57.2	66.2	81.4	50.7	98.2	123	74.5	42.0	23.8	19.8	18.0	30.0
MAX	90	90	93	70	180	170	95	55	30	26	21	47
MIN	36	54	66	37	37	97	56	29	19	17	15	18
CFSM	.84	.97	1.19	.74	1.44	1.80	1.09	.62	.35	.29	.26	.44
IN.	.97	1.08	1.38	.86	1.50	2.07	1.22	.71	.39	.33	.30	.49

CAL YR 1970 TOTAL 23,353 MEAN 64.0 MAX 187 MIN 28 CFSM .94 IN 12.74
WTR YR 1971 TOTAL 20,727 MEAN 56.8 MAX 180 MIN 15 CFSM .83 IN 11.31

NOTE.--No gage-height record Feb. 9 to Mar. 23.

04097195 Gourdneck Canal near Schoolcraft, Mich.

LOCATION.--Lat 42°09'54", long 85°36'15", in NW¼ sec.33, T.3 S., R.11 W., Kalamazoo County, on right bank at downstream end of culvert on Osterhout Avenue, 3.8 miles northeast of Schoolcraft.

PERIOD OF RECORD.--October 1965 to current year.

GAGE.--Water-stage recorder. Metal V-notch weir since Aug. 4, 1969. Datum of gage is 854.98 ft above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--6 years, 4.43 cfs.

EXTREMES.--Period of record: Maximum daily discharge, 16 cfs Dec. 10-12, 1966, Apr. 22-24, 1967; no flow for several days during period November 1970 to February 1971.
No flow observed at times during 1964, 1965.

REMARKS.--Records good. Canal diverts water from Gourdneck Creek (see station 04097200) to West Lake to sustain lake levels.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	.22	.03		0	3.7	3.3	2.5	2.1	1.4	1.6	.50
2	3.0	.22	.03		0	3.5	3.4	2.5	2.4	1.3	1.6	.70
3	3.0	.22	.07		0	3.4	3.4	2.6	2.4	.90	1.5	.80
4	3.0	.22	.02		0	3.1	3.3	2.5	2.0	.90	1.5	.80
5	3.0	.17	.01		0	3.0	3.1	2.5	1.9	1.3	1.4	.90
6	2.8	.22	0		0	3.1	3.1	2.7	1.8	1.3	1.4	1.2
7	2.7	.22	0		0	3.5	3.1	2.6	1.9	1.3	1.3	1.2
8	2.7	.22	0		0	3.4	2.9	2.6	1.8	1.5	1.3	1.2
9	3.0	.22	0		0	3.3	2.9	2.4	1.6	1.5	1.2	1.1
10	3.4	.27	0		0	3.4	2.9	2.2	1.6	1.4	1.2	1.0
11	3.3	.22	.05		0	3.3	2.9	2.1	1.6	1.3	1.3	1.0
12	3.3	.22	.02		0	3.1	2.7	2.2	1.6	1.3	1.3	.90
13	3.3	.22	.01		0	3.1	2.8	2.2	1.7	1.3	1.2	.90
14	4.3	.22	0		0	3.5	2.9	2.1	1.6	1.2	1.1	.90
15	4.6	.17	0		0	4.5	2.8	2.0	1.6	1.5	1.1	.80
16	4.5	.17	0		0	4.2	2.7	1.9	1.5	1.6	1.1	.80
17	4.3	.13	0		0	4.1	2.7	1.9	1.4	1.8	.90	.83
18	4.2	.13	0		.01	4.0	2.7	1.9	1.4	1.7	.90	.76
19	4.0	.13	0		.03	4.1	2.8	1.9	1.4	2.0	.90	.89
20	3.9	.17	0		.03	4.1	2.7	1.9	1.5	2.0	.90	1.2
21	2.5	.07	0		.03	4.0	2.7	1.7	1.8	1.9	.80	1.2
22	.33	.05	0		.02	3.9	2.7	1.6	1.6	1.8	.80	1.2
23	.33	.01	0		1.1	3.9	2.8	1.5	.80	1.8	.80	1.2
24	.33	.01	0		2.7	3.6	2.7	2.4	.80	1.7	.70	1.1
25	.33	.01	0		2.9	3.6	2.6	2.9	.80	1.7	.90	1.1
26	.33	0	0		3.3	3.5	2.6	3.0	.70	1.8	.80	1.1
27	.33	.02	0		4.2	3.4	2.5	2.9	.80	1.8	.80	1.3
28	.40	.03	0		3.7	3.4	2.7	2.8	1.1	2.0	.70	1.3
29	.33	.02	0		------	3.4	2.8	2.2	1.6	2.0	.70	1.3
30	.27	.02	0		------	3.4	2.6	1.9	1.6	1.9	.60	1.3
31	.27	------	0		------	3.3	------	2.0	------	1.8	.50	------
TOTAL	74.75	4.22	.24	0	18.02	110.8	85.8	70.1	46.40	48.70	32.80	30.48
MEAN	2.41	.14	.008	0	.64	3.57	2.86	2.26	1.55	1.57	1.06	1.02
MAX	4.6	.27	.07	0	4.2	4.5	3.4	3.0	2.4	2.0	1.6	1.3
MIN	.27	0	0	0	0	3.0	2.5	1.5	.70	.90	.50	.50

CAL YR 1970 TOTAL 991.08 MEAN 2.72 MAX 6.0 MIN 0
WTR YR 1971 TOTAL 522.31 MEAN 1.43 MAX 4.6 MIN 0

04097200 Gourdneck Creek near Schoolcraft, Mich.

LOCATION.--Lat 42°09'20", long 85°36'48", in NE¼ sec.5, T.4 S., R.11 W., Kalamazoo County, on left bank at upstream side of bridge on Oakland Drive, 3.2 miles northeast of Schoolcraft.

DRAINAGE AREA.--7.29 sq mi.

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 853.71 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to May 21, 1964, nonrecording gage at same site and datum.

AVERAGE DISCHARGE (Creek only).--7 years, 5.03 cfs (9.37 inches per year).
(Combined creek and diversion).--6 years, 9.93 cfs (18.50 inches per year).

EXTREMES.--Current year: Maximum discharge, 20 cfs Dec. 1, Feb. 20; maximum gage height, 1.69 ft Feb. 20; minimum discharge, 0.50 cfs Feb. 28; minimum daily, 0.65 cfs Aug. 26 to Sept. 1; minimum gage height, 1.08 ft June 30, July 1-5, 14, 15.
Period of record: Maximum discharge, 29 cfs Apr. 13, 1965 (caused by release of water from storage above station), Feb. 2, 1968; maximum gage height, 1.83 ft Feb. 2, 1968; minimum discharge, 0.1 cfs Feb. 3-6, 1965 (gage height, 1.00 ft).

REMARKS.--Records good. Gourdneck canal diverts water from stream 100 ft above station to sustain lake levels (see sta 04097195). Figures of runoff have been adjusted since September 1965.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	11	16	11	8.3	9.3	7.4	4.8	2.5	.75	3.8	.65
2	2.6	12	14	10	8.2	8.3	7.2	4.7	2.0	.73	3.3	1.1
3	2.6	13	15	10	8.6	7.7	6.8	4.7	2.0	.75	3.0	1.3
4	2.5	13	14	11	9.2	7.2	6.5	4.7	1.9	.73	2.7	1.3
5	2.5	13	14	11	13	6.7	6.6	4.7	1.8	1.2	2.5	1.6
6	2.5	13	12	11	14	7.3	6.5	5.0	1.7	1.3	2.2	2.5
7	2.5	12	13	10	14	8.6	6.6	5.0	1.7	1.0	2.1	2.6
8	2.6	12	12	9.9	13	8.1	6.2	5.0	1.6	1.5	2.0	2.3
9	3.1	12	12	9.4	13	7.7	5.9	5.0	1.6	1.6	1.7	2.1
10	3.4	12	12	9.0	13	7.6	5.4	5.0	1.5	1.4	1.8	2.1
11	3.1	12	14	9.2	13	7.3	5.3	5.1	1.5	1.3	2.0	2.1
12	3.1	11	15	9.1	13	7.2	5.3	5.0	1.5	1.2	1.8	1.9
13	3.4	11	15	9.0	13	7.2	5.9	4.8	1.5	1.0	1.7	1.8
14	7.2	11	14	9.0	12	9.5	6.0	4.6	1.0	.87	1.6	1.6
15	7.2	11	14	9.0	12	13	5.8	4.6	.98	1.7	1.5	1.5
16	6.5	10	14	9.0	12	12	5.6	4.6	.97	2.6	1.5	1.4
17	6.1	9.6	14	8.8	13	11	5.3	4.8	.98	2.8	1.4	1.4
18	5.7	9.5	13	8.5	14	10	4.9	5.2	.98	2.6	1.4	1.4
19	5.0	9.4	14	8.2	17	11	4.8	5.4	.99	4.6	1.3	1.5
20	5.0	12	13	8.2	20	11	4.9	5.5	1.5	5.2	1.1	2.3
21	9.9	12	13	8.1	17	9.3	4.5	5.6	2.5	4.1	1.0	2.5
22	12	13	13	8.3	16	9.7	4.7	5.5	2.7	3.5	.94	2.2
23	12	8.8	13	8.5	11	9.4	4.4	4.5	4.1	3.0	.81	2.1
24	11	11	9.7	8.4	7.9	8.9	4.4	1.4	3.7	2.9	.77	1.9
25	11	11	12	8.5	7.4	8.5	4.1	1.8	3.2	3.0	.71	1.8
26	10	11	12	7.2	8.3	8.1	4.0	1.8	2.9	4.0	.65	1.7
27	9.9	13	12	5.0	11	7.8	3.8	1.8	2.4	3.8	.65	2.1
28	11	15	12	6.9	6.7	7.9	4.4	1.7	1.8	4.5	.65	2.3
29	13	16	12	8.6	------	7.6	4.9	4.5	.81	5.3	.65	2.2
30	12	15	11	7.5	------	7.1	4.7	4.2	.80	4.9	.65	2.0
31	12	------	11	8.8	------	7.0	------	3.3	------	4.4	.65	------
TOTAL	203.5	355.3	404.7	276.1	338.6	269.0	162.8	134.3	55.11	78.23	48.53	55.25
MEAN	6.56	11.8	13.1	8.91	12.1	8.68	5.43	4.33	1.84	2.52	1.57	1.84
MAX	13	16	16	11	20	13	7.4	5.6	4.1	5.3	3.8	2.6
MIN	2.5	8.8	9.7	5.0	6.7	6.7	3.8	1.4	.80	.73	.65	.65
MEAN+	8.97	11.9	13.1	8.91	12.7	12.2	8.29	6.59	3.39	4.09	2.63	2.86
CFSM+	1.23	1.63	1.80	1.22	1.74	1.67	1.14	.90	.47	.56	.36	.39
IN+	1.42	1.83	2.07	1.41	1.82	1.94	1.27	1.04	.52	.65	.41	.44

CAL YR 1970 TOTAL 2,406.70 MEAN 6.59 MAX 16 MIN 1.7 MEAN+ 9.31 CFSM+ 1.28 IN+ 17.33
WTR YR 1971 TOTAL 2,381.42 MEAN 6.52 MAX 20 MIN .65 MEAN+ 7.96 CFSM+ 1.09 IN+ 14.81
+Adjusted for diversion.

04097500 St. Joseph River at Three Rivers, Mich.

LOCATION.--Lat 41°56'25", long 85°38'00", in SW¼ SE¼ sec.18, T.6 S., R.11 W., St. Joseph County, on right bank in Scidmore Park at Three Rivers, 250 ft downstream from Rocky River, and at mile 112.

DRAINAGE AREA.--1,350 sq mi.

PERIOD OF RECORD.--May 1953 to current year.

GAGE.--Water-stage recorder. Datum of gage is 781.34 ft above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--18 years, 1,010 cfs (10.16 inches per year).

EXTREMES.--Current year: Maximum discharge, 3,600 cfs Feb. 22 (gage height, 7.15 ft); minimum, 198 cfs Sept. 1, 2 (gage height, 2.09 ft); minimum daily discharge, 207 cfs Aug. 28, 29.
Period of record: Maximum discharge, 4,910 cfs Feb. 5, 1968 (gage height, 8.40 ft); minimum daily, 78 cfs Sept. 12, 1964. Maximum discharge since at least 1918, 8,260 cfs Apr. 27, 1950 (gage height, 10.6 ft).

REMARKS.--Records good except those for the winter period, which are fair. Flow regulated by powerplants above station.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	692	1,200	1,940	864	800	3,150	1,810	708	724	454	577	268
2	683	1,280	2,030	1,280	650	3,080	1,780	678	646	369	561	239
3	660	1,380	2,050	1,180	850	2,780	1,770	928	514	208	528	371
4	645	1,420	2,030	1,310	1,100	2,660	1,750	951	519	214	510	312
5	716	1,310	1,960	1,270	1,100	2,590	1,730	956	529	230	499	316
6	595	1,330	1,910	1,070	1,000	2,470	1,660	1,100	551	413	383	527
7	627	1,080	1,820	1,030	1,100	2,360	1,620	999	549	492	238	742
8	615	1,150	1,700	968	1,300	2,340	1,600	699	525	498	240	732
9	627	1,240	1,610	770	1,500	2,220	1,470	842	538	501	407	663
10	638	1,330	1,580	888	1,530	2,210	1,530	1,030	676	395	494	432
11	696	1,380	1,610	1,130	1,590	2,020	1,480	968	633	237	498	299
12	734	1,090	1,610	1,110	1,580	1,950	1,060	951	533	419	481	291
13	760	1,110	1,680	1,120	1,530	2,060	1,280	944	553	488	314	483
14	1,170	1,050	1,750	1,040	1,620	2,040	1,400	932	549	396	275	550
15	1,460	1,320	1,720	1,000	1,500	2,210	1,500	886	534	472	216	525
16	1,610	1,110	1,650	826	1,390	2,720	1,390	628	529	498	380	509
17	1,520	1,050	1,590	905	1,230	2,810	1,340	808	524	438	452	408
18	1,640	1,080	1,520	1,020	1,520	2,910	1,310	770	512	328	366	248
19	1,690	1,070	1,530	980	1,710	2,900	1,290	627	499	592	272	253
20	1,630	1,210	1,550	684	2,250	2,830	1,060	741	501	585	279	468
21	1,500	1,210	1,610	918	2,830	2,720	1,000	790	502	605	209	563
22	1,450	1,120	1,600	963	3,410	2,560	1,030	603	519	588	216	546
23	1,240	1,320	1,590	748	3,310	2,570	1,030	601	521	546	381	446
24	1,050	1,380	1,530	786	3,350	2,450	1,030	604	518	545	454	344
25	1,110	1,210	1,430	946	3,230	2,330	997	618	515	527	289	256
26	1,090	1,040	1,420	850	3,060	2,100	943	721	512	529	304	261
27	1,190	1,200	1,380	800	3,070	2,040	754	658	510	533	275	464
28	1,300	1,390	1,350	700	3,130	2,000	982	536	475	548	207	549
29	1,110	1,660	1,340	620	------	1,930	1,020	547	462	570	207	529
30	1,060	1,940	1,270	550	------	1,910	914	584	457	572	372	515
31	1,130	------	1,020	650	------	1,850	------	593	------	561	438	------
TOTAL	32,638	37,660	50,380	28,976	52,240	74,770	39,530	24,001	16,129	14,351	11,322	13,109
MEAN	1,053	1,255	1,625	935	1,866	2,412	1,318	774	538	463	365	437
MAX	1,690	1,940	2,050	1,310	3,410	3,150	1,810	1,100	724	605	577	742
MIN	595	1,040	1,020	550	650	1,850	754	536	457	208	207	239
CFSM	.78	.93	1.20	.69	1.38	1.79	.98	.57	.40	.34	.27	.32
IN.	.90	1.04	1.39	.80	1.44	2.06	1.09	.66	.44	.40	.31	.36

CAL YR 1970 TOTAL 455,773 MEAN 1,249 MAX 3,180 MIN 350 CFSM .93 IN 12.56
WTR YR 1971 TOTAL 395,106 MEAN 1,082 MAX 3,410 MIN 207 CFSM .80 IN 10.89

04097540 Prairie River near Nottawa, Mich.

LOCATION.--Lat 41°53'18", long 85°24'34", in NW¼ SW¼ sec.6, T.7 S., R.9 W., St. Joseph County, on left bank 10 ft upstream from bridge on State Highway 66, 3.0 miles upstream from unnamed tributary, and 3.0 miles southeast of Nottawa.

DRAINAGE AREA.--106 sq mi.

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 850 ft (from topographic map).

AVERAGE DISCHARGE.--9 years, 81.9 cfs (10.49 inches per year).

EXTREMES.--Current year: Maximum discharge, 245 cfs Feb. 21 (gage height, 4.64 ft) minimum, 17 cfs Aug. 25, 26, 27, 28, Sept. 1, 2 (gage height, 1.99 ft).
Period of record: Maximum discharge, 467 cfs Feb. 4, 1968 (gage height, 5.49 ft); minimum, 11 cfs Aug. 9, 10, Sept. 8, 9, 10, 1964; minimum gage height, 1.77 ft Aug. 9, 10, 1964.

REMARKS.--Records good except those for the winter period, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	91	143	90	52	167	122	70	44	30	28	18
2	49	89	142	90	52	160	123	70	44	29	27	19
3	47	93	136	89	52	146	124	69	43	28	26	21
4	46	94	128	92	52	153	122	67	43	26	26	23
5	45	95	122	98	70	121	118	67	42	27	26	25
6	43	92	118	90	90	130	113	83	43	29	25	29
7	42	88	112	85	100	142	109	95	44	30	25	35
8	41	83	108	85	110	143	106	97	45	32	24	34
9	45	80	104	80	120	169	103	92	45	33	24	32
10	53	82	100	75	120	135	100	85	43	33	24	30
11	55	82	104	75	120	129	95	78	42	32	26	29
12	60	84	108	75	120	125	93	79	41	31	26	29
13	64	83	112	70	120	124	93	75	40	30	25	28
14	81	82	114	70	120	135	94	71	40	29	26	27
15	100	80	112	70	110	168	94	66	39	29	24	26
16	114	78	109	70	100	194	93	62	38	33	24	26
17	118	76	108	68	100	219	91	58	36	36	23	26
18	113	73	107	67	127	220	88	55	35	36	22	25
19	103	72	110	66	154	213	86	53	35	37	22	25
20	94	80	115	66	213	202	84	52	35	38	21	28
21	90	85	120	65	241	193	82	50	38	39	20	30
22	85	90	121	65	237	186	80	48	39	40	19	30
23	84	88	121	64	221	177	77	46	38	38	18	30
24	79	87	120	63	195	168	73	46	37	37	18	29
25	75	84	120	62	172	159	72	47	35	35	18	28
26	71	82	110	60	161	150	70	50	35	35	17	28
27	72	88	105	58	163	142	70	51	33	34	17	29
28	74	110	100	56	165	136	70	49	31	34	18	30
29	87	125	100	54	------	132	71	47	30	32	18	29
30	92	136	95	52	------	129	71	46	28	31	18	28
31	94	------	90	52	------	125	------	44	------	30	18	------
TOTAL	2,267	2,652	3,514	2,222	3,657	4,892	2,787	1,968	1,161	1,013	693	826
MEAN	73.1	88.4	113	71.7	131	158	92.9	63.5	38.7	32.7	22.4	27.5
MAX	118	136	143	98	241	220	124	97	45	40	28	35
MIN	41	72	90	52	52	121	70	44	28	26	17	18
CFSM	.69	.83	1.07	.68	1.24	1.49	.88	.60	.37	.31	.21	.26
IN.	.80	.93	1.23	.78	1.28	1.72	.98	.69	.41	.36	.24	.29

CAL YR 1970 TOTAL 33,672 MEAN 92.3 MAX 267 MIN 34 CFSM .87 IN 11.82
WTR YR 1971 TOTAL 27,652 MEAN 75.8 MAX 241 MIN 17 CFSM .72 IN 9.70

NOTE.--No gage-height record Jan. 7 to Feb. 8.

04097970 Lime Lake Outlet at Panama, Ind.

LOCATION.--Lat 41°42'46", long 85°07'10", in NW1/4NW1/4 sec.35, T.38 N., R.12 E., Steuben County, on right bank 10 ft downstream from dam for Lime Lake, 30 ft upstream from bridge on Orland Road, and 0.7 mile northwest of Panama.

DRAINAGE AREA.--17.5 sq mi.

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is 950.00 ft above mean sea level.

EXTREMES.--Current year: Maximum discharge, 18 cfs Oct. 29 (gage height, 4.09 ft); no flow for several days. Period of record: Maximum discharge, 26 cfs Apr. 20, 1970 (gage height, 4.38 ft); no flow for several days in 1971.

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	14	8.4	6.9	6.0	14	12	.13	.52	.10	.12	.01
2	1.3	13	8.2	6.9	6.2	14	12	.10	.81	.07	.11	0
3	1.2	13	8.2	6.7	6.2	14	12	.10	.84	.05	.09	.01
4	1.0	12	8.2	6.9	6.4	14	12	.11	.88	0	.08	.01
5	1.0	12	8.1	6.9	8.5	14	11	.10	.90	0	.07	.01
6	.95	11	7.9	6.7	8.9	14	11	.22	1.1	0	.06	.02
7	.95	10	7.7	6.7	9.2	14	11	.27	1.0	0	.06	.02
8	.95	10	7.7	6.6	9.2	14	11	.28	.96	0	.05	0
9	1.7	10	7.5	6.4	9.2	14	10	.30	.84	0	.07	0
10	2.6	11	7.5	6.6	9.2	14	10	.36	.76	0	.18	0
11	2.3	10	7.7	6.5	9.3	14	10	.42	.68	0	.39	0
12	2.2	10	7.7	6.4	10	14	9.7	.38	.56	.02	.49	0
13	2.3	9.8	7.9	6.3	10	14	9.5	.35	.48	.05	.47	0
14	4.1	9.6	7.9	6.2	10	14	9.5	.41	.42	.06	.43	0
15	4.3	9.2	7.9	6.4	10	15	9.3	.49	.35	.10	.34	.01
16	3.9	9.0	7.9	6.2	10	16	9.2	.45	.30	.30	.23	0
17	3.6	8.8	7.9	6.2	11	16	9.5	.54	.20	.77	.23	0
18	3.3	8.6	7.9	6.2	11	16	9.9	.54	.15	.69	.22	0
19	3.1	8.4	7.9	6.3	12	15	9.8	.49	.13	.53	.26	0
20	3.3	8.6	7.7	6.2	13	15	9.7	.38	.11	1.2	.24	0
21	3.3	8.6	7.7	6.1	13	15	9.6	.31	.10	3.6	.21	0
22	2.8	8.2	7.7	6.0	14	14	9.4	.29	.09	4.1	.19	.01
23	2.8	7.9	7.7	6.0	14	14	9.3	.34	.08	4.1	.12	0
24	3.1	7.5	7.5	6.0	14	14	8.9	.54	.08	5.3	.12	0
25	3.8	7.5	7.5	6.0	14	13	8.7	.59	.09	3.9	.07	0
26	4.5	7.3	7.3	6.0	15	13	8.6	.43	.11	.22	.04	0
27	5.1	7.3	7.3	5.9	15	13	8.5	.42	.13	.18	.01	0
28	6.2	8.1	7.3	5.9	14	12	8.4	.41	.16	.16	.01	.02
29	11	8.2	7.1	6.2	------	12	8.3	.40	.18	.16	.01	.01
30	16	8.4	7.1	6.1	------	12	5.0	.42	.16	.14	.02	0
31	15	------	6.9	6.0	------	12	------	.46	------	.12	.01	------
TOTAL	119.15	267.0	238.9	196.4	298.3	433	292.8	11.03	13.17	25.92	5.00	.13
MEAN	3.84	9.57	7.71	6.34	10.7	14.0	9.76	.36	.44	.84	.16	.004
MAX	16	14	8.4	6.9	15	16	12	.59	1.1	5.3	.49	.02
MIN	.95	7.3	6.9	5.9	6.0	12	5.0	.10	.08	0	.01	0
CFSM	.22	.55	.44	.36	.61	.80	.56	.02	.03	.05	.009	.0002
IN.	.25	.61	.51	.42	.63	.92	.62	.02	.03	.06	.01	0

CAL YR 1970 TOTAL 2,055.84 MEAN 5.63 MAX 21 MIN .65 CFSM .32 IN 4.37
WTR YR 1971 TOTAL 1,920.80 MEAN 5.26 MAX 16 MIN 0 CFSM .30 IN 4.08

04098500 Fawn River near White Pigeon, Mich.

LOCATION.--Lat 41°46'56", long 85°35'00", in SW¼ sec.10, T.8 S., R.11 W., St. Joseph County, on right bank 0.3 mile downstream from bridge on county highway, 3.1 miles east of White Pigeon, and 3.5 miles upstream from Sherman Mill Creek.

DRAINAGE AREA.--192 sq mi.

PERIOD OF RECORD.--July 1903 to July 1904 (gage heights and discharge measurements only), October 1957 to current year.

GAGE.--Water-stage recorder. Datum of gage is 805.4 ft above mean sea level.

AVERAGE DISCHARGE.--14 years, 153 cfs (10.82 inches per year).

EXTREMES.--Current year: Maximum discharge, 324 cfs Feb. 23 (gage height, 3.52 ft); minimum, 40 cfs July 14; minimum gage height, 1.82 ft Sept. 1, 2.
Period of record: Maximum daily discharge, 600 cfs Jan. 30, 1969; minimum discharge, 26 cfs Aug. 5, 1964; minimum gage height, 1.72 ft Jan. 10, Sept. 10, 1964.
A daily mean discharge of 750 cfs occurred Mar. 15, 1904.

REMARKS.--Records good except those for the winter period, which are fair. Small diurnal fluctuation caused by powerplants above station.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	121	180	205	172	100	302	241	157	94	69	75	55
2	122	177	208	160	100	304	237	163	102	65	67	58
3	118	174	205	157	100	297	229	163	103	62	66	91
4	106	172	201	180	100	287	229	163	94	56	65	74
5	106	186	205	162	150	279	217	150	103	47	67	66
6	115	184	201	110	203	278	222	180	87	58	71	85
7	109	179	199	120	233	279	208	189	92	58	65	100
8	111	175	198	120	244	283	214	182	103	67	69	99
9	105	172	194	130	233	281	201	175	106	78	53	76
10	141	170	189	140	240	277	205	160	102	84	64	90
11	135	169	192	140	234	269	208	170	94	79	64	90
12	131	177	196	140	234	269	191	149	92	67	73	72
13	134	177	199	130	226	267	191	165	90	53	78	77
14	172	174	199	130	212	270	198	169	89	42	60	86
15	199	170	194	120	213	279	198	144	85	73	64	66
16	216	167	192	120	218	290	196	141	84	77	68	83
17	212	165	189	120	228	302	196	128	79	70	71	66
18	199	158	189	120	249	312	189	125	72	63	54	85
19	177	150	198	120	283	317	175	132	78	67	61	63
20	174	165	198	120	306	311	196	125	67	67	61	73
21	167	155	192	120	316	304	184	118	83	83	64	95
22	157	169	192	120	320	298	180	114	85	87	55	67
23	165	165	196	120	323	292	180	106	70	81	62	83
24	169	167	187	110	319	289	167	114	79	65	77	83
25	160	160	186	110	305	285	180	107	75	88	60	62
26	140	167	170	110	297	276	170	125	67	77	72	76
27	152	152	158	100	294	268	160	115	76	81	61	67
28	147	191	175	100	297	262	162	109	64	83	76	86
29	175	194	184	100	------	255	149	105	70	87	60	82
30	165	192	169	100	------	248	160	103	67	81	71	59
31	175	------	160	100	------	245	------	105	------	77	61	------
TOTAL	4,675	5,153	5,920	3,901	6,577	8,775	5,833	4,351	2,552	2,192	2,035	2,315
MEAN	151	172	191	126	235	283	194	140	85.1	70.7	65.6	77.2
MAX	216	194	208	180	323	317	241	189	106	88	78	100
MIN	105	150	158	100	100	245	149	103	64	42	53	55
CFSM	.79	.90	.99	.66	1.22	1.47	1.01	.73	.44	.37	.34	.40
IN.	.91	1.00	1.15	.76	1.27	1.70	1.13	.84	.49	.42	.39	.45

CAL YR 1970 TOTAL 64,719 MEAN 177 MAX 342 MIN 88 CFSM .92 IN 12.54
WTR YR 1971 TOTAL 54,279 MEAN 149 MAX 323 MIN 42 CFSM .78 IN 10.52

04099000 St. Joseph River at Mottville, Mich.

LOCATION.--Lat 41°48'03", long 85°45'22", in SW¼ sec.6, T.8 S., R.12 W., Michigan meridian, St. Joseph County, on right bank 500 ft upstream from bridge on U.S. Highway 12 at Mottville, 0.4 mile downstream from Michigan Power Co. hydroelectric plant, 4 miles upstream from Pigeon River, and at mile 96.

DRAINAGE AREA.--1,866 sq mi.

PERIOD OF RECORD.--October 1923 to current year. 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 Power Co. benchmark). Prior to Oct. 1, 1951, at site 0.4 mile upstream at datum 4.2 ft higher.

AVERAGE DISCHARGE.--48 years, 1,497 cfs (10.89 inches per year).

EXTREMES.--Current year: Maximum discharge, 4,600 cfs Feb. 22, from correlation with adjacent stations; minimum, 138 cfs Sept. 19 (gage height, 1.11 ft); minimum daily, 487 cfs Sept. 19.
Period of record: Maximum discharge, 10,700 cfs Apr. 27, 1950 (gage height, 6.56 ft, site and datum then in use); minimum daily, 39 cfs Oct. 19, 1963.

REMARKS.--Records good except those for the winter period, which are fair. Flow regulated by powerplants above station.

REVISIONS (WATER YEARS).--WSP 1387: 1930, 1932, 1938, 1940-42, 1945. WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,200	1,520	2,440	1,400	1,000	4,000	2,440	1,220	1,220	808	593	498
2	1,060	1,570	2,440	1,540	1,100	3,800	2,410	972	1,050	664	1,010	503
3	986	1,610	2,490	1,800	1,200	3,700	2,390	1,400	747	619	860	500
4	671	1,780	2,510	1,700	1,500	3,500	2,340	1,390	813	544	815	503
5	1,280	1,780	2,500	1,700	1,500	3,400	2,260	1,460	743	527	733	505
6	1,090	1,720	2,440	1,400	1,600	3,200	2,280	1,690	768	521	724	521
7	1,010	1,550	2,410	1,400	1,700	3,100	2,230	1,800	1,160	577	573	922
8	1,020	1,450	2,170	1,400	1,900	3,000	2,120	1,420	1,000	755	557	1,120
9	1,260	1,770	2,120	1,230	2,200	2,900	1,980	1,160	854	804	553	1,020
10	756	1,610	2,130	1,220	2,200	2,800	2,150	1,540	995	553	553	891
11	833	1,690	2,080	1,510	2,200	2,800	1,880	1,440	1,150	566	718	553
12	1,160	1,690	2,110	1,620	2,100	2,900	1,870	1,240	823	690	800	532
13	1,300	1,630	2,010	1,590	2,100	3,200	1,700	1,400	719	719	578	550
14	1,680	1,390	2,160	1,590	2,100	3,500	1,800	1,390	1,120	744	507	775
15	1,610	1,380	2,170	1,530	2,100	3,700	1,840	1,370	989	681	541	787
16	1,770	1,730	2,190	1,340	2,100	3,700	1,910	1,230	778	705	532	718
17	1,880	1,490	2,110	1,290	2,200	3,700	1,850	983	922	667	568	725
18	1,960	1,480	2,080	1,310	2,400	3,530	1,790	1,340	900	555	596	550
19	2,200	1,420	1,890	1,320	2,700	3,630	1,790	1,200	727	778	595	487
20	1,950	1,620	1,920	1,310	3,000	3,610	1,780	947	792	882	547	609
21	1,940	1,620	2,140	1,320	3,300	3,520	1,490	1,310	1,010	859	534	775
22	1,820	1,610	2,070	1,310	3,800	3,360	1,500	891	792	884	530	882
23	1,820	1,420	2,070	1,210	4,100	3,290	1,520	1,060	863	854	525	711
24	1,560	1,770	1,950	1,140	4,000	3,210	1,430	1,020	846	698	535	587
25	1,350	1,840	1,720	1,220	3,800	3,090	1,430	782	823	711	538	573
26	1,630	1,460	2,120	1,240	3,700	2,870	1,500	1,070	675	887	520	559
27	1,410	1,760	1,680	1,130	3,900	2,600	1,350	1,200	713	800	503	689
28	1,570	1,610	1,690	1,000	4,000	2,640	1,080	910	909	787	500	803
29	1,620	1,910	1,820	1,000	------	2,590	1,600	750	784	825	503	838
30	1,580	2,250	1,790	950	------	2,540	1,420	830	652	854	504	809
31	1,460	------	1,690	950	------	2,480	------	887	------	599	498	------
TOTAL	44,436	49,130	65,110	41,670	69,500	99,860	55,130	37,302	26,337	22,117	18,643	20,495
MEAN	1,433	1,638	2,100	1,344	2,482	3,221	1,838	1,203	878	713	601	683
MAX	2,200	2,250	2,510	1,800	4,100	4,000	2,440	1,800	1,220	887	1,010	1,120
MIN	671	1,380	1,680	950	1,000	2,480	1,080	750	652	521	498	487
CFSM	.77	.88	1.13	.72	1.33	1.73	.99	.64	.47	.38	.32	.37
IN.	.89	.98	1.30	.83	1.39	1.99	1.10	.74	.53	.44	.37	.41

CAL YR 1970 TOTAL 618,582 MEAN 1,695 MAX 3,800 MIN 650 CFSM .91 IN 12.33
WTR YR 1971 TOTAL 549,730 MEAN 1,506 MAX 4,100 MIN 487 CFSM .81 IN 10.96

04099750 Pigeon River near Scott, Ind.

LOCATION.--Lat 41°44'56", long 85°34'35", in SE1/4NW1/4 (revised) sec.14, T.38 N., R.8 E., Lagrange County, on right bank 20 ft downstream from bridge on County Road 750 North, 1,200 ft downstream from Page ditch, 0.7 mile south of Indiana-Michigan state line, and 1.2 miles northwest of Scott.

DRAINAGE AREA.--373 sq mi.

PERIOD OF RECORD.--June 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 815.00 ft above mean sea level.

EXTREMES.--Current year: Maximum discharge, 1,170 cfs Feb. 7 (gage height, 5.62 ft); minimum daily, 65 cfs Aug. 15.
Period of record: Maximum discharge, 1,450 cfs Feb. 1, 1969 (gage height, 6.34 ft); minimum daily, 65 cfs Aug. 15, 1971.

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	165	220	371	230	160	763	429	240	182	120	111	68
2	164	219	353	220	170	723	429	238	207	113	107	68
3	158	254	350	210	180	685	426	245	226	108	106	74
4	152	267	355	210	190	650	408	235	213	104	107	82
5	149	251	358	200	555	625	393	235	199	115	110	77
6	146	237	343	200	871	618	381	280	199	134	115	83
7	143	229	336	364	1,130	636	372	308	210	128	109	89
8	138	223	331	365	900	629	363	283	205	119	103	84
9	154	223	325	328	600	569	353	268	199	123	102	78
10	211	239	318	289	550	545	340	263	192	119	116	79
11	223	258	335	263	520	517	333	260	188	114	160	78
12	196	250	349	244	500	496	325	273	183	108	151	82
13	188	241	343	227	480	499	323	263	181	102	120	82
14	270	234	329	218	460	534	333	253	174	96	95	83
15	349	230	314	213	450	608	328	245	169	95	65	80
16	291	226	308	206	440	681	315	238	164	103	79	79
17	245	223	309	206	500	681	310	228	158	116	97	83
18	225	221	303	198	600	632	308	224	154	119	102	87
19	216	218	314	200	727	632	300	219	150	110	95	83
20	212	244	336	200	839	646	293	212	159	139	89	98
21	215	281	332	190	879	646	290	207	160	148	86	117
22	215	277	316	190	815	636	288	201	148	131	92	106
23	175	254	311	190	707	622	280	196	132	117	83	94
24	177	243	303	180	688	594	273	196	134	118	78	88
25	193	234	286	180	688	569	265	214	134	133	75	86
26	188	241	270	170	719	545	260	217	132	129	74	92
27	187	254	270	170	787	520	255	207	132	119	73	97
28	193	320	260	170	803	503	258	200	127	115	72	98
29	236	396	250	160	------	485	253	193	125	119	71	92
30	261	390	240	160	------	464	248	188	121	119	67	86
31	242	------	230	160	------	441	------	184	------	115	67	------
TOTAL	6,277	7,597	9,748	6,711	16,908	18,394	9,732	7,213	5,057	3,648	2,978	2,573
MEAN	202	253	314	216	604	593	324	233	169	118	96.1	85.8
MAX	349	396	371	365	1,130	763	429	308	226	148	160	117
MIN	138	218	230	160	160	441	248	184	121	95	65	68
CFSM	.54	.68	.84	.58	1.62	1.59	.87	.62	.45	.32	.26	.23
IN.	.63	.76	.97	.67	1.69	1.83	.97	.72	.50	.36	.30	.26

CAL YR 1970 TOTAL 108,688 MEAN 298 MAX 949 MIN 113 CFSM .80 IN 10.84
WTR YR 1971 TOTAL 96,836 MEAN 265 MAX 1,130 MIN 65 CFSM .71 IN 9.65

04100220 North Branch Elkhart River near Cosperville, Ind.

LOCATION.--Lat 41°29'32", long 85°26'54", in SW1/4NE1/4 sec.14, T.35 N., R.9 E., Noble County, 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.--134 sq mi (revised).

PERIOD OF RECORD.--October 1950 to September 1971 (discontinued).

GAGE.--Nonrecording gage read twice daily. Datum of gage is 880.00 ft above mean sea level.

AVERAGE DISCHARGE.--21 years, 106 cfs (10.74 inches per year).

EXTREMES.--Current year: Maximum discharge, 309 cfs Feb. 21 (gage height, 7.42 ft); minimum daily, 4.9 cfs Sept. 15, 16, 19.
Period of record: Maximum discharge observed, 717 cfs May 13, 1956 (gage height, 8.78 ft); minimum daily, 2.2 cfs Sept. 17, 18, 21, 1959.

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	47	118	70	38	276	148	53	47	28	23	5.3
2	35	51	117	68	37	267	150	49	54	27	20	5.8
3	34	59	117	67	40	248	149	49	58	21	18	6.2
4	31	61	115	64	50	235	146	51	56	20	17	6.7
5	33	60	111	61	179	226	138	49	54	28	14	5.8
6	33	59	107	60	263	230	133	88	50	28	12	6.7
7	31	59	103	60	281	228	127	109	48	27	12	7.6
8	30	56	99	59	277	224	120	110	47	27	11	9.9
9	36	54	95	58	240	211	115	110	46	23	9.9	8.6
10	45	57	95	56	220	204	111	108	46	20	9.2	7.6
11	48	62	95	55	200	194	105	105	42	19	12	7.1
12	48	64	99	54	190	187	99	101	41	19	11	7.1
13	48	64	97	52	190	184	98	96	39	17	9.9	6.7
14	56	62	96	52	180	193	98	91	38	14	9.9	5.3
15	61	61	93	50	180	201	94	87	37	13	9.9	4.9
16	62	58	95	49	170	225	89	81	36	13	9.2	4.9
17	58	57	91	48	175	230	88	79	31	14	8.6	5.3
18	56	55	89	47	204	223	87	73	27	14	8.6	5.3
19	52	53	90	47	252	223	81	67	22	15	7.6	4.9
20	52	61	95	47	303	216	77	62	18	14	7.6	7.6
21	51	75	97	46	309	222	75	58	20	13	6.7	8.6
22	50	77	95	45	306	218	69	55	20	12	6.7	9.2
23	48	75	93	44	298	216	67	53	20	12	6.2	8.6
24	46	73	87	43	290	206	63	50	20	19	6.2	7.6
25	46	71	89	43	293	199	60	55	20	20	7.6	8.0
26	45	69	87	42	306	191	59	62	20	29	8.0	9.9
27	43	68	83	41	305	184	57	65	19	27	7.6	9.9
28	43	83	81	41	288	178	55	59	18	27	6.7	9.9
29	48	99	77	40	------	170	55	55	20	29	6.7	9.9
30	52	113	75	40	------	162	53	52	27	26	5.8	9.2
31	50	------	73	39	------	154	------	50	------	25	5.8	------
TOTAL	1,411	1,963	2,954	1,588	6,064	6,525	2,866	2,232	1,041	640	314.4	220.1
MEAN	45.5	65.4	95.3	51.2	217	210	95.5	72.0	34.7	20.6	10.1	7.34
MAX	62	113	118	70	309	276	150	110	58	29	23	9.9
MIN	30	47	73	39	37	154	53	49	18	12	5.8	4.9
CFSM	.34	.49	.72	.39	1.63	1.58	.72	.54	.26	.15	.08	.06
IN.	.39	.55	.83	.44	1.70	1.83	.80	.62	.29	.18	.09	.06

CAL YR 1970 TOTAL 31,240.8 MEAN 85.6 MAX 303 MIN 8.0 CFSM .64 IN 8.74
WTR YR 1971 TOTAL 27,818.5 MEAN 76.2 MAX 309 MIN 4.9 CFSM .57 IN 7.78

04100500 Elkhart River at Goshen, Ind.

LOCATION.--Lat 41°35'36", long 85°50'55", in NE1/4NE1/4 sec.8 (revised), T.36 N., R.6 E., Elkhart County, on right bank 20 ft downstream from River Avenue Bridge at Goshen and 0.5 mile upstream from Rock Run.

DRAINAGE AREA.--594 sq mi (revised).

PERIOD OF RECORD.--April 1931 to current year.

GAGE.--Water-stage recorder. Datum of gage is 769.43 ft above mean sea level. Prior to Nov. 20, 1931, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--40 years, 496 cfs (11.61 inches per year).

EXTREMES.--Current year: Maximum discharge, 2,020 cfs Feb. 6 (gage height, 6.04 ft); minimum daily, 94 cfs Sept. 18.
Period of record: Maximum discharge, 5,440 cfs Apr. 4, 1950 (gage height, 10.15 ft); maximum gage height, 10.33 ft July 10, 1951; minimum daily discharge, 7.0 cfs Aug. 11, 1964, result of extreme regulation.

REMARKS.--Records good. The flow is regulated by three powerplants upstream from station.

REVISIONS (WATER YEARS).--WSP 1337: 1939(M), drainage area. WSP 1557: 1954.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	220	347	756	350	190	1,130	595	288	246	193	158	101
2	208	360	651	350	200	1,040	610	287	320	183	147	97
3	196	475	595	350	210	977	600	289	315	169	134	97
4	188	569	571	365	230	889	580	290	286	159	130	98
5	208	488	559	354	1,200	856	565	315	268	185	124	96
6	207	433	546	333	1,870	829	550	475	256	193	121	103
7	214	402	526	341	1,920	873	540	653	246	181	118	112
8	202	381	510	372	1,200	818	525	553	236	175	118	110
9	229	357	499	329	950	735	505	501	231	175	115	103
10	287	360	489	297	850	730	495	477	226	169	131	107
11	341	378	505	293	800	686	480	465	224	174	138	99
12	312	377	517	293	780	670	471	468	249	165	130	99
13	293	365	516	293	760	768	471	452	237	156	119	98
14	323	348	501	289	760	1,060	480	432	218	152	121	98
15	404	340	477	281	740	1,270	467	407	206	140	115	98
16	398	330	462	273	740	1,300	458	393	198	135	110	97
17	362	323	460	269	740	1,100	449	374	191	140	110	96
18	336	317	450	260	1,030	966	440	355	184	140	104	94
19	328	314	467	250	1,350	955	420	337	184	146	105	95
20	316	365	538	240	1,550	1,050	399	320	180	143	104	115
21	314	467	512	240	1,410	999	393	303	170	151	105	124
22	315	451	484	230	1,140	961	387	288	167	141	111	118
23	306	411	476	220	1,110	933	372	275	161	132	131	114
24	299	371	450	210	1,080	845	339	269	155	141	134	107
25	289	344	386	200	1,050	790	319	287	160	149	123	107
26	290	361	368	200	1,200	752	342	291	167	153	118	120
27	284	374	370	190	1,380	724	306	274	162	171	116	128
28	295	540	360	190	1,300	691	307	275	151	179	113	123
29	360	822	360	180	------	670	308	262	172	181	110	113
30	434	845	360	180	------	640	297	253	198	172	109	105
31	389	------	360	180	------	625	------	243	------	164	103	------
TOTAL	9,147	12,615	15,081	8,402	27,740	27,332	13,470	11,151	6,364	5,007	3,725	3,172
MEAN	295	421	486	271	991	882	449	360	212	162	120	106
MAX	434	845	756	372	1,920	1,300	610	653	320	193	158	128
MIN	188	314	360	180	190	625	297	243	151	132	103	94
CFSM	.51	.73	.84	.47	1.71	1.52	.77	.62	.37	.28	.21	.18
IN.	.59	.81	.97	.54	1.78	1.75	.86	.72	.41	.32	.24	.20

CAL YR 1970 TOTAL 172,817 MEAN 473 MAX 2,150 MIN 116 CFSM .82 IN 11.08
WTR YR 1971 TOTAL 143,206 MEAN 392 MAX 1,920 MIN 94 CFSM .68 IN 9.18

04101000 St. Joseph River at Elkhart, Ind.

LOCATION.--Lat 41°41'30", long 85°58'30", in SW1/4NE1/4 sec.5, T.37 N., R.5 E., Elkhart County, on left bank 200 ft downstream from mouth of Elkhart River, 200 ft upstream from Main Street Bridge in Elkhart, 2,000 ft downstream from Christiana Creek, and 0.5 mile downstream from Elkhart Hydroelectric Plant.

DRAINAGE AREA.--3,339 sq mi.

PERIOD OF RECORD.--August 1947 to current year. Gage heights at site 0.8 mile downstream at different datum for September 1924 to March 1926 are available in the district office.

GAGE.--Water-stage recorder. Datum of gage is 700.00 ft above mean sea level.

AVERAGE DISCHARGE.--24 years, 3,005 cfs (12.22 inches per year).

EXTREMES.--Current year: Maximum discharge, 7,810 cfs Feb. 23 (gage height, 22.33 ft); minimum daily, 651 cfs Aug. 26.
Period of record: Maximum discharge, 18,400 cfs Apr. 5, 1950 (gage height, 27.82 ft); minimum daily, 336 cfs Aug. 5, 1964.

REMARKS.--Records good. The flow is regulated by Elkhart Hydroelectric Plant and by a hydroelectric plant on Elkhart River at Goshen.

REVISIONS.--WSP 1337: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,900	2,790	4,550	2,600	4,320	7,050	4,460	2,360	2,010	1,400	1,080	862
2	2,040	2,990	4,420	2,480	4,CEC	6,890	4,480	2,200	2,100	1,210	1,360	848
3	1,770	3,240	4,300	3,180	3,650	6,620	4,410	2,210	1,71C	1,180	1,450	860
4	1,970	3,340	4,34C	3,140	3,57C	6,040	4,310	2,650	1,680	1,060	1,370	899
5	2,050	3,500	4,270	2,680	4,860	5,87C	4,14C	2,480	1,58C	1,070	1,370	951
6	2,050	3,260	4,13C	2,600	5,97C	5,86C	4,100	2,900	1,610	1,050	1,220	1,050
7	1,880	3,030	4,070	2,210	5,42C	5,86C	4,050	3,140	1,900	1,110	1,030	1,270
8	1,820	2,97C	3,86C	2,420	5,CCC	5,390	3,820	3,110	1,90C	1,260	1,01C	1,680
9	1,860	2,680	3,67C	2,360	4,8CC	5,27C	3,79C	2,660	1,69C	1,390	1,020	1,630
10	2,100	3,140	3,64C	2,350	4,600	5,170	3,580	2,800	1,73C	1,050	1,090	1,470
11	1,490	2,930	3,710	2,450	4,490	5,140	3,700	2,810	1,910	1,100	1,260	1,140
12	1,810	3,07C	3,75C	2,930	4,570	4,810	3,400	2,750	1,69C	1,150	1,340	999
13	2,110	3,020	3,750	2,750	4,43C	4,830	3,260	2,690	1,490	1,190	1,120	1,150
14	2,780	2,780	3,660	2,660	4,260	5,570	3,190	2,560	1,730	1,220	950	1,150
15	3,310	2,620	3,74C	2,650	4,07C	6,250	3,480	2,530	1,810	1,210	995	1,310
16	3,110	2,780	3,730	2,500	4,120	6,650	3,370	2,390	1,38C	1,210	931	1,270
17	3,320	2,820	3,72C	2,310	3,85C	6,690	3,360	2,130	1,490	1,100	936	1,220
18	3,370	2,600	3,580	2,240	4,500	6,60C	3,290	2,280	1,46C	1,190	985	1,130
19	3,430	2,620	3,500	2,200	5,57C	6,600	3,200	2,320	1,300	1,420	989	884
20	3,280	2,660	3,540	2,150	6,38C	6,68C	3,190	1,970	1,430	950	939	1,140
21	3,290	2,870	3,69C	2,100	6,47C	6,530	2,930	2,100	1,55C	1,390	922	1,300
22	3,050	3,380	3,660	2,100	7,23C	6,180	2,690	2,060	1,420	1,420	934	1,260
23	2,930	3,100	3,650	2,150	7,260	6,100	2,840	1,760	1,380	1,440	905	1,350
24	2,870	2,880	3,530	2,100	6,97C	5,84C	2,650	2,010	1,40C	1,390	911	1,200
25	2,580	3,140	3,100	2,000	6,890	5,64C	2,650	1,810	1,40C	1,250	1,140	1,370
26	2,650	3,010	3,04C	1,900	7,16C	5,32C	2,720	1,860	1,260	1,260	651	1,200
27	2,600	2,820	2,900	1,860	7,260	5,060	2,780	2,210	1,300	1,440	871	1,210
28	2,640	3,450	2,90C	1,940	7,23C	4,910	2,150	1,780	1,420	1,380	913	1,300
29	2,870	3,800	2,800	2,200	------	4,820	2,310	1,720	1,330	1,550	896	1,350
30	3,030	4,41C	2,80C	2,380	------	4,730	2,920	1,640	1,210	1,44C	868	1,330
31	2,850	------	2,700	3,600	------	4,560	------	1,640	------	1,300	859	------
TOTAL	78,81C	91,70C	112,7CC	75,190	148,98C	179,530	101,220	71,530	47,27C	38,78C	32,315	35,783
MEAN	2,542	3,057	3,635	2,425	5,321	5,791	3,374	2,307	1,576	1,251	1,042	1,193
MAX	3,430	4,410	4,550	3,600	7,260	7,050	4,480	3,140	2,10C	1,550	1,450	1,680
MIN	1,490	2,600	2,7CC	1,860	3,57C	4,560	2,150	1,640	1,210	950	651	848
CFSM	.76	.92	1.09	.73	1.59	1.73	1.01	.69	.47	.37	.31	.36
IN.	.88	1.02	1.26	.84	1.66	2.00	1.13	.80	.53	.43	.36	.40

CAL YR 1970 TOTAL 1,155,610 MEAN 3,166 MAX 7,670 MIN 1,240 CFSM .95 IN 12.87
WTR YR 1971 TOTAL 1,013,ECE MEAN 2,778 MAX 7,260 MIN 651 CFSM .83 IN 11.29

04101500 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., Berrien County, on right bank 100 ft upstream from Main Street Bridge at Niles, 0.6 mile downstream from dam at French Paper Co., 1 miles upstream from Dowagiac River, and at mile 44.

DRAINAGE AREA.--3,666 sq mi.

PERIOD OF RECORD.--October 1930 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 633.02 ft above mean sea level. Prior to Oct. 1, 1968, at datum 2.0 ft higher. Oct. 1, 1930, to Feb. 11, 1931, nonrecording gage on Main Street Bridge, and Feb. 12 to June 30, 1931, nonrecording gage 50 ft upstream from present site (gage heights referred to mean sea level). Since Apr. 13, 1970, auxiliary water-stage recorder 1.1 miles downstream from base gage at same datum. Oct. 1, 1943, to Apr. 12, 1970, auxiliary gage was headwater gage at hydroelectric plant at Buchanan Dam, 8 miles downstream from base gage at different datum.

AVERAGE DISCHARGE.--41 years, 3,092 cfs (11.45 inches per year).

EXTREMES.--Current year: Maximum discharge, 8,380 cfs Feb. 26 (gage height, 8.99 ft); minimum daily discharge 622 cfs Aug. 28.
Period of record: Maximum discharge, 20,200 cfs Apr. 5, 1950 (gage height, 15.10 ft, present datum); minimum daily, 420 cfs Aug. 30, 1931.

REMARKS.--Records good. Flow regulated by powerplants above station.

REVISIONS (WATER YEARS).--WSP 1387: 1931, 1933-36, 1940-43, 1945-46 (M) 1949 (M). WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2,460	3,020	4,700	3,470	3,100	6,650	4,630	2,840	1,900	1,460	1,500	1,070
2	2,310	3,230	4,660	3,050	3,000	6,510	4,610	2,520	2,500	1,500	1,260	1,280
3	2,170	3,440	4,380	3,060	2,700	6,600	4,610	2,470	2,350	1,250	1,640	1,060
4	2,040	3,630	4,500	3,770	2,700	6,120	4,610	2,790	1,850	1,560	1,650	1,170
5	2,440	3,810	4,200	3,220	2,900	5,770	4,410	2,830	1,990	1,360	1,740	1,230
6	2,290	3,370	4,830	3,090	3,000	5,420	4,360	3,440	1,950	1,500	1,490	1,630
7	2,220	3,500	4,000	3,000	3,500	5,640	4,320	3,780	2,010	1,370	1,180	1,490
8	2,070	3,150	4,300	2,800	4,000	5,300	4,220	2,940	2,260	1,440	1,160	1,750
9	2,180	2,960	3,860	2,500	4,300	5,260	3,800	3,240	2,140	1,910	1,340	1,780
10	2,360	3,310	3,770	2,700	4,440	4,970	4,300	2,890	1,950	1,670	1,400	1,710
11	2,040	3,170	4,050	3,000	4,150	5,040	3,810	3,160	2,100	1,400	1,680	1,730
12	1,940	3,240	3,950	3,000	4,260	4,700	3,780	3,050	2,090	1,040	1,540	1,280
13	2,520	3,230	3,860	3,000	4,580	4,790	3,680	2,710	2,000	1,240	1,430	1,170
14	3,420	3,010	3,790	3,000	3,950	5,320	3,620	2,970	1,960	1,530	1,420	1,310
15	3,200	2,800	4,120	2,830	3,980	6,480	3,680	2,850	2,040	1,410	1,190	1,370
16	3,220	3,160	3,920	2,770	3,970	7,010	3,650	2,770	2,560	1,370	1,220	1,490
17	3,720	3,120	3,840	2,480	3,750	6,700	3,710	2,500	1,790	1,770	1,260	1,420
18	3,420	2,890	3,790	2,660	4,310	6,430	3,620	2,380	1,850	1,480	1,210	1,440
19	3,530	2,820	3,720	2,510	5,700	6,570	3,490	2,710	1,830	1,910	1,220	1,350
20	3,620	2,930	3,810	2,670	6,330	6,480	3,480	2,400	1,440	1,350	1,300	1,320
21	3,450	3,000	3,840	2,500	6,610	6,480	3,460	2,090	1,570	1,390	1,260	1,350
22	3,100	3,140	3,890	2,580	6,790	6,250	3,390	2,520	1,590	1,610	1,170	1,540
23	3,180	3,820	3,820	2,430	7,210	5,930	2,840	2,020	1,610	1,640	1,270	1,570
24	3,320	3,180	3,700	2,490	6,820	5,950	2,770	2,260	1,630	1,670	1,220	1,370
25	2,940	3,420	3,590	2,730	6,620	5,670	3,010	2,120	1,630	1,540	1,360	1,580
26	2,710	3,220	3,200	2,600	7,000	5,210	3,050	2,270	1,610	1,560	1,320	1,640
27	2,880	3,160	3,760	2,310	7,080	4,960	2,910	2,220	1,520	1,630	1,150	1,310
28	2,870	3,720	3,420	2,090	7,280	4,880	2,760	2,290	1,550	1,680	622	1,470
29	2,970	4,030	3,180	1,960	------	4,970	2,640	2,130	1,870	1,740	1,040	1,700
30	3,390	4,540	3,410	2,330	------	4,840	2,920	1,860	1,620	1,650	1,360	1,380
31	2,950	------	3,190	2,050	------	4,810	------	2,090	------	1,680	1,000	------
TOTAL	86,930	99,020	121,050	84,650	134,030	177,710	110,140	81,110	56,760	47,310	40,602	42,960
MEAN	2,804	3,301	3,905	2,731	4,787	5,733	3,671	2,616	1,892	1,526	1,310	1,432
MAX	3,720	4,540	4,830	3,770	7,280	7,010	4,630	3,780	2,560	1,910	1,740	1,780
MIN	1,940	2,800	3,180	1,960	2,700	4,700	2,640	1,860	1,440	1,040	622	1,060
CFSM	.76	.90	1.07	.75	1.31	1.56	1.00	.71	.52	.42	.36	.39
IN.	.88	1.00	1.23	.86	1.36	1.80	1.12	.82	.58	.48	.41	.44

CAL YR 1970 TOTAL 1,222,500 MEAN 3,349 MAX 9,200 MIN 1,300 CFSM .91 IN 12.41
WTR YR 1971 TOTAL 1,082,272 MEAN 2,965 MAX 7,280 MIN 622 CFSM .81 IN 10.98

04101800 Dowagiac River at Summerville, Mich.

LOCATION.—Lat 41°54'57", long 86°12'47", in SE¼ sec.30, T.6 S., R.16 W., Cass County, on right bank 30 ft upstream from bridge on Indian Lake Road, 0.3 mile west of Summerville.

DRAINAGE AREA.—255 sq mi.

PERIOD OF RECORD.—October 1960 to current year.

GAGE.—Water-stage recorder. Datum of gage is 692.62 ft above mean sea level.

AVERAGE DISCHARGE.—11 years, 260 cfs (13.82 inches per year).

EXTREMES.—Current year: Maximum discharge, 757 cfs Mar. 15 (gage height, 6.46 ft); minimum, 121 cfs Aug. 31 (gage height, 2.94 ft). Period of record: Maximum discharge, 1,280 cfs June 26, 1968 (gage height, 8.78 ft); minimum, 86 cfs Sept. 10, 1964; minimum gage height, 2.57 ft Aug. 8, 9, 1964.

REMARKS.—Records excellent. Flow regulated by millpond and lake level control dam above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	222	294	432	270	213	554	358	251	200	162	162	123
2	219	302	400	268	227	494	356	248	204	159	158	125
3	213	430	372	268	237	450	352	246	201	152	157	131
4	209	424	366	285	251	408	346	239	195	149	156	134
5	209	402	354	298	394	390	340	244	194	157	151	143
6	210	364	327	275	436	400	334	340	192	177	146	182
7	204	332	319	277	410	444	327	329	197	168	140	195
8	203	312	312	270	372	428	317	293	192	166	137	174
9	212	356	308	259	346	406	310	270	189	176	137	167
10	216	352	300	259	321	408	300	259	185	168	142	160
11	212	342	364	255	317	398	296	253	184	164	173	157
12	213	321	426	251	323	396	294	253	189	158	161	152
13	218	306	400	250	306	436	306	241	185	150	148	149
14	302	293	368	250	293	556	312	233	181	142	144	146
15	368	281	340	248	296	691	304	230	180	140	141	142
16	338	279	327	246	285	715	296	225	176	140	138	141
17	300	275	323	244	289	624	296	200	173	151	134	142
18	277	272	323	241	331	554	291	201	171	167	131	142
19	264	268	348	248	440	542	285	203	175	166	127	149
20	257	283	368	246	681	544	281	203	164	181	126	197
21	255	306	340	246	705	510	277	198	158	182	137	211
22	250	294	323	242	614	496	274	195	161	177	142	190
23	244	277	315	242	556	470	268	194	164	165	134	182
24	241	275	306	242	496	444	260	197	165	164	129	176
25	235	277	293	241	464	424	255	239	164	162	131	168
26	230	279	289	233	530	408	251	239	161	167	128	169
27	228	362	291	201	699	400	250	222	159	162	127	180
28	248	510	287	212	645	412	255	212	148	159	128	184
29	356	514	283	225	------	380	260	206	144	189	124	173
30	352	478	262	233	------	368	255	201	144	190	123	166
31	319	------	281	209	------	360	------	197	------	173	122	------
TOTAL	7,824	10,060	10,347	7,734	11,477	14,510	8,906	7,261	5,295	5,083	4,334	4,850
MEAN	252	335	334	249	410	468	297	234	177	164	140	162
MAX	368	514	432	298	705	715	358	340	204	190	173	211
MIN	203	268	262	201	213	360	250	194	144	140	122	123
CFSM	.99	1.31	1.31	.98	1.61	1.84	1.16	.92	.69	.64	.55	.64
IN.	1.14	1.47	1.51	1.13	1.67	2.12	1.30	1.06	.77	.74	.63	.71

CAL YR 1970 TOTAL 115,667 MEAN 317 MAX 928 MIN 172 CFSM 1.24 IN 16.87
WTR YR 1971 TOTAL 97,681 MEAN 268 MAX 715 MIN 122 CFSM 1.05 IN 14.25

STREAMS TRIBUTARY TO LAKE MICHIGAN

04102500 Paw Paw River at Riverside, Mich.

LOCATION.—Lat 42°11'10", long 86°22'06", in SW¼ SE¼ sec.23, T.3 S., R.18 W., Berrien County, on left bank 40 ft upstream from bridge on Coloma Road, 0.8 mile east of Riverside.

DRAINAGE AREA.—390 sq mi.

PERIOD OF RECORD.—October 1951 to current year.

GAGE.—Water-stage recorder. Datum of gage is 588.80 ft above mean sea level. May 10, 1966, to July 11, 1967, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.—20 years, 402 cfs (14.00 inches per year).

EXTREMES.—Current year: Maximum discharge,1,380 cfs Feb. 25 (gage height, 8.73 ft); minimum,228 cfs Sept. 2 (gage height, 3.63 ft). Period of record: Maximum discharge, 2,140 cfs Feb. 6, 1968 (gage height, 9.32 ft); minimum, 99 cfs July 5, 1964 (gage height, 2.66 ft).

REMARKS.—Records good except those for the winter period, 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 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	305	399	450	422	290	1,090	632	391	337	242	280	243
2	299	410	476	410	290	1,050	610	401	332	241	276	229
3	292	429	489	403	300	1,050	580	406	325	242	273	241
4	286	449	509	406	310	1,050	552	404	319	245	270	284
5	280	458	525	397	370	1,000	538	402	314	304	265	327
6	277	455	525	406	430	932	525	411	306	408	261	346
7	274	444	509	400	500	867	515	403	297	376	258	350
8	273	430	486	400	540	795	501	377	292	358	255	353
9	276	423	467	400	560	739	484	356	296	360	253	360
10	277	423	452	400	580	717	474	366	297	354	252	349
11	273	426	458	400	580	699	467	367	281	354	263	337
12	272	416	480	390	560	684	457	376	283	352	260	321
13	275	401	513	390	540	678	452	378	290	350	263	291
14	316	388	513	380	520	690	457	380	291	318	262	259
15	332	375	509	370	500	771	450	394	290	301	265	270
16	333	367	511	360	500	863	446	395	288	297	260	287
17	332	359	527	360	540	845	449	374	284	305	265	285
18	333	351	537	350	620	869	460	341	282	332	242	286
19	339	344	543	350	734	1,010	465	356	286	389	241	293
20	367	344	547	350	853	1,110	464	357	287	543	241	300
21	380	346	539	350	1,180	1,120	460	343	287	537	244	288
22	375	346	529	350	1,130	1,070	446	308	282	458	239	299
23	368	344	521	340	1,140	1,000	432	332	275	388	241	305
24	365	343	509	340	1,190	929	422	325	271	349	239	306
25	365	342	523	340	1,330	877	413	298	291	331	236	302
26	367	350	519	340	1,340	833	411	298	276	317	234	292
27	365	350	503	330	1,290	798	399	317	279	293	234	301
28	361	350	478	310	1,220	762	376	328	263	255	235	308
29	371	370	438	300	------	713	380	353	235	265	234	324
30	370	400	406	290	------	679	383	358	238	275	232	330
31	363	------	397	290	------	652	------	345	------	282	231	------
TOTAL	10,061	11,632	15,388	11,324	19,937	26,942	14,100	11,240	8,674	10,421	7,804	9,066
MEAN	325	388	496	365	712	869	470	363	289	336	252	302
MAX	380	458	547	422	1,340	1,120	632	411	337	543	280	360
MIN	272	342	397	290	290	652	376	298	235	241	231	229
CFSM	.83	.99	1.27	.94	1.83	2.23	1.21	.93	.74	.86	.65	.77
IN.	.96	1.11	1.47	1.08	1.90	2.57	1.34	1.07	.83	.99	.74	.86

CAL YR 1970 TOTAL 168,703 MEAN 462 MAX 1,190 MIN 245 CFSM 1.18 IN 16.09
WTR YR 1971 TOTAL 156,589 MEAN 429 MAX 1,340 MIN 229 CFSM 1.10 IN 14.94

04102700 Black River near Bangor, Mich.

LOCATION.—Lat 42°21'15", long 86°11'15", in NW¼ sec.28, T.1 S., R.16 W., Van Buren County, on left bank 50 ft upstream from bridge on 66th Street, 4.9 miles northwest of Bangor.

DRAINAGE AREA.—83.6 sq mi.

PERIOD OF RECORD.—June 1966 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 615 ft (from topographic map).

AVERAGE DISCHARGE.—5 years, 95.8 cfs (15.56 inches per year).

EXTREMES.—Current year: Maximum discharge, 470 cfs Feb. 21; minimum, 22 cfs Sept. 2; minimum gage height, 1.96 ft July 3, 4, 5. Period of record: Maximum discharge, 681 cfs Feb. 2, 1968 (gage height, 9.92 ft); minimum, 20 cfs Sept. 28, 1966 (gage height 1.83 ft).

REMARKS.—Records good except those for the winter period and those for period of no gage-height record, which are poor. Occasional regulation caused by mills above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	48	119	62	50	355	88	56	37	26	41	23
2	37	47	113	60	50	300	86	54	37	25	39	23
3	35	63	103	58	50	250	85	53	35	24	41	90
4	34	72	91	56	50	220	81	52	34	24	39	125
5	33	79	81	55	70	200	77	51	33	80	37	137
6	32	74	74	54	90	180	74	51	33	119	35	151
7	31	68	69	53	100	160	72	49	34	85	33	141
8	31	60	65	52	110	150	69	48	33	77	32	113
9	32	55	64	52	110	140	67	47	33	75	32	89
10	32	56	63	52	110	130	65	46	32	65	32	68
11	32	58	95	52	100	120	61	46	33	53	40	57
12	32	57	159	50	95	120	62	52	32	45	34	47
13	32	55	167	50	90	140	80	51	32	41	32	42
14	50	52	152	50	85	200	97	49	33	38	32	39
15	55	49	134	50	80	300	83	47	33	54	31	55
16	53	47	117	50	80	378	78	45	33	92	29	51
17	50	46	104	50	85	321	72	43	32	92	29	35
18	46	45	95	50	100	270	71	42	31	85	28	32
19	43	44	107	50	150	243	58	40	33	76	28	35
20	41	47	131	50	350	250	77	39	31	71	30	57
21	41	53	124	50	450	227	64	37	32	65	29	73
22	40	58	106	50	450	207	59	36	31	56	28	67
23	40	58	92	50	400	183	57	36	32	49	27	54
24	39	56	84	50	350	155	55	37	29	54	26	47
25	37	56	82	50	320	135	53	40	26	48	26	43
26	36	53	78	50	310	122	51	41	28	45	26	42
27	36	63	75	50	401	113	58	40	30	42	26	84
28	37	103	72	50	416	109	54	39	28	42	26	120
29	51	128	68	50	------	104	57	38	26	50	24	75
30	51	130	66	50	------	99	56	36	25	42	23	72
31	52	------	64	50	------	92	------	36	------	43	23	------
TOTAL	1,229	1,880	3,014	1,606	5,102	5,973	2,067	1,377	951	1,783	958	2,087
MEAN	39.6	62.7	97.2	51.8	182	193	68.9	44.4	31.7	57.5	30.9	69.6
MAX	55	130	167	62	450	378	97	56	37	119	41	151
MIN	31	44	63	50	50	92	51	36	25	24	23	23
CFSM	.47	.75	1.16	.62	2.18	2.31	.82	.53	.38	.69	.37	.83
IN.	.55	.84	1.34	.71	2.27	2.66	.92	.61	.42	.79	.43	.93

CAL YR 1970 TOTAL 33,921 MEAN 92.9 MAX 518 MIN 28 CFSM 1.11 IN 15.09
WTR YR 1971 TOTAL 28,027 MEAN 76.8 MAX 450 MIN 23 CFSM .92 IN 12.47

PEAK DISCHARGE (BASE, 400 CFS)

DATE	TIME	GHT	DISCHARGE
02-21	unknown	unknown	470
02-27	2400	8.22	446

NOTE.—No gage height record Feb. 21-26.

04103500 Kalamazoo River at Marshall, Mich.

LOCATION.--Lat 42°15'55", long 84°57'55", in line between secs. 25 and 26, T.2 S., R.6 W., Calhoun County, on left bank at upstream side of bridge on U. S. Highway 27 at Marshall.

DRAINAGE AREA.--449 sq mi.

PERIOD OF RECORD.--October 1948 to current year: Monthly discharge only for October 1948, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 877.09 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to Nov. 11, 1948, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--23 years, 295 cfs (8.92 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,280 cfs Feb. 22 (gage height, 6.90 ft); minimum, 22 cfs July 31; minimum gage height, 3.22 ft Aug. 26, Sept. 2; minimum daily discharge, 40 cfs Sept. 3.
Period of record: Maximum discharge, 2,130 cfs Mar. 29, 1950 (gage height, 8.20 ft); minimum, 12 cfs Aug. 2, 1967; minimum gage height, 3.00 ft May 16, 1963; minimum daily discharge, 31 cfs Aug. 16, 1964.

REMARKS.--Records good. Diurnal fluctuation caused by powerplant above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	279	285	544	283	246	656	468	345	240	190	159	228
2	269	375	527	283	232	606	469	356	176	125	240	106
3	230	359	506	294	240	553	470	279	245	199	195	40
4	232	330	499	416	265	512	380	279	162	161	149	45
5	230	464	500	286	536	494	404	278	193	219	154	284
6	178	300	376	279	599	487	464	344	244	355	182	151
7	204	294	391	276	534	409	345	295	244	407	63	176
8	234	437	360	273	520	486	370	276	243	180	125	159
9	250	290	343	272	485	489	384	276	240	314	261	160
10	297	294	406	273	455	480	308	362	153	169	234	129
11	384	458	406	273	377	470	420	274	184	184	160	42
12	282	348	463	273	308	374	376	312	223	265	177	167
13	321	295	511	349	270	389	395	272	239	263	246	226
14	464	383	426	264	290	482	399	269	237	107	75	135
15	464	304	335	264	300	574	363	266	234	81	49	139
16	474	285	494	249	402	745	421	263	190	281	272	157
17	502	358	363	199	328	741	400	261	165	254	191	178
18	502	341	395	231	407	708	314	260	229	248	210	57
19	467	279	417	269	985	650	438	259	173	174	184	141
20	453	288	326	261	1,190	610	399	256	231	277	188	233
21	368	453	503	261	1,250	579	377	254	164	268	67	157
22	375	358	368	261	1,230	549	297	249	123	162	195	140
23	352	300	454	259	1,120	530	376	247	239	254	180	184
24	321	414	304	258	893	512	336	245	237	229	188	102
25	321	288	307	258	725	493	287	252	174	96	181	253
26	327	289	306	254	664	480	285	255	123	175	49	56
27	318	462	399	224	669	470	337	251	198	245	165	264
28	321	424	341	221	699	466	324	248	249	194	210	251
29	258	442	289	236	------	357	282	246	128	140	75	186
30	388	572	288	242	------	423	282	244	186	234	256	192
31	388	------	375	202	------	397	------	240	------	82	208	------
TOTAL	10,453	10,769	12,522	8,243	16,219	16,171	11,170	8,513	6,066	6,532	5,288	4,738
MEAN	337	359	404	266	579	522	372	275	202	211	171	158
MAX	502	572	544	416	1,250	745	470	362	249	407	272	284
MIN	178	279	288	199	232	357	282	240	123	81	49	40
CFSM	.75	.80	.90	.59	1.29	1.16	.83	.61	.45	.47	.38	.35
IN.	.87	.89	1.04	.68	1.34	1.34	.93	.71	.56	.54	.44	.39

CAL YR 1970 TOTAL 131,540 MEAN 360 MAX 779 MIN 98 CFSM .80 IN 10.90
WTR YR 1971 TOTAL 116,684 MEAN 320 MAX 1,250 MIN 40 CFSM .71 IN 9.67

04105000 Battle Creek at Battle Creek, Mich.

LOCATION.—Lat 42°19'55", long 85°09'15", in NW¼ sec.5, T.2 S., R.7 W., Calhoun County, on right bank 350 ft upstream from Emmett Street Bridge at Battle Creek, and 3.0 miles upstream from mouth.

DRAINAGE AREA.—241 sq mi.

PERIOD OF RECORD.—October 1930 to September 1931, October 1932 to July 1933, January 1934 to current year. 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 (levels by Michigan Department of Natural Resources). Prior to May 14, 1951, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.—38 years (1930-31, 1934-71), 188 cfs (10.59 inches per year).

EXTREMES.—Current year: Maximum discharge, 1,220 cfs Feb. 22 (gage height, 2.36 ft); minimum, 39 cfs July 14, 15 (gage height, 0.53 ft). Period of record: 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 gages at dam forming control.

REMARKS.—Records good. Occasional slight regulation prior to November 1943.

REVISIONS (WATER YEARS).—WSP 1387: 1931, 1944. WSP 1507: 1956.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	76	138	266	121	91	730	294	140	89	48	66	45
2	74	144	290	119	94	658	292	139	87	53	60	45
3	73	150	295	122	91	560	291	138	84	49	56	45
4	71	159	289	126	94	467	288	135	85	47	54	45
5	69	166	271	134	138	434	282	134	80	48	52	44
6	69	175	247	133	162	404	275	132	81	54	51	57
7	68	185	226	127	180	354	262	128	80	57	50	60
8	67	188	213	119	203	310	250	125	79	59	49	58
9	70	181	205	114	237	305	239	121	78	61	48	53
10	97	181	189	109	263	354	230	118	75	58	47	51
11	120	177	198	108	273	338	224	115	73	54	51	54
12	132	176	212	108	263	316	221	117	75	49	52	54
13	133	176	219	108	228	305	228	121	82	44	52	54
14	151	178	226	108	198	310	242	122	87	41	53	53
15	186	171	183	106	167	388	254	113	101	40	50	51
16	200	160	224	104	150	552	266	108	103	43	49	49
17	214	151	235	104	146	802	273	102	95	47	47	49
18	226	143	225	102	158	901	272	99	81	51	45	50
19	220	136	223	99	242	784	260	97	75	54	43	51
20	199	146	223	98	388	667	247	95	71	57	45	61
21	172	163	222	98	865	602	232	93	68	57	49	69
22	148	176	224	98	1,200	551	215	90	65	54	51	72
23	134	185	242	94	1,120	507	199	87	63	51	49	70
24	125	191	200	98	937	465	180	91	61	50	46	65
25	119	174	194	98	811	427	158	125	56	49	44	61
26	114	180	180	98	748	395	151	155	53	50	46	61
27	113	182	175	94	730	365	145	159	51	50	50	76
28	112	202	174	94	658	340	143	144	47	52	51	108
29	120	221	168	91	------	321	142	125	44	62	51	125
30	128	241	143	91	------	311	142	108	43	72	50	129
31	134	------	132	91	------	301	------	97	------	73	48	------
TOTAL	3,934	5,196	6,713	3,314	10,835	14,524	6,897	3,673	2,212	1,634	1,555	1,865
MEAN	127	173	217	107	387	469	230	118	73.7	52.7	50.2	62.2
MAX	226	241	295	134	1,200	901	294	159	103	73	66	129
MIN	67	136	132	91	91	301	142	87	43	40	43	44
CFSM	.53	.72	.90	.44	1.61	1.95	.95	.49	.31	.22	.21	.26
IN.	.61	.80	1.04	.51	1.67	2.24	1.06	.57	.34	.25	.24	.29

CAL YR 1970 TOTAL 72,271 MEAN 198 MAX 1,280 MIN 53 CFSM .82 IN 11.16
WTR YR 1971 TOTAL 62,352 MEAN 171 MAX 1,200 MIN 40 CFSM .71 IN 9.62

04105500 Kalamazoo River near Battle Creek, Mich.

LOCATION.—Lat 42°19'26", long 85°11'51", in SW¼ sec.1, T.2 S., R.8 W., Calhoun County, on left bank 20 ft upstream from bridge on Kendall Street in Battle Creek.

DRAINAGE AREA.—824 sq mi.

PERIOD OF RECORD.—July 1937 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.—Water-stage recorder. Altitude of gage is 815 ft (from topographic map). Prior to Oct. 1, 1957, water-stage recorder at site 4.7 miles downstream at different datum. Oct. 1, 1957, to June 15, 1959, nonrecording gage at bridge 1,800 ft upstream at different datum. June 16, 1959, to Oct. 13, 1960, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.—34 years, 622 cfs (10.25 inches per year).

EXTREMES.—Current year: Maximum discharge, 2,860 cfs Feb. 22 (gage height, 5.88 ft); minimum, 126 cfs Sept. 4 (gage height, 2.77 ft); minimum daily, 151 cfs Sept. 4.
Period of record: Maximum discharge, 7,290 cfs Apr. 7, 1947 (gage height, 9.13 ft, site and datum then in use); minimum, 50 cfs Sept. 22, 1939, site then in use; minimum daily, 86 cfs Aug. 5, 1964.

REMARKS.—Records good. Diurnal fluctuation, below 1,500 cfs, caused by powerplants above station.

REVISIONS (WATER YEARS).—WSP 924: 1938-39. WSP 1387: 1938, 1945-46, 1948.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	403	509	968	712	438	1,700	869	495	403	304	224	370
2	415	573	952	539	377	1,570	905	575	384	326	338	295
3	341	666	938	527	356	1,390	905	463	378	294	319	221
4	331	568	924	609	418	1,200	869	500	490	294	327	151
5	330	733	877	623	906	1,160	734	500	263	321	270	227
6	330	646	800	425	1,020	1,090	851	500	476	436	271	463
7	245	554	638	475	954	994	797	520	497	476	263	323
8	344	608	711	492	905	968	672	500	429	511	188	308
9	397	604	594	480	866	959	761	500	436	367	268	277
10	480	573	691	470	857	986	640	500	416	448	336	282
11	512	618	719	478	799	986	656	500	219	302	282	256
12	559	671	838	471	751	959	734	500	321	370	251	170
13	466	544	839	468	609	761	672	480	448	386	253	322
14	871	553	858	533	575	1,000	851	470	390	317	311	292
15	871	571	637	454	555	1,310	770	460	396	279	179	251
16	814	500	760	440	561	1,600	743	450	384	334	187	241
17	800	481	805	437	629	1,830	824	450	290	419	258	254
18	815	590	662	459	687	1,900	698	440	338	420	260	259
19	800	475	815	402	1,410	1,740	725	440	299	436	272	209
20	736	561	706	429	2,070	1,580	815	430	332	446	260	375
21	691	627	768	418	2,330	1,470	725	420	316	497	240	384
22	521	690	759	418	2,800	1,370	656	420	299	403	176	269
23	546	573	816	423	2,710	1,310	592	410	288	403	244	275
24	529	600	614	424	2,340	1,220	648	420	373	396	233	312
25	510	613	669	423	1,960	1,140	540	490	310	390	235	229
26	437	555	697	417	1,760	1,070	511	500	294	294	265	320
27	482	683	652	412	1,740	1,020	497	490	239	390	182	323
28	482	874	788	352	1,680	986	583	480	373	469	242	467
29	518	765	616	396	------	932	487	442	321	373	301	398
30	490	954	528	396	------	824	498	422	244	379	268	414
31	609	------	565	435	------	887	------	416	------	397	304	------
TOTAL	16,675	18,532	23,204	14,437	33,063	37,912	21,228	14,583	10,646	11,877	8,007	8,937
MEAN	538	618	749	466	1,181	1,223	708	470	355	383	258	298
MAX	871	954	968	712	2,800	1,900	905	575	497	511	338	467
MIN	245	475	528	352	356	761	487	410	219	279	176	151
CFSM	.65	.75	.91	.57	1.43	1.48	.86	.57	.43	.46	.31	.36
IN.	.75	.84	1.05	.65	1.49	1.71	.96	.66	.48	.54	.36	.40

CAL YR 1970 TOTAL 237,402 MEAN 650 MAX 2,190 MIN 200 CFSM .79 IN 10.72
WTR YR 1971 TOTAL 219,101 MEAN 600 MAX 2,800 MIN 151 CFSM .73 IN 9.89

04105700 Augusta Creek near Augusta, Mich.

LOCATION.--Lat 42°21'12", long 85°21'14", in SW¼ sec.27, T.1 S., R.9 W., Kalamazoo County, on left bank 15 ft downstream from bridge on EF Road, and 1.3 miles north of Augusta.

DRAINAGE AREA.--38.9 sq mi.

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 815 ft (from topographic map). Prior to June 15, 1965, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--7 years, 37.0 cfs (12.92 inches per year).

EXTREMES.--Current year: Maximum discharge, 90 cfs Feb. 20 (gage height, 1.91 ft); minimum, 9.5 cfs Dec. 30 (gage height, 0.71 ft, result of freezeup).
Period of record: Maximum discharge, 125 cfs Feb. 3, 1968 (gage height, 2.39 ft); minimum, 9.5 cfs Dec. 30, 1970 (gage height, 0.71 ft), result of freezeup; minimum gage height, 0.65 ft Jan. 19, 1970.

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	40	50	27	24	61	47	35	27	25	28	18
2	28	40	45	31	24	53	48	35	30	21	26	20
3	30	43	45	30	26	49	48	35	28	20	25	21
4	26	46	40	33	28	44	46	34	27	18	25	21
5	26	45	40	33	33	44	45	33	26	34	24	23
6	29	43	36	29	38	45	43	33	28	31	22	35
7	29	40	35	29	40	49	43	33	30	26	22	34
8	28	36	33	30	43	47	42	32	28	36	22	31
9	38	35	33	30	44	45	42	31	27	39	20	29
10	52	35	32	29	43	46	41	31	26	33	21	28
11	50	33	43	28	41	43	40	30	25	29	27	27
12	45	36	46	28	39	43	40	35	27	28	26	25
13	43	38	45	27	38	43	42	33	32	25	23	25
14	59	35	43	26	33	55	48	31	29	23	21	24
15	61	34	36	26	33	78	47	30	27	26	20	23
16	58	33	38	26	31	84	45	30	25	28	19	22
17	51	31	37	26	30	79	43	29	23	32	18	22
18	47	31	36	26	34	70	43	28	23	29	18	22
19	43	31	40	27	63	64	42	28	21	30	19	24
20	35	38	41	28	87	63	41	29	21	31	25	35
21	37	43	38	24	82	61	40	27	22	28	24	34
22	46	41	36	24	70	60	38	26	21	27	22	31
23	41	35	35	24	60	58	37	26	21	23	20	28
24	36	33	31	24	54	55	35	31	20	20	19	26
25	35	31	33	24	51	51	34	51	20	20	19	26
26	35	35	31	24	56	50	35	49	18	22	20	27
27	34	43	33	24	67	49	34	43	18	20	21	54
28	36	53	30	24	67	49	35	38	18	27	20	54
29	46	55	31	24	------	50	36	33	17	34	19	47
30	45	53	26	24	------	48	35	30	18	33	18	43
31	43	------	31	24	------	47	------	28	------	30	18	------
TOTAL	1,241	1,165	1,149	833	1,279	1,683	1,235	1,017	723	848	671	879
MEAN	40.0	38.8	37.1	26.9	45.7	54.3	41.2	32.8	24.1	27.4	21.6	29.3
MAX	61	55	50	33	87	84	48	51	32	39	28	54
MIN	26	31	26	24	24	43	34	26	17	18	18	18
CFSM	1.03	1.00	.95	.69	1.17	1.40	1.06	.84	.62	.70	.56	.75
IN.	1.19	1.11	1.10	.80	1.22	1.61	1.18	.97	.69	.81	.64	.84

CAL YR 1970 TOTAL 13,658 MEAN 37.4 MAX 82 MIN 21 CFSM .96 IN 13.06
WTR YR 1971 TOTAL 12,723 MEAN 34.9 MAX 87 MIN 17 CFSM .90 IN 12.17

04105800 Gull Creek near Galesburg, Mich.

LOCATION.—Lat 42°18'54", long 85°24'04", in NW¼ sec.7, T.2 S., R.9 W., Kalamazoo County, on right bank 15 ft upstream from bridge on 37th Street, and 2.0 miles northeast of Galesburg.

DRAINAGE AREA.—38.1 sq mi.

PERIOD OF RECORD.—October 1964 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 820 ft (from topographic map).

AVERAGE DISCHARGE.—7 years, 24.6 cfs (8.77 inches per year).

EXTREMES.—Current year: Maximum discharge, 57 cfs Mar. 15 (gage height, 3.19 ft); maximum gage height, 3.56 ft Dec. 30 (backwater from ice); minimum discharge, 3.8 cfs July 3 (gage height, 2.22 ft).
Period of record: Maximum discharge, 136 cfs July 25, 1970; maximum gage height, 4.73 ft Dec. 29, 1967 (backwater from ice); minimum discharge, 2.0 cfs Aug. 10, 1966, Aug. 14, 16, 1968; minimum gage height, 2.20 ft July 15, Aug. 10, 1966.

REMARKS.—Records good except those for the winter period and those for periods of no gage-height record, which are poor. Occasional regulation by many dams upstream.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	28	36	35	24	44	42	14	11	7.9	8.1	7.1
2	36	28	34	35	25	42	43	14	11	6.4	8.0	8.3
3	34	28	33	35	26	42	43	14	11	6.2	7.8	8.8
4	33	30	32	35	30	41	42	14	11	6.0	7.9	8.6
5	31	30	31	35	33	38	41	14	11	13	7.7	9.8
6	30	29	30	34	37	40	41	14	11	13	7.6	14
7	30	28	29	33	40	43	40	14	11	11	7.5	13
8	29	27	30	32	41	42	39	13	10	14	7.4	11
9	34	26	33	31	42	42	39	13	10	14	7.4	11
10	34	25	36	30	41	41	37	12	9.9	14	8.3	11
11	31	25	47	29	40	40	33	12	10	23	9.7	11
12	30	24	48	28	38	39	26	12	12	36	8.7	11
13	29	23	48	28	38	34	28	12	16	39	8.3	11
14	40	23	47	27	39	45	24	12	13	41	8.3	11
15	42	23	44	27	36	54	22	11	12	45	8.2	11
16	40	23	44	27	36	54	19	11	12	46	8.1	10
17	36	23	44	27	36	50	18	10	12	49	7.7	10
18	34	25	43	26	36	49	15	9.6	11	47	7.7	10
19	32	28	44	26	45	50	14	9.5	11	45	7.9	11
20	30	30	43	26	50	49	15	9.4	11	37	8.7	14
21	29	31	42	26	50	47	13	9.6	11	26	8.4	13
22	28	31	42	25	48	46	11	8.5	10	22	7.6	12
23	27	30	41	25	45	46	13	8.3	10	19	7.3	12
24	26	29	40	25	43	44	13	11	10	16	7.1	13
25	25	29	39	24	42	44	12	15	9.5	14	7.2	29
26	24	29	38	23	44	43	12	14	9.1	11	7.3	31
27	24	34	37	23	46	43	12	13	8.6	6.4	7.4	40
28	25	37	37	23	45	43	12	13	8.4	7.3	7.3	37
29	28	37	36	23	------	43	13	13	8.0	6.6	6.9	36
30	31	36	35	23	------	42	13	12	8.7	6.0	7.1	34
31	30	------	35	23	------	42	------	12	------	8.0	7.2	------
TOTAL	972	849	1,198	869	1,096	1,362	745	373.3	320.2	659.8	241.8	469.6
MEAN	31.4	28.3	38.6	28.0	39.1	43.9	24.8	12.0	10.7	21.3	7.80	15.7
MAX	42	37	48	35	50	54	43	15	16	49	9.7	40
MIN	24	23	29	23	24	34	11	8.3	8.0	6.0	6.9	7.1
CFSM	.82	.74	1.01	.73	1.03	1.15	.65	.32	.28	.56	.20	.41
IN.	.95	.83	1.17	.85	1.07	1.33	.73	.36	.31	.64	.24	.46

CAL YR 1970 TOTAL 10,013.4 MEAN 27.4 MAX 68 MIN 4.8 CFSM .72 IN 9.78
WTR YR 1971 TOTAL 9,155.7 MEAN 25.1 MAX 54 MIN 6.0 CFSM .66 IN 8.94

NOTE.—No gage-height record Oct. 14 to Nov. 20, Dec. 31 to Feb. 13.

04106000 Kalamazoo River at Comstock, Mich.

LOCATION.—Lat 42°17'05", long 85°30'50", in NE¼ sec.19, T.2 S., R.10 W., Kalamazoo County, on left bank at downstream side of bridge on River Street, in Comstock, 0.2 mile downstream from Comstock Creek.

DRAINAGE AREA.—1,010 sq mi, approximately.

PERIOD OF RECORD.—April to August 1931, October 1932 to current year. 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. Prior to November 1945, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.—39 years (1932-71), 808 cfs (10.86 inches per year).

EXTREMES.—Current year: Maximum discharge, 3,080 cfs Feb. 24 (gage height, 4.59 ft); minimum, 252 cfs Aug. 29 (gage height, 0.79 ft); minimum daily, 325 cfs Aug. 7.
Period of record: Maximum discharge, 6,910 cfs Apr. 8, 1947 (gage height, 7.94 ft); minimum, 119 cfs May 29, 1958 (gage height, 0.09 ft); minimum daily, 185 cfs Aug. 7, 1934.

REMARKS.—Records good. Flow regulated by powerplants above station. Records of water temperature for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS)—WSP 824: 1933-36. WSP 1387: 1933, 1934 (M), 1935, 1936 (M), 1938 (M), 1940 (M), 1941.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	669	734	1,210	750	510	1,980	1,120	712	645	418	511	423
2	638	701	1,290	800	505	1,910	1,160	734	570	365	469	358
3	608	768	1,260	775	544	1,750	1,180	805	600	365	419	369
4	500	900	1,240	755	580	1,640	1,190	738	556	424	444	423
5	470	828	1,200	832	817	1,500	1,170	687	507	349	421	383
6	476	932	1,180	766	1,170	1,450	1,010	641	528	440	419	382
7	470	873	1,070	587	1,290	1,440	1,070	651	556	458	325	508
8	440	709	883	567	1,190	1,340	1,040	671	542	563	341	537
9	482	751	906	664	1,110	1,260	887	662	593	701	444	514
10	638	828	884	732	1,080	1,260	947	673	563	593	424	487
11	742	819	1,080	776	1,090	1,270	903	664	556	482	481	481
12	734	810	1,120	755	1,080	1,250	872	698	500	470	488	441
13	734	837	1,160	724	1,000	1,200	954	653	488	402	471	366
14	908	742	1,160	718	816	1,150	1,060	667	535	418	419	396
15	1,270	725	1,120	721	798	1,380	1,050	647	563	446	420	452
16	1,240	725	1,000	648	818	1,640	1,010	627	514	535	455	422
17	1,080	645	1,040	593	833	1,790	979	625	542	440	403	418
18	1,040	645	1,070	530	910	1,960	1,020	635	507	570	414	445
19	1,020	709	1,010	464	1,230	2,150	953	621	514	693	411	412
20	980	701	1,070	549	1,730	2,120	886	549	494	645	442	413
21	972	785	1,010	636	2,260	1,970	956	593	488	514	456	535
22	932	828	1,040	719	2,600	1,790	889	507	507	528	392	684
23	819	882	1,020	659	2,900	1,620	779	528	578	514	396	648
24	717	819	1,020	609	3,050	1,550	714	608	500	476	390	518
25	653	793	841	621	2,860	1,490	813	623	494	452	390	454
26	669	810	679	624	2,510	1,410	704	685	507	653	396	392
27	608	802	708	454	2,200	1,350	655	709	429	514	390	609
28	615	1,010	789	451	2,070	1,290	690	709	446	452	379	867
29	693	1,200	927	517	------	1,240	734	677	413	585	330	978
30	717	1,170	799	521	------	1,160	712	645	418	506	378	858
31	693	------	774	532	------	1,110	------	608	------	475	402	------
TOTAL	23,227	24,481	31,560	20,049	39,551	47,420	28,107	20,252	15,653	15,446	12,911	15,173
MEAN	749	816	1,018	647	1,413	1,530	937	653	522	498	416	506
MAX	1,270	1,200	1,290	832	3,050	2,150	1,190	805	645	701	511	978
MIN	440	645	679	451	505	1,110	655	507	413	349	325	358
CFSM	.74	.81	1.01	.64	1.40	1.51	.93	.65	.52	.49	.41	.50
IN.	.86	.90	1.16	.74	1.46	1.75	1.04	.75	.58	.57	.48	.56

CAL YR 1970 TOTAL 327,841 MEAN 898 MAX 2,510 MIN 434 CFSM .89 IN 12.07
WTR YR 1971 TOTAL 293,830 MEAN 805 MAX 3,050 MIN 325 CFSM .80 IN 10.82

04106300 Portage Creek near Kalamazoo, Mich.

LOCATION.--Lat 42°14'46", long 85°34'33", in SE¼ sec.34, T.2 S., R.11 W., Kalamazoo County, on left bank 25 ft upstream from bridge on Lovers Lane, and 3.0 miles south of Kalamazoo.

DRAINAGE AREA.--22.4 sq mi.

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 814.88 ft above mean sea level.

AVERAGE DISCHARGE.--7 years, 40.5 cfs (unadjusted).

EXTREMES.--Current year: Maximum discharge, 101 cfs July 15 (gage height, 2.87 ft); minimum, 21 cfs July 12; minimum gage height, 1.36 ft May 13.
Period of record: Maximum discharge, 180 cfs June 25, 1968 (gage height, 3.60 ft); minimum, 8.0 cfs Jan. 19, 1965 (gage height, 0.88 ft, result of bridge construction upstream.

REMARKS.--Records good. Flow includes water which is pumped from ground water sources by industry and discharged into stream two miles above station. Records of specific conductance, water temperatures and periodic water samples for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	31	48	38	45	49	51	46	33	27	27	24
2	34	32	42	38	45	48	48	43	38	25	28	30
3	31	37	43	35	46	47	49	45	33	24	28	28
4	30	39	42	44	48	45	46	46	35	25	28	26
5	33	37	41	43	65	45	49	44	36	40	28	30
6	34	37	40	39	57	50	48	46	38	32	28	33
7	34	36	42	34	51	49	48	48	39	31	26	30
8	35	34	43	36	49	49	49	47	35	41	27	32
9	42	36	43	37	50	49	51	43	34	34	27	29
10	35	37	44	38	49	50	48	45	35	30	28	30
11	32	34	61	39	48	50	47	45	35	28	29	27
12	35	32	54	41	49	49	52	42	33	27	28	26
13	37	33	48	45	50	50	56	42	33	28	27	28
14	57	33	50	46	48	58	52	43	35	27	26	27
15	41	31	51	47	48	78	53	40	32	52	26	25
16	38	30	51	46	48	67	55	38	33	40	27	25
17	30	31	49	45	51	62	51	40	32	35	27	25
18	30	36	48	46	54	60	48	39	30	29	32	24
19	36	38	49	45	71	64	51	41	27	52	33	26
20	40	50	45	45	76	59	52	37	28	37	30	33
21	39	45	45	46	66	55	52	35	33	32	28	26
22	35	42	44	46	61	56	49	31	31	29	26	25
23	36	41	46	44	56	55	48	31	30	30	26	26
24	32	41	44	44	47	54	47	39	28	28	24	25
25	30	42	44	46	46	54	46	39	27	31	25	24
26	32	40	44	48	50	54	48	35	26	43	25	24
27	33	45	45	49	60	52	47	35	25	31	25	28
28	38	53	45	49	49	50	46	37	27	39	24	29
29	42	47	43	48	------	53	46	33	26	35	24	26
30	36	48	39	46	------	51	47	33	27	32	25	25
31	34	------	39	45	------	50	------	32	------	28	24	------
TOTAL	1,104	1,148	1,412	1,338	1,483	1,662	1,480	1,240	954	1,022	836	816
MEAN	35.6	38.3	45.5	43.2	53.0	53.6	49.3	40.0	31.8	33.0	27.0	27.2
MAX	57	53	61	49	76	78	56	48	39	52	33	33
MIN	30	30	39	34	45	45	46	31	25	24	24	24

CAL YR 1970 TOTAL 15,257 MEAN 41.8 MAX 98 MIN 30
WTR YR 1971 TOTAL 14,495 MEAN 39.7 MAX 78 MIN 24

PEAK DISCHARGE (BASE, 85 CFS)

DATE	TIME	GHT	DISCHARGE
03-15	0700	2.60	88
05-13	1900	2.64	90
07-15	1700	2.87	101
07-19	1500	2.74	90

04106400 West Fork Portage Creek at Kalamazoo, Mich.

LOCATION.—Lat 42°14'40", long 85°36'50", in NE¼ sec.5, T.3 S., R.11 W., Kalamazoo County, on right bank 30 ft upstream from culvert on Oakland Drive, 2.5 miles upstream from mouth, and 3.7 miles southwest of main business district of Kalamazoo.

DRAINAGE AREA.—18.7 sq mi.

PERIOD OF RECORD.—September 1959 to current year.

GAGE.—Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 858.09 ft above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.—12 years, 9.27 cfs (6.73 inches per year).

EXTREMES.—Current year: Maximum discharge, 28 cfs Feb. 20, based on correlation with nearby stations; maximum gage height, 2.97 ft June 12; minimum daily discharge, 6.5 cfs June 26-30, July 3, 4; minimum gage height, 1.22 ft Apr. 11, 12.
Period of record: Maximum discharge, 39 cfs Dec. 8, 1966; maximum gage height, 3.12 ft Mar. 20, 1963; minimum discharge, 1.0cfs Aug. 9, 1964; minimum gage height, 0.88 ft July 30, 1963, caused by construction.

REMARKS.—Records fair except those for periods of indefinite stage-discharge relation, which are poor. Records of specific conductance, water temperatures and periodic samples are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.2	13	14	10	10	19	14	11	10	8.0	11	7.6
2	9.0	13	13	11	10	18	14	11	10	7.0	11	8.9
3	8.7	13	12	11	10	17	14	11	10	6.5	10	10
4	8.6	14	12	12	11	16	14	11	10	6.5	11	10
5	8.6	14	12	12	15	15	14	11	10	8.0	10	10
6	8.6	14	11	12	16	16	13	11	10	11	9.7	10
7	8.6	13	11	12	16	17	13	11	10	9.0	9.7	10
8	8.7	13	11	12	15	16	13	11	10	10	9.7	10
9	9.8	12	11	11	14	15	13	10	9.5	12	8.9	10
10	11	12	11	11	13	15	13	11	9.0	10	9.4	10
11	11	12	13	11	12	15	13	11	9.0	9.0	10	9.5
12	11	12	14	11	12	15	13	11	9.0	8.0	9.7	9.0
13	11	12	14	11	12	15	13	10	9.0	8.0	9.4	8.5
14	15	11	13	11	12	18	13	10	8.5	8.0	9.1	8.1
15	17	11	13	11	12	25	13	11	8.5	8.5	8.9	7.0
16	16	11	12	11	12	26	13	11	8.5	9.5	8.6	6.8
17	15	11	12	11	12	25	13	10	8.5	10	8.3	6.9
18	13	10	12	11	14	24	13	10	8.0	10	7.9	6.8
19	13	9.7	12	11	19	22	12	9.7	7.0	10	7.9	7.4
20	12	11	12	11	28	21	12	9.1	7.0	10	8.3	9.9
21	12	13	11	11	27	20	12	8.6	6.7	9.5	7.6	10
22	11	13	11	11	25	20	12	9.7	7.0	10	7.6	10
23	11	13	11	11	22	19	11	9.4	7.0	11	7.9	10
24	11	12	12	10	19	18	11	10	7.0	11	7.9	9.6
25	11	12	11	10	17	17	11	13	7.0	11	7.9	9.0
26	11	11	11	10	19	17	11	16	6.5	12	7.6	8.6
27	11	13	11	10	20	16	11	16	6.5	11	7.6	11
28	11	15	11	10	20	16	11	14	6.5	9.7	7.6	11
29	13	14	11	10	------	15	11	11	6.5	13	7.6	11
30	14	15	11	10	------	15	11	10	6.5	13	9.4	10
31	14	------	11	10	------	15	------	10	------	13	7.0	------
TOTAL	354.8	372.7	367	337	444	558	375	339.5	248.7	303.2	274.2	276.6
MEAN	11.4	12.4	11.8	10.9	15.9	18.0	12.5	11.0	8.29	9.78	8.85	9.22
MAX	17	15	14	12	28	26	14	16	10	13	11	11
MIN	8.6	9.7	11	10	10	15	11	8.6	6.5	6.5	7.0	6.8
CFSM	.61	.66	.63	.58	.85	.96	.67	.59	.44	.52	.47	.49
IN.	.71	.74	.73	.67	.88	1.11	.75	.68	.49	.60	.55	.55

CAL YR 1970 TOTAL 4,322.5 MEAN 11.8 MAX 20 MIN 6.5 CFSM .63 IN 8.60
WTR YR 1971 TOTAL 4,250.7 MEAN 11.6 MAX 28 MIN 6.5 CFSM .62 IN 8.46

NOTE.—Stage-discharge relation indefinite Jan. 7 to May 8, May 31 to July 23.

04108500 Kalamazoo River near Fennville, Mich.

LOCATION.—Lat 42°35'36", long 85°59'03", in NE¼ sec.5, T.2 N., R.14 W., Allegan County, on left bank 40 ft upstream from bridge on State Highway 89, 2.1 miles downstream from Swan Creek, 4.0 miles downstream from Calkins Dam, and 6.1 miles east of Fennville.

DRAINAGE AREA.—1,600 sq mi, approximately.

PERIOD OF RECORD.—April 1929 to September 1936, October 1937 to current year. 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 (levels by Michigan Department of Natural Resources). April 1929 to September 1936 at bridge and October 1937 to September 1950 in powerplant, 4.0 miles upstream at mean sea level datum (levels by city of Allegan).

AVERAGE DISCHARGE.—41 years, 1,327 cfs (11.26 inches per year).

EXTREMES.—Current year: Maximum discharge, 4,160 cfs Feb. 28 (gage height, 12.17 ft); minimum, 96 cfs May 23 (gage height, 3.47 ft); minimum daily, 462 cfs May 23.
Period of record: Maximum discharge, 17,500 cfs Apr. 11, 1947 (gage height, 606.76 ft, site and datum then in use); minimum daily, 73 cfs Aug. 31, 1941.

REMARKS.—Records good except those for period of no gage-height record, which are fair. Flow regulated at low and medium stages by powerplants above station and since June 1936, by Calkins Dam and powerplant, 4.0 miles above station.

REVISIONS (WATER YEARS).—WSP 1387: 1929 (M), 1930, 1933, 1934-36 (M), 1938 (M), 1939-40, 1942.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	959	1,440	2,330	1,160	1,100	3,840	1,930	1,100	750	618	922	529
2	1,070	1,530	2,360	1,300	1,000	3,140	1,860	1,300	1,000	802	900	662
3	1,070	1,550	2,250	1,700	1,000	2,760	1,850	1,600	1,000	638	918	657
4	1,220	1,570	2,220	1,300	1,100	2,720	1,850	1,200	1,000	646	966	669
5	1,410	1,570	2,250	1,300	1,320	2,700	1,900	1,100	1,000	638	932	667
6	1,250	1,400	2,330	1,400	1,440	2,670	1,800	1,300	1,000	1,300	878	683
7	1,070	1,300	2,190	1,400	1,880	2,550	1,880	1,300	700	1,550	825	697
8	1,070	1,700	1,780	1,400	2,010	2,360	1,880	1,100	1,000	1,260	789	1,020
9	1,070	1,700	2,150	1,170	2,050	2,320	1,880	1,100	1,000	991	788	993
10	1,060	1,500	1,670	1,110	2,030	2,310	1,400	1,100	1,000	877	717	669
11	637	1,300	1,600	1,400	1,940	2,300	1,200	1,100	734	1,210	814	680
12	851	1,400	1,500	1,360	1,910	2,210	1,500	1,390	738	1,300	906	748
13	652	1,620	2,000	1,370	2,010	2,050	1,600	1,660	992	831	889	701
14	1,200	1,610	2,000	1,330	1,890	2,070	1,600	1,080	839	818	844	715
15	1,800	1,460	2,000	1,340	1,810	2,450	1,600	1,040	997	885	789	653
16	1,830	1,310	1,800	1,250	1,790	2,700	1,600	1,020	978	1,030	761	646
17	1,830	1,360	1,700	1,160	1,770	3,330	1,600	1,010	974	718	760	649
18	1,830	1,530	1,700	1,200	1,760	2,810	1,600	1,030	722	1,090	755	653
19	1,830	1,260	1,300	1,090	1,810	2,820	1,600	1,020	714	1,210	744	651
20	1,830	1,320	1,800	1,110	2,130	3,120	1,100	1,000	721	1,300	731	698
21	1,830	1,190	1,800	1,070	2,980	2,920	1,300	1,020	735	1,330	738	1,010
22	1,240	1,260	1,800	1,230	3,770	3,120	1,600	898	610	1,350	721	743
23	1,410	1,620	1,800	1,230	3,700	2,910	1,600	462	790	1,360	721	688
24	1,810	1,620	1,600	1,220	3,650	2,780	1,200	1,010	910	985	722	1,010
25	1,770	1,630	1,300	1,220	3,660	2,570	1,100	1,020	850	880	704	740
26	1,140	1,660	1,500	1,230	3,850	2,700	1,300	1,340	766	1,210	675	768
27	1,390	1,560	1,500	1,230	3,950	2,430	1,500	1,430	673	855	708	847
28	1,170	1,550	1,300	1,170	4,130	2,370	1,200	998	748	894	707	1,060
29	1,240	1,510	1,700	848	------	2,240	1,100	1,000	618	956	633	1,220
30	1,280	1,800	1,030	993	------	2,210	1,100	700	808	1,230	688	1,280
31	1,230	------	1,230	1,230	------	2,190	------	1,000	------	1,250	635	------
TOTAL	41,049	44,830	55,490	38,521	63,440	81,670	46,230	34,428	25,367	32,012	24,280	23,406
MEAN	1,324	1,494	1,790	1,243	2,266	2,635	1,541	1,111	846	1,033	783	780
MAX	1,830	1,800	2,360	1,700	4,130	3,840	1,930	1,660	1,000	1,550	966	1,280
MIN	637	1,190	1,030	848	1,000	2,050	1,100	462	610	618	633	529
CFSM	.83	.93	1.12	.78	1.42	1.65	.96	.69	.53	.65	.49	.49
IN.	.95	1.04	1.29	.90	1.47	1.90	1.07	.80	.59	.74	.56	.54

CAL YR 1970 TOTAL 556,323 MEAN 1,524 MAX 3,350 MIN 553 CFSM .95 IN 12.93
WTR YR 1971 TOTAL 510,723 MEAN 1,399 MAX 4,130 MIN 462 CFSM .87 IN 11.87

NOTE.--No gage-height record Apr. 10 to May 11.

04108600 Rabbit River near Hopkins, Mich.

LOCATION.—Lat 42°38'32", long 85°43'19", in SE¼ sec.16, T.3 N., R.12 W., Allegan County, on left bank at downstream side of bridge on 18th Street, 2.5 miles northeast of Hopkins.

DRAINAGE AREA.—71.4 sq mi.

PERIOD OF RECORD.—October 1965 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 700 ft (from topographic map).

AVERAGE DISCHARGE.—6 years, 48.2 (9.17 inches per year).

EXTREMES.—Current year: Maximum discharge, 450 cfs Feb. 21 on basis of correlation with nearby stations; maximum gage height, 7.89 ft Feb. 21 (backwater from ice); minimum discharge, 8.4 cfs Aug. 23 (gage height, 1.99 ft).
Period of record: Maximum discharge, 550 cfs Feb. 1, 1968; maximum gage height, 7.89 ft Feb. 21, 1971 (backwater from ice); minimum discharge not determined; minimum daily, 9.2 cfs Aug. 27, 28, 1970; Sept. 18, 1971; minimum gage height, 1.93 ft Sept. 20, 26, 27, 1966.

REMARKS.—Records good except those for winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	35	69	37	20	281	68	37	21	14	18	10
2	22	33	65	37	20	161	68	37	21	13	16	11
3	21	48	58	37	20	127	67	36	21	13	18	13
4	19	61	53	38	20	107	65	35	20	12	18	15
5	18	65	51	40	40	90	64	34	20	17	15	14
6	17	54	46	45	60	85	62	34	19	25	14	20
7	16	45	40	45	70	93	60	34	21	19	13	22
8	16	39	37	42	80	89	59	33	22	21	13	18
9	17	35	38	39	80	103	56	32	21	25	12	15
10	23	35	37	36	80	90	54	31	20	21	12	14
11	23	35	34	34	75	78	51	31	19	18	14	14
12	21	34	42	32	70	74	49	31	18	16	13	13
13	20	33	47	31	60	72	77	31	19	16	12	12
14	54	31	50	29	55	96	118	31	23	15	12	11
15	67	29	63	28	50	330	104	30	22	16	13	11
16	55	28	61	27	45	300	85	29	21	19	12	9.6
17	43	27	57	26	45	233	74	28	19	30	13	9.5
18	35	26	53	25	50	150	68	27	18	25	13	9.2
19	32	25	61	24	90	118	63	26	17	25	13	10
20	30	29	88	23	200	123	60	26	17	40	14	18
21	30	57	80	23	400	123	56	26	19	31	13	19
22	29	53	64	22	400	132	52	25	21	24	12	14
23	28	43	54	22	350	123	49	24	18	21	10	12
24	26	39	52	22	300	103	46	24	17	23	12	11
25	25	45	50	22	255	87	44	24	16	22	12	10
26	24	42	47	21	258	81	41	25	16	20	13	11
27	23	65	45	20	375	78	39	25	16	18	12	33
28	24	126	43	20	390	77	37	25	15	18	12	47
29	42	100	41	20	------	78	38	24	14	25	11	34
30	49	82	39	20	------	75	38	23	14	22	9.8	25
31	42	------	37	20	------	71	------	22	------	20	10	------
TOTAL	914	1,399	1,602	907	3,958	3,828	1,812	900	565	644	404.8	485.3
MEAN	29.5	46.6	51.7	29.3	141	123	60.4	29.0	18.8	20.8	13.1	16.2
MAX	67	126	88	45	400	330	118	37	23	40	18	47
MIN	16	25	34	20	20	71	37	22	14	12	9.8	9.2
CFSM	.41	.65	.72	.41	1.97	1.72	.85	.41	.26	.29	.18	.23
IN.	.48	.73	.83	.47	2.06	1.99	.94	.47	.29	.34	.21	.25

CAL YR 1970 TOTAL 15,658.8 MEAN 42.9 MAX 345 MIN 9.2 CFSM .60 IN 8.16
WTR YR 1971 TOTAL 17,419.1 MEAN 47.7 MAX 400 MIN 9.2 CFSM .67 IN 9.08

PEAK DISCHARGE (BASE, 300 CFS)

DATE	TIME	GHT	DISCHARGE
02-21	—	—	about 450
02-27	2200	7.50	410
03-15	1100	7.35	376

04108800 Black River near Zeeland, Mich.

LOCATION.—Lat 42°46'40", long 86°01'06", in NW¼ sec.31, T.5 N., R.14 W., Ottawa County, on left bank 20 ft upstream from bridge on State Road, 0.2 mile downstream from South Branch, and 2.5 miles south of Zeeland.

DRAINAGE AREA.—65.8 sq mi.

PERIOD OF RECORD.—October 1960 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 595 ft (from topographic map).

AVERAGE DISCHARGE.—11 years, 51.4 cfs (10.61 inches per year).

EXTREMES.—Current year: Maximum discharge, 2,170 cfs Feb. 21 (gage height, 11.67 ft); minimum, 1.4 cfs Aug. 8; minimum gage height, 1.98 ft Aug. 22, 23, 24, 30.
Period of record: Maximum discharge, 2,760 cfs Feb. 10, 1966 (gage height, 12.66 ft); minimum, 0.9 cfs Aug. 24, 1962; minimum gage height, 1.79 ft Sept. 30, Oct. 3, 1969.

REMARKS.—Records fair except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	34	112	35	15	299	38	16	6.5	3.4	1.8	2.8
2	15	34	91	35	15	173	37	15	6.7	3.3	1.9	2.8
3	13	218	127	35	15	115	33	15	6.4	3.4	2.3	2.9
4	12	245	242	45	15	78	30	14	5.6	3.3	2.0	2.8
5	10	138	91	60	50	65	29	14	5.1	5.0	1.8	3.5
6	8.4	68	55	75	100	105	26	14	5.2	4.7	1.8	5.8
7	7.3	46	43	70	170	108	25	12	5.9	3.6	1.8	8.7
8	6.6	36	39	60	150	67	23	12	5.4	4.7	1.6	6.1
9	5.9	32	43	50	120	67	22	11	5.2	4.3	1.6	4.4
10	5.9	48	41	45	100	49	20	11	4.8	3.3	1.9	4.4
11	5.6	74	43	41	80	46	19	11	4.8	2.6	2.2	4.2
12	5.6	47	41	38	60	48	26	12	4.8	2.4	2.3	4.0
13	5.9	38	42	36	50	57	530	11	6.3	2.3	1.8	3.7
14	245	33	43	34	40	422	169	10	5.9	2.3	1.9	3.7
15	124	29	44	32	35	1,330	61	9.4	5.0	2.6	1.8	3.5
16	45	27	45	30	30	472	41	9.7	4.7	2.6	1.8	3.2
17	32	25	48	28	30	106	36	9.0	4.5	2.7	1.9	3.2
18	26	25	50	27	50	72	31	8.9	4.3	2.6	1.9	3.2
19	23	24	214	25	200	61	28	8.9	4.7	3.0	2.0	4.0
20	20	36	347	24	1,370	114	25	8.5	5.0	3.3	2.0	4.7
21	19	91	155	23	1,970	192	23	8.3	5.6	2.4	1.9	4.7
22	18	44	79	22	1,170	328	21	7.9	5.0	3.1	1.9	4.2
23	17	32	62	21	684	145	19	8.1	4.7	2.7	2.0	3.8
24	16	34	60	20	450	64	18	9.2	4.5	2.6	1.9	3.8
25	15	40	55	19	440	48	18	10	4.3	2.3	2.0	3.8
26	14	32	50	19	669	48	16	10	3.9	1.9	2.2	4.4
27	13	324	47	18	1,610	55	16	9.1	3.8	1.9	2.7	33
28	17	562	44	17	978	66	17	8.3	3.4	2.0	3.0	29
29	196	241	41	17	------	57	17	7.7	3.4	2.1	2.8	18
30	96	173	38	16	------	40	16	7.4	3.6	2.0	2.5	15
31	44	------	36	15	------	37	------	6.9	------	1.9	2.6	------
TOTAL	1,098.2	2,830	2,468	1,032	10,666	4,934	1,430	325.3	149.0	90.3	63.6	201.3
MEAN	35.4	94.3	79.6	33.3	381	159	47.7	10.5	4.97	2.91	2.05	6.71
MAX	245	562	347	75	1,970	1,330	530	16	6.7	5.0	3.0	33
MIN	5.6	24	36	15	15	37	16	6.9	3.4	1.9	1.6	2.8
CFSM	.54	1.43	1.21	.51	5.79	2.42	.72	.16	.08	.04	.03	.10
IN.	.62	1.60	1.40	.58	6.03	2.79	.81	.18	.08	.05	.04	.11

CAL YR 1970 TOTAL 20,540.9 MEAN 56.3 MAX 970 MIN 1.8 CFSM .86 IN 11.61
WTR YR 1971 TOTAL 25,287.7 MEAN 69.3 MAX 1,970 MIN 1.6 CFSM 1.05 IN 14.30

PEAK DISCHARGE (BASE, 900 CFS, REVISED)

DATE	TIME	GHT	DISCHARGE
02-21	0200	11.67	2,170
02-27	1000	11.41	1,940
03-15	0500	10.86	1,500

04109000 Grand River at Jackson, Mich.

LOCATION.—Lat 42°17'05", long 84°24'30", in sec.22, T.2 S., R.1 W., Jackson County, on left bank of sewage-treatment plant, 1 mile north of Jackson, 2.2 miles upstream from Portage River, and at mile 216.

DRAINAGE AREA.—174 sq mi.

PERIOD OF RECORD.—April 1935 to current year.

GAGE.—Water-stage recorder. Datum of gage is 900.00 ft above mean sea level (Fargo Engineering Co. bench mark). Prior to Sept. 24, 1935, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.—36 years, 115 cfs (8.98 inches per year).

EXTREMES.—Current year: Maximum discharge, 516 cfs Feb. 25 (gage height, 11.73 ft); minimum, 22 cfs Sept. 19 (gage height, 8.12 ft); minimum daily, 24 cfs Sept. 12, 19.
Period of record: Maximum discharge, 1,070 cfs June 25, 1937 (gage height, 13.50 ft); maximum gage height, 15.44 ft June 25, 1968; minimum discharge, 9.2 cfs Aug. 22, 1936.

REMARKS.—Records good. Slight regulation by mills above station. Flow includes about 17 cfs as sewage effluent from the city of Jackson which originates from ground water sources.

REVISIONS (WATER YEARS).—WSP 974: 1937 (M). WSP 1387: 1936. WSP 1727: 1950 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	83	192	264	71	54	414	205	183	89	45	31	35
2	65	205	261	73	54	370	204	168	96	39	38	36
3	55	150	234	71	54	343	193	170	90	32	38	35
4	48	111	196	105	71	303	182	153	93	28	38	30
5	55	95	181	144	192	298	188	79	84	118	38	26
6	57	92	158	141	180	297	186	84	86	76	37	26
7	57	84	160	141	200	283	183	73	97	54	31	34
8	55	77	160	134	220	261	183	64	88	55	27	36
9	64	92	148	120	210	234	173	59	58	47	35	36
10	77	104	97	113	200	280	161	67	51	39	48	41
11	52	97	129	111	180	281	154	67	50	34	51	30
12	62	97	160	65	172	266	159	67	44	41	40	24
13	70	97	162	56	168	249	175	64	63	42	40	32
14	158	91	163	65	153	258	170	62	54	41	34	34
15	113	85	101	59	161	325	168	53	52	54	29	34
16	167	91	113	53	156	340	163	48	51	41	37	35
17	169	105	111	49	180	344	121	55	51	47	39	35
18	167	162	155	57	215	349	100	58	49	32	39	29
19	171	163	178	57	396	361	107	59	45	46	42	24
20	122	190	171	56	419	352	107	54	37	45	43	51
21	113	165	172	57	440	343	104	52	45	44	33	38
22	104	156	174	57	467	345	104	43	46	44	27	36
23	98	122	129	52	479	258	97	38	46	45	35	35
24	85	90	80	50	484	249	83	61	45	40	36	35
25	78	91	83	58	495	251	73	66	44	32	36	30
26	83	87	83	57	501	239	81	104	38	65	37	29
27	84	115	91	50	478	218	82	117	33	97	36	112
28	85	234	90	56	425	202	85	114	41	89	30	56
29	106	253	91	56	------	206	165	54	42	44	25	47
30	146	262	79	50	------	203	196	68	48	48	33	65
31	185	------	79	47	------	202	------	78	------	44	35	------
TOTAL	3,034	3,955	4,453	2,331	7,404	8,924	4,352	2,482	1,756	1,548	1,118	1,146
MEAN	97.9	132	144	75.2	264	288	145	80.1	58.5	49.9	36.1	38.2
MAX	185	262	264	144	501	414	205	183	97	118	51	112
MIN	48	77	79	47	54	202	73	38	33	28	25	24
CFSM	.56	.76	.83	.43	1.52	1.66	.83	.46	.34	.29	.21	.22
IN.	.65	.85	.95	.50	1.58	1.91	.93	.53	.38	.33	.24	.25

CAL YR 1970 TOTAL 46,616 MEAN 128 MAX 415 MIN 34 CFSM .74 IN 9.97
WTR YR 1971 TOTAL 42,503 MEAN 116 MAX 501 MIN 24 CFSM .67 IN 9.09

04111000 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., Eaton County, on right bank 400 ft upstream from bridge on Petrieville Highway, 2 miles northeast of Eaton Rapids, 2.5 miles downstream from Spring Brook, 25 miles upstream from Cedar River, and at mile 178.

DRAINAGE AREA.--661 sq mi.

PERIOD OF RECORD.--October 1950 to current year. Gage-height record 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 (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--21 years, 425 cfs (8.73 inches per year).

EXTREMES.--Current year: Maximum discharge, 3,500 cfs Feb. 21 (gage height, 7.52 ft); minimum, 24 cfs June 29 (gage height, 0.76 ft); minimum daily, 40 cfs Aug. 29.
Period of record: Maximum discharge, 3,500 cfs Feb. 21, 1971; maximum gage height, 8.19 ft June 28, 1968; minimum discharge, 14 cfs Dec. 20, 1962, Oct. 14, 1966; minimum gage height, 0.67 ft Dec. 20, 1962; minimum daily discharge, 21 cfs Oct. 12, 1964. Flood of Apr. 4, 1950 reached a stage of 8.15 ft (discharge, 3,860 cfs).

REMARKS.--Records good except those for the winter period, which are poor. Diurnal fluctuation caused by powerplant at Smithville and mills at Eaton Rapids. Records of water temperatures for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1707: 1951 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	324	475	660	390	190	1,990	860	482	214	135	78	56
2	308	371	689	370	190	1,720	856	416	204	126	111	63
3	207	513	704	334	190	1,490	864	506	201	121	103	81
4	207	530	716	335	220	1,350	852	441	218	113	101	88
5	212	569	693	367	400	1,170	839	472	219	124	75	79
6	201	544	682	400	650	1,160	813	466	215	192	103	98
7	138	531	648	380	740	1,160	787	442	210	291	100	64
8	204	495	633	370	780	1,110	771	414	207	320	65	60
9	219	484	563	350	840	1,120	757	369	203	225	93	59
10	235	450	572	340	800	1,000	749	370	205	177	80	83
11	237	467	552	340	700	1,000	740	366	199	86	73	106
12	288	447	578	340	640	945	732	335	177	163	105	89
13	254	476	580	328	560	907	735	367	304	159	109	54
14	412	384	618	304	520	1,010	781	364	334	118	107	61
15	420	531	621	266	500	1,480	781	284	335	119	90	58
16	491	405	581	257	450	1,690	765	279	232	124	74	67
17	495	412	617	241	450	1,730	752	270	205	134	88	73
18	513	413	560	232	600	1,510	745	264	192	109	50	117
19	522	406	526	227	1,770	1,370	709	246	181	174	53	98
20	498	446	549	233	2,990	1,270	731	243	181	128	71	68
21	488	500	574	230	3,390	1,230	671	179	193	121	118	69
22	476	510	590	230	3,400	1,170	608	204	155	130	104	106
23	458	527	605	220	2,960	1,130	555	212	121	126	96	115
24	430	506	582	220	2,580	1,100	551	218	155	113	99	78
25	399	486	539	220	2,400	1,020	546	223	150	110	59	100
26	376	430	485	220	2,410	968	509	242	152	121	77	99
27	357	471	435	210	2,350	936	500	255	149	116	57	149
28	346	520	490	200	2,160	927	456	311	145	127	108	209
29	352	564	418	190	------	911	393	224	101	177	40	299
30	375	589	420	190	------	890	408	226	117	166	57	213
31	381	------	400	190	------	868	------	223	------	152	57	------
TOTAL	10,823	14,452	17,880	8,724	35,830	37,332	20,816	9,913	5,874	4,597	2,601	2,959
MEAN	349	482	577	281	1,280	1,204	694	320	196	148	83.9	98.6
MAX	522	589	716	400	3,400	1,990	864	506	335	320	118	299
MIN	138	371	400	190	190	868	393	179	101	86	40	54
CFSM	.53	.73	.87	.43	1.94	1.82	1.05	.48	.30	.22	.13	.15
IN.	.61	.81	1.01	.49	2.02	2.10	1.17	.56	.33	.26	.15	.17

CAL YR 1970 TOTAL 172,919 MEAN 474 MAX 1,970 MIN 94 CFSM .72 IN 9.73
WTR YR 1971 TOTAL 171,801 MEAN 471 MAX 3,400 MIN 40 CFSM .71 IN 9.67

04111500 Deer Creek near Dansville, Mich.

LOCATION.--Lat 42°36'30", long 84°19'15", in E½ sec.33, T.3 N., R.1 E., Ingham County, on right bank 15 ft upstream from bridge on Clark Road, 3.5 miles north of Dansville, and 7.2 miles upstream from mouth.

DRAINAGE AREA.--16.3 sq mi.

PERIOD OF RECORD.--May 1954 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 889.08 ft above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--17 years, 9.42 cfs (7.85 inches per year).

EXTREMES.--Current year: Maximum discharge, 346 cfs Feb. 19 (gage height, 7.12 ft); minimum, 0.08 cfs Sept. 10 (gage height, 2.57 ft). Period of record: Maximum discharge, 570 cfs May 13, 1956 (gage height, 8.83 ft); minimum, 0.06 cfs Jan. 10, 1970, result of freezeup.

REMARKS.--Records good except those for the winter period, which are poor.

REVISIONS (WATER YEAR).--WSP 1727: 1954 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	4.2	14	5.4	2.2	35	17	5.8	2.0	1.3	.29	.15
2	1.6	4.8	12	5.2	2.1	25	19	5.6	2.9	.94	.26	.15
3	1.5	13	11	5.2	2.1	18	17	5.3	2.5	.81	.28	.14
4	1.4	15	15	6.0	2.5	14	15	5.0	2.1	.71	.32	.17
5	1.3	15	12	8.0	25	12	14	4.8	1.8	1.2	.26	.18
6	1.2	11	11	7.6	45	13	13	4.7	1.9	1.6	.22	.17
7	1.2	8.7	7.5	7.0	30	22	13	4.4	1.9	.96	.19	.18
8	1.2	7.2	7.1	6.6	18	13	12	4.3	1.6	.96	.18	.13
9	1.3	6.8	7.5	6.0	14	15	12	4.1	1.6	.93	.16	.09
10	2.4	11	7.5	5.6	11	13	11	3.9	1.5	.71	.19	.13
11	1.9	10	7.9	5.4	9.0	11	10	3.8	1.4	.58	.32	.23
12	1.8	9.0	8.5	5.1	8.0	11	9.9	4.8	1.3	.53	.21	.19
13	1.8	7.8	8.3	4.8	7.0	11	23	4.4	11	.56	.16	.18
14	11	6.9	7.7	4.5	6.5	90	25	3.9	6.5	.54	.16	.17
15	14	6.6	7.9	4.3	6.0	185	18	3.6	4.1	.54	.16	.14
16	7.1	6.3	7.7	4.0	5.2	81	15	3.5	3.0	.53	.18	.13
17	5.3	6.1	7.7	3.5	6.0	39	14	3.3	2.4	.69	.16	.14
18	4.3	6.0	7.8	2.9	25	27	13	3.1	2.1	.54	.13	.14
19	3.7	5.8	13	3.4	250	25	11	3.1	1.8	.54	.12	.18
20	3.4	9.8	19	3.3	300	28	10	3.2	1.7	.56	.16	.60
21	4.4	12	15	3.5	120	23	9.2	2.9	3.8	.46	.15	.50
22	4.3	9.8	13	3.3	80	24	8.0	2.8	2.5	.38	.12	.32
23	3.7	7.7	11	3.2	50	23	7.4	2.7	2.6	.32	.13	.30
24	3.4	6.6	11	3.1	35	18	6.8	3.1	2.3	.34	.11	.30
25	3.2	6.0	8.4	3.1	50	16	6.4	3.5	1.8	.35	.11	.32
26	2.9	6.0	7.9	3.0	90	15	6.1	3.3	1.5	.43	.17	.69
27	2.9	7.7	7.4	2.9	110	15	5.9	3.0	1.3	.40	.25	2.1
28	2.7	17	7.3	2.7	60	17	6.2	2.8	1.1	.36	.32	2.2
29	4.1	17	6.7	2.5	------	18	6.2	2.6	.91	.39	.22	1.2
30	5.9	16	6.2	2.4	------	15	5.9	2.3	.92	.34	.16	.99
31	4.9	------	5.6	2.3	------	15	------	2.1	------	.34	.13	------
TOTAL	111.4	276.8	299.6	135.8	1,369.6	887	360.0	115.7	73.83	19.84	5.98	12.51
MEAN	3.59	9.23	9.66	4.38	48.9	28.6	12.0	3.73	2.46	.64	.19	.42
MAX	14	17	19	8.0	300	185	25	5.8	11	1.6	.32	2.2
MIN	1.2	4.2	5.6	2.3	2.1	11	5.9	2.1	.91	.32	.11	.09
CFSM	.22	.57	.59	.27	3.00	1.75	.74	.23	.15	.04	.01	.03
IN.	.25	.63	.68	.31	3.13	2.02	.82	.26	.17	.05	.01	.03

CAL YR 1970 TOTAL 4,011.98 MEAN 11.0 MAX 113 MIN .42 CFSM .67 IN 9.16
WTR YR 1971 TOTAL 3,668.06 MEAN 10.0 MAX 300 MIN .09 CFSM .61 IN 8.37

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	GHT	DISCHARGE
02-19	2200	7.12	346
02-27	unknown	unknown	150
03-14	2300	5.99	237

04112000 Sloan Creek near Williamston, Mich.

LOCATION.--Lat 42°40'33", long 84°21'50", in SE¼ NE¼ sec.1, T.3 N., R.1 W., Ingham County, on left bank 30 ft downstream from bridge on Meridian Road, 2.1 mies upstream from mouth, and 4.2 miles west of Williamston.

DRAINAGE AREA.--9.34 sq mi.

PERIOD OF RECORD.--June 1954 to current year.

GAGE.--Water-stage recorder and concrete control with V-notch sharp-crested weir. Datum of gage is 862.12 ft above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--17 years, 4.98 cfs (7.24 inches per year).

EXTREMES.--Current year: Maximum discharge, 281 cfs Feb. 19 (gage height, 4.94 ft); minimum, 0.03 cfs Aug. 23, 25, 26, Sept. 5, 16, 17 (gage height, 1.32 ft).
Period of record: Maximum discharge, 773 cfs June 25, 1968 (gage height, 7.84 ft); minimum, 0.01 cfs Sept. 11, 1954, Jan. 18, 1957 (gage height, 1.10 ft), caused by unusual regulation; minimum natural discharge, 0.02 cfs July 27, 1965 (gage height, 1.18 ft).

REMARKS.--Records good except those for the winter period and those below 0.1 cfs, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.57	2.6	8.8	3.6	1.3	19	8.4	3.1	.96	3.1	.30	.08
2	.52	3.6	7.1	3.6	1.2	14	8.9	3.0	1.0	1.1	.23	.08
3	.48	11	6.8	3.4	1.2	9.4	7.9	2.8	.98	.81	.32	.08
4	.46	18	12	5.1	1.4	7.5	6.9	2.6	.90	.66	.29	.08
5	.44	13	8.6	6.5	20	6.6	6.4	2.6	.85	2.0	.17	.06
6	.44	8.4	6.4	6.0	25	13	6.2	2.5	.92	3.3	.14	.07
7	.46	6.3	5.1	4.8	15	17	6.1	2.3	.93	1.3	.13	.08
8	.54	5.1	4.7	4.1	9.5	7.1	6.0	2.2	.85	.99	.11	.08
9	.63	4.6	4.5	3.7	7.6	8.1	5.8	2.1	.83	.87	.10	.07
10	1.1	7.0	4.2	3.6	5.5	7.5	5.2	1.9	.75	.69	.20	.08
11	.87	6.8	4.3	3.3	4.6	6.7	5.0	1.9	.72	.54	.23	.08
12	.72	5.9	4.5	2.9	4.5	6.2	5.0	2.4	.79	.48	.16	.08
13	.69	5.1	4.4	2.7	4.1	6.2	12	2.4	1.6	.44	.13	.09
14	11	4.5	4.4	2.8	3.8	48	12	1.9	1.3	.38	.12	.08
15	9.2	4.0	4.4	2.5	3.1	120	9.1	1.8	.92	.44	.12	.05
16	4.9	3.7	4.6	2.3	2.8	56	7.6	1.6	.80	.40	.12	.05
17	3.7	3.5	4.7	2.3	3.6	33	7.0	1.5	.72	.43	.10	.05
18	2.9	3.4	4.8	2.2	16	23	6.5	1.4	.65	.39	.09	.05
19	2.3	3.2	9.8	1.9	141	19	5.9	1.3	.61	.43	.08	.16
20	2.0	7.0	17	1.9	173	20	5.5	1.4	.72	.39	.08	.36
21	2.5	8.5	11	2.0	59	14	5.2	1.2	2.0	.34	.07	.09
22	2.4	6.5	7.8	1.9	39	14	4.7	1.2	1.3	.27	.06	.08
23	2.2	5.1	6.7	1.9	27	13	4.3	1.2	1.2	.25	.05	.08
24	1.9	4.1	5.8	1.8	19	9.8	4.1	1.4	1.0	.26	.06	.08
25	1.8	3.7	5.2	1.8	32	8.8	3.7	1.7	.81	.25	.05	.08
26	1.6	3.5	4.9	1.8	61	8.8	3.5	1.4	.69	.39	.08	.14
27	1.5	4.1	4.5	1.7	71	8.8	3.3	1.2	.63	.31	.09	.32
28	1.4	14	4.2	1.5	29	9.6	3.6	1.1	.52	.29	.10	.26
29	2.4	15	3.9	1.4	------	9.6	3.4	1.1	.46	.36	.08	.18
30	3.6	13	3.6	1.4	------	8.2	3.1	1.0	.87	.36	.08	.19
31	3.1	------	3.7	1.3	------	7.6	------	.98	------	.33	.08	------
TOTAL	68.32	204.2	192.4	87.7	781.2	559.5	182.3	56.18	27.28	22.55	4.02	3.31
MEAN	2.20	6.81	6.21	2.83	27.9	18.0	6.08	1.81	.91	.73	.13	.11
MAX	11	18	17	6.5	173	120	12	3.1	2.0	3.3	.32	.36
MIN	.44	2.6	3.6	1.3	1.2	6.2	3.1	.98	.46	.25	.05	.05
CFSM	.24	.73	.66	.30	2.99	1.93	.65	.19	.10	.08	.01	.01
IN.	.27	.81	.77	.35	3.11	2.23	.73	.22	.11	.09	.02	.01

CAL YR 1970 TOTAL 1,906.21 MEAN 5.22 MAX 68 MIN .18 CFSM .56 IN 7.59
WTR YR 1971 TOTAL 2,188.96 MEAN 6.00 MAX 173 MIN .05 CFSM .64 IN 8.72

PEAK DISCHARGE (BASE, 120 CFS)

DATE	TIME	GHT	DISCHARGE
02-19	2300	4.94	281
03-14	1700	4.62	234

04112500 Red 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., Ingham County, 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.

PERIOD OF RECORD.—August 1902 to December 1903, March 1931 to current year. Monthly discharge only for some periods, published in WSP 1307. Published as Red Cedar River at Agricultural College August 1902 to December 1903 and as Cedar River at East Lansing March 1931 to September 1965. 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. August 1902 to December 1903 nonrecording gage at site 0.8 mile downstream at different datum. March 1931 to November 1940 water-stage recorder at site 250 ft upstream at present datum.

AVERAGE DISCHARGE.—41 years, 197 cfs (7.54 inches per year).

EXTREMES.—Current year: Maximum discharge, 2,150 cfs Feb. 21 (gage height, 7.46 ft); minimum, 15 cfs Sept. 1, 2, 3, 10 (gage height, 3.07 ft).
Period of record: Maximum discharge, 5,920 cfs Apr. 7, 1947 (gage height, 11.58 ft); minimum, 3 cfs July 31, 1931. Flood of Mar. 24, 1904, reached a stage of 13.4 ft (discharge, 8,000 cfs).

REMARKS.—Records good. Occasional regulation at low flow by mill at Williamston, 16 miles above station.

REVISIONS (WATER YEARS).—WSP 1307: 1936 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	62	117	303	111	67	1,100	351	146	62	67	23	16
2	57	126	275	105	65	890	347	142	62	67	23	15
3	60	208	254	108	60	730	347	138	65	49	20	16
4	65	307	258	120	62	550	343	129	67	38	20	16
5	67	351	264	156	126	515	323	123	65	67	20	18
6	62	311	233	177	230	462	307	120	67	105	18	21
7	62	261	188	160	315	485	291	117	62	74	18	20
8	60	226	184	146	347	423	275	114	60	55	17	18
9	60	202	170	126	355	399	261	108	60	49	17	16
10	89	202	170	120	311	367	247	108	57	40	23	16
11	77	222	170	114	258	331	236	102	51	36	31	16
12	72	230	170	111	226	303	222	105	49	32	23	16
13	69	216	174	108	202	291	244	114	77	29	20	16
14	129	198	180	105	184	343	315	108	82	26	18	16
15	264	177	146	102	170	1,140	347	102	69	26	18	16
16	244	163	170	95	152	1,720	343	95	57	26	18	16
17	184	152	198	92	142	1,640	331	92	51	29	18	16
18	149	146	188	87	156	1,260	307	89	44	28	17	16
19	129	138	191	82	490	1,020	283	87	38	28	16	21
20	117	160	254	82	1,270	895	261	89	42	28	16	31
21	114	208	299	82	2,030	795	244	84	60	26	16	32
22	114	222	283	79	2,000	700	222	79	57	23	16	32
23	114	205	258	79	1,670	635	208	77	65	23	16	26
24	108	177	216	79	1,440	575	188	77	51	21	16	24
25	95	142	170	77	1,290	495	174	95	44	21	16	23
26	92	149	166	77	1,200	444	160	95	40	26	16	28
27	87	152	174	69	1,310	415	152	100	36	24	18	51
28	87	212	170	62	1,380	399	149	89	31	24	24	53
29	97	279	142	67	------	395	149	74	28	23	21	47
30	114	311	117	67	------	391	149	69	34	24	20	40
31	120	------	114	65	------	367	------	67	------	23	17	------
TOTAL	3,220	6,170	6,249	3,110	17,508	20,475	7,776	3,134	1,633	1,157	590	708
MEAN	104	206	202	100	625	660	259	101	54.4	37.3	19.0	23.6
MAX	264	351	303	177	2,030	1,720	351	146	82	105	31	53
MIN	57	117	114	62	60	291	149	67	28	21	16	15
CFSM	.29	.58	.57	.28	1.76	1.86	.73	.28	.15	.11	.05	.07
IN.	.34	.65	.65	.33	1.83	2.15	.81	.33	.17	.12	.06	.07

CAL YR 1970 TOTAL 67,692 MEAN 185 MAX 1,190 MIN 28 CFSM .52 IN 7.09
WTR YR 1971 TOTAL 71,730 MEAN 197 MAX 2,030 MIN 15 CFSM .55 IN 7.52

PEAK DISCHARGE (BASE, 1,100 CFS).—Feb. 21 (2200) 2,150 cfs (7.46 ft); Mar. 16 (2000) 1,780 cfs (6.85 ft).

04113000 Grand River at Lansing, Mich.

LOCATION.--Lat 42°45'02", long 84°33'19", in NW¼ sec.9, T.4 N., R.2 W., Ingham County, on right bank 30 ft upstream from bridge on North Grand River Avenue in Lansing, 2.0 miles downstream from Red Cedar River, and at mile 152.

DRAINAGE AREA.--1,230 sq mi, approximately.

PERIOD OF RECORD.--March 1901 to September 1906, October 1934 to current year. 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 (levels by Michigan Department of Natural Resources). Prior to August 1906, nonrecording gage at same site at different datum. November 1934 to June 1949 water-stage recorder at site 1.8 miles downstream at datum 2.42 ft lower.

AVERAGE DISCHARGE.--42 years, 802 cfs (8.85 inches per year).

EXTREMES.--Current year: Maximum discharge, 5,460 cfs Feb. 22 (gage height, 9.97 ft); minimum, 15 cfs Aug. 19 (gage height, 1.26 ft); minimum daily, 58 cfs Aug. 20.
Period of record: 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, 2.8 cfs Sept. 9, 1963 (gage height, 0.85 ft); minimum daily, 20 cfs Aug. 25, 1941.
Maximum discharge since at least 1901, that of Mar. 26, 1904.

REMARKS.--Records good. Large diurnal fluctuation at medium and low flows caused by powerplants above station. Records of water temperature for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1174: 1949. WSP 1387: 1901, 1903-4, 1935, 1937, 1942.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	360	539	1,130	579	257	3,500	1,470	646	373	251	200	71
2	423	728	1,140	566	288	3,130	1,430	714	395	229	131	73
3	351	719	1,200	548	266	2,780	1,510	610	340	254	157	88
4	261	1,080	1,150	571	311	2,190	1,440	695	387	197	116	114
5	270	1,110	1,210	529	815	2,220	1,350	620	379	437	196	169
6	279	1,060	1,070	595	977	2,000	1,340	672	431	337	111	197
7	243	938	993	557	1,100	2,130	1,260	623	347	407	120	134
8	213	888	943	539	1,150	1,890	1,200	599	335	475	148	78
9	364	823	934	506	1,250	1,540	1,190	572	360	367	71	82
10	481	819	811	477	1,190	1,850	1,140	535	322	290	207	114
11	351	759	908	539	1,010	1,590	1,140	511	315	252	217	134
12	369	835	892	481	925	1,560	1,070	552	343	167	147	177
13	391	746	929	468	835	1,490	1,290	495	818	184	140	128
14	714	782	925	445	773	1,800	1,330	525	594	221	146	80
15	888	624	811	427	764	3,520	1,370	497	621	189	133	78
16	807	759	786	387	665	4,440	1,300	454	443	214	134	90
17	807	642	947	360	638	4,270	1,240	473	309	193	131	96
18	701	571	956	343	862	3,710	1,200	449	341	223	132	93
19	741	647	920	347	2,240	3,200	1,140	422	285	181	89	205
20	701	759	993	331	3,940	2,900	1,130	447	305	243	58	279
21	660	773	1,120	339	4,890	2,620	1,060	387	481	227	59	104
22	669	867	1,010	351	5,280	2,500	908	348	337	170	131	149
23	642	795	1,060	323	4,650	2,290	969	418	329	167	104	157
24	583	799	835	293	3,830	2,180	696	440	267	175	165	185
25	539	755	764	369	3,390	1,890	823	491	224	215	114	85
26	518	692	522	331	3,390	1,810	741	404	260	252	102	189
27	468	692	782	323	3,830	1,690	732	495	205	182	120	382
28	535	912	714	311	3,850	1,670	755	471	262	233	128	360
29	571	1,020	674	311	------	1,640	620	486	186	230	161	369
30	566	1,110	548	270	------	1,590	599	361	237	244	82	365
31	599	------	603	302	------	1,520	------	400	------	197	73	------
TOTAL	16,065	24,243	28,280	13,218	53,366	73,110	33,443	15,812	10,831	7,603	4,023	4,825
MEAN	518	808	912	426	1,906	2,358	1,115	510	361	245	130	161
MAX	888	1,110	1,210	629	5,280	4,440	1,510	714	818	475	217	382
MIN	213	539	522	270	257	1,490	599	348	186	167	58	71
CFSM	.42	.66	.74	.35	1.55	1.92	.91	.41	.29	.20	.11	.13
IN.	.49	.73	.86	.40	1.61	2.21	1.01	.48	.33	.23	.12	.15

CAL YR 1970 TOTAL 285,195 MEAN 781 MAX 4,010 MIN 145 CFSM .64 IN 8.63
WTR YR 1971 TOTAL 284,819 MEAN 780 MAX 5,280 MIN 58 CFSM .63 IN 8.61

04114000 Grand River at Portland, Mich.

LOCATION.—Lat 42°51'20", long 84°54'45", in NW¼ sec.4, T.5 N., R.5 W., Ionia County, 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.

PERIOD OF RECORD.—August 1952 to current year. 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 (levels by Michigan Department of Natural Resources). Prior to July 6, 1953, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.—19 years, 816 cfs (8.00 inches per year).

EXTREMES.—Current year: Maximum discharge, 6,110 cfs Feb. 22 (gage height, 10.15 ft); minimum, 77 cfs Sept. 24 (gage height, 3.95 ft); minimum daily, 134 cfs Sept. 23.
Period of record: Maximum discharge, 9,100 cfs May 13, 1956; maximum gage height, 11.77 ft Feb. 12, 1968 (backwater from ice); minimum discharge, 38 cfs Oct. 10, 1963; minimum daily, 58 cfs Oct. 9, 1963.

REMARKS.—Records good except those for the winter period, which are fair. Slight diurnal fluctuation caused by powerplants above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	498	706	1,360	740	350	4,000	1,840	718	429	308	307	159
2	484	686	1,340	720	350	3,500	1,710	771	419	344	291	153
3	534	1,010	1,310	720	350	3,100	1,720	793	447	304	219	153
4	470	1,160	1,350	803	350	2,600	1,710	743	393	304	254	159
5	366	1,440	1,300	771	510	2,400	1,660	761	429	318	231	169
6	394	1,360	1,280	740	1,100	2,300	1,580	730	423	678	243	260
7	401	1,260	1,210	720	1,300	2,200	1,550	742	501	480	249	363
8	394	1,080	1,100	700	1,400	2,100	1,470	709	410	520	216	255
9	341	1,040	1,080	660	1,500	1,700	1,410	674	386	585	218	196
10	823	1,050	1,020	600	1,500	2,000	1,340	634	404	485	220	165
11	709	982	1,050	680	1,300	1,800	1,330	618	369	367	256	176
12	557	947	1,040	680	1,100	1,700	1,310	598	367	326	355	218
13	548	993	1,060	580	1,000	1,700	1,580	624	781	300	259	235
14	809	881	1,060	560	950	1,790	1,710	552	1,090	270	230	187
15	1,330	892	1,060	540	900	3,960	1,670	582	749	278	232	193
16	1,230	794	950	500	820	5,020	1,620	537	687	270	218	150
17	1,040	825	935	460	760	5,040	1,530	480	550	336	205	156
18	967	755	1,110	450	1,000	4,500	1,460	511	405	304	217	166
19	846	712	1,110	430	1,910	3,760	1,400	490	422	291	217	171
20	867	811	1,190	420	4,640	3,410	1,290	475	387	321	220	283
21	835	1,000	1,250	430	5,680	3,040	1,330	478	647	347	163	452
22	770	989	1,340	440	6,010	2,840	1,190	417	599	281	148	285
23	778	997	1,210	440	5,720	2,680	1,080	376	472	250	138	134
24	728	936	1,240	390	4,950	2,450	1,070	459	486	318	209	189
25	687	917	991	450	4,000	2,260	856	517	362	313	193	242
26	620	861	962	460	3,800	2,120	940	555	325	264	269	205
27	616	826	721	410	4,000	1,970	852	475	337	349	229	310
28	567	970	999	400	4,300	1,950	867	551	283	304	219	608
29	675	1,180	860	390	------	1,940	867	523	336	417	232	476
30	735	1,310	700	360	------	1,870	743	509	287	355	190	465
31	688	------	720	350	------	1,810	------	405	------	358	219	------
TOTAL	21,307	29,370	33,908	16,994	61,550	83,510	40,685	18,007	14,182	10,945	7,066	7,333
MEAN	687	979	1,094	548	2,198	2,694	1,356	581	473	353	228	244
MAX	1,330	1,440	1,360	803	6,010	5,040	1,840	793	1,090	678	355	608
MIN	341	686	700	350	350	1,700	743	376	283	250	138	134
CFSM	.50	.71	.79	.40	1.59	1.95	.98	.42	.34	.25	.16	.18
IN.	.57	.79	.91	.46	1.65	2.24	1.09	.48	.38	.29	.19	.20

CAL YR 1970 TOTAL 344,160 MEAN 943 MAX 5,020 MIN 220 CFSM .68 IN 9.24
WTR YR 1971 TOTAL 344,857 MEAN 945 MAX 6,010 MIN 134 CFSM .68 IN 9.26

04114500 Looking Glass River near Eagle, Mich.
(Formerly published as Lookingglass River near Eagle, Mich.)

LOCATION.--Lat 42°49'45", long 84°46'40", in sec.10, T.5 N., R.4 W., Clinton County, on right bank at upstream side of highway bridge, 1.5 miles northeast of Eagle and 10 miles upstream from mouth.

DRAINAGE AREA.--281 sq mi.

PERIOD OF RECORD.--August 1944 to current year.

GAGE.--Water-stage recorder. Datum of gage is 747.09 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to June 2, 1962, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--27 years, 160 cfs (7.73 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,800 cfs Feb. 22; maximum gage height, 7.48 ft Feb. 22 (backwater from ice); minimum discharge, 23 cfs Aug. 22, 23, 24 (gage height, 1.27 ft).
Period of record: 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; maximum gage height, 9.9 ft Mar. 7, 1956 (ice jam), from high water mark; minimum discharge, 10 cfs July 28, 1965 (gage height, 1.01 ft).

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, which are poor. Small intermittent diversion at times into Lake Geneva when discharge is above 50 cfs.

REVISIONS (WATER YEARS).--WSP 1387: 1946-47.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74	110	226	150	70	1,400	453	144	70	40	38	28
2	74	119	225	150	70	1,300	423	139	69	39	36	27
3	72	177	229	150	70	1,100	398	136	66	41	35	26
4	64	237	237	150	70	1,000	375	132	64	44	32	27
5	61	239	240	145	80	900	354	128	63	81	31	28
6	58	230	239	145	200	830	338	124	64	89	30	35
7	56	228	247	145	240	750	322	117	63	66	29	36
8	54	233	261	135	260	635	305	112	62	77	28	32
9	56	245	218	125	270	583	293	107	63	88	27	30
10	92	275	212	120	270	554	276	103	63	93	27	29
11	76	281	177	115	260	511	261	100	63	88	29	29
12	75	279	182	110	230	453	251	101	64	75	29	28
13	75	272	199	110	200	436	332	98	181	62	28	27
14	173	261	228	105	180	547	316	98	106	51	28	26
15	157	250	202	100	160	990	291	96	82	47	28	27
16	139	240	234	95	150	1,300	282	93	70	43	26	27
17	130	229	216	94	150	1,400	285	89	62	42	26	28
18	131	219	197	92	170	1,350	292	86	57	39	26	27
19	132	207	206	90	400	1,250	292	83	52	42	25	29
20	136	220	220	90	900	1,200	289	80	51	42	25	37
21	141	217	257	88	1,600	1,000	281	75	77	39	25	36
22	137	203	248	88	1,700	950	268	74	61	37	24	33
23	131	188	245	86	1,600	850	254	73	67	35	23	32
24	123	187	232	84	1,500	763	238	79	62	46	23	31
25	115	204	220	82	1,400	736	220	97	58	39	25	31
26	109	179	200	80	1,300	682	203	89	52	37	32	33
27	104	175	190	78	1,300	639	185	89	47	38	36	47
28	102	197	180	76	1,400	599	170	89	44	45	32	50
29	114	213	160	76	------	558	157	85	43	57	30	47
30	116	227	150	74	------	511	148	79	40	46	29	46
31	112	------	150	72	------	471	------	74	------	42	28	------
TOTAL	3,189	6,541	6,627	3,300	16,200	26,248	8,552	3,069	1,986	1,650	890	969
MEAN	103	218	214	106	579	847	285	99.0	66.2	53.2	28.7	32.3
MAX	173	281	261	150	1,700	1,400	453	144	181	93	38	50
MIN	54	110	150	72	70	436	148	73	40	35	23	26
CFSM	.37	.78	.76	.38	2.06	3.01	1.01	.35	.24	.19	.10	.11
IN.	.42	.87	.88	.44	2.14	3.47	1.13	.41	.26	.22	.12	.13

CAL YR 1970 TOTAL 51,990 MEAN 142 MAX 629 MIN 30 CFSM .51 IN 6.88
WTR YR 1971 TOTAL 79,221 MEAN 217 MAX 1,700 MIN 23 CFSM .77 IN 10.49

NOTE.--No gage height record Feb. 22-24.

04115000 Maple River at Maple Rapids, Mich.

LOCATION.--Lat 43°06'35", long 84°41'35", in sec.5, T.8 N., R.3 W., Clinton County, on right bank at downstream side of bridge on Maple Road at Maple Rapids, 50 ft upstream from Pine Creek, and 0.8 mile upstream from Hayworth Creek. Records include flow of Pine Creek.

DRAINAGE AREA.--434 sq mi.

PERIOD OF RECORD.--August 1944 to current year.

GAGE.--Water-stage recorder. Datum of gage is 642.58 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to Oct. 4, 1968, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--27 years, 231 cfs (7.23 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,890 cfs Feb. 28 (gage height, 8.85 ft); minimum, 8.3 cfs Aug. 22 (gage height, 2.17 ft).
Period of record: 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, 4.4 cfs Aug. 13, 1965 (gage height, 1.62 ft).
Flood in March 1904 reached a stage of 13.8 ft, from information by local resident.

REMARKS.--Records fair.

REVISIONS (WATER YEAR).--WSP 1707: 1956.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	95	232	325	247	76	1,600	722	228	68	22	15	16
2	90	236	341	235	71	1,500	678	221	66	21	15	15
3	86	314	360	225	67	1,400	660	209	64	20	14	14
4	82	462	379	221	64	1,300	628	197	63	20	13	14
5	78	586	396	216	69	1,200	591	186	62	20	12	14
6	74	666	405	214	75	1,000	554	175	61	20	11	19
7	70	687	402	213	86	900	516	164	60	20	10	28
8	67	660	386	208	96	800	483	153	60	20	10	33
9	65	622	382	203	106	740	450	144	60	21	11	33
10	74	596	368	196	116	700	426	136	59	21	10	30
11	97	582	365	191	122	660	400	129	57	21	10	28
12	110	559	349	184	123	630	384	121	57	19	9.7	26
13	118	534	328	175	125	620	411	116	58	18	9.9	24
14	148	505	313	168	121	800	456	112	57	18	10	23
15	232	474	297	161	114	1,190	485	105	52	17	11	22
16	305	447	283	152	107	1,320	507	102	48	16	10	21
17	348	428	275	145	104	1,410	513	98	45	16	9.9	20
18	372	403	268	139	102	1,480	507	92	42	16	9.7	19
19	377	377	269	135	134	1,480	488	87	39	17	9.9	19
20	369	366	286	125	308	1,420	466	82	36	16	9.8	20
21	355	366	311	119	658	1,300	445	79	34	16	9.4	22
22	337	354	328	114	1,070	1,150	418	76	32	16	9.2	23
23	319	344	342	109	1,270	1,060	388	72	30	16	10	23
24	302	343	346	105	1,390	920	360	71	28	16	10	24
25	285	331	344	102	1,430	840	340	72	27	15	10	24
26	266	327	334	101	1,470	770	319	73	27	14	10	26
27	251	316	319	112	1,760	733	298	75	26	14	11	29
28	239	306	308	99	1,700	711	274	75	25	14	14	35
29	233	297	293	92	------	734	255	73	24	15	17	40
30	233	307	280	86	------	752	242	71	23	15	17	43
31	234	------	263	81	------	754	------	69	------	15	17	------
TOTAL	6,311	13,027	10,245	4,873	12,934	31,874	13,664	3,663	1,390	545	355.5	727
MEAN	204	434	330	157	462	1,028	455	118	46.3	17.6	11.5	24.2
MAX	377	687	405	247	1,760	1,600	722	228	68	22	17	43
MIN	65	232	263	81	64	620	242	69	23	14	9.2	14
CFSM	.47	1.00	.76	.36	1.06	2.37	1.05	.27	.11	.04	.03	.06
IN.	.54	1.12	.88	.42	1.11	2.73	1.17	.31	.12	.05	.03	.06

CAL YR 1970 TOTAL 74,867.0 MEAN 205 MAX 968 MIN 19 CFSM .47 IN 6.42
WTR YR 1971 TOTAL 99,608.5 MEAN 273 MAX 1,760 MIN 9.2 CFSM .63 IN 8.54

04116000 Grand River at Ionia, Mich.

LOCATION.--Lat 42°58'20", long 85°04'13", in NW¼ sec.30, T.7 N., R.6 W., Ionia County, 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.

PERIOD OF RECORD.--March to June 1931, July and September 1931 (fragmentary), July 1951 to current year. 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. Mar. 19 to Sept. 24, 1931, nonrecording gage at site 1.5 miles upstream at different datum.

AVERAGE DISCHARGE.--20 years (1951-71), 1,687 cfs (8.07 inches per year).

EXTREMES.--Current year: Maximum daily discharge, 13,000 cfs Feb. 23; maximum gage height recorded, 19.53 ft Feb. 28; minimum discharge, 168 cfs Sept. 25; minimum daily, 225 cfs Aug. 23.
Period of record: Maximum discharge, 21,500 cfs Apr. 1, 1960 (gage height, 23.43 ft); minimum, 40 cfs May 13, 1968 (gage height, 5.61 ft); minimum daily, 115 cfs Aug. 27, 1953.

REMARKS.--Records fair. Diurnal fluctuation below about 5,000 cfs caused by powerplants above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,060	1,800	3,500	1,800	600	10,900	4,110	1,590	871	413	418	380
2	994	1,690	3,500	2,100	850	9,730	4,030	1,480	751	459	409	450
3	940	2,170	3,500	2,000	900	8,830	3,900	1,620	726	554	475	350
4	920	2,920	3,500	2,200	1,180	7,800	3,640	1,570	792	428	339	300
5	944	3,710	3,500	2,000	1,400	6,800	3,580	1,410	852	516	336	250
6	988	4,200	3,500	2,100	2,670	6,000	3,380	1,450	791	714	323	382
7	1,250	4,010	3,400	1,500	2,870	5,000	3,130	1,430	802	882	321	950
8	748	3,350	3,000	1,700	3,040	4,500	3,030	1,430	931	695	326	250
9	518	3,410	2,400	1,400	2,600	4,000	2,860	1,310	788	787	413	300
10	1,310	3,170	3,000	1,700	2,660	3,700	2,770	1,250	718	995	379	400
11	2,180	3,070	2,700	1,800	3,140	3,500	2,590	1,170	702	538	413	300
12	1,860	3,070	2,800	1,800	2,770	3,300	2,510	1,150	699	482	250	400
13	1,560	2,760	2,700	1,900	2,700	3,100	2,890	1,010	1,120	526	521	450
14	2,040	2,870	2,500	1,800	1,800	3,290	3,360	1,130	1,940	430	396	558
15	3,410	2,440	2,600	1,500	2,100	6,300	3,570	1,110	1,400	446	380	408
16	3,410	2,490	2,700	1,200	2,200	8,820	3,310	1,130	981	453	277	387
17	2,960	2,340	2,600	1,200	2,400	9,850	3,060	970	981	433	326	313
18	2,770	2,410	2,600	1,400	1,900	9,610	3,190	964	899	271	419	264
19	2,570	1,960	3,000	840	3,000	8,600	2,910	1,070	721	662	247	274
20	2,300	2,070	3,100	820	5,000	7,660	2,590	846	669	319	438	374
21	2,270	2,390	3,300	1,200	9,000	7,090	2,620	983	826	469	442	416
22	2,140	2,530	3,000	1,400	12,000	6,490	2,630	971	1,290	432	430	783
23	1,930	2,350	3,600	1,200	13,000	5,900	2,490	801	907	323	225	511
24	1,850	2,380	3,200	1,240	12,500	5,400	2,170	792	742	284	405	290
25	1,950	2,120	2,600	900	11,000	5,000	2,010	995	634	499	266	298
26	1,700	2,070	2,000	1,100	12,000	4,600	1,920	1,050	652	466	544	428
27	1,620	2,170	2,200	1,400	11,400	4,290	1,960	1,110	638	355	568	961
28	1,570	2,070	2,100	540	11,600	4,160	1,870	955	553	489	380	1,040
29	1,660	2,200	1,300	800	------	4,250	1,720	925	378	505	350	1,010
30	1,680	3,300	2,700	1,000	------	4,210	1,710	906	725	583	350	680
31	1,760	------	2,100	950	------	4,230	------	888	------	542	350	------
TOTAL	54,862	79,490	88,200	44,490	138,280	186,910	85,510	35,466	25,479	15,950	11,716	14,157
MEAN	1,770	2,650	2,845	1,435	4,939	6,029	2,850	1,144	849	515	378	472
MAX	3,410	4,200	3,600	2,200	13,000	10,900	4,110	1,620	1,940	995	568	1,040
MIN	518	1,690	1,300	540	600	3,100	1,710	792	378	271	225	250
CFSM	.62	.93	1.00	.51	1.74	2.12	1.00	.40	.30	.18	.13	.17
IN.	.72	1.04	1.16	.58	1.81	2.45	1.12	.46	.33	.21	.15	.19

CAL YR 1970 TOTAL 671,797 MEAN 1,841 MAX 8,750 MIN 166 CFSM .65 IN 8.80
WTR YR 1971 TOTAL 780,510 MEAN 2,138 MAX 13,000 MIN 225 CFSM .75 IN 10.22

NOTE.--No gage-height record Feb. 14-26.

*04116500 Flat River at Smyrna, Mich.

LOCATION.--Lat 43°03'10", long 85°15'50", in NW¼ sec.28, T.8 N., R.8 W., Ionia County, on right bank at downstream side of highway bridge, 600 ft downstream from dam and inactive powerplant, and 0.5 mile south of Smyrna.

DRAINAGE AREA.--528 sq mi.

PERIOD OF RECORD.--October 1950 to current year. Monthly discharge only for some periods, published in WSP 1727.

GAGE.--Water-stage recorder. Datum of gage is 729.53 ft above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--21 years, 402 cfs (10.34 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,590 cfs Mar. 19 (gage height, 5.79 ft); maximum gage height, 7.75 ft Jan. 8 (backwater from ice); minimum discharge, 52 cfs Sept. 13 (gage height, 2.75 ft); minimum daily discharge, 179 cfs July 4, 26.
Period of record: Maximum discharge, 3,100 cfs Apr. 22, 1967 (gage height, 7.27 ft caused by momentary release of water from storage above station); maximum gage height, 7.75 ft Jan. 8, 1971 (backwater from ice); minimum discharge, 7.4 cfs Sept. 9, 1953; minimum daily, 70 cfs Sept. 6, 1964.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, which are poor. Diurnal fluctuation caused by powerplants above station prior to September 1956; occasional diurnal fluctuation since.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	527	558	680	500	330	864	803	477	278	180	186	216
2	501	518	700	470	330	946	929	485	293	180	187	220
3	532	570	760	460	340	919	992	461	315	180	194	224
4	369	715	840	450	390	868	1,000	502	340	179	194	219
5	482	752	840	450	520	837	988	390	294	197	190	245
6	386	787	800	440	550	822	905	465	306	207	182	347
7	399	775	760	430	500	795	914	392	315	204	183	334
8	358	709	710	440	450	747	840	439	310	213	180	307
9	332	734	680	450	420	692	818	397	298	216	181	271
10	450	744	620	470	390	710	780	338	283	209	189	263
11	407	673	580	500	360	691	818	340	271	201	203	253
12	478	678	550	490	350	658	730	359	266	201	200	261
13	421	662	540	460	350	628	905	416	379	201	202	223
14	599	642	530	430	350	656	940	318	408	197	199	234
15	658	594	530	410	370	830	946	299	428	197	193	225
16	616	513	530	400	380	942	929	356	297	195	194	219
17	687	554	540	390	420	1,270	918	340	299	191	195	216
18	612	571	540	380	480	1,290	864	318	281	189	189	210
19	550	523	540	380	540	1,340	812	399	265	190	185	214
20	574	496	540	380	580	1,200	781	285	269	185	184	248
21	515	565	540	370	599	1,090	650	256	291	190	183	251
22	546	513	530	370	619	1,130	666	325	238	184	180	242
23	424	527	530	360	703	1,040	625	316	272	183	180	239
24	514	520	530	350	680	810	595	342	211	182	183	226
25	414	520	530	350	661	835	550	313	217	181	231	224
26	489	520	500	340	733	790	543	366	256	179	236	238
27	373	550	450	340	898	784	499	354	246	181	262	318
28	461	590	400	330	911	682	484	341	234	188	232	383
29	487	630	410	330	------	873	543	301	183	192	228	273
30	488	660	470	330	------	803	449	320	183	195	231	275
31	516	------	520	330	------	747	------	366	------	191	222	------
TOTAL	15,165	18,363	18,220	12,580	14,204	27,289	23,216	11,376	8,526	5,958	6,178	7,618
MEAN	489	612	588	406	507	880	774	367	284	192	199	254
MAX	687	787	840	500	911	1,340	1,000	502	428	216	262	383
MIN	332	496	400	330	330	628	449	256	183	179	180	210
CFSM	.93	1.16	1.11	.77	.96	1.67	1.47	.70	.54	.36	.38	.48
IN.	1.07	1.29	1.28	.89	1.00	1.92	1.64	.80	.60	.42	.44	.54

CAL YR 1970 TOTAL 158,285 MEAN 434 MAX 919 MIN 179 CFSM .82 IN 11.15
WTR YR 1971 TOTAL 168,693 MEAN 462 MAX 1,340 MIN 179 CFSM .88 IN 11.89

NOTE.--No gage-height record Nov. 23 to Dec. 28.

04117000 Quaker Brook near Nashville, Mich.

LOCATION.—Lat 42°33'57", long 85°05'37", in NW¼ sec.13, T.2 N., R.7 W., Barry County, on left bank 150 ft upstream from culvert on county road, 500 ft upstream from small tributary, and 2.5 miles south of Nashville.

DRAINAGE AREA.—7.60 sq mi.

PERIOD OF RECORD.—August 1954 to current year.

GAGE.—Water-stage recorder and concrete control. Datum of gage is 821.89 ft above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.—17 years, 5.66 cfs (10.11 inches per year).

EXTREMES.—Current year: Maximum discharge, 150 cfs Feb. 20 (gage height, 4.52 ft); minimum, 1.5 cfs Jan. 26 (gage height, 1.67 ft), result of freezeup.
Period of record: Maximum discharge, 294 cfs Oct. 4, 1954 (gage height, 5.47 ft), from rating curve extended above 140 cfs; minimum, 0.44 cfs Nov. 3, 1966 (gage height, 1.40 ft, result of snow dam).

REMARKS.—Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	5.2	8.4	4.2	3.6	11	8.8	5.1	3.4	2.8	3.1	2.4
2	4.0	6.5	7.7	4.5	3.5	9.5	9.1	5.2	3.5	2.3	2.8	2.3
3	3.7	11	6.6	4.7	3.6	7.8	7.8	5.0	3.4	2.2	2.8	2.3
4	3.5	11	6.8	6.9	4.1	6.5	7.3	4.7	3.2	2.1	2.8	2.3
5	3.3	9.5	5.9	6.9	12	6.7	7.0	4.7	3.1	7.4	2.6	2.4
6	3.2	6.9	4.8	5.4	22	8.8	6.7	4.7	3.7	9.3	2.5	8.3
7	3.2	5.9	4.5	4.7	14	10	6.4	4.4	3.9	3.5	2.5	6.8
8	3.2	5.3	4.8	4.4	8.1	7.1	6.4	4.3	3.7	4.4	2.4	3.6
9	6.1	5.7	5.7	4.0	5.5	7.1	6.3	4.2	3.3	4.0	2.4	2.9
10	23	11	5.5	4.4	5.2	7.0	6.2	4.0	3.0	3.0	2.8	2.6
11	10	8.6	7.1	4.5	5.2	6.8	5.9	4.1	2.9	2.6	5.2	2.7
12	5.4	6.8	8.7	4.4	6.1	6.7	6.0	6.1	3.0	2.4	3.2	2.6
13	5.1	6.1	7.1	4.3	5.2	7.0	15	4.8	7.3	2.3	2.8	2.7
14	31	5.6	6.5	4.4	4.7	50	12	4.2	4.3	2.2	2.7	2.5
15	24	5.2	5.3	4.3	4.8	72	7.8	3.9	3.3	2.9	2.6	2.4
16	9.7	5.1	6.1	4.1	4.7	25	6.8	3.8	2.9	3.0	2.5	2.3
17	6.4	4.8	6.1	4.1	6.1	14	7.3	3.6	2.7	6.1	2.4	2.5
18	5.5	4.8	6.3	4.0	12	10	6.9	3.5	2.5	3.6	2.3	2.4
19	5.0	4.9	9.4	3.6	91	11	6.2	3.5	2.5	3.5	2.3	3.2
20	5.1	10	11	3.8	102	15	5.8	3.6	2.4	3.6	2.8	6.9
21	6.1	14	7.1	4.0	25	12	5.8	3.4	2.6	2.9	2.6	5.1
22	5.2	7.7	6.1	4.1	14	14	5.3	3.3	2.4	2.7	2.4	3.4
23	4.8	6.0	5.9	4.1	12	11	4.9	3.2	2.5	2.7	2.2	3.0
24	4.7	5.4	5.2	4.1	10	7.9	4.8	4.9	2.4	4.0	2.2	2.8
25	4.6	5.1	5.1	4.2	12	7.0	5.1	15	2.2	3.3	2.2	2.8
26	4.5	5.6	4.5	4.0	28	7.6	4.7	7.6	2.2	4.0	2.9	3.5
27	4.5	11	5.4	4.0	41	8.0	4.7	5.0	2.1	3.1	3.1	18
28	4.9	20	4.9	3.7	17	8.9	5.4	4.2	1.9	5.9	3.2	16
29	9.9	14	4.7	3.7	------	9.4	5.4	3.8	1.9	9.5	2.6	5.5
30	8.1	10	4.2	3.7	------	7.7	5.0	3.5	2.4	4.3	2.4	3.8
31	5.9	------	4.4	4.0	------	7.9	------	3.4	------	3.5	2.3	------
TOTAL	227.2	238.7	191.8	135.2	482.4	400.4	202.8	144.7	90.6	119.1	83.6	130.0
MEAN	7.33	7.96	6.19	4.36	17.2	12.9	6.76	4.67	3.02	3.84	2.70	4.33
MAX	31	20	11	6.9	102	72	15	15	7.3	9.5	5.2	18
MIN	3.2	4.8	4.2	3.6	3.5	6.5	4.7	3.2	1.9	2.1	2.2	2.3
CFSM	.96	1.05	.81	.57	2.26	1.70	.89	.61	.40	.51	.36	.57
IN.	1.11	1.17	.94	.66	2.36	1.96	.99	.71	.44	.58	.41	.64

CAL YR 1970 TOTAL 2,628.8 MEAN 7.20 MAX 78 MIN 2.1 CFSM .95 IN 12.87
WTR YR 1971 TOTAL 2,446.5 MEAN 6.70 MAX 102 MIN 1.9 CFSM .88 IN 11.97

PEAK DISCHARGE (BASE, 50 CFS)

DATE	TIME	GHT	DISCHARGE
02-20	0100	4.52	150
02-27	0300	2.95	61
03-14	2100	3.91	124

04117500 Thornapple River near Hastings, Mich.

LOCATION.—Lat 42°36'57", long 85°14'11", in SE¼ sec.27, T.3 N., R.8 W., Barry County, on downstream side of highway bridge, 0.6 mile downstream from Cedar Creek, 2.0 miles downstream from Thornapple Lake, and 3.2 miles southeast of Hastings.

DRAINAGE AREA.—385 sq mi.

PERIOD OF RECORD.—October 1944 to current year.

GAGE.—Water-stage recorder. Datum of gage is 786.71 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to Oct. 1, 1965, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.—27 years, 286 cfs (10.09 inches per year).

EXTREMES.—Current year: Maximum discharge, 2,130 cfs Feb. 23 (gage height, 6.65 ft); minimum, 76 cfs Sept. 2-5 (gage height, 2.88 ft).
Period of record: Maximum discharge, 6,810 cfs Apr. 7, 1947 (gage height, 10.20 ft, from graph based on gage readings); minimum, 33 cfs Aug. 10, 1964 (gage height, 2.71 ft).

REMARKS.—Records good except those for the winter period, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	143	260	553	245	140	1,590	481	225	145	127	143	79
2	138	264	574	236	135	1,430	463	224	139	128	131	77
3	126	278	563	236	131	1,260	460	221	135	127	123	76
4	116	318	526	239	130	1,060	444	213	135	121	118	76
5	114	375	471	248	161	900	419	206	131	146	111	76
6	111	434	429	254	212	755	394	205	128	206	105	110
7	108	458	383	248	267	652	370	201	129	252	101	174
8	105	439	344	245	322	580	354	193	134	245	96	205
9	121	402	316	239	355	526	335	188	135	231	94	197
10	203	372	307	233	353	514	325	185	132	207	91	192
11	291	361	314	230	324	473	310	183	125	184	97	204
12	359	366	314	224	288	440	300	178	122	162	98	140
13	358	365	315	218	255	408	355	179	136	138	98	116
14	365	351	318	209	230	429	438	182	227	133	98	131
15	432	326	282	203	218	812	505	174	340	127	97	140
16	528	299	289	197	210	1,420	524	170	400	120	93	124
17	585	280	305	191	204	1,690	503	165	390	124	89	87
18	578	263	314	185	212	1,700	463	156	314	125	86	85
19	521	253	317	182	326	1,580	417	148	239	125	84	86
20	441	258	352	176	836	1,380	378	143	203	127	83	110
21	376	301	402	170	1,510	1,170	346	143	179	128	83	130
22	324	350	431	170	2,000	1,030	313	142	164	127	81	133
23	288	388	442	165	2,100	935	288	139	164	125	79	125
24	260	382	400	160	2,000	856	263	141	164	129	79	118
25	244	353	350	160	1,730	761	251	175	163	129	79	111
26	229	329	304	160	1,570	665	244	212	156	123	84	109
27	218	324	296	155	1,600	591	234	220	142	119	80	232
28	212	370	300	150	1,630	549	227	203	132	124	83	368
29	228	440	300	150	------	534	224	180	124	153	83	430
30	246	513	268	145	------	524	227	167	120	166	82	416
31	257	------	251	140	------	506	------	156	------	158	81	------
TOTAL	8,625	10,472	11,330	6,163	19,449	27,720	10,855	5,617	5,347	4,636	2,930	4,657
MEAN	278	349	365	199	695	894	362	181	178	150	94.5	155
MAX	585	513	574	254	2,100	1,700	524	225	400	252	143	430
MIN	105	253	251	140	130	408	224	139	120	119	79	76
CFSM	.72	.91	.95	.52	1.81	2.32	.94	.47	.46	.39	.25	.40
IN.	.83	1.01	1.09	.60	1.88	2.68	1.05	.54	.52	.45	.28	.45

CAL YR 1970 TOTAL 116,204 MEAN 318 MAX 2,190 MIN 85 CFSM .83 IN 11.23
WTR YR 1971 TOTAL 117,801 MEAN 323 MAX 2,100 MIN 76 CFSM .84 IN 11.38

04118000. Thornapple River near Caledonia, Mich.

LOCATION.--Lat 42°48'40", long 85°29'00", in NW¼ sec.22, T.5 N., R.10 W., Kent County, on right bank 200 ft downstream from LaBarge powerplant, 2.3 miles northeast of Caledonia, and 3.3 miles downstream from Coldwater River.

DRAINAGE AREA.--773 sq mi.

PERIOD OF RECORD.--October 1930 to September 1938, October 1951 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 676.31 ft above mean sea level, unadjusted (Consumers Power Co. bench mark). Oct. 1, 1930, to Sept. 30, 1938, nonrecording gage at same site at mean sea level datum (unadjusted).

AVERAGE DISCHARGE.--28 years, 509 cfs (8.94 inches per year).

EXTREMES.--Current year: Maximum discharge, 3,150 cfs Feb. 27 (gage height, 7.62 ft); minimum, 19 cfs Oct. 9 (gage height, 1.59 ft); minimum daily, 27 cfs Oct. 10.
Period of record: Maximum discharge, 6,290 cfs May 10, 1956 (gage height, 10.79 ft); minimum, 1.0 cfs May 28, 1968 (gage height, 1.40 ft), result of regulation during bridge construction.
Flood of Apr. 7, 1947 reached a stage of 14.4 ft, from information by powerplant operator.

REMARKS.--Records good except those for the winter period, which are fair. Prior to Dec. 1, 1958, large diurnal fluctuation at low and medium flow caused by powerplant above station; occasional fluctuation since.

REVISIONS (WATER YEARS).--WSP 824: 1931-36. WSP 1307: 1931-37.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	373	554	902	480	270	2,800	962	500	324	296	392	174
2	360	566	921	460	265	2,640	949	489	339	308	352	229
3	347	604	917	460	260	2,390	917	469	348	305	335	242
4	325	670	888	470	260	2,070	900	469	324	280	267	236
5	323	741	829	480	300	1,870	902	456	304	306	285	193
6	318	784	772	500	400	1,600	863	446	324	471	222	263
7	304	807	714	490	500	1,390	827	442	343	438	222	284
8	313	806	659	475	600	1,230	766	442	333	534	230	301
9	137	794	581	474	700	1,060	717	438	336	507	236	290
10	27	763	624	450	700	1,050	749	423	326	470	227	298
11	345	735	569	445	660	974	688	415	310	416	249	290
12	560	694	600	435	580	919	643	403	285	352	246	255
13	652	680	608	420	520	881	853	417	341	318	225	236
14	826	670	612	410	470	934	979	407	418	281	211	234
15	899	662	584	400	430	1,710	980	378	461	281	223	230
16	923	623	575	380	420	2,330	986	383	548	274	225	228
17	971	588	598	370	405	2,620	952	396	609	307	221	229
18	995	576	602	360	410	2,690	914	360	560	292	220	208
19	975	536	653	355	600	2,650	858	353	542	319	188	228
20	907	523	692	345	1,600	2,490	806	361	408	361	209	272
21	893	582	728	335	2,240	2,240	739	362	493	374	182	292
22	735	612	782	330	2,630	2,060	683	337	466	343	219	287
23	701	853	791	320	2,990	1,870	673	336	440	311	209	285
24	629	1,030	774	320	3,030	1,680	600	326	407	296	198	285
25	574	794	690	315	2,920	1,440	526	363	390	307	186	281
26	511	674	600	310	2,860	1,350	541	399	378	285	189	287
27	523	638	580	300	3,030	1,240	538	429	361	271	248	331
28	495	717	580	295	3,000	1,140	525	438	325	274	212	521
29	601	781	560	290	------	1,090	495	410	285	335	177	522
30	525	850	520	280	------	1,040	474	384	276	387	242	559
31	536	------	500	275	------	1,010	------	356	------	423	214	------
TOTAL	17,603	20,907	21,005	12,029	33,050	52,458	23,005	12,587	11,604	10,722	7,261	8,570
MEAN	568	697	678	388	1,180	1,692	767	406	387	346	234	286
MAX	995	1,030	921	500	3,030	2,800	986	500	609	534	392	559
MIN	27	523	500	275	260	881	474	326	276	271	177	174
CFSM	.73	.90	.88	.50	1.53	2.19	.99	.53	.50	.45	.30	.37
IN.	.85	1.01	1.01	.58	1.59	2.52	1.11	.61	.56	.52	.35	.41

CAL YR 1970 TOTAL 216,093 MEAN 592 MAX 2,910 MIN 27 CFSM .77 IN 10.40
WTR YR 1971 TOTAL 230,801 MEAN 632 MAX 3,030 MIN 27 CFSM .82 IN 11.11

04118500 Rogue River near Rockford, Mich.

LOCATION.--Lat 43°05'00", long 85°35'30", in NE¼ sec. 15, T.8 N., R.11 W., Kent County, 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.

PERIOD OF RECORD.--February 1952 to current year.

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, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--19 years, 210 cfs (12.19 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,370 cfs Mar. 16 (gage height, 7.38 ft); minimum, 69 cfs Aug. 10; minimum gage height, 3.77 ft Aug. 24, 25; minimum daily discharge,70 cfs Aug. 9.
Period of record: Maximum discharge, 2,640 cfs Mar. 31, 1960 (gage height, 8.59 ft); minimum, 28 cfs Jan. 22, 1967 (gage height, 3.41 ft); minimum daily discharge, 49 cfs Aug. 27, 1955.

REMARKS.--Records good except those for the winter period, which are poor. Some diurnal fluctuation caused by mills above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	282	258	302	168	150	902	460	220	137	92	80	87
2	270	269	301	165	150	715	475	220	137	89	80	84
3	245	321	331	165	155	544	486	224	136	84	81	84
4	226	364	367	170	170	459	477	219	135	84	81	87
5	215	370	377	170	240	392	439	215	140	102	77	100
6	205	401	356	170	250	374	403	208	140	108	73	169
7	189	412	319	180	220	396	365	199	140	110	73	169
8	179	377	304	180	200	368	354	192	140	109	72	158
9	183	334	284	190	180	362	354	184	140	136	70	130
10	193	314	259	225	170	348	317	180	142	105	72	128
11	189	286	251	220	160	320	303	177	143	91	82	126
12	191	268	239	220	155	325	305	178	142	93	100	116
13	193	253	238	210	155	322	445	166	138	89	99	111
14	334	243	236	190	155	422	514	162	134	84	90	106
15	280	232	186	180	160	727	638	158	131	81	85	102
16	285	219	208	180	170	1,180	567	155	127	81	82	99
17	272	206	235	170	180	1,100	473	150	123	81	78	97
18	255	194	249	165	210	795	410	150	121	78	78	97
19	234	185	269	160	230	611	370	150	114	78	78	104
20	214	219	270	170	270	528	310	150	117	77	76	122
21	200	233	230	175	320	469	314	148	134	79	75	122
22	190	244	220	175	360	413	290	148	127	80	73	115
23	180	246	220	175	420	410	270	148	127	80	72	100
24	174	231	214	175	470	398	254	147	119	79	72	100
25	168	228	210	175	500	337	243	147	116	79	72	100
26	161	227	190	175	579	348	231	145	112	79	76	107
27	155	245	200	170	732	346	225	144	106	76	88	162
28	172	258	195	170	874	363	231	143	103	76	120	153
29	231	280	190	165	------	383	230	141	99	78	113	138
30	232	290	180	160	------	420	224	139	94	80	99	130
31	259	------	170	155	------	437	------	138	------	81	113	------
TOTAL	6,756	8,207	7,800	5,518	7,985	15,514	10,977	5,245	3,814	2,719	2,580	3,503
MEAN	218	274	252	178	285	500	366	169	127	87.7	83.2	117
MAX	334	412	377	225	874	1,180	638	224	143	136	120	169
MIN	155	185	170	155	150	320	224	138	94	76	70	84
CFSM	.93	1.17	1.08	.76	1.22	2.14	1.56	.72	.54	.37	.36	.50
IN.	1.07	1.30	1.24	.88	1.27	2.47	1.75	.83	.61	.43	.41	.56

CAL YR 1970 TOTAL 78,772 MEAN 216 MAX 589 MIN 94 CFSM .92 IN 12.52
WTR YR 1971 TOTAL 80,618 MEAN 221 MAX 1,180 MIN 70 CFSM .94 IN 12.82

04119000 Grand River at Grand Rapids, Mich.

LOCATION.--Lat 42°57'52", long 85°40'35", in NE¼ sec.25, T.7 N., R.12 W., Kent County, 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.

PERIOD OF RECORD.--March 1901 to December 1905, January 1906 to August 1918 (gage heights only), October 1930 to current year. 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 (levels by City of Grand Rapids). March 1901 to August 1918, nonrecording 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.--45 years, 3,389 cfs (9.39 inches per year).

EXTREMES.--Current year: Maximum discharge, 24,600 cfs Mar. 1 (gage height, 16.85 ft); minimum, 653 cfs Aug. 24 (gage height, 2.59 ft).
Period of record: 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 at least 1901, that of Mar. 28, 1904.

REMARKS.--Records good except those for the winter period, which are fair. Moderate diurnal fluctuation at low and medium flow caused by powerplants above station.

REVISIONS (WATER YEARS).--WSP 924: 1938 (M). WSP 1387: 1901-5, 1940.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2,820	3,490	5,090	3,600	1,800	19,400	7,070	3,520	2,300	1,330	1,480	1,060
2	2,720	3,670	5,090	3,600	1,900	21,600	7,020	3,300	2,300	1,240	1,270	1,000
3	2,510	3,900	5,220	3,500	1,500	18,600	6,910	3,150	2,190	1,090	1,150	1,090
4	2,430	4,560	5,430	3,500	1,500	16,100	6,810	3,240	2,110	1,090	1,360	1,150
5	2,300	5,280	5,270	3,500	1,700	12,500	6,590	3,180	2,190	1,330	1,070	1,120
6	2,320	6,010	5,150	3,500	2,000	10,800	6,410	2,990	2,240	1,330	990	1,410
7	2,300	6,320	4,930	3,500	2,500	9,880	6,120	2,940	2,160	1,770	964	1,570
8	2,490	6,130	4,830	3,500	3,500	8,850	5,830	3,350	2,050	2,030	938	2,020
9	2,140	5,640	4,710	3,500	3,900	7,770	5,480	2,510	2,110	1,860	912	1,660
10	1,770	5,580	4,420	3,500	3,900	7,090	5,330	2,380	1,970	1,770	1,040	1,450
11	2,300	5,410	4,480	3,400	3,800	6,630	5,110	2,350	1,880	1,910	1,150	1,390
12	3,520	5,170	4,350	3,400	3,700	6,470	4,990	2,490	1,800	1,620	1,080	1,330
13	3,490	5,050	4,380	3,300	3,700	6,130	5,820	2,460	1,830	1,240	999	1,260
14	4,420	4,800	4,330	3,300	3,700	6,110	6,300	2,490	2,300	1,070	1,090	1,250
15	4,870	4,650	3,910	3,200	3,400	7,960	6,710	2,540	2,900	1,070	1,040	1,260
16	5,650	4,430	3,400	3,000	3,000	10,400	6,580	2,510	2,640	990	938	1,220
17	5,550	4,210	4,360	2,900	2,900	11,900	6,340	2,540	2,270	1,070	885	1,140
18	5,270	4,150	4,490	2,800	3,000	13,700	6,050	2,490	2,350	1,150	915	1,070
19	5,020	4,040	4,360	2,600	3,400	15,300	5,830	2,490	2,190	990	941	1,020
20	4,690	3,900	4,650	2,400	5,000	15,200	5,450	2,540	2,000	1,180	860	1,200
21	4,450	4,080	4,720	2,300	7,200	13,900	5,120	2,380	1,740	1,180	913	1,270
22	4,220	4,260	4,740	2,200	8,200	12,600	4,810	2,410	1,940	1,150	934	1,310
23	4,030	4,460	4,580	2,300	9,840	11,500	4,800	2,380	2,350	1,210	881	1,570
24	3,750	4,530	4,630	2,600	11,700	10,700	4,520	2,300	2,030	1,120	747	1,400
25	3,630	4,510	4,300	2,600	13,500	9,840	4,260	2,320	1,800	938	846	1,140
26	3,350	4,130	3,400	2,300	14,200	8,850	3,890	2,490	1,680	1,020	835	1,230
27	3,180	4,220	3,400	2,200	14,700	8,100	3,750	2,490	1,590	1,070	1,110	1,910
28	3,130	4,450	3,500	2,300	15,500	7,590	3,780	2,820	1,480	1,070	1,270	2,380
29	3,380	4,530	3,600	2,300	------	7,410	3,820	2,460	1,330	1,150	1,180	2,370
30	3,580	4,640	3,600	1,800	------	7,200	3,900	2,320	1,150	1,270	1,060	2,080
31	3,440	------	3,600	1,600	------	7,210	------	2,350	------	1,420	1,090	------
TOTAL	108,720	140,200	136,920	90,000	154,640	337,290	165,400	82,180	60,870	39,728	31,938	42,330
MEAN	3,507	4,673	4,417	2,903	5,523	10,880	5,513	2,651	2,029	1,282	1,030	1,411
MAX	5,650	6,320	5,430	3,600	15,500	21,600	7,070	3,520	2,900	2,030	1,480	2,380
MIN	1,770	3,490	3,400	1,600	1,500	6,110	3,750	2,300	1,150	938	747	1,000
CFSM	.72	.95	.90	.59	1.13	2.22	1.13	.54	.41	.26	.21	.29
IN.	.83	1.06	1.04	.68	1.17	2.56	1.26	.62	.46	.30	.24	.32

CAL YR 1970 TOTAL 1,302,506 MEAN 3,569 MAX 12,600 MIN 912 CFSM .73 IN 9.89
WTR YR 1971 TOTAL 1,390,216 MEAN 3,809 MAX 21,600 MIN 747 CFSM .78 IN 10.55

04121000 Muskegon River near Merritt, Mich.

LOCATION.--Lat 44°20'08", long 84°53'24" in NW¼ NW¼ sec.2, T.22 N., R.5 W., Missaukee County, on right bank 35 ft upstream from bridge on State Highway 55, 0.7 mile upstream from West Branch, 2.7 miles east of Merritt, 4.3 miles downstream from Reedsburg Dam, at mile 210.8.

DRAINAGE AREA.--355 sq mi.

PERIOD OF RECORD.--October 1946 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,117.82 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to July 13, 1949, nonrecording gage at bridge at present datum.

AVERAGE DISCHARGE.--25 years, 230 cfs (8.80 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,160 cfs Apr. 14 (gage height, 8.13 ft); minimum, 42 cfs Sept. 11, 12.
Period of record: Maximum discharge, 1,340 cfs Apr. 8, 1959 (gage height, 8.16 ft); maximum gage height, 8.25 ft July 11, 1957; minimum discharge, 26 cfs Aug. 17, 18-20, Sept. 2-5, 12-15, 1958.

REMARKS.--Records good except those for winter periods, which are fair. Occasional regulation by manipulation of stop logs at Reedsburg Dam.

REVISIONS.--WSP 2111: Drainage area.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting control method used Oct. 23 to Nov. 13; stage-discharge relation affected by ice Nov. 23, 24, Dec. 5 to Mar. 13, Mar. 24-26)

Oct. 1 to Mar. 2		Mar. 3 to Sept. 30			
4.6	172	2.6	40	6.5	445
6.0	323	3.5	91	7.0	615
7.0	575	5.0	219	8.2	1,210
8.0	1,070	6.0	340		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	200	236	464	310	285	450	494	617	381	160	114	104
2	194	243	491	315	290	410	527	624	375	153	114	105
3	190	301	531	320	300	390	558	613	375	143	117	107
4	181	340	600	330	320	390	586	594	367	138	114	106
5	173	358	580	330	330	405	601	584	361	140	110	106
6	174	366	570	325	330	420	570	585	351	138	107	127
7	194	368	540	315	310	450	593	573	344	130	104	116
8	239	365	530	310	290	450	636	561	359	129	101	109
9	235	352	510	290	300	430	699	547	353	134	98	104
10	235	350	490	320	330	430	738	528	342	129	102	94
11	250	350	490	335	340	500	766	508	334	127	117	43
12	270	347	480	325	310	650	830	498	329	119	108	43
13	260	358	470	320	290	630	1,020	475	331	116	110	46
14	250	369	450	320	270	624	1,130	473	323	118	114	49
15	240	363	430	315	290	656	1,120	451	309	113	112	52
16	230	347	420	315	305	682	1,030	449	299	114	107	54
17	220	345	420	310	320	686	968	450	287	124	104	57
18	215	348	410	300	340	669	924	429	267	119	101	59
19	215	346	400	300	370	711	876	428	253	123	132	61
20	210	361	370	325	410	681	842	405	241	117	198	66
21	210	370	360	320	410	676	816	416	253	111	250	68
22	205	389	340	315	400	681	775	417	232	108	188	70
23	200	370	330	310	370	622	728	399	211	126	153	73
24	195	370	320	310	360	620	707	396	197	139	129	73
25	195	365	320	310	370	590	679	409	188	133	124	73
26	195	368	310	305	400	540	663	416	177	132	133	76
27	190	381	310	285	450	507	645	435	164	129	127	76
28	190	397	305	290	470	493	639	426	159	123	119	77
29	207	414	290	300	------	478	631	412	153	124	112	80
30	226	439	280	290	------	466	619	400	150	121	110	87
31	231	------	300	280	------	463	------	392	------	120	107	------
TOTAL	6,619	10,676	13,111	9,645	9,560	16,850	22,410	14,910	8,465	3,950	3,836	2,361
MEAN	214	356	423	311	341	544	747	481	282	127	124	78.7
MAX	270	439	600	335	470	711	1,130	624	381	160	250	127
MIN	173	236	280	280	270	390	494	392	150	108	98	43
CFSM	.60	1.00	1.19	.88	.96	1.53	2.10	1.35	.79	.36	.35	.22
IN.	.69	1.12	1.37	1.01	1.00	1.77	2.35	1.56	.89	.41	.40	.25

CAL YR 1970 TOTAL 98,132 MEAN 269 MAX 600 MIN 99 CFSM .76 IN 10.28
WTR YR 1971 TOTAL 122,393 MEAN 335 MAX 1,130 MIN 43 CFSM .94 IN 12.83

04121300 Clam River at Vogel Center, Mich.

LOCATION.—Lat 44°12'02", long 85°03'10", in SW¼ NW¼ sec.21, T.21 N., R.6 W., Missaukee County, on left bank 10 ft downstream from bridge on county road, 0.5 mile north of Vogel Center, and 3.5 miles southeast of Falmouth.

DRAINAGE AREA.—243 sq mi.

PERIOD OF RECORD.—June 1966 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 1,130 ft (from topographic map).

AVERAGE DISCHARGE.—5 years, 133 cfs (7.43 inches per year).

EXTREMES.—Current year: Maximum discharge, 1,150 cfs Apr. 13 (gage height, 6.33 ft); minimum, 60 cfs Aug. 6, 8.
Period of record: Maximum discharge, that of Apr. 13, 1971; minimum, 29 cfs Nov. 3, 1969, result of freezeup.

REMARKS.—Records good except those for winter periods, which are fair. Some regulation by dams above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting control method used Oct. 1-13, June 17 to Sept. 30; stage-discharge relation affected by ice Nov. 23-26, Dec. 6-8, Dec. 13 to Feb. 18, Feb. 26 to Mar. 11, Mar. 20-27)

2.5	55
4.0	330
5.0	590
6.0	960
6.3	1,130

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74	93	195	115	110	140	186	271	178	76	70	79
2	71	90	209	125	110	145	222	272	160	78	68	78
3	70	161	212	125	110	160	232	265	160	76	67	77
4	70	229	255	125	105	165	227	252	143	76	66	77
5	78	211	279	125	105	165	220	243	128	80	64	79
6	78	183	180	125	105	165	219	238	115	80	64	82
7	73	163	190	125	100	155	228	231	109	82	65	76
8	68	152	195	120	105	150	273	222	103	84	64	74
9	72	147	188	120	110	145	347	218	103	84	66	73
10	112	153	186	115	115	140	420	214	95	78	79	73
11	111	156	173	115	120	145	538	209	91	75	85	73
12	87	155	168	115	120	149	708	206	92	74	87	73
13	83	145	160	115	115	149	1,000	206	93	78	82	75
14	89	141	155	115	110	152	1,060	202	97	76	82	74
15	86	137	155	115	105	183	774	196	101	77	81	71
16	76	134	150	115	105	210	545	190	105	76	79	70
17	73	134	150	110	105	222	457	180	100	75	77	68
18	71	133	150	110	110	224	449	174	90	75	76	68
19	69	131	140	110	116	219	420	171	83	78	75	71
20	68	138	135	110	137	195	373	160	80	78	75	75
21	70	164	125	110	148	195	342	138	79	78	73	78
22	69	183	120	115	160	190	317	130	79	77	76	74
23	67	165	115	115	156	185	296	125	78	78	87	74
24	67	155	115	115	156	180	282	126	75	77	94	77
25	69	140	115	110	149	180	280	156	75	75	94	75
26	67	155	115	105	145	180	279	187	75	76	102	77
27	66	158	110	105	140	175	274	180	74	74	106	81
28	69	141	110	110	140	174	268	175	73	73	101	84
29	91	151	105	110	------	169	270	165	72	73	92	86
30	113	174	110	110	------	166	269	152	73	70	85	84
31	103	------	110	110	------	167	------	148	------	72	82	------
TOTAL	2,430	4,572	4,875	3,565	3,412	5,339	11,775	6,002	2,979	2,379	2,464	2,276
MEAN	78.4	152	157	115	122	172	393	194	99.3	76.7	79.5	75.9
MAX	113	229	279	125	160	224	1,060	272	178	84	106	86
MIN	66	90	105	105	100	140	186	125	72	70	64	68
CFSM	.32	.63	.65	.47	.50	.71	1.62	.80	.41	.32	.33	.31
IN.	.37	.70	.75	.55	.52	.82	1.80	.92	.46	.36	.38	.35

CAL YR 1970 TOTAL 44,180 MEAN 121 MAX 469 MIN 62 CFSM .50 IN 6.76
WTR YR 1971 TOTAL 52,068 MEAN 143 MAX 1,060 MIN 64 CFSM .59 IN 7.97

04121500 Muskegon River at Evart, Mich.

LOCATION.--Lat 43°53'57", long 85°15'19", in NW¼ NE¼ sec.3, T.17 N., R.8 W., Osceola County, 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.

DRAINAGE AREA.--1,450 sq mi, approximately.

PERIOD OF RECORD.--October 1930 to September 1931, October 1933 to current year. 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. Prior to Nov. 7, 1956, nonrecording gages at sites 400 and 500 ft upstream at present datum.

AVERAGE DISCHARGE.--39 years, 972 cfs (9.10 inches per year).

EXTREMES.--Current year: Maximum discharge, 7,660 cfs Apr. 15 (gage height, 14.37 ft); minimum, 367 cfs Sept. 18 (gage height, 6.58 ft).
Period of record: Maximum discharge, 7,750 cfs Apr. 9, 1959 (gage height, 14.42 ft; minimum observed, 164 cfs Dec. 20, 1947, result of freezeup.

REMARKS.--Records good except those for the winter period, which are fair. Some regulation by dams above station. Records of water temperatures for the current year are published in Part 2 of this report.

REVISIONS(WATER YEARS).--WSP 1437: 1934, 1947 (M).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 28, 29, Mar. 31 to Apr. 6; stage-discharge relation affected by ice Nov. 25, 26, Dec. 6, 7, Dec. 25-30, Jan. 8 to Mar. 5, Mar. 8, 9, 11, 15-18, 24-27, 30)

6.5	335
7.0	570
7.5	900
10.0	3,000
14.0	7,180
14.5	7,900

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	697	872	1,510	986	1,000	1,350	2,330	2,070	1,280	576	485	480
2	678	879	1,590	986	1,050	1,350	2,570	2,040	1,290	555	475	470
3	660	1,270	1,660	1,070	1,050	1,450	2,720	2,010	1,310	545	470	465
4	642	1,630	1,900	1,170	1,100	1,500	2,730	1,950	1,250	540	460	460
5	624	1,750	2,000	1,190	1,150	1,600	2,680	1,870	1,190	545	455	470
6	624	1,750	1,950	1,200	1,150	1,640	2,690	1,830	1,170	545	445	480
7	612	1,630	1,900	1,150	1,100	1,630	2,850	1,770	1,160	530	440	470
8	594	1,550	1,890	1,150	1,000	1,600	3,170	1,710	1,110	530	435	455
9	600	1,550	1,890	1,100	1,050	1,550	3,710	1,630	1,060	530	430	460
10	711	1,590	1,850	1,050	1,100	1,510	4,170	1,590	1,010	520	455	450
11	788	1,610	1,800	1,050	1,150	1,480	4,650	1,540	970	505	480	440
12	795	1,570	1,710	1,020	1,100	1,470	5,120	1,510	949	500	490	435
13	795	1,510	1,670	1,030	1,050	1,470	6,300	1,470	921	505	495	425
14	879	1,410	1,610	1,050	1,000	1,480	7,180	1,430	893	505	500	393
15	921	1,330	1,570	1,050	930	1,550	7,560	1,390	886	495	485	380
16	886	1,270	1,480	1,040	950	1,800	6,860	1,380	865	495	475	371
17	851	1,230	1,460	1,030	1,000	2,000	5,930	1,340	851	495	465	371
18	816	1,190	1,480	1,040	1,000	2,250	5,200	1,300	823	480	460	367
19	795	1,160	1,430	1,060	1,050	2,340	4,670	1,270	788	495	450	380
20	767	1,190	1,430	1,100	1,150	2,310	4,310	1,260	760	505	440	398
21	753	1,270	1,310	1,100	1,350	2,360	3,970	1,230	725	495	435	402
22	739	1,330	1,190	1,100	1,300	2,320	3,640	1,190	697	495	480	406
23	718	1,370	1,150	1,060	1,250	2,280	3,350	1,160	672	500	570	406
24	704	1,350	1,080	1,050	1,200	2,200	3,070	1,180	672	505	594	406
25	684	1,250	1,050	1,050	1,150	2,100	2,860	1,290	666	495	565	406
26	672	1,250	1,050	1,050	1,200	2,050	2,670	1,350	660	500	540	430
27	666	1,350	1,050	1,050	1,300	2,050	2,500	1,390	630	505	550	450
28	672	1,370	1,050	1,000	1,400	2,070	2,280	1,380	612	495	545	505
29	760	1,390	1,000	1,030	------	2,060	2,210	1,350	582	490	535	490
30	851	1,430	1,000	1,030	------	2,050	2,120	1,320	560	485	510	530
31	879	------	914	1,000	------	2,110	------	1,310	------	480	495	------
TOTAL	22,833	41,301	45,624	33,042	31,280	56,980	116,070	46,510	27,012	15,841	15,109	13,051
MEAN	737	1,377	1,472	1,066	1,117	1,838	3,869	1,500	900	511	487	435
MAX	921	1,750	2,000	1,200	1,400	2,360	7,560	2,070	1,310	576	594	530
MIN	594	872	914	986	930	1,350	2,120	1,160	560	480	430	367
CFSM	.51	.95	1.02	.74	.77	1.27	2.67	1.03	.62	.35	.34	.30
IN.	.59	1.06	1.17	.85	.80	1.46	2.98	1.19	.69	.41	.39	.33

CAL YR 1970 TOTAL 398,396 MEAN 1,091 MAX 3,130 MIN 425 CFSM .75 IN 10.22
WTR YR 1971 TOTAL 464,653 MEAN 1,273 MAX 7,560 MIN 367 CFSM .88 IN 11.92

04121900 Little Muskegon River near Morley, Mich.

LOCATION.—Lat 43°30'09", long 85°20'33", in SW¼ SW¼ sec.24, T.13 N., R.9 W., Mecosta County, on right bank at upstream side of highway bridge on 130th Avenue, 0.5 mile downstream from Rustford Dam, and 5.2 miles east of Morley.

DRAINAGE AREA.—138 sq mi.

PERIOD OF RECORD.—October 1966 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 920 ft (from topographic map).

AVERAGE DISCHARGE.—5 years, 116 cfs (11.42 inches per year).

EXTREMES.—Current year: Maximum discharge, 409 cfs Apr. 13 (gage height, 3.54 ft); minimum, 35 cfs Aug. 22 (gage height, 1.63 ft). Period of record: Maximum discharge, 698 cfs Dec. 8, 1966 (gage height, 4.73 ft); minimum, 35 cfs Aug. 22, 1971 (gage height, 1.63 ft).

REMARKS.—Records good except those for winter periods, which are fair. Some regulation from dams above station. Records of water temperatures for current year are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Nov. 24, 25,
Dec. 6, 7, 15, 16, Dec. 21 to Mar. 10, Mar. 21-26)

1.6	33
4.0	515

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	76	99	124	105	84	115	275	112	71	50	43	45
2	74	99	126	110	85	120	337	124	80	47	43	43
3	74	215	128	115	86	125	299	120	114	47	45	45
4	76	233	167	115	86	130	243	111	107	48	43	53
5	76	207	151	110	88	135	217	111	98	76	42	57
6	72	165	115	100	89	135	225	109	92	60	42	58
7	69	143	102	80	89	135	251	103	83	55	42	55
8	69	130	99	70	89	125	281	101	80	58	40	53
9	76	118	105	72	89	120	309	99	74	60	38	50
10	99	137	105	75	87	115	307	98	74	57	40	50
11	90	139	105	78	86	114	291	94	72	50	48	50
12	81	128	111	80	84	111	285	94	72	58	43	48
13	85	118	112	80	83	111	381	94	96	64	42	48
14	107	112	111	82	82	116	369	90	87	50	40	45
15	99	109	108	82	82	257	309	89	74	48	38	45
16	89	103	104	83	83	303	243	90	64	48	40	42
17	85	99	103	84	85	255	207	89	62	47	38	42
18	81	99	103	85	90	237	199	89	60	47	38	43
19	80	96	109	88	95	217	187	89	57	50	38	47
20	81	120	112	90	98	201	169	92	53	50	38	53
21	81	135	100	90	100	170	161	89	55	50	36	52
22	83	122	95	88	100	160	147	85	53	47	36	50
23	81	112	92	86	100	150	139	83	52	45	43	48
24	81	105	90	86	100	145	135	90	52	47	43	48
25	80	98	90	86	100	135	132	96	52	45	47	50
26	80	101	92	86	105	135	130	98	50	45	50	57
27	78	114	92	86	110	143	126	89	50	45	50	55
28	87	116	90	86	110	147	126	81	48	47	48	64
29	118	120	88	84	------	167	130	76	47	47	47	64
30	116	124	86	84	------	167	122	72	47	43	45	57
31	103	------	95	84	------	199	------	71	------	43	45	------
TOTAL	2,627	3,816	3,310	2,730	2,565	4,895	6,732	2,928	2,076	1,574	1,311	1,517
MEAN	84.7	127	107	88.1	91.6	158	224	94.5	69.2	50.8	42.3	50.6
MAX	118	233	167	115	110	303	381	124	114	76	50	64
MIN	69	96	86	70	82	111	122	71	47	43	36	42
CFSM	.61	.92	.78	.64	.66	1.14	1.62	.68	.50	.37	.31	.37
IN.	.71	1.03	.89	.74	.69	1.32	1.81	.79	.56	.42	.35	.41

CAL YR 1970 TOTAL 37,561 MEAN 103 MAX 432 MIN 43 CFSM .75 IN 10.13
WTR YR 1971 TOTAL 36,081 MEAN 98.9 MAX 381 MIN 36 CFSM .72 IN 9.73

PEAK DISCHARGE (BASE, 400 CFS).—Apr. 13 (1300) 409 cfs (3.54 ft).

04122000 Muskegon River at Newaygo, Mich.

LOCATION.—Lat 43°25'20", long 85°48'04", in NE¼ NE¼ sec.24, T.12 N., R.13 W., Newaygo County, on left bank in tailrace of nonoperative powerplant at Newaygo, 600 ft downstream from Penoyer Creek and at mile 39.1.

DRAINAGE AREA.—2,350 sq mi, approximately.

PERIOD OF RECORD.—July to December 1908, July 1909 to July 1915, January 1916 to December 1919, October 1930 to current year. 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 625.83 ft above mean sea level. October 1930 to January 1939, nonrecording gage, and Jan. 31, 1939 to Sept. 30, 1963, water-stage recorder at present site at datum 40.0 ft lower.

AVERAGE DISCHARGE.—49 years (1909-14, 1916-19, 1930-71), 1,925 cfs (11.12 inches per year).

EXTREMES.—Current year: Maximum discharge, 7,220 cfs Apr. 17 (gage height, 12.31 ft); maximum gage height, 14.47 ft Feb. 2 (backwater from ice); minimum discharge, 305 cfs July 22, minimum daily, 760 cfs Aug. 12.
Period of record: Maximum daily discharge, 14,950 cfs Mar. 25, 1913; minimum, 52 cfs Oct. 2, 1965 (gage height, 5.31 ft), result of regulation during pipeline repair; minimum daily, 330 cfs Feb. 15, 1914.

REMARKS.—Records good. Flow regulated by powerplants above station, the largest of which are at Croton Dam, Hardy Dam (since 1931), and Rogers Dam. Since Dec. 27, 1965, powerplant at Newaygo nonoperative.

REVISIONS (WATER YEARS).—WSP 974: 1933, 1935, 1937-38. WSP 1307: 1940 (M). See also PERIOD OF RECORD.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting control method used Sept. 7-16)

Oct. 1 to Apr. 20		Apr. 21 to Sept. 30	
7.2	840	6.5	750
9.0	2,590	7.0	1,150
11.0	5,270	9.0	3,070
13.0	8,250	12.0	6,770

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,050	1,270	3,320	1,900	1,700	3,160	3,520	3,050	2,310	1,090	1,050	942
2	1,060	1,620	3,870	900	1,800	3,160	3,970	3,040	2,720	1,050	1,050	926
3	1,060	2,180	3,180	900	2,100	3,040	4,780	3,020	2,450	1,050	1,050	1,160
4	1,050	4,000	3,190	2,000	2,100	2,910	4,960	3,010	2,280	1,050	1,040	1,380
5	1,390	4,000	3,730	2,900	2,100	2,920	4,750	3,010	1,860	1,050	1,040	942
6	1,980	4,030	3,610	2,200	2,000	3,050	4,500	3,000	1,830	1,050	1,030	934
7	1,160	3,610	3,600	2,150	1,600	3,530	4,370	3,000	1,920	1,050	920	1,130
8	1,050	2,610	3,190	2,040	1,770	3,530	4,720	2,690	2,090	1,370	1,010	1,450
9	1,050	3,080	2,630	1,720	1,980	3,530	4,990	2,290	1,800	1,480	1,010	942
10	1,030	2,330	3,140	1,100	1,960	3,520	5,310	2,130	1,790	1,050	1,040	926
11	1,010	2,330	3,020	1,670	1,930	3,510	5,310	1,870	1,790	1,050	900	934
12	1,140	3,100	3,040	1,920	1,920	3,510	5,500	1,870	1,700	1,040	760	934
13	1,680	3,140	2,360	2,060	1,200	3,490	5,940	1,870	1,380	1,050	1,010	934
14	2,300	1,580	2,750	2,160	900	3,490	6,580	1,860	1,450	1,050	1,010	910
15	2,400	1,850	2,900	2,120	1,670	3,850	6,930	1,860	1,830	1,050	1,010	902
16	2,220	2,720	2,040	1,400	2,420	4,860	7,160	1,870	2,050	1,050	1,010	902
17	1,160	2,520	1,820	1,090	3,170	5,190	7,170	1,870	1,780	1,050	1,010	910
18	1,030	1,900	2,280	1,910	2,570	5,430	7,170	1,870	1,700	1,050	1,020	910
19	1,470	2,510	3,100	2,080	1,940	5,440	6,900	1,880	1,610	1,050	998	926
20	2,200	2,460	2,400	2,100	1,950	5,420	6,440	1,800	1,190	1,050	1,010	934
21	1,980	2,210	2,860	2,110	1,010	5,430	6,070	1,520	1,160	1,350	998	926
22	1,540	1,810	1,760	2,110	1,650	4,560	5,430	1,460	1,380	814	990	934
23	1,270	2,640	1,740	1,940	2,710	3,180	5,440	1,450	1,690	966	982	950
24	1,220	3,010	1,600	1,080	2,700	3,170	4,980	1,550	1,610	1,050	990	990
25	984	3,040	1,500	1,880	2,700	3,170	4,200	1,940	1,300	1,050	1,230	990
26	1,300	2,230	1,550	2,080	2,880	3,340	4,020	2,560	1,250	1,050	1,470	998
27	1,720	2,530	1,500	2,100	3,210	3,520	4,160	2,740	1,100	1,050	998	1,010
28	1,750	1,380	1,700	2,280	3,180	3,510	4,170	2,290	1,490	1,050	966	1,020
29	1,780	1,890	1,600	1,920	------	3,490	3,840	1,880	1,100	1,050	958	1,010
30	1,790	3,080	1,700	1,400	------	3,490	3,400	1,870	1,320	1,050	950	998
31	1,740	------	1,600	1,080	------	3,490	------	1,860	------	1,050	934	------
TOTAL	45,564	76,660	78,280	56,300	58,820	116,890	156,680	67,980	50,930	33,310	31,444	29,754
MEAN	1,470	2,555	2,525	1,816	2,101	3,771	5,223	2,193	1,698	1,075	1,014	992
MAX	2,400	4,030	3,870	2,900	3,210	5,440	7,170	3,050	2,720	1,480	1,470	1,450
MIN	984	1,270	1,500	900	900	2,910	3,400	1,450	1,100	814	760	902
CFSM	.63	1.09	1.07	.77	.89	1.60	2.22	.93	.72	.46	.43	.42
IN.	.72	1.21	1.24	.89	.93	1.85	2.48	1.08	.81	.53	.50	.47

CAL YR 1970 TOTAL 735,310 MEAN 2,015 MAX 5,860 MIN 802 CFSM .86 IN 11.64
WTR YR 1971 TOTAL 802,612 MEAN 2,199 MAX 7,170 MIN 760 CFSM .94 IN 12.71

04122100 Bear Creek near Muskegon, Mich.

LOCATION.—Lat 43°17'19", long 86°13'22", in SW¼ NW¼ sec.4, T.10 N., R.16 W., Muskegon County, on left bank at upstream side of bridge on North Getty Street, 1.5 miles upstream from Little Bear Creek, and 3.9 miles northeast of Muskegon.

DRAINAGE AREA.—14.8 sq mi.

PERIOD OF RECORD.—October 1965 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 610 ft (from topographic map).

AVERAGE DISCHARGE.—6 years, 14.7 cfs (13.49 inches per year).

EXTREMES.—Current year: Maximum discharge, 204 cfs Feb. 27 (gage height, 7.99 ft); minimum, 1.0 cfs Aug. 5, 17, 22.
Period of record: Maximum discharge, 274 cfs Feb. 10, 1966 (gage height, 8.43 ft); minimum, 1.0 cfs Aug. 5, 17, 22, 1971.

REMARKS.—Records good except those for the winter periods, which are fair. Some regulation above station at low flows.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 21 to Nov. 24; stage-discharge relation affected by ice Nov. 25, Dec. 11-16, Dec. 21 to Feb. 24, Feb. 28 to Mar. 11, Mar. 19-26)

3.7	1.4
3.8	2.2
3.9	3.4
4.0	5.0
5.0	24
6.0	58
7.0	106
8.0	205

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	17	26	9.3	10	60	35	13	10	4.2	2.4	2.2
2	11	15	25	9.3	10	40	33	13	13	3.7	2.4	2.0
3	9.7	33	24	10	10	30	28	12	15	3.2	2.4	2.3
4	8.8	39	46	10	11	23	24	11	11	3.0	2.4	2.4
5	8.0	30	31	11	11	20	23	12	10	4.2	1.6	2.8
6	7.7	19	22	11	11	19	22	11	9.1	3.7	2.0	2.4
7	7.3	15	20	11	11	18	21	10	11	3.0	2.0	2.3
8	7.3	13	19	11	11	18	20	10	10	6.4	2.0	2.1
9	7.9	13	19	11	11	18	19	9.5	8.4	4.8	2.0	2.1
10	8.9	20	17	10	10	19	18	8.9	7.5	3.6	2.3	3.0
11	8.6	18	17	10	11	21	17	9.1	7.5	3.3	3.9	3.3
12	8.0	15	16	10	11	23	25	11	7.5	2.7	2.6	3.0
13	8.0	13	15	10	10	23	85	11	7.0	3.0	2.2	3.3
14	18	11	15	10	10	41	57	9.3	6.3	2.6	2.4	3.3
15	16	11	15	10	9.2	152	34	8.9	6.1	2.8	2.1	2.2
16	12	10	15	10	9.5	91	27	9.3	5.5	2.7	2.0	2.3
17	11	9.8	17	10	10	56	23	8.8	5.3	2.8	2.0	2.9
18	10	9.5	17	10	10	41	21	8.2	5.0	2.8	2.0	2.2
19	8.9	9.5	24	10	11	35	20	8.2	5.5	3.0	2.1	3.4
20	8.4	19	28	11	12	31	19	7.9	6.6	3.3	2.4	4.2
21	8.2	28	17	11	13	31	17	7.5	7.0	2.6	2.6	3.6
22	7.7	20	14	11	14	30	16	7.3	5.5	2.8	2.0	3.2
23	7.1	7.0	12	11	16	28	15	7.1	5.3	2.8	2.0	3.3
24	6.6	5.6	11	11	20	25	14	12	4.5	3.2	2.0	3.2
25	6.3	5.8	10	10	42	23	14	29	4.5	2.4	2.4	3.2
26	6.0	7.3	10	10	56	22	13	28	4.5	3.0	2.4	4.0
27	6.0	32	10	10	159	29	13	18	4.2	2.4	2.7	4.5
28	11	40	10	10	95	38	14	14	4.0	2.3	2.8	3.9
29	28	32	9.5	10	------	58	14	12	3.7	3.0	2.3	6.0
30	20	31	9.5	10	------	38	13	11	3.7	2.3	2.3	4.0
31	16	------	9.0	10	------	35	------	10	------	2.6	2.3	------
TOTAL	318.4	548.5	550.0	318.6	624.7	1,136	714	358.0	214.2	98.2	71.0	92.6
MEAN	10.3	18.3	17.7	10.3	22.3	36.6	23.8	11.5	7.14	3.17	2.29	3.09
MAX	28	40	46	11	159	152	85	29	15	6.4	3.9	6.0
MIN	6.0	5.6	9.0	9.3	9.2	18	13	7.1	3.7	2.3	1.6	2.0
CFSM	.70	1.24	1.20	.70	1.51	2.47	1.61	.78	.48	.21	.15	.21
IN.	.80	1.38	1.38	.80	1.57	2.86	1.79	.90	.54	.25	.18	.23

CAL YR 1970 TOTAL 5,182.5 MEAN 14.2 MAX 110 MIN 3.2 CFSM .96 IN 13.03
WTR YR 1971 TOTAL 5,044.2 MEAN 13.8 MAX 159 MIN 1.6 CFSM .93 IN 12.68

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	GHT	DISCHARGE
02-27	1100	7.99	204
03-15	0300	7.67	165
04-13	1200	7.14	116

04122200 White River near Whitehall, Mich.

LOCATION.--Lat 43°27'51", long 86°13'57", in SE¼ NW¼ sec.4, T.12 N., R.16 W., Muskegon County, on right bank 30 ft downstream from bridge on Fruitvale Road, 6.3 miles downstream from North Branch, and 6.9 miles northeast of Whitehall.

DRAINAGE AREA.--380 sq mi, approximately.

PERIOD OF RECORD.--August 1957 to current year.

GAGE.--Water-stage recorder. Datum of gage is 594.1 ft above mean sea level, unadjusted. Nov. 18, 1957, to Oct. 22, 1958, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--14 years, 393 cfs (14.04 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,900 cfs Mar. 16 (gage height, 5.78 ft); minimum, 187 cfs Aug. 17.
Period of record: Maximum discharge, 3,740 cfs Apr. 17, 1967 (gage height, 6.76 ft); minimum, 163 cfs Aug. 18, 19, 1958.

REMARKS.--Records good except those for the winter periods, which are fair. Some regulation from dams above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting control method used May 18 to June 21, July 26 to Aug. 17, Sept. 24-30; stage-discharge relation affected by ice Nov. 24-26, Dec. 15 to Mar. 11, Mar. 19-26)

1.5	192
2.5	288
4.0	610
5.0	1,130
5.5	1,570
6.0	2,230

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	298	443	518	350	340	530	671	464	408	248	210	215
2	288	432	513	350	350	500	843	471	426	250	211	213
3	281	439	505	360	360	470	1,000	473	472	247	210	211
4	278	495	495	360	370	480	891	463	507	241	207	211
5	277	560	534	360	370	470	805	457	474	240	203	214
6	274	569	541	360	370	460	774	447	440	238	201	215
7	269	536	506	360	360	470	753	435	411	238	200	215
8	265	495	473	350	370	450	748	423	390	241	198	213
9	268	448	448	350	390	430	782	410	380	248	198	211
10	278	432	434	350	390	430	832	403	361	240	202	210
11	285	444	432	360	380	450	817	399	345	235	205	211
12	291	439	430	360	370	470	807	408	332	228	206	213
13	291	420	429	350	350	453	963	418	337	225	207	213
14	313	399	429	350	340	467	1,290	419	355	223	202	213
15	340	380	410	350	360	579	1,060	408	335	222	202	217
16	345	367	400	350	380	1,590	903	400	324	221	202	208
17	335	359	400	360	400	1,500	844	389	309	220	194	209
18	319	353	400	360	430	1,070	788	381	296	217	201	206
19	308	348	390	360	470	950	724	373	289	218	200	208
20	304	367	390	360	520	850	649	358	278	222	202	215
21	302	418	390	350	520	750	599	346	305	221	204	218
22	298	466	380	350	500	650	562	350	305	216	202	217
23	295	465	380	350	480	600	530	345	287	214	200	214
24	293	440	380	340	460	580	510	368	276	215	202	215
25	289	420	380	340	460	550	493	444	273	215	209	211
26	287	430	380	340	500	530	477	526	267	214	218	226
27	286	440	380	340	580	528	467	602	260	212	233	236
28	310	459	380	340	600	531	461	588	256	212	238	242
29	382	500	370	340	------	536	460	546	249	212	231	232
30	449	503	360	340	------	589	461	483	250	211	223	227
31	462	------	350	330	------	619	------	429	------	209	218	------
TOTAL	9,560	13,266	13,207	10,870	11,770	19,532	21,964	13,426	10,197	7,013	6,439	6,479
MEAN	308	442	426	351	420	630	732	433	340	226	208	216
MAX	462	569	541	360	600	1,590	1,290	602	507	250	238	242
MIN	265	348	350	330	340	430	460	345	249	209	194	206
CFSM	.81	1.16	1.12	.92	1.11	1.66	1.93	1.14	.89	.59	.55	.57
IN.	.94	1.30	1.29	1.06	1.15	1.91	2.15	1.31	1.00	.69	.63	.63

CAL YR 1970 TOTAL 140,570 MEAN 385 MAX 827 MIN 212 CFSM 1.01 IN 13.76
WTR YR 1971 TOTAL 143,723 MEAN 394 MAX 1,590 MIN 194 CFSM 1.04 IN 14.07

04122500 Pere Marquette River at Scottville, Mich.

LOCATION.--Lat 43°56'42", long 86°16'43", in NW¼ NW¼ sec.19, T.18 N., R.16 W., Mason County, on right bank 20 ft upstream from highway bridge at south edge of Scottville, 1.4 miles upstream from India Creek, and 5.6 miles downstream from Big South Branch.

DRAINAGE AREA.--709 sq mi.

PERIOD OF RECORD.--August 1939 to current year. Prior to October 1942, published as "at Custer".

GAGE.--Water-stage recorder. Datum of gage is 597.66 ft above mean sea level. Prior to June 12, 1943, nonrecording gage at bridge 4.5 miles upstream at different datum.

AVERAGE DISCHARGE.--32 years, 634 cfs (12.14 inches per year).

EXTREMES.--Current year: Maximum discharge, 2,220 cfs Apr. 15 (gage height, 5.44 ft); minimum, 349 cfs Sept. 17, 18, 19. Period of record: Maximum discharge, 2,970 cfs July 1, 1969 (gage height, 6.26 ft); minimum, 209 cfs Dec. 11, 1962 (discharge measurement); minimum daily, 310 cfs Aug. 9, 10, 1941.

REMARKS.--Records good except those for the winter period, which are fair. Some regulation above station. Record of water temperatures for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1437: 1941 (M), 1943 (M), 1949 (M), 1950.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting control method used July 25 to Sept. 30; stage-discharge relation affected by ice Dec. 18 to Mar. 12, Mar. 21-26)

1.3	343
2.5	610
4.0	1,240
5.0	1,880
6.0	2,760

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	560	736	845	580	530	1,000	1,120	915	743	533	436	391
2	547	713	867	580	540	900	1,300	913	732	540	444	389
3	543	757	878	570	560	900	1,450	921	733	529	438	385
4	537	815	899	590	580	800	1,560	915	752	511	434	380
5	532	898	893	600	600	830	1,500	884	771	504	428	375
6	524	971	907	600	600	840	1,360	856	743	498	423	371
7	514	936	895	590	580	840	1,310	831	734	495	416	371
8	508	847	841	560	560	820	1,350	810	721	500	408	367
9	507	786	800	540	580	800	1,470	787	701	506	404	364
10	511	767	777	580	630	800	1,600	766	673	502	415	361
11	521	755	777	600	620	800	1,710	756	643	489	434	361
12	529	747	777	580	580	820	1,790	760	626	475	440	363
13	525	722	758	560	540	814	1,920	765	630	472	428	364
14	526	694	747	560	540	822	2,050	771	654	463	429	364
15	532	669	737	560	550	1,140	2,150	763	661	469	433	359
16	553	651	710	560	570	1,490	2,090	748	638	476	428	354
17	553	635	700	560	600	1,720	1,800	729	622	475	414	353
18	543	623	700	560	620	1,740	1,600	712	597	462	405	349
19	535	614	680	520	700	1,740	1,470	706	580	464	398	354
20	529	635	660	530	850	1,680	1,390	699	580	467	391	368
21	531	679	650	550	1,000	1,450	1,290	688	599	459	388	373
22	531	740	640	550	950	1,300	1,190	679	605	447	382	373
23	530	782	620	550	900	1,200	1,110	669	578	441	379	375
24	531	791	620	550	860	1,100	1,050	685	561	440	382	375
25	527	771	600	550	860	1,050	1,000	736	561	436	394	377
26	523	738	600	560	900	1,000	965	804	565	433	399	395
27	523	743	580	500	950	1,000	940	914	549	428	416	401
28	553	760	580	490	1,050	994	924	992	533	425	465	407
29	617	790	580	540	------	999	913	949	522	426	446	411
30	662	814	560	540	------	997	911	856	512	440	412	411
31	731	------	550	520	------	1,020	------	785	------	443	398	------
TOTAL	16,888	22,579	22,428	17,280	19,400	33,406	42,283	24,764	19,119	14,648	12,907	11,241
MEAN	545	753	723	557	693	1,078	1,409	799	637	473	416	375
MAX	731	971	907	600	1,050	1,740	2,150	992	771	540	465	411
MIN	507	614	550	490	530	800	911	669	512	425	379	349
CFSM	.77	1.06	1.02	.79	.98	1.52	1.99	1.13	.90	.67	.59	.53
IN.	.89	1.18	1.18	.91	1.02	1.75	2.22	1.30	1.00	.77	.68	.59

CAL YR 1970 TOTAL 247,347 MEAN 678 MAX 1,440 MIN 415 CFSM .96 IN 12.98
WTR YR 1971 TOTAL 256,943 MEAN 704 MAX 2,150 MIN 349 CFSM .99 IN 13.48

04123000 Big Sable River near Freesoil, Mich.

LOCATION.—Lat 44°07'13", long 86°16'48", in NE¼ NE¼ sec.24, T.20 N., R.17 W., Mason County, near center of span on downstream side of bridge on U. S. Highway 31, 3.4 miles northwest of Freesoil, and 7 miles upstream from Hamlin Lake.

DRAINAGE AREA.—127 sq mi.

PERIOD OF RECORD.—May 1942 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.—Nonrecording gage. Datum of gage is 615.32 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to Sept. 15, 1959, at site 30 ft downstream at present datum.

AVERAGE DISCHARGE.—29 years, 140 cfs (14.97 inches per year).

EXTREMES.—Current year: Maximum discharge, 442 cfs Apr. 15 (gage height, 3.28 ft); minimum, 82 cfs Sept. 10.
Period of record: Maximum discharge, 555 cfs Apr. 7, 1959 (gage height, 3.4 ft, from floodmark); maximum gage height, 3.7 ft Feb. 16, 1967, backwater from ice ; minimum discharge, 65 cfs Dec. 11, 1962 (discharge measurement); minimum daily discharge, 81 cfs Aug. 14, 1944.

REMARKS.—Records good except those for the winter period, which are fair.

REVISIONS (WATER YEARS).—WSP 1437: 1946 (M), 1947. WSP 1727: 1953 (M).

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting control method used Aug. 11 to Sept. 30; stage-discharge relation affected by ice Nov. 25, 26, Dec. 21, Dec. 24 to Jan. 1, Jan. 6-20, Jan. 24 to Feb. 17, Mar. 1-5, 22-26)

Oct. 1 to Feb. 14		Feb. 15 to Sept. 30	
1.3	107	0.9	82
2.0	184	2.0	190
		2.5	259
		3.3	448

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	127	145	155	130	120	200	236	190	144	110	100	84
2	124	145	158	137	125	185	266	185	146	110	100	84
3	120	164	165	135	125	180	280	184	151	109	99	84
4	120	171	179	140	125	165	270	183	149	108	98	84
5	116	177	172	145	130	170	256	177	147	107	95	83
6	113	178	165	140	130	176	246	174	145	106	94	83
7	112	170	161	135	130	170	253	170	143	105	93	84
8	111	160	156	125	125	163	280	166	143	107	93	83
9	111	147	154	120	125	155	314	160	138	110	93	83
10	110	148	153	125	135	170	328	158	136	108	95	83
11	110	148	152	130	135	165	340	156	133	107	96	84
12	110	146	150	125	130	160	356	158	133	106	96	85
13	110	142	150	125	125	157	392	161	130	105	94	84
14	109	140	148	120	120	200	428	160	130	104	93	84
15	110	135	146	120	120	273	423	161	128	104	92	84
16	109	133	145	120	125	276	374	155	126	105	92	84
17	109	130	147	120	130	278	340	152	124	106	91	84
18	109	128	147	120	140	280	310	149	122	106	90	85
19	108	129	148	115	149	280	292	145	119	107	90	86
20	108	135	145	120	178	278	265	143	120	107	90	88
21	108	142	140	122	220	240	244	142	124	104	88	88
22	109	150	137	123	208	205	226	142	125	103	88	86
23	109	154	133	126	194	200	212	145	123	103	88	86
24	108	148	135	125	186	190	204	148	119	104	89	87
25	108	145	130	125	180	180	195	158	119	102	89	87
26	107	145	130	120	184	180	190	168	118	101	91	90
27	109	148	125	115	186	184	188	168	115	101	91	95
28	126	150	125	110	210	185	189	163	113	102	88	94
29	134	150	125	120	------	191	191	156	111	101	87	92
30	137	153	125	120	------	195	190	150	110	103	87	92
31	142	------	120	120	------	200	------	145	------	102	85	------
TOTAL	3,553	4,456	4,521	3,873	4,190	6,231	8,278	4,972	3,884	3,263	2,855	2,580
MEAN	115	149	146	125	150	201	276	160	129	105	92.1	86.0
MAX	142	178	179	145	220	280	428	190	151	110	100	95
MIN	107	128	120	110	120	155	188	142	110	101	85	83
CFSM	.91	1.17	1.15	.98	1.18	1.58	2.17	1.26	1.02	.83	.73	.68
IN.	1.04	1.31	1.32	1.13	1.23	1.83	2.42	1.46	1.14	.96	.84	.76

CAL YR 1970 TOTAL 49,945 MEAN 137 MAX 248 MIN 90 CFSM 1.08 IN 14.63
WTR YR 1971 TOTAL 52,656 MEAN 144 MAX 428 MIN 83 CFSM 1.13 IN 15.42

04123500 Manistee River near Grayling, Mich.

LOCATION.—Lat 44°41'35", long 84°50'50", in SW¼ NW¼ sec.31, T.27 N., R.4 W., Crawford County, on right bank 25 ft upstream from bridge on State Highway 72, 3.3 miles downstream from Goose Creek, and 6.8 miles northwest of Grayling.

DRAINAGE AREA.—159 sq mi.

PERIOD OF RECORD.—October 1942 to current year. Monthly discharge only for October 1942, published in WSP 1307.

GAGE.—Water-stage recorder. Datum of gage is 1,120.64 ft above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.—29 years, 183 cfs (15.63 inches per year).

EXTREMES.—Current year: Maximum discharge, 343 cfs Apr. 18 (gage height, 1.61 ft); minimum, 114 cfs Jan. 27, result of freezeup. Period of record: Maximum discharge, 388 cfs Apr. 18, 1960 (gage height, 1.88 ft); maximum gage height, 2.43 ft Feb. 7, 1967 (backwater from ice); minimum discharge, 114 cfs Jan. 27, 1971, result of freezeup.

REMARKS.—Records good except those for the period Dec. 29 to Mar. 15 which are fair. Records of water temperatures for the current year are published in Part 2 of this report.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Dec. 29 to Jan. 1, Jan. 7-22, Jan. 28 to Feb. 9, Feb. 12-18, Feb. 28 to Mar. 5, Mar. 9)

Oct. 1 to Mar. 16		Mar. 17 to Sept. 30	
0.4	120	0.6	172
1.0	225	1.6	341
1.4	313		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	193	189	205	180	170	180	202	254	215	196	191	180
2	193	187	231	187	170	175	219	251	214	195	188	180
3	195	211	223	185	170	175	215	246	215	191	186	180
4	205	203	221	187	170	170	207	239	210	188	185	180
5	201	195	209	183	175	170	203	236	205	188	183	180
6	195	189	195	175	175	179	202	234	205	188	180	180
7	191	185	211	170	175	179	207	229	207	185	180	180
8	189	183	201	165	170	173	222	227	227	186	180	178
9	193	183	199	160	170	170	241	224	230	188	180	178
10	215	189	197	170	171	169	244	222	220	185	193	178
11	205	189	195	180	175	169	256	220	210	183	217	182
12	195	185	193	180	170	167	298	224	205	180	207	183
13	193	183	191	175	170	167	329	225	205	200	193	183
14	193	183	189	170	165	173	314	222	205	196	196	182
15	189	181	187	170	165	213	298	220	202	188	190	180
16	189	183	187	170	170	233	297	219	205	188	186	177
17	189	183	187	170	170	219	322	214	200	196	183	180
18	187	179	185	165	170	208	339	215	198	191	183	178
19	185	179	187	165	175	208	329	222	196	196	182	182
20	183	193	185	165	211	207	314	220	200	193	182	195
21	185	213	183	165	201	202	297	217	207	186	182	188
22	183	215	183	170	185	198	287	214	202	188	183	183
23	181	203	185	175	185	198	271	208	200	208	186	185
24	181	213	185	171	177	195	266	215	198	222	183	185
25	181	201	181	173	175	193	264	246	205	205	191	183
26	179	195	179	152	175	191	261	256	203	193	188	183
27	179	195	179	125	205	191	254	242	198	190	190	185
28	181	191	179	150	195	193	254	235	195	188	188	190
29	195	191	170	165	------	193	259	225	191	188	182	198
30	203	197	165	170	------	191	254	220	191	185	182	202
31	193	------	180	170	------	190	------	215	------	195	183	------
TOTAL	5,919	5,766	5,947	5,256	4,555	5,839	7,925	7,056	6,164	5,949	5,803	5,498
MEAN	191	192	192	170	177	188	264	228	205	192	187	183
MAX	215	215	231	187	211	233	339	256	230	222	217	202
MIN	179	179	165	125	165	167	202	208	191	180	180	177
CFSM	1.20	1.21	1.21	1.07	1.11	1.18	1.66	1.43	1.29	1.21	1.18	1.15
IN.	1.38	1.35	1.39	1.23	1.16	1.37	1.85	1.65	1.44	1.39	1.36	1.29

CAL YR 1970 TOTAL 65,506 MEAN 179 MAX 267 MIN 145 CFSM 1.13 IN 15.33
WTR YR 1971 TOTAL 72,077 MEAN 197 MAX 339 MIN 125 CFSM 1.24 IN 16.86

04124800 Manistee River near Sherman, Mich.

LOCATION.—Lat 44°26'11", long 85°41'55", in NE¼ NE¼ sec.36, T.24 N., R.12 W., Wexford County, on downstream side of bridge near right pier on State Highway 37, 250 ft upstream from Wheeler Creek, 0.9 mile north of Sherman, and at mile 60.8.

DRAINAGE AREA.—900 sq mi.

PERIOD OF RECORD.—July 1903 to May 1916, October 1930 to September 1931, October 1933 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.—Nonrecording gage. Altitude of gage is 804 ft (from river-profile map). Prior to Apr. 13, 1934 at various datums.

AVERAGE DISCHARGE.—51 years (1903-15, 1930-31, 1933-71), 1,057 cfs (15.95 inches per year).

EXTREMES.—Current year: Maximum discharge, 3,110 cfs Apr. 14 (gage height, 15.29 ft); minimum, 745 cfs Jan. 27.
Period of record: Maximum discharge, 3,570 cfs Mar. 25, 1913 (gage height, 7.1 ft, from graph based on gage readings, datum then in use); minimum daily, 540 cfs Feb. 21-23, 1936.

REMARKS.—Records good except those for the winter periods, which are fair.

REVISIONS (WATER YEARS).—WSP 1004: 1936 (m). WSP 1307: 1911, 1913-14(M), 1934 (M), 1936 (M), 1937, 1939-40(M), WSP 1437: 1911, 1913 (M), 1937.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Nov. 23, 24, Dec. 27 to Feb. 19, Feb. 23, 24, Feb. 27 to Mar. 4)

10.5	760
12.0	1,280
14.0	2,200
15.3	3,120

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,090	1,080	1,200	960	920	1,200	1,240	1,540	1,140	916	853	835
2	1,060	1,050	1,280	960	900	1,150	1,490	1,540	1,130	910	871	835
3	1,020	1,220	1,390	960	900	1,120	1,530	1,510	1,150	910	862	832
4	994	1,400	1,600	970	900	1,100	1,460	1,470	1,140	901	847	829
5	982	1,340	1,680	1,000	930	1,140	1,380	1,430	1,130	895	835	826
6	979	1,250	1,560	1,000	940	1,170	1,340	1,380	1,110	886	829	823
7	967	1,160	1,380	1,000	930	1,180	1,400	1,350	1,090	880	823	823
8	955	1,090	1,280	950	910	1,160	1,550	1,320	1,080	877	817	820
9	946	1,040	1,260	900	900	1,100	1,880	1,280	1,090	889	814	814
10	970	1,060	1,260	950	910	1,100	2,060	1,260	1,090	886	900	811
11	976	1,050	1,230	1,000	920	1,080	2,140	1,240	1,100	871	970	808
12	1,060	1,030	1,190	1,000	910	1,080	2,330	1,250	1,050	859	955	811
13	1,040	1,020	1,150	960	880	1,070	2,740	1,240	1,050	853	919	820
14	1,020	997	1,120	950	870	1,080	3,080	1,220	1,050	850	901	820
15	985	976	1,100	950	860	1,320	3,050	1,200	1,050	859	889	811
16	970	961	1,090	940	870	1,550	2,790	1,200	1,030	865	883	811
17	958	952	1,070	940	880	1,510	2,530	1,180	1,010	886	850	796
18	952	952	1,060	930	910	1,460	2,380	1,160	991	904	835	787
19	946	952	1,060	900	950	1,440	2,320	1,150	976	904	826	793
20	934	976	1,060	920	1,220	1,330	2,280	1,150	979	889	829	817
21	934	1,080	1,020	940	1,310	1,290	2,190	1,140	991	883	832	829
22	931	1,280	1,010	940	1,270	1,260	2,060	1,130	991	880	850	826
23	925	1,250	1,010	940	1,250	1,240	1,920	1,110	982	919	895	829
24	922	1,200	1,010	940	1,200	1,190	1,840	1,130	964	913	889	820
25	919	1,150	1,000	920	1,180	1,150	1,720	1,280	961	904	886	814
26	913	1,150	982	850	1,150	1,130	1,650	1,350	955	904	949	820
27	910	1,160	960	770	1,200	1,120	1,610	1,380	958	886	994	820
28	919	1,160	950	760	1,250	1,120	1,570	1,380	949	868	940	829
29	976	1,160	940	850	------	1,120	1,570	1,330	934	850	892	880
30	1,060	1,170	920	900	------	1,110	1,550	1,250	922	844	862	991
31	1,090	------	940	910	------	1,120	------	1,180	------	847	850	------
TOTAL	30,303	33,316	35,762	28,860	28,220	37,240	58,650	39,730	31,043	27,388	27,147	24,780
MEAN	978	1,111	1,154	931	1,008	1,201	1,955	1,282	1,035	883	876	826
MAX	1,090	1,400	1,680	1,000	1,310	1,550	3,080	1,540	1,150	919	994	991
MIN	910	952	920	760	860	1,070	1,240	1,110	922	844	814	787
CFSM	1.09	1.23	1.28	1.03	1.12	1.33	2.17	1.42	1.15	.98	.97	.92
IN.	1.25	1.38	1.48	1.19	1.17	1.54	2.42	1.64	1.28	1.13	1.12	1.02

CAL YR 1970 TOTAL 369,523 MEAN 1,012 MAX 1,840 MIN 766 CFSM 1.12 IN 15.27
WTR YR 1971 TOTAL 402,439 MEAN 1,103 MAX 3,080 MIN 760 CFSM 1.23 IN 16.63

04125500 Pine River near Hoxeyville, Mich.

LOCATION.—Lat 44°12'11", long 85°47'58", in SW¼ NW¼ sec.20, T.21 N., R.12 W., Wexford County, on right bank 500 ft upstream from bridge on State Highway 37, 4.2 miles northwest of Hoxeyville, 8.0 miles east of Wellston, and 8 miles upstream from mouth.

DRAINAGE AREA.—251 sq mi.

PERIOD OF RECORD.—July 1952 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 775 ft (by barometer).

AVERAGE DISCHARGE.—19 years, 281 cfs (15.20 inches per year).

EXTREMES.—Current year: Maximum discharge, 1,970 cfs Apr. 14 (gage height, 6.60 ft); minimum, 177 cfs Feb. 14.
Period of record: Maximum discharge, 2,440 cfs Aug. 6, 1956 (gage height, 6.82 ft), from rating curve extended above 1,100 cfs; minimum, 161 cfs Feb. 2, 1961.

REMARKS.—Records good.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 3 to June 15; stage-discharge relation affected by ice Dec. 31 to Jan. 1, Jan. 7-10, 18-20, Jan. 28 to Feb. 3, Feb. 7-10, 13-17, Mar. 1-5).

Oct. 1 to Feb. 17		Feb. 18 to Sept. 30	
2.4	192	2.4	210
3.0	340	4.0	669
4.0	655	5.0	1,040
		6.3	1,760

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	259	296	380	245	220	345	415	385	291	247	234	223
2	254	283	436	245	230	330	547	406	297	243	235	221
3	254	367	427	246	240	315	550	386	314	237	235	220
4	256	485	454	256	247	305	470	366	310	235	233	221
5	259	435	481	260	257	330	432	351	294	236	228	221
6	254	357	400	261	259	324	446	338	286	234	226	222
7	247	309	333	250	240	325	505	327	289	231	225	220
8	244	283	315	240	225	314	628	317	289	236	223	216
9	245	271	304	220	235	292	789	309	283	239	223	213
10	250	276	305	250	250	310	874	305	273	236	230	213
11	258	283	306	256	260	301	856	300	269	231	253	211
12	253	274	291	248	248	295	1,010	309	269	227	251	216
13	252	265	282	245	220	292	1,420	316	271	230	234	217
14	250	258	281	246	210	298	1,750	308	265	230	238	216
15	263	253	276	243	230	435	1,070	299	261	231	242	213
16	258	250	271	241	240	580	798	299	256	236	233	210
17	250	248	269	242	250	539	709	296	257	235	228	210
18	246	246	269	235	260	476	680	295	254	232	227	216
19	244	244	274	225	269	465	623	292	251	238	226	218
20	243	266	277	235	327	419	562	288	257	232	223	227
21	243	347	267	241	368	388	510	283	264	236	220	222
22	242	387	257	239	359	375	468	281	256	248	227	217
23	242	391	264	237	341	382	434	276	250	252	288	219
24	241	341	261	238	326	347	407	286	248	242	343	224
25	240	318	259	239	316	329	400	376	254	240	273	219
26	239	302	256	243	322	335	389	541	254	237	259	235
27	238	305	253	216	396	337	373	484	247	233	249	243
28	247	312	251	225	413	326	372	411	243	232	245	241
29	291	309	251	235	------	330	384	354	238	235	234	253
30	341	343	234	225	------	330	379	321	238	235	227	253
31	316	------	240	220	------	338	------	303	------	235	224	------
TOTAL	7,919	9,304	9,424	7,447	7,758	11,107	19,250	10,408	8,028	7,321	7,436	6,670
MEAN	255	310	304	240	277	358	642	336	268	236	240	222
MAX	341	485	481	261	413	580	1,750	541	314	252	343	253
MIN	238	244	234	216	210	292	372	276	238	227	220	210
CFSM	1.02	1.24	1.21	.96	1.10	1.43	2.56	1.34	1.07	.94	.96	.88
IN.	1.17	1.38	1.40	1.10	1.15	1.65	2.85	1.54	1.19	1.09	1.10	.99

CAL YR 1970 TOTAL 105,434 MEAN 289 MAX 767 MIN 210 CFSM 1.15 IN 15.63
WTR YR 1971 TOTAL 112,072 MEAN 307 MAX 1,750 MIN 210 CFSM 1.22 IN 16.61

PEAK DISCHARGE (BASE, 650 CFS).—Apr. 14 (0900) 1,970 cfs (6.60 ft).

04126000 Manistee River near Manistee, Mich.

LOCATION.—Lat 44°16'14", long 86°11'56", in NW¼ NW¼ sec.36, T.22 N., R.16 W., Manistee County, on right bank 6.4 miles northeast of Manistee, 6.4 miles south of Onekama, 7.8 miles upstream from Manistee Lake, and at mile 10.8.

DRAINAGE AREA.—1,780 sq mi, approximately.

PERIOD OF RECORD.—October 1951 to current year. Monthly discharge only for October, November 1951, published in WSP 1727.

GAGE.—Water-stage recorder. Altitude of gage is 585 ft (from river-profile map).

AVERAGE DISCHARGE.—20 years, 1,975 cfs (15.07 inches per year).

EXTREMES.—Current year: Maximum discharge, 6,980 cfs Apr. 15 (gage height, 8.22 ft); maximum gage height, 8.60 ft Feb. 6 (backwater from ice); minimum discharge, 1,030 cfs Sept. 18, 19 (gage height, 3.94 ft).
Period of record: Maximum discharge, that of Apr. 15, 1971; maximum gage height, 9.15 ft Feb. 12, 1955 (ice jam); minimum daily discharge, 992 cfs Oct. 10, 1966.

REMARKS.—Records good except those for the winter period, which are fair. Flow regulated at all stages by powerplant 21 miles above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 2-30; stage discharge relation affected by ice Dec. 27-31, Jan. 7 to Mar. 7, Mar. 20-26)

Oct. 1 to Apr. 14		Apr. 15 to Sept 30	
4.3	1,200	4.3	1,140
6.0	2,120	6.0	2,060
7.0	2,950	7.0	3,130
7.5	3,840	7.5	4,380
8.2	6,800	8.2	6,900

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2,140	1,910	2,360	1,480	1,200	2,700	2,210	2,890	1,840	1,590	1,220	1,560
2	2,000	1,900	2,390	1,720	2,000	2,700	2,710	3,060	2,190	1,570	1,280	1,580
3	1,970	2,210	2,500	1,940	1,700	2,500	3,040	2,360	2,000	1,600	1,710	1,700
4	1,550	2,460	2,850	2,130	1,800	2,400	3,200	2,770	2,170	1,350	1,590	1,670
5	1,550	2,770	3,060	2,360	2,900	2,450	3,180	2,900	2,160	1,490	1,340	1,410
6	1,970	3,080	3,100	2,200	2,000	2,250	3,110	2,620	1,740	1,570	1,500	1,420
7	1,830	2,670	3,080	2,000	2,200	2,250	3,000	2,480	1,780	1,670	1,470	1,410
8	1,700	1,940	2,780	1,800	2,000	2,350	3,130	2,150	2,050	1,670	1,290	1,710
9	1,940	1,690	2,530	1,300	2,100	2,430	3,350	2,100	1,960	1,610	1,180	1,620
10	1,670	1,990	2,450	1,600	2,000	2,230	3,740	2,200	2,080	1,650	1,660	1,400
11	1,540	1,950	2,380	1,350	1,600	2,410	3,810	2,230	1,880	1,200	1,820	1,580
12	1,630	2,140	2,420	2,000	2,100	2,200	4,690	2,250	1,750	1,310	1,960	1,280
13	1,930	2,070	2,070	1,800	2,200	2,240	4,680	2,220	1,690	1,580	1,750	1,160
14	1,910	1,880	1,960	2,000	1,900	2,120	6,420	2,280	1,790	1,550	1,560	1,590
15	1,900	1,660	2,250	2,000	1,300	2,560	6,570	2,240	1,920	1,500	1,350	1,510
16	1,890	1,630	2,030	2,000	1,800	2,840	6,400	2,420	1,920	1,580	1,480	1,500
17	1,700	1,820	2,100	1,400	2,100	3,230	5,580	1,830	1,830	1,520	1,500	1,450
18	1,460	1,880	2,130	1,300	2,000	3,540	5,170	2,000	1,880	1,260	1,510	1,490
19	1,610	1,910	2,110	2,000	2,000	3,510	4,590	2,080	1,620	1,420	1,520	1,160
20	1,790	1,920	1,810	2,000	2,300	3,000	4,570	2,110	1,510	1,880	1,510	1,310
21	1,740	2,030	1,820	1,500	2,500	2,650	4,250	2,080	1,520	1,410	1,490	1,640
22	1,760	2,060	2,080	2,300	2,600	2,400	4,130	2,170	1,770	1,530	1,170	1,550
23	1,670	2,340	2,210	2,100	2,600	2,400	3,980	2,190	1,790	1,670	1,560	1,730
24	1,740	2,530	1,900	1,900	2,600	2,400	3,910	1,870	1,830	1,540	1,760	1,710
25	1,460	2,450	1,890	1,700	2,300	2,650	3,910	2,180	1,770	1,480	1,730	1,470
26	1,500	2,370	1,880	2,300	2,500	2,200	3,410	2,650	1,790	1,210	1,700	1,350
27	1,810	2,330	1,700	2,500	2,400	2,330	3,270	2,930	1,410	1,690	1,620	1,380
28	1,750	2,160	1,500	2,300	2,500	2,330	2,650	3,030	1,320	1,580	2,010	1,700
29	2,020	1,930	1,900	1,200	------	2,200	2,580	3,040	1,990	1,600	1,520	1,900
30	1,970	2,310	2,100	1,200	------	2,050	2,580	2,950	1,400	1,530	1,380	1,850
31	2,120	------	1,800	1,400	------	2,350	------	2,070	------	1,530	1,670	------
TOTAL	55,220	63,990	69,140	56,780	59,200	77,870	117,820	74,350	54,350	47,340	47,810	45,790
MEAN	1,781	2,133	2,230	1,832	2,114	2,512	3,927	2,398	1,812	1,527	1,542	1,526
MAX	2,140	3,080	3,100	2,500	2,900	3,540	6,570	3,060	2,190	1,880	2,010	1,900
MIN	1,460	1,630	1,500	1,200	1,200	2,050	2,210	1,830	1,320	1,200	1,170	1,160
CFSM	1.00	1.20	1.25	1.03	1.19	1.41	2.21	1.35	1.02	.86	.87	.86
IN.	1.15	1.34	1.44	1.19	1.24	1.63	2.46	1.55	1.14	.99	1.00	.96

CAL YR 1970 TOTAL 711,640 MEAN 1,950 MAX 3,800 MIN 1,000 CFSM 1.10 IN 14.87
WTR YR 1971 TOTAL 769,660 MEAN 2,109 MAX 6,570 MIN 1,160 CFSM 1.18 IN 16.09

04126200 Little Manistee River near Freesoil, Mich.

LOCATION.—Lat 44°11'00", long 86°10'00", in NE¼ NE¼ sec.31, T.21 N., R.15 W., Manistee County, on right bank 25 ft upstream from Sixmile Bridge, 5.8 miles north of Freesoil, 7.4 miles upstream from mouth, and 9.0 miles southeast of Manistee.

DRAINAGE AREA.—200 sq mi.

PERIOD OF RECORD.—October 1956 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 610 ft (from survey line in vicinity).

AVERAGE DISCHARGE.—15 years, 174 cfs (11.81 inches per year).

EXTREMES.—Current year: Maximum discharge, 564 cfs Apr. 15 (gage height, 3.78 ft); minimum, 102 cfs Feb. 1.
Period of record: Maximum discharge, 575 cfs Apr. 6, 1959 (gage height, 3.70 ft); minimum, 71 cfs Feb. 11, 1958, result of freezeup.

REMARKS.—Records good. Some regulation above station. Records of water temperatures for the current year are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 7-13, Jan. 1 to Feb. 23;
stage-discharge relation affected by ice Mar. 2-4)

1.2	100
3.0	372
4.0	640

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	149	173	197	152	104	205	228	264	202	163	145	133
2	146	172	204	154	110	185	258	263	206	167	149	132
3	148	186	209	150	132	175	274	261	210	163	146	132
4	145	205	215	155	150	170	274	253	208	160	144	133
5	143	210	212	158	155	184	250	246	201	159	142	133
6	142	191	205	156	155	190	244	241	197	158	140	133
7	140	179	193	150	154	190	256	236	197	155	139	133
8	138	173	186	146	142	186	288	232	199	158	138	131
9	138	172	185	132	140	179	334	228	197	160	138	130
10	140	178	185	156	142	180	356	227	190	158	145	130
11	140	176	188	160	150	182	374	224	188	154	149	130
12	140	172	185	155	150	178	394	228	187	151	148	132
13	138	167	182	150	137	176	448	228	190	150	143	133
14	141	164	180	149	122	182	462	225	189	151	144	133
15	140	162	178	148	142	221	536	220	187	151	145	132
16	140	160	176	145	145	249	461	219	183	151	143	130
17	140	160	174	143	154	263	376	214	180	151	139	129
18	140	158	174	142	155	258	348	212	177	152	138	129
19	138	158	179	133	166	242	336	212	175	155	137	132
20	140	167	178	143	185	233	320	210	177	154	139	137
21	141	179	174	149	185	223	298	208	181	151	137	137
22	142	196	170	145	182	213	284	204	178	148	136	134
23	149	193	168	143	179	213	274	202	173	150	136	136
24	149	190	167	142	173	210	271	208	171	150	140	136
25	152	182	164	141	172	196	267	230	173	148	141	134
26	149	178	162	141	176	201	263	246	173	145	141	143
27	145	180	161	123	196	202	259	255	171	144	140	144
28	158	182	160	129	205	204	261	239	168	145	139	144
29	172	185	156	137	------	204	263	224	163	145	137	140
30	178	186	156	129	------	204	261	212	162	146	135	144
31	180	------	150	112	------	207	------	206	------	147	134	------
TOTAL	4,541	5,334	5,573	4,468	4,358	6,305	9,518	7,077	5,553	4,740	4,367	4,029
MEAN	146	178	180	144	156	203	317	228	185	153	141	134
MAX	180	210	215	160	205	263	536	264	210	167	149	144
MIN	138	158	150	112	104	170	228	202	162	144	134	129
CFSM	.73	.89	.90	.72	.78	1.02	1.59	1.14	.93	.77	.71	.67
IN.	.84	.99	1.04	.83	.81	1.17	1.77	1.32	1.03	.88	.81	.75

CAL YR 1970 TOTAL 63,680 MEAN 174 MAX 300 MIN 125 CFSM .87 IN 11.84
WTR YR 1971 TOTAL 65,863 MEAN 180 MAX 536 MIN 104 CFSM .90 IN 12.25

04127000 Boardman River near Mayfield, Mich.

LOCATION.--Lat 44°38'18", long 85°31'10", in SE¼ NE¼ sec.21, T.26 N., R.10 W., Grand Traverse County, on right bank 25 ft downstream from Brown's Bridge, 300 ft downstream from East Creek, 0.9 mile downstream from Brown's Bridge Dam, 1.0 mile northeast of Mayfield, and 9.6 miles southeast of Traverse City.

DRAINAGE AREA.--223 sq mi.

GAGE.--Water-stage recorder. Altitude of gage is 760 ft (by barometer).

PERIOD OF RECORD.--June 1952 to current year.

AVERAGE DISCHARGE.--19 years, 194 cfs (11.81 inches per year).

EXTREMES.--Current year: Maximum discharge, 710 cfs Apr. 13 (gage height, 5.55 ft); minimum, 48 cfs Feb. 14, minimum daily, 113 cfs Aug. 7,
Period of record: Maximum discharge, 1,220 cfs Sept. 14, 1961 (gage height, 6.90 ft); minimum, 30 cfs Jan. 15, 1965 (gage height, 2.53 ft); minimum daily, 47 cfs Nov. 2, 3, 1963.

REMARKS.--Records good. Flow regulated by powerplant 0.9 mile above station. Records of water temperatures for the current year are published in Part 2 of this report.

Rating tables (gage height, in feet and discharge in cubic feet per second)
(Stage-discharge relation affected by ice Jan. 27 to Feb. 4)

Oct. 1 to Apr. 12		Apr. 13 to Sept. 30	
3.3	133	3.1	105
4.0	268	4.0	285
5.0	535	5.0	545
5.2	605	5.5	695

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	190	202	232	187	165	225	240	308	212	178	179	178
2	210	214	243	188	170	177	305	311	215	178	180	177
3	283	235	284	188	170	201	302	334	240	177	178	164
4	206	253	380	196	175	196	293	323	283	175	178	144
5	196	301	392	202	186	196	217	303	286	174	176	145
6	187	250	373	200	186	246	240	301	183	174	149	140
7	179	247	281	197	183	227	258	286	200	172	113	136
8	179	182	179	189	172	181	329	274	216	174	114	129
9	174	191	184	188	182	157	356	273	219	174	144	135
10	171	206	194	191	176	211	342	264	249	172	188	154
11	165	172	246	191	180	244	448	268	211	172	187	178
12	180	173	290	191	181	194	588	281	187	171	183	178
13	231	190	284	192	173	177	681	254	198	174	182	161
14	245	189	225	195	150	184	645	231	208	172	183	133
15	190	188	144	191	154	250	612	244	189	172	181	138
16	186	188	145	187	155	302	537	266	222	161	162	136
17	186	186	167	185	181	298	504	257	183	172	145	137
18	188	186	184	181	190	250	490	270	170	176	147	147
19	188	186	218	167	179	236	478	274	216	180	147	151
20	188	198	247	170	205	233	473	274	208	175	158	168
21	188	206	194	167	199	229	464	219	197	174	172	185
22	188	219	193	171	205	223	428	184	176	185	184	183
23	181	249	197	181	207	227	374	184	173	255	187	182
24	162	301	203	191	201	219	335	226	217	211	179	157
25	158	253	202	186	206	173	328	411	227	226	179	132
26	178	218	202	173	253	175	408	345	222	167	166	162
27	190	250	203	165	284	181	436	312	165	119	190	159
28	192	218	201	170	266	199	370	313	134	124	182	165
29	216	219	200	170	------	240	310	300	136	126	195	165
30	238	234	186	170	------	215	303	289	177	151	178	197
31	238	------	167	160	------	177	------	215	------	182	180	------
TOTAL	6,051	6,504	7,040	5,680	5,334	6,643	12,094	8,594	6,119	5,393	5,266	4,716
MEAN	195	217	227	183	191	214	403	277	204	174	170	157
MAX	283	301	392	202	284	302	681	411	286	255	195	197
MIN	158	172	144	160	150	157	217	184	134	119	113	129
CFSM	.87	.97	1.02	.82	.86	.96	1.81	1.24	.91	.78	.76	.70
IN.	1.01	1.08	1.17	.95	.89	1.11	2.02	1.43	1.02	.90	.88	.79

CAL YR 1970 TOTAL 74,355 MEAN 204 MAX 518 MIN 109 CFSM .91 IN 12.40
WTR YR 1971 TOTAL 79,434 MEAN 218 MAX 681 MIN 113 CFSM .98 IN 13.25

04127800 Jordan River near East Jordan, Mich.

LOCATION.--Lat 45°06'09", long 85°05'53", in NW¼ NW¼ sec.7, T.31 N., R.6 W., Antrim County, on right bank 600 ft downstream from Webster Bridge, 4.2 miles south of East Jordan, and 4.5 miles upstream from mouth.

DRAINAGE AREA.--67.6 sq mi.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1960-65. October 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 610 ft (from topographic map). Nov. 19, 1959 to Sept. 30, 1966, nonrecording gage at present site and at site 600 ft upstream at same datum.

AVERAGE DISCHARGE.--5 years, 183 cfs (36.76 inches per year).

EXTREMES.--Current year: Maximum discharge, 458 cfs July 23 (gage height, 4.74 ft); maximum gage height, 5.09 ft Feb. 15 (backwater from ice); minimum discharge, 118 cfs Jan. 19, 27.
Period of record: Maximum discharge, 832 cfs Sept. 24, 1970 (gage height, 5.56 ft); minimum, 109 cfs Mar. 1, 8, 1967, result of freezeup.

REMARKS.--Records good. Records of water temperatures for the current year are published in Part 2 of this report.

Rating tables (gage height, in feet, and discharge in cubic feet per second)
(Stage-discharge relation affected by ice Dec. 4-8, Dec. 27 to Jan. 11, Jan. 13, Jan. 19 to Feb. 23, Mar. 3-5, 8, 9).

Oct. 1-4		Oct. 4 to Sept. 30	
3.2	181	2.9	125
4.0	295	4.0	293
		4.5	384
		5.0	530

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	181	178	212	160	160	189	272	220	190	171	174	169
2	184	172	212	160	160	183	288	211	191	163	175	167
3	189	182	190	160	160	175	225	200	192	160	175	165
4	188	172	185	165	165	165	201	194	185	159	174	162
5	172	168	180	165	170	165	192	194	184	160	170	173
6	167	167	175	160	175	179	202	195	182	158	168	176
7	164	164	165	160	175	180	233	188	182	158	167	162
8	164	164	170	155	170	170	294	186	273	164	167	162
9	170	166	182	145	180	165	335	185	195	164	166	162
10	200	178	186	155	185	172	293	185	181	158	206	165
11	172	174	178	165	185	171	343	185	177	158	232	172
12	168	168	172	168	180	170	406	216	177	156	180	170
13	168	166	168	165	160	171	350	202	180	208	172	168
14	170	164	168	168	160	188	263	192	178	172	184	165
15	168	161	167	167	155	272	254	188	171	165	176	163
16	172	164	166	167	155	246	265	187	169	177	169	161
17	168	164	167	167	155	208	374	184	167	199	165	162
18	166	162	168	166	150	197	295	263	165	171	165	163
19	164	162	172	130	160	195	259	304	163	195	166	172
20	164	190	168	150	200	190	244	232	186	172	172	199
21	166	210	166	155	180	183	226	202	204	166	180	173
22	164	216	166	155	170	180	213	194	170	194	171	167
23	164	202	167	155	175	179	207	191	166	372	177	179
24	162	182	170	155	175	176	219	206	165	227	179	175
25	162	178	168	155	174	173	230	315	196	185	214	167
26	162	176	167	150	184	172	224	303	173	178	292	171
27	162	182	160	130	249	172	206	226	164	177	215	170
28	166	174	155	140	209	178	237	205	161	177	183	199
29	224	190	155	150	------	182	228	197	159	175	173	273
30	197	200	145	160	------	178	206	192	164	173	180	211
31	180	------	150	160	------	193	------	189	------	181	178	------
TOTAL	5,368	5,296	5,320	4,863	4,876	5,717	7,784	6,531	5,410	5,593	5,665	5,243
MEAN	173	177	172	157	174	184	259	211	180	180	183	175
MAX	224	216	212	168	249	272	406	315	273	372	292	273
MIN	162	161	145	130	150	165	192	184	159	156	165	161
CFSM	2.56	2.62	2.54	2.32	2.57	2.72	3.83	3.12	2.66	2.66	2.71	2.59
IN.	2.95	2.91	2.93	2.68	2.68	3.15	4.28	3.59	2.98	3.08	3.12	2.89

CAL YR 1970 TOTAL 64,186 MEAN 176 MAX 552 MIN 144 CFSM 2.60 IN 35.32
WTR YR 1971 TOTAL 67,666 MEAN 185 MAX 406 MIN 130 CFSM 2.74 IN 37.24

PEAK DISCHARGE (BASE, 400 CFS REVISED)

DATE	TIME	GHT	DISCHARGE	DATE	TIME	GHT	DISCHARGE
04-12	0200	4.77	450	05-25	2200	4.63	428
04-17	1430	4.69	428	07-23	1300	4.74	458

04128000 Sturgeon River near Wolverine, Mich.

LOCATION.—Lat 45°17'56", long 84°36'40", in SE¼ NE¼ sec.36, T.34 N., R.3 W., Cheboygan County, on left bank 1.8 miles north of Wolverine, 2.8 miles downstream from West Branch, and 9 miles upstream from mouth.

DRAINAGE AREA.—170 sq mi, approximately.

PERIOD OF RECORD.—April 1942 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 740 ft (from topographic map). Prior to June 15, 1942, non-recording gage at site 1.0 mile upstream, and June 16, 1942, to Sept. 30, 1958 at site 0.7 mile upstream at different datums.

AVERAGE DISCHARGE.—29 years, 204 cfs (16.30 inches per year).

EXTREMES.—Current year: Maximum discharge, 728 cfs Apr. 13 (gage height, 3.04 ft); minimum, 94 cfs Jan. 19, result of freezeup. Period of record: Maximum discharge, 1,180 cfs Sept. 14, 1961 (gage height, 4.48 ft); minimum, 94 cfs Jan. 19, 1971, result of freezeup; minimum daily, 113 cfs Aug. 6, 1958.

REMARKS.—Records good except those for the winter periods and those for periods of no gage-height record, which are fair. Intermittent regulation at low flows from ponds 2.4 miles above station. Records of water temperatures for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).—WSP 1307: 1944 (M), 1948 (M). WSP 1727: 1951 (M).

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Dec. 6-8, 13, 14, Dec. 21 to Feb. 18, Feb. 22-24, Feb. 28 to Mar. 14)

Oct. 1 to Feb. 15		Feb. 16 to Sept. 30	
1.8	150	1.8	172
2.0	210	2.5	400
2.5	400	3.0	700

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	214	207	284	190	190	250	310	336	256	226	211	211
2	224	201	336	190	190	230	420	353	253	220	202	205
3	259	214	273	190	195	215	380	329	256	208	208	202
4	288	204	266	200	195	210	350	313	244	205	202	202
5	252	207	266	200	200	210	310	307	241	202	196	199
6	231	214	240	200	205	230	320	284	241	199	193	211
7	204	204	220	190	205	230	360	272	268	199	187	205
8	201	198	235	185	205	220	450	265	462	196	187	196
9	201	195	242	175	210	210	540	259	350	205	184	196
10	312	195	245	190	215	220	470	253	281	196	208	211
11	259	195	234	200	215	220	504	247	253	190	310	226
12	228	192	228	200	215	220	644	278	247	187	232	217
13	217	189	215	190	210	220	637	272	253	253	214	214
14	231	189	205	190	205	230	492	259	250	241	214	205
15	228	186	204	200	200	260	425	250	232	211	211	202
16	228	186	210	200	200	280	445	247	220	208	199	202
17	217	186	210	200	205	280	558	241	214	238	196	202
18	201	198	207	195	210	270	582	320	214	217	193	202
19	195	210	210	185	223	260	504	552	214	235	193	211
20	198	234	207	185	268	260	480	405	223	226	199	272
21	201	328	195	195	265	250	450	320	250	211	196	238
22	195	300	200	200	235	240	396	291	226	286	196	214
23	192	292	200	200	225	230	372	275	220	498	214	220
24	192	248	200	200	225	220	372	281	214	498	205	223
25	195	231	200	190	235	215	376	410	259	310	241	211
26	192	228	200	180	250	220	368	462	250	262	294	211
27	195	231	190	155	333	225	333	346	229	238	300	214
28	195	224	190	170	280	225	368	300	223	226	238	316
29	228	238	185	180	------	230	380	278	217	223	223	323
30	245	276	175	190	------	235	343	265	217	211	232	281
31	217	------	180	190	------	250	------	256	------	211	226	------
TOTAL	6,835	6,600	6,852	5,905	6,209	7,265	12,939	9,526	7,477	7,436	6,704	6,642
MEAN	220	220	221	190	222	234	431	307	249	240	216	221
MAX	312	328	336	200	333	280	644	552	462	498	310	323
MIN	192	186	175	155	190	210	310	241	214	187	184	196
CFSM	1.29	1.29	1.30	1.12	1.31	1.38	2.54	1.81	1.46	1.41	1.27	1.30
IN.	1.50	1.44	1.50	1.29	1.36	1.59	2.83	2.08	1.64	1.63	1.47	1.45

CAL YR 1970 TOTAL 79,756 MEAN 219 MAX 517 MIN 141 CFSM 1.29 IN 17.45
WTR YR 1971 TOTAL 90,390 MEAN 248 MAX 644 MIN 155 CFSM 1.46 IN 19.78

NOTE.—No gage-height record Jan. 12-24, Mar. 11 to Apr. 10.

04128500 Indian River at Indian River, Mich.

LOCATION.--Lat 45°24'38", long 84°37'12", in NE¼ SW¼ sec.24, T.35 N., R.3 W., Cheboygan County, on left bank at Indian River, 500 ft downstream from Burt Lake, and 2.3 miles upstream from Mullett Lake.

DRAINAGE AREA.--583 sq mi.

PERIOD OF RECORD.--April 1942 to current year.

GAGE.--Water-stage recorder. Datum of gage is 590.21 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to Nov. 12, 1942, nonrecording gage at site 100 ft downstream.

AVERAGE DISCHARGE.--29 years, 550 cfs (12.81 inches per year).

EXTREMES.--Current year: Maximum daily discharge, 1,150 cfs May 2, 3; maximum daily gage height, 5.24 ft May 2; minimum daily discharge, 440 cfs Sept. 17, 18; minimum daily gage height, 3.78 ft Feb. 16-18.
Period of record: Maximum daily discharge, 1,150 cfs May 2, 3, 1971; maximum daily gage height, 5.58 ft May 13, 14, 1960; minimum daily discharge, 212 cfs Sept. 2, 1970; minimum daily gage height, 3.34 ft Oct. 21, 1957.

REMARKS.--Records fair. Seasonal distribution of flow modified by regulation from dam at Cheboygan.

REVISIONS (WATER YEARS).--WSP 1437: 1942 (M), 1945 (M), 1947.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	750	617	511	572	673	600	615	1,140	998	665	555	490
2	750	635	545	581	664	600	615	1,150	987	645	570	480
3	760	673	572	581	664	605	625	1,150	976	625	565	470
4	740	673	702	599	664	600	630	1,140	960	615	560	460
5	711	682	654	608	673	595	625	1,130	948	605	560	460
6	711	673	682	617	673	605	625	1,120	938	595	550	460
7	692	654	682	626	673	625	630	1,110	932	585	545	460
8	682	644	635	617	664	630	635	1,100	976	570	535	450
9	673	617	644	617	654	625	655	1,090	954	565	525	450
10	682	635	644	608	644	625	680	1,060	926	555	525	450
11	682	617	644	617	644	620	706	1,050	916	545	540	460
12	664	608	635	617	654	620	756	1,050	899	515	515	460
13	654	608	635	617	644	615	816	1,020	888	520	520	460
14	654	590	626	617	617	615	860	1,000	872	510	545	465
15	626	554	626	617	599	620	888	982	800	495	535	460
16	599	528	626	617	572	630	910	976	680	495	520	450
17	581	511	617	617	572	630	960	954	680	490	515	440
18	563	494	608	617	563	635	982	965	680	475	510	440
19	545	494	608	599	572	650	1,000	1,010	680	480	500	450
20	536	520	617	599	575	665	1,010	1,010	680	470	490	450
21	528	520	608	599	580	660	1,020	1,020	767	460	480	470
22	528	511	617	608	585	660	1,030	1,010	745	520	480	500
23	520	572	617	599	595	660	1,040	998	728	590	480	500
24	536	545	635	608	600	650	1,080	998	712	610	480	490
25	554	511	626	608	590	645	1,090	1,030	718	610	490	480
26	554	511	626	664	590	640	1,100	1,060	706	615	530	470
27	563	528	626	654	590	625	1,100	1,060	690	605	550	470
28	545	502	617	654	605	635	1,120	1,050	685	590	550	470
29	563	511	608	654	------	630	1,130	1,040	680	590	540	490
30	617	528	599	673	------	620	1,130	1,030	670	585	520	505
31	617	------	581	673	------	615	------	1,010	------	575	500	------
TOTAL	19,380	17,266	19,273	19,154	17,393	19,450	26,063	32,513	24,471	17,370	16,280	14,010
MEAN	625	576	622	618	621	627	869	1,049	816	560	525	467
MAX	760	682	702	673	673	665	1,130	1,150	998	665	570	505
MIN	520	494	511	572	563	595	615	954	670	460	480	440
CFSM	1.07	.99	1.07	1.06	1.07	1.08	1.49	1.80	1.40	.96	.90	.80
IN.	1.24	1.10	1.23	1.22	1.11	1.24	1.66	2.07	1.56	1.11	1.04	.89

CAL YR 1970 TOTAL 200,890 MEAN 550 MAX 830 MIN 212 CFSM .94 IN 12.82
WTR YR 1971 TOTAL 242,623 MEAN 665 MAX 1,150 MIN 440 CFSM 1.14 IN 15.48

04129000 Pigeon River near Vanderbilt, Mich.

LOCATION.--Lat 45°10'15", long 84°26'18", in SE¼ SW¼ sec.9, T.32 N., R.1 W., Otsego County, on right bank at Pigeon River Fisheries Experiment Station, 11.1 miles east of Vanderbilt, and 26 miles upstream from Mullett Lake.

DRAINAGE AREA.--63 sq mi, approximately.

PERIOD OF RECORD.--September 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 886.24 ft above mean sea level.

AVERAGE DISCHARGE.--21 years, 75.7 cfs (16.32 inches per year).

EXTREMES.--Current year: Maximum discharge, 396 cfs July 23 (gage height, 4.95 ft); minimum, 24 cfs June 29 (gage height, 1.63 ft). Period of record: Maximum discharge, 1,500 cfs May 15, 1957 (gage height, 6.80 ft, from floodmark), from rating curve extended above 500 cfs, result of failure of Lansing Club Dam; minimum, 13 cfs Jan. 8, 1957.

REMARKS.--Records good except those for the winter period, which are fair. Prior to May 16, 1957, and since Apr. 22, 1958, occasional regulation by Lansing Club Dam 3.5 miles above station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Dec. 5 to Mar. 7,
Mar. 10-13, 16-21, 24-27, 29)

Oct. 1 to Apr. 9		Apr. 10 to Sept. 30	
2.2	53	2.1	52
3.0	118	2.5	83
4.0	220	3.0	127
		4.0	235
		5.0	400

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	76	89	60	62	75	99	139	78	96	66	71
2	69	68	120	60	62	72	104	140	78	76	65	70
3	83	76	110	60	63	70	115	99	73	73	65	68
4	115	84	78	61	63	70	90	114	80	73	64	65
5	71	77	84	64	65	70	66	118	77	67	64	65
6	90	69	73	64	67	75	75	112	75	69	62	64
7	68	61	62	62	68	70	107	81	90	70	62	61
8	63	65	70	60	68	59	102	86	130	64	61	58
9	75	73	75	56	68	74	163	85	180	65	60	66
10	106	69	75	60	70	73	141	96	150	67	81	64
11	111	70	70	62	71	66	153	86	115	68	121	61
12	82	64	66	62	71	72	258	96	105	61	86	62
13	77	67	66	60	70	70	243	92	95	93	68	66
14	75	70	66	60	67	68	213	88	90	69	77	65
15	74	62	65	60	66	111	132	83	85	69	65	66
16	68	64	65	60	66	110	172	82	83	69	65	62
17	72	63	65	60	67	95	199	80	81	74	66	58
18	66	68	65	60	70	80	252	94	80	76	63	61
19	65	69	63	58	75	66	198	189	76	83	61	62
20	60	79	63	58	90	70	185	122	80	82	63	79
21	77	122	62	60	90	70	193	110	84	73	64	82
22	66	122	61	63	80	70	172	86	80	69	66	71
23	66	122	63	64	75	71	151	84	85	247	65	71
24	66	89	63	64	75	75	141	101	100	208	69	65
25	61	65	63	62	77	61	119	127	92	114	82	65
26	64	65	62	60	85	65	132	170	97	89	101	65
27	64	93	60	54	110	72	90	111	85	76	92	65
28	64	71	60	56	92	57	146	94	70	76	80	124
29	68	57	60	60	------	62	145	91	55	70	65	165
30	102	86	56	62	------	63	136	83	66	68	77	132
31	79	------	60	62	------	73	------	84	------	67	65	------
TOTAL	2,345	2,286	2,160	1,874	2,053	2,255	4,492	3,223	2,715	2,621	2,211	2,199
MEAN	75.6	76.2	69.7	60.5	73.3	72.7	150	104	90.5	84.5	71.3	73.3
MAX	115	122	120	64	110	111	258	189	180	247	121	165
MIN	60	57	56	54	62	57	66	80	55	61	60	58
CFSM	1.20	1.21	1.11	.96	1.16	1.15	2.38	1.65	1.44	1.34	1.13	1.16
IN.	1.38	1.35	1.28	1.11	1.21	1.33	2.65	1.90	1.60	1.55	1.31	1.30

CAL YR 1970 TOTAL 26,995 MEAN 74.0 MAX 287 MIN 41 CFSM 1.17 IN 15.94
WTR YR 1971 TOTAL 30,434 MEAN 83.4 MAX 258 MIN 54 CFSM 1.32 IN 17.97

04129500 Pigeon River at Afton, Mich.

LOCATION.--Lat 45°22'26", long 84°30'54", in NW¼ NE¼ sec.2, T.34 N., R.2 W., Cheboygan County, on upstream side of bridge on State Highway 68, 0.9 mile west of Afton, 2.2 miles downstream from Wilkes Creek, and 7 miles upstream from Mullett Lake.

DRAINAGE AREA.--159 sq mi.

PERIOD OF RECORD.--April 1942 to current year.

GAGE.--Nonrecording gage. Altitude of gage is 675 ft (by barometer). Prior to Oct. 1, 1961, at various sites upstream at present datum.

AVERAGE DISCHARGE.--29 years, 136 cfs (11.62 inches per year).

EXTREMES.--Current year: Maximum discharge, 849 cfs Apr. 13 (gage height, 6.58 ft); minimum, 79 cfs June 30.
Period of record: Maximum discharge, 1,170 cfs Apr. 17, 1960 (gage height, 6.80 ft, from high-water mark); maximum gage height, about 10.5 ft Mar. 31, 1943, from flood marks (ice jam); minimum discharge, 49 cfs Aug. 8, 1958.

REMARKS.--Records good except those for the winter period, which are fair. Occasional regulation by Lansing Club Dam 22 miles above station.

REVISIONS (WATER YEARS).--WSP 1437: 1945-46, 1950.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 10-18; stage-discharge relation affected by ice Nov. 24-29, Dec. 4 to Apr. 1)

Oct. 1 to June 9		June 10 to Sept. 30	
4.4	87	4.3	75
5.0	220	5.0	220
5.5	385	5.5	385
6.3	800		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	166	144	171	110	110	200	200	303	171	118	116	114
2	138	133	202	110	110	170	266	310	162	134	112	114
3	155	129	212	110	115	150	275	286	157	112	112	116
4	171	135	200	110	115	140	269	230	153	112	108	108
5	183	133	170	115	115	130	205	232	153	114	106	106
6	153	127	160	115	115	130	185	228	153	104	104	110
7	148	121	160	115	120	135	230	212	171	104	101	114
8	121	111	160	120	120	135	303	178	266	102	99	108
9	129	121	155	115	120	130	393	164	381	102	99	101
10	155	121	145	115	120	125	475	176	271	101	102	99
11	176	121	135	120	125	130	530	173	197	101	149	108
12	169	119	130	120	130	135	680	183	173	97	166	108
13	144	111	125	125	130	130	764	193	157	106	132	108
14	138	117	125	125	130	135	565	183	151	118	126	108
15	135	115	120	125	125	140	456	171	140	108	122	106
16	129	111	120	120	120	130	438	164	134	106	108	99
17	129	111	120	115	120	200	570	155	130	112	106	99
18	123	111	120	110	120	200	610	201	124	116	106	97
19	117	111	120	110	120	190	595	417	120	124	102	99
20	111	125	120	110	125	160	530	484	124	126	104	126
21	121	160	120	110	140	145	490	306	132	122	102	138
22	115	205	115	115	160	135	434	238	126	130	102	128
23	109	218	115	120	165	135	365	202	128	197	102	120
24	105	185	115	120	150	135	349	198	157	385	106	118
25	101	150	120	120	140	140	342	328	149	324	122	112
26	103	130	120	120	140	140	328	434	153	211	134	110
27	109	130	115	115	140	135	303	397	136	166	157	110
28	113	130	115	105	150	135	310	263	122	145	147	140
29	131	130	110	100	------	135	361	222	108	136	126	182
30	146	148	110	105	------	140	331	195	89	122	116	202
31	162	------	105	105	------	150	------	176	------	118	122	------
TOTAL	4,205	4,013	4,230	3,550	3,590	4,520	12,152	7,602	4,788	4,273	3,616	3,508
MEAN	136	134	136	115	128	146	405	245	160	138	117	117
MAX	183	218	212	125	165	200	764	484	381	385	166	202
MIN	101	111	105	100	110	125	185	155	89	97	99	97
CFSM	.86	.84	.86	.72	.81	.92	2.55	1.54	1.01	.87	.74	.74
IN.	.98	.94	.99	.83	.84	1.06	2.84	1.78	1.12	1.00	.85	.82

CAL YR 1970 TOTAL 48,691 MEAN 133 MAX 452 MIN 68 CFSM .84 IN 11.39
WTR YR 1971 TOTAL 60,047 MEAN 165 MAX 764 MIN 89 CFSM 1.04 IN 14.05

04130000 Cheboygan River near Cheboygan, Mich.

LOCATION.--Lat 45°34'38", long 84°29'15", in SW¼ sec.19, T.37 N., R.1 W., Cheboygan County, on right bank 300 ft downstream from Mullett Lake, 2.4 miles upstream from Black River, and 4.8 miles south of Cheboygan.

DRAINAGE AREA.--865 sq mi.

PERIOD OF RECORD.--October 1942 to current year. Monthly discharge only for October 1942, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 591.21 ft above mean sea level. Auxiliary water-stage recorder 5.1 miles downstream from base gage, in Cheboygan, datum of gage is 590.00 ft above mean sea level. Prior to Aug. 30, 1967, nonrecording auxiliary gage in Cheboygan, 5.2 miles downstream at present datum.

AVERAGE DISCHARGE.--29 years, 792 cfs (12.43 inches per year).

EXTREMES.--Current year: Maximum daily discharge, 1,630 cfs June 10; maximum daily gage height, 2.88 ft May 1-3; minimum daily discharge, 469 cfs Aug. 29; minimum daily gage height, 1.20 ft Apr. 1.
Period of record: Maximum daily discharge, 1,640 cfs May 8, 1959; maximum daily gage height, 3.27 ft May 13, 14, 1960; minimum daily discharge, 90 cfs Mar. 29, 30, 1958; minimum daily gage height, 1.12 ft Dec. 29, 1952.

REMARKS.--Records fair. Flow regulated by dam in Cheboygan; prior to Dec. 31, 1965, flow affected by variable backwater from powerplant in Cheboygan 5.2 miles below station and by Alverno powerplant.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,250	874	871	1,140	840	910	1,130	1,530	1,600	1,090	493	692
2	1,170	965	805	1,130	840	910	1,140	1,530	1,600	1,080	752	658
3	1,150	1,060	870	1,140	850	894	1,140	1,540	1,600	1,010	871	675
4	1,140	1,040	1,070	1,130	860	802	1,140	1,560	1,600	928	948	668
5	1,070	1,040	950	1,110	880	974	1,130	1,550	1,600	911	1,020	668
6	842	1,030	1,050	1,090	900	981	1,100	1,540	1,600	635	1,100	669
7	868	1,030	947	991	900	1,010	1,100	1,530	1,600	602	1,150	669
8	907	1,020	908	991	900	1,010	1,100	1,520	1,610	570	1,170	676
9	1,060	1,030	898	991	920	990	1,150	1,520	1,620	538	1,050	688
10	1,070	1,020	885	1,000	940	1,030	1,150	1,520	1,630	698	813	672
11	1,120	1,030	872	926	960	1,060	1,200	1,510	1,600	684	690	687
12	1,170	1,000	898	724	970	1,080	1,200	1,520	1,560	643	755	692
13	1,160	1,020	902	743	988	1,110	1,220	1,490	1,560	629	897	723
14	1,080	1,030	940	745	968	1,100	1,230	1,460	1,550	624	995	753
15	966	1,030	1,130	764	948	1,110	1,250	1,390	1,190	630	1,030	827
16	883	1,010	1,130	768	903	1,150	1,270	1,380	892	640	1,060	880
17	724	1,010	1,140	770	896	1,140	1,300	1,360	929	640	771	693
18	721	1,010	1,120	798	882	1,140	1,340	1,370	934	640	672	676
19	677	999	1,130	854	886	1,150	1,360	1,390	934	650	668	508
20	634	1,010	1,120	860	906	1,160	1,390	1,440	879	650	644	669
21	729	1,010	1,100	870	879	1,140	1,410	1,430	1,290	670	646	686
22	919	990	1,100	880	872	1,160	1,420	1,430	1,400	686	640	588
23	943	988	1,100	880	883	1,210	1,440	1,440	1,390	749	638	530
24	936	994	1,100	870	859	1,200	1,460	1,460	1,280	986	640	530
25	909	926	1,140	860	886	1,190	1,470	1,450	1,370	909	626	561
26	907	911	1,140	840	900	1,180	1,490	1,440	1,380	921	595	559
27	898	940	1,140	800	910	1,160	1,500	1,460	1,350	1,000	483	545
28	883	945	1,140	760	910	1,160	1,510	1,550	1,260	800	482	563
29	904	927	1,150	820	------	1,160	1,520	1,620	1,100	781	469	723
30	882	908	1,150	840	------	1,140	1,520	1,590	1,100	814	640	756
31	883	------	1,140	840	------	1,130	------	1,580	------	776	697	------
TOTAL	29,455	29,797	32,036	27,925	25,236	33,541	38,780	46,100	41,008	23,584	24,105	19,884
MEAN	950	993	1,033	901	901	1,082	1,293	1,487	1,367	761	778	663
MAX	1,250	1,060	1,150	1,140	988	1,210	1,520	1,620	1,630	1,090	1,170	880
MIN	634	874	805	724	840	802	1,100	1,360	879	538	469	508
CFSM	1.10	1.15	1.19	1.04	1.04	1.25	1.49	1.72	1.58	.88	.90	.77
IN.	1.27	1.28	1.38	1.20	1.09	1.44	1.67	1.98	1.76	1.01	1.04	.86

CAL YR 1970 TOTAL 311,232 MEAN 853 MAX 1,380 MIN 350 CFSM .99 IN 13.39
WTR YR 1971 TOTAL 371,451 MEAN 1,018 MAX 1,630 MIN 469 CFSM 1.18 IN 15.97

04130500 Black River near Tower, Mich.

LOCATION.--Lat 45°23'33", long 84°20'00", in SE¼ NE¼ sec.29, T.35 N., R.1 E., Cheboygan County, on right bank 400 ft downstream from Kleber Dam, 1,000 ft upstream from Milligan Creek, 3.0 miles northwest of Tower, and 10.8 miles upstream from Black Lake.

DRAINAGE AREA.--313 sq mi.

PERIOD OF RECORD.--October 1942 to current year. Monthly discharge only for October 1942, published in WSP 1307.

GAGE.--Water stage recorder. Datum of gage is 658.00 ft above mean sea level (Stanley Engineering Co. bench mark). Prior to Aug. 1, 1949 at site 1 mile upstream at different datum.

AVERAGE DISCHARGE.--29 years, 258 cfs (11.19 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,470 cfs Apr. 11 (gage height, 5.62 ft); minimum, 7.0 cfs Feb. 17 (gage height, 1.02 ft); minimum daily, 149 cfs Aug. 8.
Period of record: Maximum discharge, 2,340 cfs Apr. 17, 1960 (gage height, 7.13 ft); minimum, 0.60 cfs Mar. 11, 1950; minimum daily, 4.0 cfs Nov. 27, 1949.

REMARKS.--Records good. Flow regulated by powerplant 400 ft above station.

Rating tables (gage height, in feet, and discharge in cubic feet per second)
(Stage-discharge relation affected by ice Jan. 12-19)

Oct. 1 to Dec. 26		Dec. 27 to Sept. 30	
2.4	173	2.2	140
3.0	325	3.0	330
4.0	690	4.0	740
		6.0	1,650

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	309	354	355	226	228	390	487	766	350	269	212	245
2	298	265	254	259	193	360	502	779	300	293	247	249
3	365	306	444	261	219	370	503	700	400	328	244	225
4	298	304	301	276	209	370	505	632	300	242	231	162
5	380	255	321	293	236	360	505	524	270	258	226	225
6	348	216	383	291	235	370	505	517	330	233	183	230
7	279	285	325	273	230	350	505	514	270	200	172	216
8	269	261	242	249	231	330	577	512	315	220	149	181
9	225	253	356	237	218	310	933	494	471	209	208	187
10	369	263	437	220	241	294	943	350	493	210	250	205
11	483	263	381	237	232	285	1,060	270	493	189	254	176
12	483	246	297	220	243	312	1,390	410	461	207	316	206
13	484	246	271	250	238	317	1,340	430	393	191	269	208
14	485	239	368	270	216	314	1,300	400	312	272	289	204
15	424	268	301	240	234	396	1,270	420	289	217	254	190
16	298	208	332	230	229	503	1,070	300	244	184	249	181
17	295	202	253	225	212	501	1,140	300	275	230	226	192
18	287	229	353	225	250	500	1,140	360	262	220	207	184
19	275	249	318	220	260	504	1,140	330	239	228	205	196
20	262	239	326	259	250	505	1,140	500	287	232	215	215
21	238	287	219	219	250	505	1,140	370	207	235	205	235
22	243	296	189	202	270	445	1,070	470	250	276	193	236
23	263	492	199	174	240	420	928	470	307	457	241	278
24	246	305	205	189	260	405	789	350	266	497	226	249
25	260	373	195	263	270	383	794	470	244	603	210	221
26	247	415	301	250	320	391	794	440	230	704	282	197
27	241	242	287	236	290	303	789	460	259	585	285	209
28	246	286	267	230	410	353	730	500	279	492	308	201
29	241	367	257	245	------	339	600	480	254	344	286	273
30	251	323	190	231	------	262	648	450	262	203	244	258
31	402	------	213	234	------	330	------	500	------	252	249	------
TOTAL	9,794	8,537	9,140	7,434	6,914	11,777	26,237	14,468	9,312	9,280	7,335	6,434
MEAN	316	285	295	240	247	380	875	467	310	299	237	214
MAX	485	492	444	293	410	505	1,390	779	493	704	316	278
MIN	225	202	189	174	193	262	487	270	207	184	149	162
CFSM	1.01	.91	.94	.77	.79	1.21	2.80	1.49	.99	.96	.76	.68
IN.	1.16	1.01	1.09	.88	.82	1.40	3.12	1.72	1.11	1.10	.87	.76

CAL YR 1970 TOTAL 104,400 MEAN 286 MAX 802 MIN 108 CFSM .91 IN 12.41
WTR YR 1971 TOTAL 126,662 MEAN 347 MAX 1,390 MIN 149 CFSM 1.11 IN 15.05

04131500 Rainy River near Ocqueoc, Mich.

LOCATION.--Lat 45°24'30", long 84°10'45", in NE¼ NW¼ sec.22, T.35 N., R.2 E., Presque Isle County, on upstream side of highway bridge, 4.4 miles west of Ocqueoc, and 5 miles upstream from Black Lake.

DRAINAGE AREA.--85 sq mi, approximately.

PERIOD OF RECORD.--October 1952 to current year.

GAGE.--Nonrecording gage. Datum of gage is 674.85 ft above mean sea level, unadjusted.

AVERAGE DISCHARGE.--19 years, 39.5 cfs (6.31 inches per year).

EXTREMES.--Current year: Maximum discharge, 740 cfs Apr. 12 (gage height, 6.05 ft); minimum, 3.4 cfs July 21.
Period of record: Maximum discharge, 946 cfs Apr. 18, 1960 (gage height, 6.33 ft, from floodmark); minimum, 0.4 cfs Sept. 7, 1955.

REMARKS.--Records fair except those for the winter period, which are poor.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 6-28; stage-discharge relation affected by ice Dec. 5-8, Dec. 11 to Mar. 13, Mar. 18-27)

1.4	2.1	3.0	140
1.5	4.8	4.0	322
1.7	12	6.0	845
1.9	22		
2.4	65		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	43	81	35	27	55	98	199	73	26	28	13
2	65	41	93	35	27	53	120	199	67	23	22	12
3	64	41	68	34	26	52	140	192	56	18	20	11
4	67	37	52	34	26	52	150	170	51	17	18	9.1
5	64	35	65	34	26	52	148	151	48	16	16	11
6	60	33	70	34	26	51	145	132	51	14	13	13
7	51	31	77	34	26	51	159	119	50	12	11	16
8	45	27	82	33	26	51	201	102	76	10	9.9	13
9	43	28	86	33	26	51	284	94	73	9.5	11	12
10	77	29	87	33	26	51	315	86	62	8.2	12	11
11	83	29	80	33	26	52	440	74	52	7.9	14	9.5
12	83	27	72	34	27	54	669	74	50	8.2	15	12
13	78	27	67	34	27	57	529	70	48	8.2	13	12
14	70	26	63	33	27	62	472	63	56	7.5	12	10
15	52	25	60	32	28	68	431	57	60	5.5	8.2	9.1
16	50	22	56	32	30	80	429	53	50	5.8	7.9	8.2
17	50	22	53	32	32	88	488	45	41	6.2	7.5	7.2
18	45	21	50	31	35	80	510	76	39	5.5	7.2	6.5
19	40	20	47	31	35	70	465	266	35	4.8	5.8	6.8
20	36	24	45	31	33	62	434	231	29	3.7	8.6	16
21	35	42	43	30	33	60	402	201	26	4.0	7.2	16
22	35	50	41	30	33	65	349	170	26	21	6.5	14
23	34	50	39	30	35	68	292	134	25	78	11	13
24	33	58	38	29	42	70	256	102	26	75	11	12
25	31	53	37	29	54	72	235	118	27	52	12	11
26	31	55	36	28	66	74	222	142	30	47	20	9.9
27	30	52	36	28	61	75	211	136	26	35	20	9.1
28	29	53	36	28	58	77	201	132	22	31	19	8.6
29	35	56	35	27	------	78	199	110	19	29	16	8.6
30	44	68	35	27	------	78	201	102	20	28	15	8.6
31	45	------	35	27	------	87	------	81	------	27	15	------
TOTAL	1,573	1,125	1,765	975	944	1,996	9,195	3,881	1,314	644.0	412.8	329.2
MEAN	50.7	37.5	56.9	31.5	33.7	64.4	307	125	43.8	20.8	13.3	11.0
MAX	83	68	93	35	66	88	669	266	76	78	28	16
MIN	29	20	35	27	26	51	98	45	19	3.7	5.8	6.5
CFSM	.60	.44	.67	.37	.40	.76	3.61	1.47	.52	.24	.16	.13
IN.	.69	.49	.77	.43	.41	.87	4.02	1.70	.58	.28	.18	.14

CAL YR 1970 TOTAL 16,807.8 MEAN 46.0 MAX 290 MIN 2.9 CFSM .54 IN 7.36
WTR YR 1971 TOTAL 24,154.0 MEAN 66.2 MAX 669 MIN 3.7 CFSM .78 IN 10.57

04132000 Black River near Cheboygan, Mich.

LOCATION.--Lat 45°29'59", long 84°19'36", in NW¼ NW¼ sec.21, T.36 N., R.1 E., Cheboygan County, on left bank 0.3 mile downstream from Black Lake, 5.3 miles upstream from Alverno Dam, and 12.6 miles southeast of Cheboygan.

DRAINAGE AREA.--597 sq mi.

PERIOD OF RECORD.--October 1942 to current year. Monthly discharge only for October 1942, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 609.26 ft above mean sea level. Auxiliary water-stage recorder 3 miles downstream from base gage at same datum.

AVERAGE DISCHARGE.--29 years, 438 cfs (9.96 inches per year).

EXTREMES.--Current year: Maximum daily discharge, 2,530 cfs Apr. 21, 22; maximum daily gage height, 5.37 ft Apr. 21, 22; minimum daily discharge, 200 cfs Sept. 16-18; minimum daily gage height, 1.58 ft Jan. 25.
Period of record: Maximum daily discharge, 2,530 cfs Apr. 21, 22, 1971; maximum daily gage height, 5.74 ft Apr. 20, 1960; minimum daily discharge, 11 cfs Aug. 14, 1949; minimum daily gage height, about 1.10 ft Mar. 1, 1964.

REMARKS.--Records fair. Flow regulated by Alverno Dam; prior to Dec. 31, 1965, flow regulated by powerplant at Alverno Dam.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	956	543	462	463	360	463	589	2,020	950	260	944	706
2	966	549	494	450	360	443	590	1,970	991	265	826	694
3	946	521	544	433	360	457	626	1,930	980	275	734	716
4	986	532	698	441	360	459	660	1,890	936	305	645	709
5	972	570	699	428	386	472	682	1,850	874	302	546	731
6	914	546	676	428	386	479	696	1,780	779	292	414	702
7	863	529	682	437	382	538	720	1,680	713	321	351	715
8	858	518	678	433	382	574	739	1,630	731	318	330	709
9	528	504	658	439	382	529	833	1,530	721	312	321	620
10	520	507	642	440	396	536	930	1,480	721	310	346	540
11	541	498	623	428	402	517	1,120	1,380	707	293	418	490
12	540	509	601	423	406	504	1,420	1,220	666	297	383	470
13	530	498	589	416	410	500	1,770	1,100	599	306	320	420
14	540	506	605	383	418	481	1,990	1,000	606	271	273	370
15	540	496	598	371	422	477	2,140	884	526	266	250	348
16	610	472	612	364	422	500	2,200	892	500	230	240	200
17	628	450	580	364	421	510	2,320	829	500	201	235	200
18	640	442	567	376	410	533	2,400	806	490	220	239	200
19	600	438	570	368	418	575	2,450	748	486	230	245	210
20	599	416	560	365	459	603	2,500	806	482	230	291	234
21	582	436	570	361	450	615	2,530	868	431	230	320	225
22	592	418	552	358	450	620	2,530	888	338	230	298	225
23	579	432	520	343	475	630	2,490	925	301	238	341	255
24	578	454	519	340	457	640	2,490	980	280	330	314	230
25	589	454	504	348	457	650	2,390	1,190	275	448	304	210
26	578	412	484	350	452	650	2,310	1,270	270	629	372	210
27	540	463	479	355	437	667	2,240	1,280	265	662	486	220
28	506	452	485	355	450	667	2,220	1,110	255	800	560	259
29	519	441	474	360	------	639	2,140	647	255	987	537	384
30	542	460	467	360	------	628	2,070	876	260	964	582	371
31	528	------	466	360	------	590	------	925	------	959	690	------
TOTAL	20,410	14,466	17,658	12,140	11,570	17,146	50,785	38,384	16,888	11,981	13,155	12,573
MEAN	658	482	570	392	413	553	1,693	1,238	563	386	424	419
MAX	986	570	699	463	475	667	2,530	2,020	991	987	944	731
MIN	506	412	462	340	360	443	589	647	255	201	235	200
CFSM	1.10	.81	.95	.66	.69	.93	2.84	2.07	.94	.65	.71	.70
IN.	1.27	.90	1.10	.76	.72	1.07	3.16	2.39	1.05	.75	.82	.78

CAL YR 1970 TOTAL 184,324 MEAN 505 MAX 1,200 MIN 100 CFSM .85 IN 11.49
WTR YR 1971 TOTAL 237,156 MEAN 650 MAX 2,530 MIN 200 CFSM 1.09 IN 14.78

04132500 Thunder Bay River near Hillman, Mich.

LOCATION.—Lat 45°00'30", long 83°58'21", in NE¼ SE¼ sec.8, T.30 N., R.4 E., Montmorency County, on left bank 25 ft upstream from bridge on State Highway 32, 0.4 mile downstream from Miller Creek, and 5.2 miles southwest of Hillman.

DRAINAGE AREA.—232 sq mi.

PERIOD OF RECORD.—June 1945 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 760 ft (by barometer).

AVERAGE DISCHARGE.—26 years, 213 cfs (12.47 inches per year).

EXTREMES.—Current year: Maximum discharge, 1,180 cfs Apr. 13 (gage height, 9.34 ft); minimum daily, 160 cfs Jan. 27.
Period of record: Maximum discharge, 1,380 cfs Apr. 12, 1947 (gage height, 8.86 ft); maximum gage height, 9.63 ft May 11, 1963 (backwater from bridge repair); minimum daily discharge, 98 cfs Aug. 7, 1949.

REMARKS.—Records fair. Prior to May 12, 1950, diurnal fluctuation below about 500 cfs by powerplant at Atlanta . Occasional regulation from dams above station.

REVISIONS (WATER YEARS).—WSP 1307: 1946(M).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Nov. 26-28, Dec. 5 to Mar. 27)

4.8	158	6.5	370
5.5	217	9.0	1,050
		9.4	1,200

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	210	215	227	175	185	280	328	479	259	319	197	205
2	202	208	276	180	185	250	483	498	255	266	192	200
3	199	241	264	180	185	230	465	475	281	231	190	190
4	205	238	260	180	190	210	416	435	265	213	188	185
5	204	229	260	185	195	210	382	405	250	204	184	180
6	198	216	260	190	200	230	395	380	243	198	181	180
7	191	202	260	190	200	230	460	360	249	193	178	175
8	187	197	250	190	200	230	545	340	564	190	175	175
9	186	195	230	180	200	220	653	330	534	193	174	170
10	258	196	240	170	200	235	665	320	418	186	199	170
11	305	202	250	175	210	240	731	310	351	183	263	170
12	295	199	240	175	210	240	928	300	306	181	245	170
13	258	199	230	175	205	240	1,120	296	298	190	221	175
14	234	199	220	175	205	250	946	284	278	190	211	175
15	222	196	205	170	205	280	820	274	250	181	205	175
16	211	193	200	170	205	350	712	275	269	183	194	168
17	203	192	205	180	205	330	710	263	267	206	190	165
18	198	192	205	180	210	310	755	259	249	196	180	167
19	192	191	205	175	225	290	691	302	231	210	180	168
20	192	202	205	170	260	280	615	314	216	209	170	188
21	196	262	200	170	250	260	605	295	229	196	170	189
22	198	296	190	180	240	250	561	278	217	215	175	183
23	194	325	190	180	230	240	518	265	214	492	180	180
24	192	288	190	180	230	240	490	263	208	566	200	180
25	190	260	190	180	250	240	483	350	268	445	220	178
26	188	240	190	170	300	250	465	483	304	353	250	180
27	188	220	185	160	350	255	447	451	255	289	300	182
28	188	200	180	165	300	274	473	397	228	246	280	197
29	208	204	175	175	------	271	507	347	217	225	250	236
30	237	222	175	180	------	266	480	305	258	209	230	228
31	227	------	170	180	------	272	------	275	------	201	220	------
TOTAL	6,556	6,619	6,727	5,485	6,230	7,953	17,849	10,608	8,431	7,559	6,392	5,484
MEAN	211	221	217	177	223	257	595	342	281	244	206	183
MAX	305	325	276	190	350	350	1,120	498	564	566	300	236
MIN	186	191	170	160	185	210	328	259	208	181	170	165
CFSM	.91	.95	.94	.76	.96	1.11	2.56	1.47	1.21	1.05	.89	.79
IN.	1.05	1.06	1.08	.88	1.00	1.28	2.86	1.70	1.35	1.21	1.02	.88

CAL YR 1970 TOTAL 81,682 MEAN 224 MAX 850 MIN 144 CFSM .97 IN 13.10
WTR YR 1971 TOTAL 95,893 MEAN 263 MAX 1,120 MIN 160 CFSM 1.13 IN 15.38

PEAK DISCHARGE (BASE, 600 CFS)

DATE	TIME	GHT	DISCHARGE
04-13	1000	9.34	1,180
06-08	1800	7.61	642
07-24	0300	7.46	605

04133500 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., Alpena County, on left bank 0.5 mile upstream from Orchard Hill Bridge, 4 miles upstream from North Branch, 5 miles southwest of Bolton, and 11 miles northwest of Alpena.

DRAINAGE AREA.--588 sq mi.

PERIOD OF RECORD.--March 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 671.96 ft above mean sea level, unadjusted. Prior to Aug. 12, 1945, non-recording gage at site 500 ft downstream at different datum.

AVERAGE DISCHARGE.--26 years, 452 cfs.

EXTREMES.--Current year: Maximum discharge, 3,750 cfs Apr. 13 (gage height, 9.30 ft); minimum, 244 cfs Oct. 21 (gage height, 3.38 ft).
Period of record: Maximum discharge, 4,070 cfs Apr. 13, 1965 (gage height, 9.99 ft); minimum, 92 cfs Sept. 28, 29, 1955.

REMARKS.--Records good except those for winter periods, which are poor. Regulation by Fletcher Pond on the Upper South Branch Thunder Bay River (usable capacity, 40,170 acre-ft).

REVISIONS (WATER YEARS).--WSP 1437: 1946. WSP 1727: 1947 (M).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 4-17; stage-discharge relation affected by ice Nov. 24-28, Dec. 4-8, Dec. 12 to Apr. 4)

Oct. 1 to Apr. 4		Apr. 5 to Sept. 30	
3.6	295	3.7	336
4.0	405	5.0	810
5.0	780	7.0	1,900
7.0	1,860	9.3	3,750

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	427	438	505	360	400	700	900	935	542	747	482	454
2	446	420	547	360	400	620	1,000	945	491	776	462	426
3	454	414	575	360	400	560	1,100	950	491	696	436	417
4	443	432	480	370	400	500	1,300	885	538	611	426	401
5	438	442	470	370	410	460	1,630	786	517	528	382	388
6	434	435	470	380	420	460	1,300	718	524	484	385	387
7	427	417	490	390	430	490	1,360	614	526	477	413	383
8	413	399	550	390	430	490	1,660	610	808	458	358	371
9	402	381	583	390	430	470	2,100	554	1,170	438	400	363
10	408	384	615	380	430	470	2,360	509	1,390	426	388	356
11	455	390	630	370	430	500	2,640	460	1,150	420	427	355
12	502	396	600	360	420	500	3,170	450	878	413	474	356
13	508	392	550	360	430	500	3,680	443	800	423	507	360
14	484	387	500	360	440	510	3,420	469	746	413	447	364
15	432	382	470	360	430	550	2,670	481	758	407	432	361
16	414	380	450	370	420	600	2,090	462	713	404	429	353
17	401	372	440	370	430	750	1,780	423	655	410	410	342
18	392	369	430	370	430	800	1,670	436	608	410	395	337
19	380	366	430	370	450	750	1,640	510	575	420	384	336
20	365	378	430	370	500	670	1,550	633	541	429	378	347
21	302	414	420	360	560	620	1,370	662	539	445	371	363
22	375	480	400	370	550	600	1,220	635	479	457	379	371
23	388	572	390	370	520	580	1,080	589	470	677	396	366
24	368	520	380	380	500	580	990	564	464	1,040	403	360
25	355	500	380	380	500	600	910	664	487	1,310	433	356
26	368	480	380	380	550	600	885	878	509	1,170	498	351
27	377	460	390	350	650	620	835	1,010	593	925	567	349
28	369	450	390	310	750	650	820	960	543	744	613	347
29	384	452	380	360	------	700	885	814	490	628	562	381
30	390	460	380	380	------	750	930	688	582	495	504	427
31	432	------	370	390	------	800	------	605	------	471	472	------
TOTAL	12,733	12,762	14,475	11,440	13,110	18,450	48,945	20,342	19,577	18,152	13,613	11,128
MEAN	411	425	467	369	468	595	1,632	656	653	586	439	371
MAX	508	572	630	390	750	800	3,680	1,010	1,390	1,310	613	454
MIN	302	366	370	310	400	460	820	423	464	404	358	336

CAL YR 1970 TOTAL 160,903 MEAN 441 MAX 1,930 MIN 243
WTR YR 1971 TOTAL 214,727 MEAN 588 MAX 3,680 MIN 302

04134000 North Branch Thunder Bay River near Bolton, Mich.

LOCATION.—Lat 45°08'55", long 83°36'35", in SE¼ sec.29, T.32 N., R.7 E., Alpena County, on left bank 1.5 miles upstream from mouth, 2.5 miles south of Bolton, and 9 miles northwest of Alpena.

DRAINAGE AREA.—184 sq mi.

PERIOD OF RECORD.—March 1945 to current year.

GAGE.—Water-stage recorder. Datum of gage is 675.52 ft above mean sea level, unadjusted. Prior to Aug. 16, 1945, nonrecording gage at site 0.5 mile upstream at different datum.

AVERAGE DISCHARGE.—26 years, 112 cfs (8.27 inches per year).

EXTREMES.—Current year: Maximum discharge, 2,520 cfs Apr. 13 (gage height, 7.07 ft); minimum, 17 cfs Sept. 18, 19, (gage height, 2.72 ft).
Period of record: Maximum discharge, 2,920 cfs Apr. 13, 1965 (gage height, 7.85 ft); maximum gage height, 7.98 ft Mar. 31, 1950 (ice jam); minimum discharge, 0.40 cfs Oct. 14, 1955.

REMARKS.—Records good except those for the winter periods, which are poor. Occasional regulation during low flow from dams above station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Nov. 22-26, Dec. 5 to Mar. 31)

Oct. 1 to Feb. 28		Mar. 1 to Sept. 30			
3.0	38	2.7	17	4.5	420
3.4	88	3.0	40	5.0	700
3.7	150	3.4	90	6.0	1,470
4.0	240	3.8	180	7.0	2,450

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	157	84	147	96	85	220	556	500	163	74	79	55
2	125	91	174	95	84	210	515	500	138	89	67	50
3	105	93	205	94	84	200	495	480	127	108	61	45
4	92	88	172	94	84	190	505	460	112	107	57	40
5	88	83	160	94	84	180	520	402	103	88	51	37
6	93	79	160	93	83	180	556	343	97	70	46	34
7	91	74	170	93	83	180	592	297	97	59	41	35
8	82	69	180	93	83	180	664	264	277	53	37	36
9	72	67	190	93	84	180	766	234	442	47	34	33
10	65	66	200	93	85	180	953	204	736	43	32	30
11	60	63	200	94	86	190	1,330	178	631	39	34	27
12	61	62	170	95	87	190	1,640	157	395	36	36	26
13	71	63	170	97	89	200	2,270	141	274	37	40	24
14	81	62	170	98	90	210	2,330	126	223	35	42	23
15	78	59	160	97	92	250	2,170	119	221	35	40	22
16	72	57	140	97	93	300	1,770	113	215	36	40	20
17	69	54	130	95	95	320	1,530	101	165	35	40	19
18	65	52	120	94	100	300	1,380	107	118	32	39	17
19	61	54	120	93	110	270	1,300	163	92	34	36	17
20	57	57	110	92	115	230	1,140	233	76	34	34	19
21	57	63	110	92	120	230	984	325	67	33	32	19
22	56	75	100	92	110	240	855	331	60	36	35	21
23	54	95	100	92	110	260	736	273	56	51	38	23
24	52	110	100	92	110	270	622	231	52	109	38	23
25	50	130	100	92	115	290	532	241	55	181	47	24
26	48	155	100	91	150	300	490	269	57	237	50	23
27	47	147	100	90	200	310	470	275	57	273	58	23
28	47	144	100	90	220	320	480	288	56	256	68	21
29	50	133	98	90	------	340	475	287	53	195	73	21
30	59	134	96	87	------	370	480	249	62	135	69	23
31	71	------	96	86	------	440	------	202	------	100	62	------
TOTAL	2,236	2,563	4,348	2,884	2,931	7,730	29,106	8,093	5,277	2,697	1,456	830
MEAN	72.1	85.4	140	93.0	105	249	970	261	176	87.0	47.0	27.7
MAX	157	155	205	98	220	440	2,330	500	736	273	79	55
MIN	47	52	96	86	83	180	470	101	52	32	32	17
CFSM	.39	.46	.76	.51	.57	1.35	5.27	1.42	.96	.47	.26	.15
IN.	.45	.52	.88	.58	.59	1.56	5.88	1.64	1.07	.55	.29	.17

CAL YR 1970 TOTAL 48,293.1 MEAN 132 MAX 1,160 MIN 7.9 CFSM .72 IN 9.76
WTR YR 1971 TOTAL 70,151.0 MEAN 192 MAX 2,330 MIN 17 CFSM 1.04 IN 14.18

PEAK DISCHARGE (BASE, 500 CFS).—Apr. 13 (1800) 2,520 cfs (7.07 ft); June 10 (1400) 766 cfs (5.20 ft).

04135500 Au Sable River at Grayling, Mich.

LOCATION.--Lat 44°39'35", long 84°42'45", in SE¼ SE¼ sec.7, T.26 N., R.3 W., Crawford County, on right bank 65 ft upstream from bridge on Interstate Highway 75 (Business Loop) at Grayling, 0.7 mile upstream from East Branch, and 114 miles upstream from mouth.

DRAINAGE AREA.--110 sq mi.

PERIOD OF RECORD.--October 1942 to current year. Monthly discharge only for some periods, published in WSP 1307. Prior to October 1954, published as Middle Branch Au Sable River at Grayling.

GAGE.--Water-stage recorder above steel-crested dam. Datum of gage is 1,123.49 ft above mean sea level.

AVERAGE DISCHARGE.--29 years, 74.1 cfs (9.15 inches per year).

EXTREMES.--Current year: Maximum discharge, 221 cfs Apr. 14 (gage height,2.61 ft); minimum, 59 cfs Jan. 28.
Period of record: Maximum discharge, 274 cfs June 2, 1943 (gage height, 3.00 ft); minimum, 28 cfs Apr. 21, 1946 (gage height, 0.80 ft).

REMARKS.--Records excellent except those for the winter periods, which are good. Prior to Dec. 31, 1952, diurnal fluctuation caused by powerplant 2.5 miles above station. Records of water temperatures for the current year are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge in cubic feet per second)
(Stage-discharge relation affected by ice Jan. 30 to Feb. 1, Mar. 2-4)

1.2	56
1.5	84
2.6	220

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77	82	91	73	66	85	84	132	95	76	76	70
2	75	80	103	73	68	80	94	131	95	76	75	70
3	75	82	113	73	69	76	100	128	96	75	73	70
4	76	95	116	75	69	74	95	125	95	73	71	69
5	77	90	108	75	71	76	91	121	92	72	70	68
6	77	88	97	75	71	81	89	116	89	70	68	68
7	72	82	91	73	70	81	91	112	89	69	68	67
8	70	80	91	70	68	80	98	108	95	70	67	66
9	71	77	95	69	68	72	115	103	104	69	66	66
10	89	81	94	72	68	76	126	101	102	68	73	66
11	96	81	90	74	70	77	139	100	96	68	83	66
12	96	80	88	74	70	76	166	98	92	67	83	66
13	89	77	85	71	68	77	212	100	88	70	80	66
14	84	76	82	70	66	78	216	98	84	73	80	66
15	80	75	81	72	68	94	197	96	85	71	77	65
16	77	74	80	71	68	102	184	96	89	72	75	64
17	76	73	80	71	68	104	193	95	86	73	72	63
18	74	73	80	70	69	98	207	94	88	72	70	63
19	73	73	80	66	70	95	203	95	82	74	69	64
20	73	77	80	66	82	94	197	95	81	74	69	67
21	73	89	73	71	86	90	184	94	81	73	68	69
22	71	101	75	71	89	86	168	92	82	72	68	68
23	71	98	78	70	90	85	154	90	80	76	69	68
24	71	94	77	70	86	82	146	92	77	84	70	68
25	71	92	78	71	89	78	140	110	78	85	73	67
26	70	91	76	70	88	77	136	128	82	81	80	67
27	69	89	73	62	94	80	132	132	82	77	81	67
28	70	86	73	62	90	80	130	124	78	75	81	68
29	76	84	73	67	------	78	132	113	76	72	77	78
30	82	85	69	66	------	77	131	106	75	72	73	83
31	84	------	70	66	------	77	------	100	------	78	72	------
TOTAL	2,385	2,505	2,640	2,179	2,099	2,566	4,350	3,325	2,614	2,277	2,277	2,033
MEAN	76.9	83.5	85.2	70.3	75.0	82.8	145	107	87.1	73.5	73.5	67.8
MAX	96	101	116	75	94	104	216	132	104	85	83	83
MIN	69	73	69	62	66	72	84	90	75	67	66	63
CFSM	.70	.76	.77	.64	.68	.75	1.32	.97	.79	.67	.67	.62
IN.	.81	.85	.89	.74	.71	.87	1.47	1.12	.88	.77	.77	.69

CAL YR 1970 TOTAL 28,050 MEAN 76.8 MAX 145 MIN 50 CFSM .70 IN 9.49
WTR YR 1971 TOTAL 31,250 MEAN 85.6 MAX 216 MIN 62 CFSM .78 IN 10.57

04135600 East Branch Au Sable River at Grayling, Mich.

LOCATION.--Lat 44°40'08", long 84°42'20", in NW¼ NW¼ sec.8, T.26 N., R.3 W., Crawford County, on right bank at south boundary of State Research Center in Grayling and 0.4 mile upstream from mouth.

DRAINAGE AREA.--76.0 sq mi.

PERIOD OF RECORD.--April 1958 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,110 ft (from topographic map). Prior to Sept. 30, 1958, nonrecording gage at site 10 ft downstream at present datum.

AVERAGE DISCHARGE.--13 years, 43.3 cfs (7.74 inches per year).

EXTREMES.--Current year: Maximum discharge, 201 cfs Apr. 13 (gage height, 5.19 ft); minimum, 21 cfs Mar. 10; minimum daily, 31 cfs Jan. 27.
Period of record: Maximum discharge, 201 cfs Apr. 13, 1971 (gage height, 5.19 ft); minimum, 7.0 cfs Mar. 27, 1965, result of freezup; minimum daily, 16 cfs Aug. 20, 1964.

REMARKS.--Records good. Occasional regulation by State Research Center above gage.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Dec. 7, 8, 22, 30, Jan. 9, Feb. 7, Mar. 3-7)

Oct. 1 to May 2		May 3 to Sept. 30	
3.3	37	3.2	34
5.0	176	4.5	131
5.2	202		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	52	70	46	42	56	58	98	65	52	50	47
2	49	51	82	46	41	48	67	96	65	50	49	47
3	49	67	82	47	40	48	65	91	66	48	48	46
4	52	64	80	47	39	44	62	86	63	47	47	46
5	52	60	80	49	42	46	61	84	62	47	46	45
6	49	57	74	45	42	48	62	81	61	45	45	44
7	47	55	60	45	40	46	67	79	61	45	44	44
8	46	53	67	43	40	46	74	77	61	45	44	43
9	46	52	69	43	42	45	83	74	59	46	43	42
10	67	55	66	45	41	47	93	72	58	44	50	41
11	67	54	64	45	40	46	112	71	57	43	58	42
12	61	53	62	44	39	46	153	71	57	42	56	42
13	57	51	60	42	40	46	196	70	57	49	52	43
14	55	51	58	45	38	47	183	69	56	50	54	42
15	54	50	57	44	39	66	168	67	57	47	54	41
16	52	49	56	44	38	69	158	67	59	47	51	40
17	51	48	55	42	38	65	170	65	55	50	48	40
18	49	47	54	42	40	62	179	65	53	47	46	40
19	51	47	54	38	42	61	168	67	52	51	46	41
20	48	53	53	44	50	61	155	68	52	49	46	45
21	48	62	48	44	53	58	143	66	54	46	45	44
22	48	64	50	43	53	56	131	64	52	46	44	43
23	47	57	52	43	45	55	119	63	51	52	47	44
24	47	53	51	43	50	54	114	64	50	64	48	43
25	47	70	51	43	51	51	108	81	55	61	52	42
26	46	64	49	41	53	52	102	88	55	55	55	42
27	46	59	47	31	64	52	98	86	53	52	56	43
28	47	58	49	43	59	51	98	79	50	51	55	45
29	55	59	42	45	------	51	98	73	48	49	52	51
30	57	62	45	42	------	50	96	70	48	49	50	55
31	54	------	47	42	------	51	------	67	------	54	49	------
TOTAL	1,593	1,677	1,834	1,346	1,241	1,624	3,441	2,319	1,692	1,523	1,530	1,313
MEAN	51.4	55.9	59.2	43.4	44.3	52.4	115	74.8	56.4	49.1	49.4	43.8
MAX	67	70	82	49	64	69	196	98	66	64	58	55
MIN	46	47	42	31	38	44	58	63	48	42	43	40
CFSM	.68	.74	.78	.57	.58	.69	1.51	.98	.74	.65	.65	.58
IN.	.78	.82	.90	.66	.61	.79	1.68	1.14	.83	.75	.75	.64

CAL YR 1970 TOTAL 17,601 MEAN 48.2 MAX 108 MIN 26 CFSM .63 IN 8.62
WTR YR 1971 TOTAL 21,133 MEAN 57.9 MAX 196 MIN 31 CFSM .76 IN 10.34

04135700 South Branch Au Sable River near Luzerne, Mich.

LOCATION.--Lat 44°36'53", long 84°27'20", in SE¼ SE¼ sec.29, T.26 N., R.1 W., Crawford County, on right bank 10 ft upstream from Smith Bridge, 400 ft downstream from highway bridge on State Highway 72, 4.6 miles upstream from mouth, and 9.1 miles west of Luzerne.

DRAINAGE AREA.--401 sq mi.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1951-66. October 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1070 ft (from topographic map). Apr. 19, 1951, to Nov. 14, 1966, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--5 years, 229 cfs (7.76 inches per year).

EXTREMES.--Current year: Maximum discharge, 932 cfs Apr. 14 (gage height, 6.83 ft); minimum, 122 cfs Sept. 18 (gage height, 4.24 ft).
Period of record: Maximum discharge, 932 cfs Apr. 14, 1971 (gage height, 6.83 ft); maximum gage height, 7.17 ft Feb. 5, 1970 (backwater from ice); minimum daily discharge, 105 cfs Oct. 7-9, Nov. 3, 1966.

REMARKS.--Records good. Occasional regulation by dams above station. Records for water temperatures for the current year are published in Part 2 of this report.

REVISIONS.--WSP 2111: Drainage area.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Dec. 5-8, Dec. 27 to Jan. 1, Jan. 7-10, 13, 14, 17-20, Jan. 28 to Feb. 14, Feb. 22, 23, Mar. 3-5, 8,9)

4.2	112
5.0	305
6.9	960

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	164	265	334	240	200	287	345	444	259	159	156	142
2	160	266	378	233	200	294	399	444	265	160	151	140
3	155	342	385	227	205	275	405	430	284	155	146	137
4	155	367	421	227	210	270	405	413	281	151	142	137
5	152	384	400	230	220	270	399	397	275	149	139	136
6	148	401	370	229	215	288	402	380	264	147	135	136
7	146	374	340	230	210	282	427	364	260	144	134	139
8	143	341	330	220	210	260	490	351	321	143	133	134
9	149	319	333	220	210	260	584	338	304	146	130	130
10	272	313	328	230	210	269	612	327	285	144	142	129
11	274	308	325	226	210	260	654	318	265	140	169	129
12	276	300	318	221	200	258	728	315	238	137	180	131
13	286	296	309	220	190	257	880	308	231	139	169	131
14	277	289	303	215	200	260	928	302	226	137	156	131
15	253	280	296	222	204	320	892	296	215	136	152	129
16	240	274	289	222	204	349	812	290	212	138	145	125
17	235	269	285	220	198	346	766	284	213	158	139	124
18	224	264	283	210	199	361	742	279	207	158	135	124
19	212	258	283	205	204	371	710	281	195	159	134	126
20	205	268	280	205	249	360	675	285	190	152	133	137
21	204	289	258	214	247	341	630	283	212	146	131	140
22	200	303	268	213	240	329	578	278	215	141	138	139
23	198	318	262	212	240	333	539	275	216	157	179	147
24	199	308	255	211	245	327	514	280	196	187	180	142
25	205	300	258	212	250	320	494	300	187	195	171	137
26	208	304	251	209	260	316	472	305	181	197	189	138
27	212	304	250	210	298	315	452	309	176	175	179	138
28	218	301	240	200	293	311	448	304	169	159	168	146
29	242	303	240	200	------	308	452	293	163	153	157	186
30	256	312	240	200	------	306	438	281	159	150	150	183
31	259	------	235	200	------	311	------	268	------	159	145	------
TOTAL	6,527	9,220	9,347	6,733	6,221	9,414	17,272	10,022	6,864	4,771	4,707	4,143
MEAN	211	307	302	217	222	304	576	323	229	154	152	138
MAX	286	401	421	240	298	371	928	444	321	197	189	186
MIN	143	258	235	200	190	257	345	268	159	136	130	124
CFSM	.53	.77	.75	.54	.55	.76	1.44	.81	.57	.38	.38	.34
IN.	.61	.86	.87	.62	.58	.87	1.60	.93	.64	.44	.44	.38

CAL YR 1970 TOTAL 81,523 MEAN 223 MAX 462 MIN 117 CFSM .56 IN 7.56
WTR YR 1971 TOTAL 95,241 MEAN 261 MAX 928 MIN 124 CFSM .65 IN 8.84

04136500 Au Sable River at Mio, Mich.

LOCATION.—Lat 44°39'36", long 84°07'52", in NW¼ sec.7, T.26 N., R.3 E., Oscoda County, on right bank 150 ft upstream from bridge on State Highway 33 in Mio, 500 ft downstream from Mio powerplant, 9.5 miles downstream from Big Creek, and 73.0 miles upstream from mouth.

DRAINAGE AREA.—1,100 sq mi, approximately.

PERIOD OF RECORD.—July 1952 to current year.

GAGE.—Water-stage recorder. Datum of gage is 929.60 ft above mean sea level.

AVERAGE DISCHARGE.—19 years, 957 cfs (11.81 inches per year).

EXTREMES.—Current year: Maximum discharge, 4,160 cfs Apr. 13 (gage height, 6.00 ft); minimum, 20 cfs Sept. 30; minimum daily, 686 cfs Sept. 30.
Period of record: Maximum discharge, 4,160 cfs Apr. 13, 1971 (gage height, 6.00 ft); minimum, 18 cfs Sept. 18, 19, 20, 21, 28, 1962 (gage height, 0.10 ft); minimum daily, 277 cfs Sept. 24, 1969.

REMARKS.—Records good. Flow regulated at all stages by powerplant 500 ft above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1, June 10 to Sept. 20)

2.0	460
3.0	1,020
4.0	1,860
6.0	4,160

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	953	1,170	1,310	1,010	876	1,380	1,270	1,800	1,190	970	888	912
2	942	1,130	1,720	1,140	876	1,230	1,640	1,890	1,220	962	889	858
3	942	1,290	1,700	1,210	926	1,210	1,590	1,810	1,320	928	877	864
4	942	1,640	1,660	1,130	995	1,080	1,420	1,680	1,340	900	882	864
5	942	1,600	1,500	1,110	1,020	1,160	1,450	1,620	1,300	894	871	864
6	942	1,280	1,340	1,120	1,050	1,220	1,340	1,590	1,230	894	840	865
7	938	1,310	1,230	986	1,000	1,210	1,680	1,500	1,240	893	840	864
8	909	1,270	1,280	922	943	1,140	1,800	1,490	1,710	891	838	855
9	878	1,200	1,440	887	960	1,060	2,260	1,390	1,600	890	953	772
10	1,200	1,160	1,320	949	959	1,070	2,300	1,360	1,370	873	1,010	828
11	1,390	1,170	1,270	1,150	978	1,110	2,230	1,360	1,220	828	986	831
12	1,390	1,170	1,240	1,100	980	1,100	2,550	1,470	1,180	886	943	816
13	1,300	1,160	1,210	1,000	937	1,080	3,870	1,350	1,140	886	942	833
14	1,260	1,150	1,180	1,010	882	1,080	3,830	1,300	1,070	883	940	842
15	1,200	1,130	1,170	1,040	978	1,240	3,060	1,330	1,040	883	930	840
16	1,090	1,080	1,180	998	993	1,590	3,060	1,320	1,050	892	910	840
17	1,070	1,050	1,140	977	996	1,560	3,010	1,270	1,050	920	878	822
18	1,040	1,050	1,110	960	1,060	1,340	3,200	1,260	1,020	942	868	799
19	1,010	1,070	1,160	924	1,020	1,500	3,030	1,260	934	985	834	810
20	990	1,120	1,120	958	1,140	1,470	2,680	1,310	979	903	849	895
21	997	1,180	1,010	1,040	1,260	1,100	2,430	1,340	1,050	887	856	919
22	982	1,300	1,080	1,000	1,180	1,200	2,270	1,310	1,030	960	841	888
23	976	1,400	1,150	996	1,160	1,330	2,160	1,270	1,000	1,090	902	933
24	976	1,200	1,110	1,000	1,180	1,240	2,070	1,250	1,000	1,120	976	971
25	973	1,310	1,080	997	1,140	1,190	1,940	1,500	1,000	1,020	995	966
26	972	1,270	1,060	994	1,240	1,100	1,760	1,630	1,010	966	1,110	918
27	978	1,210	1,060	844	1,310	1,100	1,810	1,650	1,030	930	1,160	882
28	978	1,210	1,050	731	1,320	1,170	1,800	1,620	1,030	919	1,120	860
29	1,040	1,200	976	864	------	1,150	1,910	1,480	961	891	970	1,290
30	1,160	1,230	686	990	------	1,150	1,910	1,320	931	902	937	686
31	1,200	------	823	923	------	1,150	------	1,220	------	919	912	------
TOTAL	32,560	36,710	37,365	30,929	29,359	37,950	67,230	44,950	34,245	28,707	28,747	26,187
MEAN	1,050	1,224	1,205	998	1,049	1,224	2,241	1,450	1,142	926	927	873
MAX	1,390	1,640	1,720	1,210	1,320	1,590	3,870	1,890	1,710	1,120	1,160	1,290
MIN	878	1,050	686	731	876	1,060	1,270	1,220	931	828	834	686
CFSM	.95	1.11	1.10	.91	.95	1.11	2.04	1.32	1.04	.84	.84	.79
IN.	1.10	1.24	1.26	1.05	.99	1.28	2.27	1.52	1.16	.97	.97	.89

CAL YR 1970 TOTAL 385,144 MEAN 1,055 MAX 2,200 MIN 628 CFSM .96 IN 13.02
WTR YR 1971 TOTAL 434,939 MEAN 1,192 MAX 3,870 MIN 686 CFSM 1.08 IN 14.71

04138000 East Branch Au Gres River at McIvor, Mich.

LOCATION.—Lat 44°13'57", long 83°42'03", in NW¼ NW¼ sec.10, T.21 N., R.6 E., Iosco County, on right bank 25 ft downstream from bridge on Whittemore Road at McIvor, 0.9 mile east of National City, 9.3 miles southwest of Tawas City, and 11.5 miles upstream from mouth.

DRAINAGE AREA.—84 sq mi, approximately.

PERIOD OF RECORD.—October 1950 to current year. Monthly discharge only for October, November 1950, published in WSP 1727.

GAGE.—Water-stage recorder. Datum of gage is 646.58 ft above mean sea level. Prior to Aug. 30, 1951, nonrecording gage at bridge at present datum.

AVERAGE DISCHARGE.—21 years, 63.8 cfs (10.31 inches per year).

EXTREMES.—Current year: Maximum discharge, 510 cfs Apr. 13 (gage height, 6.64 ft); minimum, 22 cfs Aug. 22.
Period of record: Maximum discharge, 1,310 cfs May 20, 1959 (gage height, 8.88 ft); minimum, 12 cfs Mar. 11, 1969 (discharge measurement); minimum daily, 22 cfs June 20, 21, 26-28, July 6, 7, July 30 to Aug. 1, Sept. 7, 1964.

REMARKS.—Records good except those for winter periods, which are fair. Some intermittent regulation during period 1952-66 at low and medium flow by dam 2.5 miles above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	52	78	53	43	135	212	121	62	44	45	39
2	37	53	82	54	43	125	432	119	64	42	42	38
3	36	158	77	56	43	110	341	112	67	41	43	39
4	35	203	189	56	44	105	200	106	61	40	41	38
5	35	104	150	56	44	96	162	102	57	41	39	38
6	34	75	110	56	44	92	170	100	56	42	38	40
7	33	66	80	55	45	87	230	94	54	39	37	41
8	33	59	75	54	45	84	275	91	55	39	36	39
9	33	54	70	54	45	82	292	87	52	41	35	37
10	40	74	72	52	45	80	233	85	50	38	40	36
11	37	70	72	51	46	78	212	83	49	37	56	36
12	36	66	71	50	46	76	234	83	68	36	41	38
13	35	64	68	48	47	74	443	81	160	40	38	40
14	57	63	67	47	48	68	342	78	99	38	38	36
15	46	63	58	45	48	120	236	75	82	37	38	34
16	40	63	53	45	49	178	195	73	72	39	36	33
17	38	64	54	44	50	182	205	70	64	69	35	34
18	37	51	54	43	51	160	224	69	58	45	35	34
19	35	46	54	41	58	140	192	70	54	46	35	35
20	35	60	55	41	85	120	170	73	52	42	34	43
21	44	74	56	41	125	105	157	68	65	40	35	49
22	40	77	56	42	120	100	145	66	55	39	33	41
23	40	76	56	42	115	95	135	66	52	46	44	39
24	40	67	55	42	120	85	133	79	51	47	38	38
25	40	63	54	42	115	80	128	123	52	42	51	37
26	40	62	54	42	115	80	121	97	51	39	69	37
27	41	69	54	42	145	80	114	93	47	39	59	37
28	41	72	53	43	140	82	122	80	45	44	58	68
29	77	74	52	43	------	84	122	72	42	44	46	51
30	80	81	52	43	------	90	115	67	43	40	41	43
31	58	------	52	43	------	110	------	63	------	61	41	------
TOTAL	1,290	2,223	2,183	1,466	1,964	3,183	6,292	2,646	1,839	1,317	1,297	1,188
MEAN	41.6	74.1	70.4	47.3	70.1	103	210	85.4	61.3	42.5	41.8	39.6
MAX	80	203	189	56	145	182	443	123	160	69	69	68
MIN	33	46	52	41	43	68	114	63	42	36	33	33
CFSM	.50	.88	.84	.56	.83	1.23	2.50	1.02	.73	.51	.50	.47
IN.	.57	.98	.97	.65	.87	1.41	2.79	1.17	.81	.58	.57	.53

CAL YR 1970 TOTAL 24,304 MEAN 66.6 MAX 418 MIN 32 CFSM .79 IN 10.76
WTR YR 1971 TOTAL 26,888 MEAN 73.7 MAX 443 MIN 33 CFSM .88 IN 11.91

PEAK DISCHARGE (BASE, 300 CFS)

DATE	TIME	GHT	DISCHARGE
04-02	1600	6.55	488
04-09	0800	5.44	304
04-13	1700	6.64	510

04138500 Au Gres River near National City, Mich.

LOCATION.—Lat 44°10'26", long 83°44'36", in NE¼ NE¼ sec.31, T.21 N., R.6 E., Iosco County, on left bank 15 ft upstream from highway bridge on Allen Road, 1.7 miles upstream from Elm Creek, 4.4 miles southwest of National City, 12.8 miles southwest of Tawas City, and 13 miles upstream from mouth.

DRAINAGE AREA.—169 sq mi.

PERIOD OF RECORD.—October 1950 to current year. Monthly discharge only for October, November 1950, published in WSP 1727.

GAGE.—Water-stage recorder. Altitude of gage is 710 ft (by barometer). Prior to Oct. 1, 1951, nonrecording gage at site 1.5 miles upstream at different datum. Oct. 1, 1951 to July 24, 1969, water-stage recorder at site 50 ft downstream at present datum.

AVERAGE DISCHARGE.—21 years, 97.5 cfs (7.83 inches per year).

EXTREMES.—Current year: Maximum discharge, 1,460 cfs Apr. 2 (gage height, 6.13 ft); minimum, 15 cfs Aug. 22.
Period of record: Maximum discharge, 2,350 cfs Aug. 16, 1969 (gage height, 8.32 ft); maximum gage height, 10.5 ft Feb. 21, 1953 (ice jam); minimum discharge, 5.9 cfs Nov. 3, 1966, result of freezeup.

REMARKS.—Records good except those for the winter period, which are fair.

REVISIONS (WATER YEARS).—WSP 1911, 1959-60.

Rating tables (gage height, in feet, and discharge, in cubic feet per second).
(Shifting-control method used Oct. 1-28; stage-discharge relation affected by ice Dec. 7-9, 15-17, Dec. 20 to Mar. 30).

Oct. 1 to Mar. 16		Mar. 17 to Sept. 30	
1.0	20	0.8	13
1.3	56	1.0	27
1.8	140	1.5	97
3.0	420	2.0	184
4.0	720	3.0	425
		6.0	1,400

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	62	126	80	68	350	706	155	47	25	28	21
2	22	60	152	82	68	320	1,310	151	47	25	22	21
3	22	439	141	84	68	300	964	135	62	23	22	21
4	22	348	463	88	68	280	561	120	55	22	21	21
5	22	180	301	90	70	260	405	114	47	23	19	21
6	22	142	180	90	72	245	453	102	43	40	18	21
7	20	115	140	90	74	240	624	94	42	24	17	21
8	20	99	110	88	78	230	735	97	40	21	17	20
9	20	92	110	86	77	215	762	94	39	21	17	19
10	34	124	128	84	75	205	587	92	37	21	18	18
11	32	134	118	82	74	200	477	90	34	20	25	18
12	26	111	111	80	71	200	450	91	34	19	21	21
13	25	99	113	76	70	205	880	88	51	19	18	21
14	56	91	107	75	70	220	706	85	46	21	18	19
15	49	86	105	74	71	260	432	79	38	20	18	19
16	34	78	100	72	73	370	358	72	35	20	18	17
17	29	75	100	68	75	450	372	64	35	40	17	17
18	27	73	102	66	78	350	395	60	34	27	17	18
19	26	70	104	66	86	290	330	56	33	25	16	18
20	26	94	105	65	110	250	280	62	32	24	16	25
21	38	140	98	65	230	230	255	56	33	21	16	34
22	38	128	94	65	280	210	228	54	33	21	16	24
23	32	124	92	66	260	205	204	51	31	25	21	21
24	30	102	90	66	240	200	194	61	29	29	19	21
25	30	88	84	66	240	200	188	157	28	29	26	21
26	28	96	80	66	250	195	178	104	27	24	52	21
27	30	97	80	66	290	190	164	96	26	21	40	22
28	35	111	80	67	360	195	170	79	25	21	35	38
29	95	111	80	67	------	215	178	67	25	25	26	38
30	109	140	80	68	------	260	160	55	25	22	22	26
31	73	------	80	68	------	342	------	52	------	38	21	------
TOTAL	1,097	3,709	3,854	2,316	3,646	7,882	13,706	2,733	1,113	756	677	663
MEAN	35.4	124	124	74.7	130	254	457	88.2	37.1	24.4	21.8	22.1
MAX	109	439	463	90	360	450	1,310	157	62	40	52	38
MIN	20	60	80	65	68	190	160	51	25	19	16	17
CFSM	.21	.73	.73	.44	.77	1.50	2.70	.52	.22	.14	.13	.13
IN.	.24	.82	.85	.51	.80	1.73	3.02	.60	.24	.17	.15	.15

CAL YR 1970 TOTAL 38,433 MEAN 105 MAX 1,190 MIN 15 CFSM .62 IN 8.46
WTR YR 1971 TOTAL 42,152 MEAN 115 MAX 1,310 MIN 16 CFSM .68 IN 9.28

PEAK DISCHARGE (BASE, 600 CFS)

DATE	TIME	GHT	DISCHARGE
11-03	1630	3.72	615
04-02	1400	6.13	1,460
04-09	0800	4.24	792
04-13	1900	4.85	975

04139000 Houghton Creek near Lupton, Mich.

LOCATION.--Lat 44°23'45", long 84°02'50", in SE¼ SE¼ sec.10, T.23 N., R.3 E., Ogemaw County, on right bank 1700 ft upstream from mouth, 2.7 miles southwest of Lupton, and 3.5 miles downstream from Wilkins Creek.

DRAINAGE AREA.--29.7 sq mi.

PERIOD OF RECORD.--July 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 864.55 ft above mean sea level.

AVERAGE DISCHARGE.--21 years, 51.2 cfs (23.41 inches per year).

EXTREMES.--Current year: Maximum discharge, 432 cfs Apr. 13 (gage height, 5.94 ft); minimum, 28 cfs Jan. 19, Feb. 16, result of freezeup.
Period of record: Maximum discharge, 955 cfs May 20, 1959 (gage height, 7.15 ft), from rating curve extended above 400 cfs on basis of slope-area measurement of peak flow; minimum, 28 cfs Feb. 1, 1953, Jan. 19, Feb. 16, 1971, result of freezeup.

REMARKS.--Records good. Intermittent regulation at low flow by sawmill on Sandback Creek at Rose City prior to June 1955 and since November 1958.

REVISIONS.--WSP 2111: Drainage area.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 28, Dec. 20 to Jan. 5, Jan. 9, 12-16, 19-26, Feb. 24 to Mar. 7, Mar. 10-24, Aug. 6-18, Sept. 20-30; stage-discharge relation affected by ice Dec. 29, Jan. 6-8, 10, 11, 17, 18, Jan. 27 to Feb. 23, Mar. 8, 9)

2.2	33
4.0	168
5.0	260
5.7	360

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	49	86	42	40	71	116	69	49	47	40	39
2	41	47	112	44	40	62	166	79	50	43	38	38
3	41	182	76	42	40	55	144	65	54	40	39	39
4	40	213	160	49	40	57	104	58	50	39	38	39
5	38	97	108	55	43	49	89	56	48	41	37	39
6	37	66	69	53	49	48	115	55	48	40	36	39
7	38	57	56	50	45	55	152	52	50	38	36	39
8	36	51	53	46	43	50	193	51	75	39	35	38
9	38	49	55	43	42	49	230	51	53	40	35	37
10	88	59	60	43	41	48	179	50	48	38	40	37
11	58	58	56	43	40	48	174	48	46	38	48	37
12	46	52	54	42	40	47	202	49	47	37	38	37
13	44	49	53	42	40	45	336	49	73	45	36	38
14	57	47	51	42	39	47	204	47	53	38	36	37
15	55	45	49	41	40	103	122	46	48	38	36	36
16	46	43	48	40	40	131	102	46	46	38	35	36
17	43	43	49	42	41	99	124	45	45	50	35	37
18	42	42	49	45	42	80	142	45	44	40	35	38
19	39	42	50	37	45	75	104	48	44	42	35	38
20	39	62	50	42	80	69	88	61	49	40	36	49
21	45	87	45	40	74	61	80	49	100	40	36	41
22	43	78	45	41	68	58	72	48	53	38	40	37
23	42	83	46	39	63	57	65	46	47	44	53	38
24	41	60	47	39	58	55	66	59	44	46	39	38
25	38	54	46	40	55	53	68	125	44	41	44	37
26	39	51	46	42	54	53	62	83	44	39	52	37
27	37	58	43	41	106	53	59	77	42	38	44	37
28	38	63	43	41	99	54	66	61	41	38	41	43
29	82	64	43	41	------	56	74	53	40	39	39	42
30	96	88	44	41	------	58	64	50	40	38	38	38
31	58	------	44	40	------	74	------	49	------	48	39	------
TOTAL	1,465	2,039	1,836	1,328	1,447	1,920	3,762	1,770	1,515	1,260	1,209	1,155
MEAN	47.3	68.0	59.2	42.8	51.7	61.9	125	57.1	50.5	40.6	39.0	38.5
MAX	96	213	160	55	106	131	336	125	100	50	53	49
MIN	36	42	43	37	39	45	59	45	40	37	35	36
CFSM	1.59	2.29	1.99	1.44	1.74	2.08	4.21	1.92	1.70	1.37	1.31	1.30
IN.	1.83	2.55	2.30	1.66	1.81	2.40	4.71	2.22	1.90	1.58	1.51	1.45

CAL YR 1970 TOTAL 19,611 MEAN 53.7 MAX 213 MIN 34 CFSM 1.81 IN 24.56
WTR YR 1971 TOTAL 20,706 MEAN 56.7 MAX 336 MIN 35 CFSM 1.91 IN 25.93

PEAK DISCHARGE (BASE, 180 CFS)

DATE	TIME	GHT	DISCHARGE
11-03	2300	5.39	280
12-04	1500	4.35	183
04-09	0800	4.91	251
04-13	1300	5.94	432

04139500 Rifle River at "The Ranch" near Lupton, Mich.

LOCATION.—Lat 44°23'06", long 84°02'18", in SE¼ SW¼ sec.11, T.23 N., R.3 E., Ogemaw County, on left bank at downstream side of bridge, 1,300 ft downstream from Houghton Creek, and 2.7 miles south of Lupton.

DRAINAGE AREA.—56.8 sq mi.

PERIOD OF RECORD.—July 1950 to current year. (Discontinued).

GAGE.—Water-stage recorder and wooden control. Datum of gage is 857.47 ft above mean sea level.

AVERAGE DISCHARGE.—21 years, 91.7 cfs (21.92 inches per year).

EXTREMES.—Current year: Maximum discharge, 558 cfs Apr. 13 (gage height, 9.74 ft); minimum, 53 cfs Sept. 17.
Period of record: Maximum discharge, 1,330 cfs May 20, 1959 (gage height, 10.10 ft); minimum, 48 cfs Oct. 8, 1952, Mar. 3, 1968.

REMARKS.—Records good. Occasional regulation by dams above station. Records of water temperatures for the current year are published in Part 2 of this report.

REVISIONS.—WSP 2111: Drainage area.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 5, Aug. 7 to Sept. 30;
stage-discharge relation affected by ice Dec. 6, 7, 21, 22, 26,
Dec. 28 to Jan. 2, Jan. 6 to Mar. 5, Mar. 8-10)

5.9	48
7.0	128
8.0	238
9.0	383
9.6	505

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75	102	136	84	72	138	166	117	83	77	73	65
2	75	101	168	88	72	120	254	127	83	74	70	64
3	73	283	132	91	72	110	233	116	88	70	71	63
4	73	368	249	97	72	105	181	106	83	69	69	63
5	72	203	190	108	72	106	162	100	81	71	67	63
6	71	146	120	100	72	105	193	97	80	71	63	63
7	71	122	100	95	70	110	250	93	80	68	63	62
8	71	109	100	86	72	100	330	90	109	70	61	60
9	72	101	100	84	72	95	395	88	95	72	61	58
10	119	109	105	82	72	96	348	88	85	70	65	57
11	98	109	103	85	72	98	336	85	81	69	77	57
12	87	101	99	86	70	95	378	84	80	70	68	57
13	84	96	96	85	70	94	505	83	103	77	66	58
14	98	93	93	84	72	95	413	82	90	70	63	56
15	96	88	89	83	72	159	267	79	84	70	63	55
16	88	86	87	84	72	206	205	78	81	71	61	54
17	84	84	90	84	74	172	230	77	79	87	59	54
18	81	84	89	84	89	149	269	77	77	79	59	57
19	77	84	90	82	93	143	210	79	75	82	59	58
20	77	105	91	80	162	137	175	94	80	78	58	72
21	84	136	82	76	140	125	158	87	132	77	58	68
22	83	130	82	74	130	118	140	85	92	75	63	65
23	82	138	87	72	129	114	126	81	85	80	80	64
24	81	117	89	72	124	109	122	90	80	83	66	65
25	77	105	88	72	118	103	122	176	78	77	72	63
26	77	100	88	72	114	103	114	144	77	75	83	65
27	76	105	86	72	170	102	109	132	74	71	76	65
28	77	110	84	72	166	101	113	114	72	71	73	76
29	128	111	82	72	------	101	122	99	71	72	70	75
30	148	136	80	72	------	103	114	90	71	70	67	72
31	114	------	80	72	------	117	------	84	------	81	66	------
TOTAL	2,669	3,762	3,255	2,550	2,655	3,629	6,740	3,022	2,529	2,297	2,070	1,874
MEAN	86.1	125	105	82.3	94.8	117	225	97.5	84.3	74.1	66.8	62.5
MAX	148	368	249	108	170	206	505	176	132	87	83	76
MIN	71	84	80	72	70	94	109	77	71	68	58	54
CFSM	1.52	2.20	1.85	1.45	1.67	2.06	3.96	1.72	1.48	1.30	1.18	1.10
IN.	1.75	2.46	2.13	1.67	1.74	2.38	4.41	1.98	1.66	1.50	1.36	1.23

CAL YR 1970 TOTAL 35,798 MEAN 98.1 MAX 411 MIN 62 CFSM 1.73 IN 23.45
WTR YR 1971 TOTAL 37,052 MEAN 102 MAX 505 MIN 54 CFSM 1.80 IN 24.27

PEAK DISCHARGE (BASE, 270 CFS)

DATE	TIME	GHT	DISCHARGE
11-04	0300	9.38	424
12-04	1630	8.45	286
04-09	1230	9.18	411
04-13	1300	9.74	558
04-18	0200	8.40	293

STREAMS TRIBUTARY TO LAKE HURON

04140000 Prior Creek near Selkirk, Mich.

LOCATION.--Lat 44°20'06", long 84°04'06", in SE¼ SE¼ sec.33, T.23 N., R.3 E., Ogemaw County, on right bank 20 ft upstream from culverts on Peters Road, 0.2 mile upstream from mouth, 0.6 mile downstream from Ammond Creek, and 1.5 miles north of Selkirk.

DRAINAGE AREA.--21.4 sq mi.

PERIOD OF RECORD.--September 1950 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 840 ft (by barometer).

AVERAGE DISCHARGE.--21 years, 17.1 cfs (10.85 inches per year).

EXTREMES.--Current year: Maximum discharge, 229 cfs Apr. 13 (gage height, 5.03 ft); minimum, 4.5 cfs Aug. 9, 10.
Period of record: Maximum discharge, 584 cfs May 20, 1959 (gage height, 5.64 ft); minimum, 2.4 cfs Nov. 4, 1966, result of freezeup.

REMARKS.--Records good except those for winter periods, which are poor. Some regulation from dams above station.

REVISIONS.--WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.9	20	45	16	14	42	63	30	14	11	6.3	5.8
2	9.5	19	66	17	14	39	132	31	15	9.5	5.7	5.7
3	9.1	.102	41	18	14	37	140	26	18	8.7	5.7	5.8
4	9.3	130	130	18	14	34	97	23	15	8.5	5.3	5.7
5	8.7	53	72	19	14	30	57	22	13	9.1	5.1	5.7
6	8.6	30	34	18	14	26	75	21	13	9.0	4.9	6.0
7	8.4	24	29	17	14	26	131	20	14	8.2	4.7	5.7
8	8.0	20	22	17	15	27	164	19	19	8.6	4.5	5.1
9	8.8	19	22	16	15	28	166	18	15	8.8	4.5	5.1
10	27	24	23	16	15	28	112	16	12	8.2	7.1	5.3
11	18	24	23	16	15	26	107	17	11	8.0	10	7.2
12	13	20	22	16	15	23	119	17	11	7.9	6.5	7.5
13	12	18	21	16	15	22	192	17	16	8.4	5.5	7.4
14	18	18	20	15	14	20	108	16	14	7.9	6.1	7.0
15	18	17	19	15	14	45	60	15	13	7.9	6.3	6.5
16	14	16	18	15	13	76	50	15	11	8.6	6.2	6.4
17	13	16	18	15	13	97	61	14	11	13	6.2	6.4
18	12	16	18	15	14	85	85	14	9.9	9.4	6.0	7.0
19	11	16	18	15	17	55	51	15	9.4	10	6.2	7.4
20	11	29	18	15	39	48	42	22	11	9.1	5.7	12
21	15	51	18	15	35	36	38	17	37	8.6	5.5	9.9
22	14	40	18	15	33	30	34	15	17	8.0	7.9	8.0
23	13	36	17	15	31	25	30	13	13	9.0	13	7.9
24	12	30	17	14	31	24	29	20	11	10	6.4	7.9
25	12	27	17	14	32	23	30	55	11	8.4	11	7.7
26	12	25	17	14	31	22	27	36	10	7.3	18	8.3
27	12	32	17	14	39	21	26	33	9.5	6.5	10	8.4
28	13	38	17	14	44	20	30	24	8.9	6.7	8.6	16
29	32	36	16	14	------	22	34	19	8.5	6.9	6.7	11
30	45	56	16	14	------	24	29	16	8.6	5.9	6.0	8.7
31	25	------	16	14	------	34	------	15	------	8.6	6.3	------
TOTAL	452.3	1,002	865	482	588	1,095	2,319	651	399.8	265.7	217.9	224.5
MEAN	14.6	33.4	27.9	15.5	21.0	35.3	77.3	21.0	13.3	8.57	7.03	7.48
MAX	45	130	130	19	44	97	192	55	37	13	18	16
MIN	8.0	16	16	14	13	20	26	13	8.5	5.9	4.5	5.1
CFSM	.68	1.56	1.30	.72	.98	1.65	3.61	.98	.62	.40	.33	.35
IN.	.79	1.74	1.50	.84	1.02	1.90	4.03	1.13	.69	.46	.38	.39

CAL YR 1970 TOTAL 8,130.0 MEAN 22.3 MAX 201 MIN 6.8 CFSM 1.04 IN 14.13
WTR YR 1971 TOTAL 8,562.2 MEAN 23.5 MAX 192 MIN 4.5 CFSM 1.10 IN 14.88

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	GHT	DISCHARGE
11-03	2300	4.99	160
12-04	1300	4.72	167
04-02	1800	4.89	165
04-09	0300	4.91	198
04-13	0700	5.03	229

04140500 Rifle River at Selkirk, Mich.

LOCATION.—Lat 44°18'48", long 84°04'10", in SE¼ NE¼ sec.9, T.22 N., R.3 E., Ogemaw County, on left bank at upstream side of bridge on State Road at Selkirk, 1.0 miles downstream from Klacking Creek.

DRAINAGE AREA.—117 sq mi.

PERIOD OF RECORD.—September 1950 to current year.

GAGE.—Water-stage recorder. Datum of gage is 828.47 ft above mean sea level.

AVERAGE DISCHARGE.—21 years, 143 cfs (16.60 inches per year).

EXTREMES.—Current year: Maximum discharge, 1,310 cfs Apr. 13 (gage height, 4.41 ft); minimum, 70 cfs Sept. 9, 10.
Period of record: Maximum discharge, 2,760 cfs May 20, 1959 (gage height, 6.76 ft); minimum, 55 cfs Aug. 19, 1958.

REMARKS.—Records good except those for the winter periods, which are fair. Some regulation from dams above station. Records of water temperatures for the current year are published in Part 2 of this report.

REVISIONS.—WSP 2111: Drainage area.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Nov. 23, 24, Dec. 6-8, 15, 21, Dec. 26 to Feb. 22, Mar. 1-5, 9-11)

Oct. 1 to Mar. 1		Mar. 2 to Sept. 30	
1.7	80	1.6	68
2.0	156	2.0	164
3.0	490	3.0	500
4.0	970	5.0	1,660

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	95	156	235	125	110	250	336	201	128	101	92	80
2	93	150	298	120	110	230	496	219	128	95	84	78
3	93	493	235	140	110	220	505	198	142	88	86	78
4	91	660	444	140	110	200	413	181	128	86	84	78
5	89	416	392	140	110	190	336	172	120	88	82	76
6	87	258	220	140	110	186	392	164	118	88	80	80
7	87	204	190	135	110	186	530	158	115	84	78	80
8	87	174	160	130	110	186	690	150	156	86	76	74
9	91	162	162	130	110	170	844	144	142	86	74	72
10	174	180	177	125	110	165	706	144	123	82	84	72
11	142	180	177	125	110	160	645	139	115	80	110	72
12	118	165	171	125	110	158	700	142	113	78	88	72
13	112	156	162	125	110	158	1,220	139	144	90	84	74
14	136	150	153	120	110	164	1,000	136	131	82	82	76
15	148	139	145	120	110	284	545	128	120	80	82	74
16	123	134	139	115	110	378	406	126	115	86	80	74
17	118	134	142	110	115	357	406	120	110	115	76	74
18	112	128	142	110	115	319	476	118	106	103	74	76
19	107	128	145	110	140	284	399	123	101	108	76	78
20	105	165	145	110	280	268	330	156	101	106	76	101
21	118	248	140	110	250	246	287	131	201	103	74	97
22	118	229	134	110	240	225	255	131	142	99	84	90
23	110	210	134	110	232	213	231	123	118	103	123	88
24	110	190	134	110	242	198	219	136	108	113	95	88
25	107	177	134	110	232	192	219	284	103	99	108	86
26	105	162	130	110	219	184	204	246	103	90	133	86
27	105	180	130	110	280	178	192	228	97	84	115	90
28	107	195	130	110	304	178	201	189	95	82	108	120
29	192	192	125	110	------	181	219	164	90	86	95	115
30	251	248	120	110	------	186	198	144	88	82	88	106
31	183	------	120	110	------	216	------	133	------	101	86	------
TOTAL	3,714	6,363	5,465	3,705	4,409	6,710	13,600	4,967	3,601	2,854	2,757	2,505
MEAN	120	212	176	120	157	216	453	160	120	92.1	88.9	83.5
MAX	251	660	444	140	304	378	1,220	284	201	115	133	120
MIN	87	128	120	110	110	158	192	118	88	78	74	72
CFSM	1.03	1.81	1.50	1.03	1.34	1.85	3.87	1.37	1.03	.79	.76	.71
IN.	1.18	2.02	1.74	1.18	1.40	2.13	4.32	1.58	1.14	.91	.88	.80

CAL YR 1970 TOTAL 57,075 MEAN 156 MAX 885 MIN 80 CFSM 1.33 IN 18.15
WTR YR 1971 TOTAL 60,650 MEAN 166 MAX 1,220 MIN 72 CFSM 1.42 IN 19.28

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	GHT	DISCHARGE
11-04	0300	3.52	730
12-04	2000	3.03	502
04-02	1900	3.15	575
04-09	0300	3.69	874
04-13	1300	4.41	1,310

04141000 South Branch Shepards Creek near Selkirk, Mich.

LOCATION.—Lat 44°18'28", long 84°05'13", in SE¼ SE¼ sec.8, T.22 N., R.3 E., Ogemaw County, on right bank 200 ft upstream from mouth, 600 ft west of bridge on Bedtelyon Road, and 1.1 miles southwest of Selkirk.

DRAINAGE AREA.--1.15 sq mi.

PERIOD OF RECORD.—October 1951 to current year.

GAGE.--Water-stage recorder and V notch sharp-crested weir. Altitude of gage is 845 ft (by barometer)

AVERAGE DISCHARGE.--20 years, 0.53 cfs (6.26 inches per year).

EXTREMES.--Current year: Maximum discharge, 48 cfs Apr. 12 (gage height, 3.42 ft); minimum, 0.02 cfs Aug. 22 (gage height, 1.16 ft).
Period of record: Maximum discharge, 181 cfs Apr. 3, 1956 (gage height, 4.42 ft), from rating curve extended above 40 cfs; no flow at times each year, except 1956, and 1967-70.

REMARKS.—Records fair.

REVISIONS (WATER YEARS).--WSP 1557: 1952 (M), 1954 (M), 1955 (P). WSP 2111: Drainage area.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Feb. 9, 10)

1.1	.008	1.6	.69
1.2	.042	1.8	1.5
1.3	.115	1.9	2.1
1.4	.24	2.1	4.5
1.5	.42	2.5	12
		3.0	26

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.12	.26	1.4	.19	.20	3.0	8.8	.45	.18	.10	.10	.06
2	.11	.68	1.1	.19	.19	2.2	18	.42	.20	.09	.09	.06
3	.10	11	2.2	.20	.18	1.4	7.0	.35	.24	.06	.09	.06
4	.10	2.1	8.6	.35	.18	1.0	2.5	.29	.18	.06	.07	.06
5	.09	1.0	1.4	.45	.58	.73	2.0	.33	.15	.06	.06	.05
6	.09	.64	.58	.45	.56	.61	7.2	.29	.15	.06	.05	.06
7	.08	.40	.35	.45	.37	.61	11	.24	.18	.04	.04	.05
8	.09	.29	.28	.45	.31	.58	11	.24	.19	.06	.04	.04
9	.22	.28	.33	.45	.30	.53	6.3	.24	.12	.06	.05	.04
10	.65	.47	.40	.38	.28	.45	3.8	.22	.12	.04	.12	.07
11	.26	.40	.37	.33	.40	.40	3.9	.22	.11	.04	.16	.08
12	.22	.33	.35	.28	.35	.37	8.9	.23	.11	.04	.09	.08
13	.19	.28	.35	.26	.29	.37	11	.22	.14	.05	.07	.07
14	.40	.26	.33	.26	.26	.50	1.9	.22	.12	.04	.07	.06
15	.28	.22	.26	.24	.23	3.4	1.2	.22	.11	.04	.06	.05
16	.22	.22	.26	.24	.22	8.4	.98	.20	.10	.09	.05	.04
17	.20	.20	.28	.24	.20	8.6	2.4	.19	.09	.20	.04	.04
18	.19	.20	.28	.22	.22	5.1	1.5	.19	.08	.10	.04	.04
19	.16	.20	.35	.19	.29	3.4	.94	.20	.07	.12	.04	.06
20	.16	.96	.37	.19	1.5	2.6	.83	.23	.08	.09	.04	.19
21	.26	.98	.29	.20	1.5	1.7	.69	.20	.10	.06	.03	.13
22	.19	1.3	.28	.20	1.9	1.3	.53	.19	.07	.10	.07	.10
23	.18	.73	.28	.22	1.6	.98	.42	.18	.06	.20	.11	.09
24	.16	.45	.29	.22	1.6	.87	.40	.37	.06	.16	.09	.08
25	.16	.38	.26	.22	1.5	.73	.37	.47	.07	.10	.15	.09
26	.14	.37	.26	.23	1.3	.64	.29	.35	.07	.09	.19	.09
27	.14	.76	.28	.22	2.6	.56	.33	.38	.06	.07	.13	.09
28	.20	1.1	.26	.20	3.5	.58	.45	.24	.04	.09	.12	.26
29	.91	1.2	.20	.20	------	.76	.45	.19	.07	.10	.08	.14
30	.47	1.6	.19	.20	------	.94	.37	.19	.15	.09	.07	.13
31	.31	------	.19	.20	------	1.8	------	.18	------	.15	.07	------
TOTAL	7.05	29.26	22.62	8.32	22.61	55.11	115.45	8.13	3.47	2.65	2.48	2.46
MEAN	.23	.98	.73	.27	.81	1.78	3.85	.26	.12	.086	.080	.082
MAX	.91	11	8.6	.45	3.5	8.6	18	.47	.24	.20	.19	.26
MIN	.08	.20	.19	.19	.18	.37	.29	.18	.04	.04	.03	.04
CFSM	.20	.85	.63	.23	.70	1.55	3.35	.23	.10	.07	.07	.07
IN.	.23	.95	.73	.27	.73	1.78	3.73	.26	.11	.09	.08	.08

CAL YR 1970 TOTAL 204.75 MEAN .56 MAX 18 MIN .02 CFSM .49 IN 6.62
WTR YR 1971 TOTAL 279.61 MEAN .77 MAX 18 MIN .03 CFSM .67 IN 9.04

PEAK DISCHARGE (BASE, 20 CFS)

DATE	TIME	GHT	DISCHARGE
12-04	0100	2.91	22
04-02	0100	2.97	25
04-08	1730	2.92	23
04-12	2330	3.42	48

04142000 Rifle River near Sterling, Mich.
(International hydrological decade station)

LOCATION.—Lat 44°04'21", long 84°01'12", in NE¼ SW¼ sec.5, T.19 N., R.4 E., Arenac County, on left bank 30 ft downstream from bridge on Old-M70, 2.8 miles north of Sterling, and 20 miles upstream from mouth.

DRAINAGE AREA.—320 sq mi, approximately.

PERIOD OF RECORD.—November 1905 to December 1908 (gage heights and discharge measurements only), October 1936 to current year. Monthly discharge only for some periods, published in WSP 1307. Published as Rifle River at Michigan Highway 70 near Sterling 1936-61.

GAGE.—Water-stage recorder. Datum of gage is 649.48 ft above mean sea level. November 1905 to December 1908, nonrecording gage at site 400 ft downstream at different datum. Jan. 13, 1937, to Jan. 10, 1939, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.—35 years, 306 cfs (12.99 inches per year).

EXTREMES.—Current year: Maximum discharge, 2,660 cfs Apr. 14 (gage height, 9.14 ft); minimum, 128 cfs Aug. 21, 22 (gage height, 1.42 ft).
Period of record: Maximum discharge, 5,340 cfs Mar. 28, 1950 (gage height, 13.74 ft), from rating curve extended above 3,800 cfs; minimum, 75 cfs Nov. 22, 1964, result of freezeup.

REMARKS.—Records good except those for winter periods, which are fair. Occasional regulation from dams above station. Records of suspended sediment loads for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).—WSP 1437: 1937 (M), 1938, 1939-40 (M).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Dec. 6-8, 15-17, 22-25, Dec. 27 to Mar. 27)

1.4	125	7.0	1,770
2.5	335	9.0	2,600
4.5	870		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	186	308	499	285	250	760	901	425	251	172	171	155
2	180	293	597	300	250	680	1,570	460	262	167	155	153
3	179	1,030	535	310	250	600	1,580	427	291	157	155	151
4	174	1,560	1,020	320	250	560	1,240	385	274	151	154	153
5	174	1,100	1,020	330	250	520	992	358	250	159	147	152
6	172	659	600	320	270	490	1,040	344	236	162	142	156
7	170	490	450	310	280	460	1,340	327	232	152	139	153
8	171	404	380	300	280	450	1,700	313	274	153	136	146
9	176	360	390	295	280	450	2,010	304	275	158	133	144
10	314	390	392	295	270	450	1,820	294	237	150	140	141
11	336	398	401	290	265	430	1,610	289	223	144	188	149
12	253	359	389	285	260	410	1,630	291	224	140	172	148
13	229	332	376	280	260	400	2,300	282	240	162	150	146
14	271	313	360	275	260	400	2,340	274	256	156	147	143
15	299	303	340	270	265	480	1,510	267	224	152	145	140
16	256	282	330	265	270	800	1,090	262	216	148	140	135
17	233	275	330	255	280	1,150	1,000	251	202	171	136	135
18	220	268	321	250	290	1,000	1,130	245	190	179	133	138
19	211	266	325	250	320	800	977	247	182	171	132	144
20	207	317	329	250	450	720	801	291	180	170	132	177
21	225	500	305	250	560	640	691	276	242	163	131	192
22	233	482	310	250	680	560	608	257	255	163	152	164
23	222	488	300	250	620	500	542	246	200	175	215	157
24	216	411	300	250	640	480	497	272	184	211	189	156
25	212	359	300	250	640	450	482	497	175	183	190	152
26	208	335	282	250	620	430	452	530	177	162	240	155
27	206	352	280	250	610	420	418	443	171	153	230	160
28	211	422	290	250	800	438	425	397	165	154	194	184
29	314	415	290	250	------	452	468	328	156	160	175	217
30	487	500	280	250	------	473	441	292	157	153	161	190
31	381	------	280	250	------	543	------	266	------	170	159	------
TOTAL	7,326	13,971	12,601	8,485	10,720	17,396	33,605	10,140	6,601	5,021	4,983	4,686
MEAN	236	466	406	274	383	561	1,120	327	220	162	161	156
MAX	487	1,560	1,020	330	800	1,150	2,340	530	291	211	240	217
MIN	170	266	280	250	250	400	418	245	156	140	131	135
CFSM	.74	1.4	1.27	.86	1.20	1.75	3.50	1.02	.69	.51	.50	.49
IN.	.85	1.62	1.46	.99	1.25	2.02	3.91	1.18	.77	.58	.58	.54

CAL YR 1970 TOTAL 123,878 MEAN 339 MAX 2,190 MIN 137 CFSM 1.06 IN 14.40
WTR YR 1971 TOTAL 135,535 MEAN 371 MAX 2,340 MIN 131 CFSM 1.16 IN 15.76

PEAK DISCHARGE (BASE, 1,600 CFS)

DATE	TIME	GHT	DISCHARGE
11-04	0800	6.71	1,650
04-03	0200	6.89	1,730
04-09	1700	7.87	2,120
04-14	0200	9.14	2,660

04143500 North Branch Kawkawlin River near Kawkawlin, Mich.

LOCATION.—Lat 43°40'05", long 83°58'13", in SE¼ SE¼ sec.27, T.15 N., R.4 E., Bay County, on left bank 50 ft upstream from bridge on Beaver Road, 1.7 miles northwest of Kawkawlin, and 2.4 miles upstream from mouth.

DRAINAGE AREA.—101 sq mi.

PERIOD OF RECORD.—March 1951 to current year.

GAGE.—Water-stage recorder. Datum of gage is 584.00 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to Sept. 26, 1951, nonrecording gage at site 70 ft downstream, and Sept. 27, 1951, to Sept. 30, 1960, water-stage recorder at present site, at datum 2.00 ft higher.

AVERAGE DISCHARGE.—20 years, 54.9 cfs (7.38 inches per year).

EXTREMES.—Current year: Maximum discharge, 846 cfs Apr. 4 (gage height, 8.76 ft); maximum gage height, 9.01 ft Mar. 18 (backwater from ice); no flow at times.
Period of record: Maximum discharge, 1,540 cfs Apr. 1, 1960, Apr. 13, 1965; maximum gage height, 10.33 ft Apr. 13, 1965; no flow at times in each year.

REMARKS.—Records good except those for winter periods, which are poor. Some diversion above station for irrigation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	31	49	33	14	190	439	34	8.5			
2	28	35	56	32	13	210	593	35	9.1			
3	21	140	86	30	13	210	732	38	9.3			
4	14	167	209	29	14	210	730	38	7.3			
5	9.8	166	178	28	14	200	494	38	5.8			
6	4.4	191	174	27	14	180	370	39	4.3			
7	2.3	197	170	25	14	170	304	40	2.8			
8	7.2	167	160	25	15	165	249	38	1.9			
9	15	126	150	24	15	160	220	35	1.0			
10	21	106	125	23	15	155	202	33	.10			
11	20	83	86	22	16	150	196	29	0			
12	12	68	64	22	16	145	178	26	0			
13	6.3	61	63	21	16	135	186	23	0			
14	89	63	66	20	17	130	164	21	0			
15	81	67	68	20	17	130	172	18	0			
16	90	62	54	19	18	150	227	16	0			
17	103	54	50	19	19	210	214	15	0			
18	107	47	52	18	21	210	180	13	0			
19	88	42	52	18	25	180	148	12	0			
20	67	46	52	17	33	155	124	16	0			
21	52	53	50	17	56	140	110	14	0			
22	42	48	50	17	90	130	99	13	0			
23	33	48	49	16	150	120	85	12	0			
24	28	52	48	16	145	115	73	12	0			
25	25	54	48	16	140	110	62	14	0			
26	20	55	47	16	135	115	52	13	0			
27	17	52	46	15	150	130	45	12	0			
28	15	46	45	15	170	180	42	10	0			
29	21	42	40	14	------	230	39	7.8	0			
30	36	46	37	14	------	270	35	7.0	0			
31	30	------	35	14	------	333	------	7.9	------			------
TOTAL	1,137.0	2,415	2,459	642	1,375	5,318	6,764	679.7	50.10	0	0	0
MEAN	36.7	80.5	79.3	20.7	49.1	172	225	21.9	1.67	0	0	0
MAX	107	197	209	33	170	333	732	40	9.3	0	0	0
MIN	2.3	31	35	14	13	110	35	7.0	0	0	0	0
CFSM	.36	.80	.79	.21	.49	1.70	2.23	.22	.02	0	0	0
IN.	.42	.89	.91	.24	.51	1.96	2.49	.25	.02	0	0	0

CAL YR 1970 TOTAL 23,363.27 MEAN 64.0 MAX 506 MIN 0 CFSM .63 IN 8.61
WTR YR 1971 TOTAL 20,839.80 MEAN 57.1 MAX 732 MIN 0 CFSM .57 IN 7.68

04143900 Shiawassee River at Linden, Mich.

LOCATION.—Lat 42°48'56", long 83°48'08", in SW¼ sec.19, T.5 N., R.6 E., Genesee County, on right bank at upstream side of bridge on Hogan Road, 1.0 mile west of Linden.

DRAINAGE AREA.—81.2 sq mi.

PERIOD OF RECORD.—October 1967 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 850 ft (from topographic map).

EXTREMES.—Current year: Maximum discharge, 198 cfs Feb. 28 (gage height, 6.07 ft); maximum gage height, 6.17 ft Mar. 4 (backwater from ice); minimum discharge, 0.74 cfs May 22, 23; minimum gage height, 2.82 ft Aug. 2.
Period of record: Maximum discharge, 262 cfs Feb. 7, 1968 (gage height, 6.16 ft); maximum gage height, 6.31 ft Feb. 10, 1968 (backwater from ice); minimum discharge, 0.74 cfs May 22,23, 1971; minimum gage height, 2.82 ft Aug. 2, 1971.

REMARKS.—Records fair except those for the winter period, which are poor. Low flow regulated at times by lakes above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	62	60	50	27	195	127	57	27	5.0	1.5	4.8
2	45	59	60	50	27	189	125	63	27	5.0	1.4	5.2
3	46	57	60	50	27	183	120	64	23	5.5	1.4	5.2
4	46	57	62	55	30	180	108	63	4.1	5.5	1.4	5.2
5	45	67	69	60	40	160	104	62	3.7	6.8	1.5	5.7
6	44	65	70	55	45	150	103	54	5.2	7.3	1.7	5.7
7	41	63	69	55	50	140	98	52	4.8	15	1.6	6.0
8	37	63	67	55	55	130	79	50	5.0	47	1.5	5.7
9	38	74	61	55	55	126	83	49	5.5	49	1.5	5.7
10	44	83	60	55	55	120	86	46	5.7	48	1.9	5.5
11	48	84	67	53	57	110	89	35	6.0	47	2.3	5.7
12	42	83	66	50	55	110	90	32	6.5	31	1.4	6.0
13	38	82	67	45	50	110	93	33	11	2.6	1.6	6.2
14	49	79	67	43	48	110	92	33	11	2.3	1.6	6.5
15	57	70	67	40	48	144	91	33	11	2.5	1.7	6.5
16	56	67	67	39	50	161	90	32	11	2.0	3.0	6.8
17	58	65	68	37	50	160	90	31	11	2.6	3.2	6.8
18	66	58	68	35	57	177	91	30	12	2.2	3.3	7.0
19	75	47	69	34	78	181	90	27	11	2.3	3.3	7.0
20	79	51	69	33	99	186	91	18	11	2.3	3.5	7.5
21	88	65	69	32	99	195	91	1.4	11	2.3	4.3	9.7
22	89	62	69	31	107	195	90	.91	11	2.2	4.3	10
23	89	60	69	31	144	186	89	1.1	11	2.2	6.2	10
24	86	59	72	30	160	173	88	7.8	13	2.3	5.7	10
25	81	59	78	29	184	170	87	16	43	1.7	6.0	10
26	76	59	75	29	192	161	79	25	42	1.2	6.5	11
27	74	60	65	28	195	159	62	27	5.0	1.0	6.8	16
28	74	62	60	28	196	153	57	27	3.5	1.4	5.5	17
29	75	62	55	27	------	132	56	27	3.3	1.6	5.2	18
30	76	61	55	27	------	112	55	27	3.3	1.6	5.2	19
31	71	------	50	27	------	124	------	26	------	1.5	5.7	------
TOTAL	1,879	1,945	2,030	1,268	2,280	4,782	2,694	1,050.21	358.6	309.9	101.7	251.4
MEAN	60.6	64.8	65.5	40.9	81.4	154	89.8	33.9	12.0	10.0	3.28	8.38
MAX	89	84	78	60	196	195	127	64	43	49	6.8	19
MIN	37	47	50	27	27	110	55	.91	3.3	1.0	1.4	4.8
CFSM	.75	.80	.81	.50	1.00	1.90	1.11	.42	.15	.12	.04	.10
IN.	.86	.89	.93	.58	1.04	2.19	1.23	.48	.16	.14	.05	.12

CAL YR 1970 TOTAL 18,377.80 MEAN 50.4 MAX 136 MIN 5.2 CFSM .62 IN 8.42
WTR YR 1971 TOTAL 18,949.81 MEAN 51.9 MAX 196 MIN .91 CFSM .64 IN 8.68

04144000 Shiawassee River at Byron, Mich.

LOCATION.—Lat 42°49'25", long 83°56'45", in NE¼ NE¼ sec.23, T.5 N., R.4 E., Shiawassee County, on upstream side of highway bridge at Byron, 0.3 mile downstream from milldam which is just upstream from South Branch Shiawassee River.

DRAINAGE AREA.—368 sq mi.

PERIOD OF RECORD.—October 1947 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.—Water-stage recorder. Datum of gage is 811.54 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to Oct. 17, 1960, nonrecording gage and crest-stage gage at same site and datum.

AVERAGE DISCHARGE.—24 years, 237 cfs (8.75 inches per year).

EXTREMES.—Current year: Maximum discharge, 1,200 cfs Mar. 18 (gage height, 9.15 ft); maximum gage height, 11.20 ft Feb. 24 (backwater from ice); minimum discharge, 22 cfs Sept. 17 (gage height, 3.77 ft).
Period of record: Maximum discharge, 2,900 cfs Apr. 1, 1960; maximum gage height, 12.58 ft May 15, 1956, Apr. 1, 1960; minimum discharge, 19 cfs Aug. 16, 1965; minimum gage height, 3.55 ft Sept. 16, 1960.

REMARKS.—Records fair except those for the winter period, which are poor. Low flow slightly regulated at times by mills above station. Records of water temperature for the current year are published in Part 2 of this report.

REVISIONS.—WSP 1144: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	162	245	269	140	80	1,100	414	224	66	57	41	37
2	150	235	314	130	80	1,000	406	218	74	61	37	37
3	147	231	316	130	80	900	410	210	78	56	39	38
4	144	252	321	140	80	800	406	190	81	53	42	37
5	134	292	322	160	90	750	380	174	80	54	41	37
6	136	303	320	190	200	648	360	163	77	59	39	33
7	138	293	271	200	250	567	340	161	72	63	35	33
8	127	263	289	180	300	534	328	150	97	61	35	39
9	107	232	240	160	300	501	309	137	130	69	31	36
10	107	230	192	150	300	584	288	129	130	78	34	36
11	114	254	180	142	290	512	302	124	124	79	41	36
12	111	312	184	142	270	464	294	121	92	78	41	40
13	118	322	198	134	250	434	320	121	79	77	39	35
14	140	307	190	134	240	488	352	114	78	63	39	40
15	180	293	175	133	220	670	382	110	76	51	37	39
16	217	273	186	126	210	793	380	104	75	49	31	31
17	221	262	212	120	200	1,080	364	98	65	51	33	26
18	198	253	196	110	200	1,190	354	101	62	47	33	31
19	168	245	198	110	220	1,160	342	98	63	40	31	36
20	180	239	218	100	350	1,070	336	96	64	39	31	37
21	218	239	225	100	800	961	322	91	58	38	30	41
22	236	255	265	95	950	871	306	82	64	37	32	42
23	246	256	250	95	1,000	793	296	76	62	37	29	40
24	244	228	250	90	1,000	700	284	69	61	37	30	42
25	242	177	240	90	900	648	274	78	57	34	28	41
26	238	161	230	90	900	609	252	85	69	37	35	45
27	226	155	220	90	900	544	256	88	73	40	50	48
28	225	178	200	85	950	502	250	88	62	39	43	56
29	217	202	180	85	------	478	240	84	51	40	40	56
30	226	233	170	85	------	462	228	78	50	43	34	50
31	239	------	150	80	------	442	------	71	------	40	37	------
TOTAL	5,556	7,420	7,171	3,816	11,610	22,255	9,775	3,733	2,270	1,607	1,118	1,175
MEAN	179	247	231	123	415	718	326	120	75.7	51.8	36.1	39.2
MAX	246	322	322	200	1,000	1,190	414	224	130	79	50	56
MIN	107	155	150	80	80	434	228	69	50	34	28	26
CFSM	.49	.67	.63	.33	1.13	1.95	.89	.33	.21	.14	.10	.11
IN.	.56	.75	.72	.39	1.17	2.25	.99	.38	.23	.16	.11	.12

CAL YR 1970 TOTAL 74,014 MEAN 203 MAX 831 MIN 50 CFSM .55 IN 7.48
WTR YR 1971 TOTAL 77,506 MEAN 212 MAX 1,190 MIN 26 CFSM .58 IN 7.83

04144500 Shiawassee River at Owosso, Mich.
(International hydrological decade station)

LOCATION.—Lat 43°00'54", long 84°10'52", in SW¼ sec.12, T.7 N., R.2 E., Shiawassee County, on right bank on grounds of sewage-treatment plant, 1.5 miles north of Owosso.

DRAINAGE AREA.—538 sq mi.

PERIOD OF RECORD.—March 1931 to current year. Monthly discharge only for some periods, published in WSP 1307. Gage-height records for flood seasons collected in this vicinity 1904, 1910-30 are contained in reports of U. S. Weather Bureau.

GAGE.—Water-stage recorder. Datum of gage is 707.25 ft above mean sea level. Prior to Oct. 15, 1933, at site 1.5 miles upstream at datum 5.46 ft higher.

AVERAGE DISCHARGE.—40 years, 310 cfs (7.82 inches per year).

EXTREMES.—Current year: Maximum discharge, 2,940 cfs Mar. 15 (gage height, 7.03 ft); maximum gage height, 7.12 ft Feb. 26 (backwater from ice); minimum discharge, 7.1 cfs Sept. 12 (gage height, 1.44 ft).
Period of record: 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 the winter period, which are poor. Flow regulated below about 800 cfs by powerplant at Shiawasseetown prior to February 1953. Records of suspended sediment loads for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).—WSP 1307: 1949 (M). WSP 1337: 1932, 1934, 1936-38, 1944.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	211	284	400	190	110	1,600	623	280	84	74	70	50
2	197	313	450	180	110	1,520	601	269	82	75	68	51
3	184	372	450	180	110	1,310	579	250	78	84	69	47
4	175	455	450	200	110	1,090	564	251	81	94	66	49
5	171	481	450	250	150	1,070	543	233	100	143	62	47
6	162	454	430	300	300	948	512	215	102	340	62	59
7	155	423	400	260	350	769	487	199	110	218	61	52
8	154	383	400	240	390	628	463	194	100	158	62	45
9	156	354	320	230	430	631	446	187	119	132	59	82
10	142	355	260	220	430	689	422	173	166	116	63	56
11	126	359	227	210	400	687	390	138	181	115	59	16
12	125	367	213	200	380	655	409	174	183	121	50	16
13	130	395	223	190	360	598	555	170	199	120	50	40
14	210	395	234	190	330	954	584	167	401	121	55	38
15	253	375	202	180	310	2,750	560	162	227	125	54	42
16	263	357	209	170	290	1,910	553	161	169	108	52	44
17	273	336	254	160	280	1,580	536	155	145	102	51	45
18	277	324	275	150	280	1,570	523	141	132	87	48	43
19	256	312	293	150	400	1,560	498	141	114	84	45	52
20	234	315	376	140	800	1,560	472	139	120	82	46	62
21	239	313	400	140	1,200	1,360	438	123	118	75	50	54
22	259	300	328	140	1,400	1,220	423	110	122	69	52	50
23	268	290	352	130	1,400	1,150	395	98	102	72	45	49
24	271	270	335	130	1,400	1,030	373	99	79	72	37	49
25	271	250	308	130	1,300	935	355	95	145	71	37	46
26	271	240	301	120	1,300	873	340	94	96	78	45	68
27	272	240	294	120	1,300	831	315	92	67	77	46	91
28	263	300	260	120	1,400	774	317	97	127	84	44	71
29	277	330	230	120	------	733	311	98	125	76	47	68
30	272	370	210	110	------	682	291	94	143	70	50	70
31	300	------	200	110	------	646	------	87	------	70	52	------
TOTAL	6,817	10,312	9,734	5,360	17,020	34,313	13,878	4,886	4,017	3,313	1,657	1,552
MEAN	220	344	314	173	608	1,107	463	158	134	107	53.5	51.7
MAX	300	481	450	300	1,400	2,750	623	280	401	340	70	91
MIN	125	240	200	110	110	598	291	87	67	69	37	16
CFSM	.41	.64	.58	.32	1.13	2.06	.86	.29	.25	.20	.10	.10
IN.	.47	.71	.67	.37	1.18	2.37	.96	.34	.28	.23	.11	.11

CAL YR 1970 TOTAL 101,486 MEAN 278 MAX 1,290 MIN 74 CFSM .52 IN 7.02
WTR YR 1971 TOTAL 112,859 MEAN 309 MAX 2,750 MIN 16 CFSM .57 IN 7.80

PEAK DISCHARGE (BASE, 1,500 CFS).

DATE	TIME	GHT	DISCHARGE
02-23	—	—	about 1,500
03-01	—	—	about 1,700
03-15	0600	7.03	2,940

04145000 Shiawassee River near Fergus, Mich.

LOCATION.--Lat 43°15'17", long 84°06'20", in sec.22, T.10 N., R.3 E., Saginaw County, on right bank at downstream side of county highway bridge, 1.2 miles east of Fergus, 1.8 miles upstream from Bear Creek, and 14 miles above mouth.

DRINAGE AREA.--637 sq mi.

PERIOD OF RECORD.--October 1939 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 587.80 ft above mean sea level. Prior to Aug. 22, 1968, non-recording gage at same site and datum.

AVERAGE DISCHARGE.--32 years, 359 cfs (8.34 inches per year).

EXTREMES.--Current year: Maximum discharge, 4,580 cfs Mar. 15 (gage height, 12.94 ft); maximum gage height, 14.25 ft Feb. 28 (backwater from ice); minimum discharge, 37 cfs Sept. 13, 14 (gage height, 1.83 ft).
Period of record: Maximum discharge, 7,500 cfs Apr. 6, 1947 (includes overflow bypassing gage); maximum gage height, 14.25 ft Feb. 28, 1971 (backwater from ice); minimum discharge, 27 cfs Aug. 8, 1966; minimum gage-height observed, 0.31 ft Aug. 18, 19, 1970.

REMARKS.--Records fair except those for the winter period which are poor. Some regulation at low stages by powerplant above Owosso prior to February 1953; occasional regulation at low stages since.

REVISIONS (WATER YEARS).--WSP 1337: 1940 (M), 1941-42, 1943 (M), 1944, 1945 (M), 1946, 1947 (M), 1948, 1950. WSP 1627: 1952, 1954 (M), 1957

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	229	326	500	220	130	1,900	754	300	107	99	57	57
2	220	319	520	210	130	1,800	742	290	104	73	57	53
3	207	503	520	210	130	1,600	700	280	101	55	60	54
4	196	787	520	230	130	1,400	664	270	95	55	59	57
5	187	760	520	250	200	1,300	658	248	97	65	57	56
6	185	646	500	330	350	1,200	620	232	114	112	54	57
7	177	556	470	310	450	1,000	590	215	121	223	53	78
8	173	492	450	300	500	800	556	203	126	154	53	63
9	174	442	400	280	520	750	535	197	126	120	53	49
10	182	442	350	260	500	800	500	185	142	103	52	76
11	165	459	300	250	480	800	464	167	169	92	58	73
12	151	442	250	240	450	800	453	151	172	87	61	46
13	155	450	260	240	420	700	643	172	178	91	50	39
14	222	467	270	230	400	808	784	170	254	91	49	39
15	388	445	250	220	370	3,390	706	170	290	91	52	47
16	338	418	250	210	350	3,190	667	170	197	108	52	47
17	315	396	300	200	330	1,990	655	160	156	94	49	49
18	310	373	330	190	350	1,680	600	160	134	79	49	50
19	295	367	350	180	500	1,630	570	150	125	75	49	50
20	270	350	400	170	1,000	1,620	532	150	100	71	51	61
21	266	350	460	170	1,500	1,540	506	150	100	67	53	72
22	276	350	400	160	1,600	1,340	475	140	99	61	51	65
23	295	340	400	160	1,700	1,290	440	140	99	57	53	59
24	303	320	400	150	1,600	1,120	410	130	84	56	51	57
25	306	300	380	150	1,500	1,010	386	127	82	58	46	55
26	299	280	350	150	1,500	979	362	119	87	56	50	62
27	299	290	350	140	1,600	950	340	118	95	55	56	81
28	288	340	320	140	1,700	900	317	116	59	63	62	100
29	292	380	290	140	------	850	322	120	68	71	53	80
30	328	430	260	130	------	802	320	118	87	68	53	76
31	328	------	230	130	------	772	------	113	------	60	57	------
TOTAL	7,819	12,820	11,550	6,350	20,390	40,711	16,271	5,431	3,768	2,610	1,660	1,808
MEAN	252	427	373	205	728	1,313	542	175	126	84.2	53.5	60.3
MAX	388	787	520	330	1,700	3,390	784	300	290	223	62	100
MIN	151	280	230	130	130	700	317	113	59	55	46	39
CFSM	.40	.67	.59	.32	1.14	2.06	.85	.27	.20	.13	.08	.09
IN.	.46	.75	.67	.37	1.19	2.38	.95	.32	.22	.15	.10	.11

CAL YR 1970 TOTAL 114,530 MEAN 314 MAX 1,800 MIN 62 CFSM .49 IN 6.69
WTR YR 1971 TOTAL 131,188 MEAN 359 MAX 3,390 MIN 39 CFSM .56 IN 7.66

04146000 Farmers Creek near Lapeer, Mich.

LOCATION.—Lat 43°02'41", long 83°20'14", in sec.6, T.7 N., R.10 E., Lapeer County, on left bank at sewage-treatment plant at Michigan Home and Training School, 2.0 miles west of Lapeer.

DRAINAGE AREA.—55.2 sq mi (revised).

PERIOD OF RECORD.—October 1932 to current year. 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. Prior to May 25, 1954, non-recording gage at same site and datum.

AVERAGE DISCHARGE.—39 years, 28.1 cfs (6.69 inches per year).

EXTREMES.—Current year: Maximum discharge, 360 cfs Mar. 17 (gage height, 17.45 ft); maximum gage height, 17.82 ft Feb. 23 (backwater from ice); minimum discharge, 0.90 cfs Aug. 10 (gage height, 14.96 ft).
Period of record: 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 measurement of peak flow; minimum not determined.

REMARKS.—Records good except those for the winter period, which are poor. 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), 1948-51 (M). WSP 1727: 1952 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	18	31	24	15	150	83	29	3.2	2.8	1.7	2.6
2	15	18	32	22	15	130	82	28	4.3	2.6	1.5	2.6
3	15	20	32	21	15	110	78	27	4.3	2.6	1.3	2.6
4	15	24	32	20	15	95	80	27	3.2	2.4	1.3	3.0
5	15	25	31	20	20	80	80	26	3.0	2.4	1.2	3.2
6	14	30	30	21	30	60	75	26	4.6	2.6	1.2	3.5
7	13	36	31	22	35	50	69	24	5.6	2.8	1.2	3.2
8	11	42	32	20	40	41	64	23	5.9	3.0	1.1	3.2
9	10	42	33	20	40	40	61	23	5.9	2.8	1.0	3.0
10	8.7	41	32	19	35	40	57	25	5.4	2.4	1.1	2.8
11	8.7	38	27	19	31	45	53	20	5.1	2.2	1.2	2.6
12	8.7	33	31	18	28	50	51	11	6.2	2.1	1.3	2.4
13	8.4	32	32	18	26	57	53	8.4	7.0	2.1	1.2	2.4
14	13	30	30	17	25	72	53	8.7	7.6	2.2	1.2	2.4
15	8.7	28	27	17	25	149	54	9.9	8.0	2.1	1.2	2.2
16	9.0	26	31	17	25	195	59	7.3	8.0	1.9	1.2	2.1
17	11	26	29	16	25	304	59	5.6	7.6	2.1	1.1	2.1
18	12	25	29	16	27	264	58	4.8	7.6	1.9	1.1	2.1
19	13	24	31	15	30	207	53	4.6	7.6	2.1	1.1	2.2
20	14	24	31	15	60	169	53	4.3	7.0	1.9	1.2	3.2
21	43	24	32	15	100	151	53	3.7	6.2	1.7	4.0	4.3
22	72	23	35	15	150	137	51	3.5	5.4	1.5	4.3	4.6
23	36	22	32	15	150	117	46	3.5	4.8	1.5	4.3	4.6
24	27	19	31	15	130	112	43	3.7	4.6	1.3	4.3	4.6
25	24	22	32	15	120	101	39	4.6	4.0	1.3	4.0	4.3
26	21	21	28	15	130	93	36	4.0	3.7	1.3	3.2	4.6
27	21	23	32	15	150	88	34	3.5	3.5	1.5	3.5	5.1
28	20	27	30	15	160	83	32	3.2	3.5	1.7	3.7	5.9
29	19	27	28	15	------	82	30	3.0	3.2	1.9	3.5	6.2
30	19	29	27	15	------	82	29	2.6	3.0	2.1	3.2	6.6
31	19	------	25	15	------	83	------	2.4	------	1.9	3.0	------
TOTAL	559.2	819	946	542	1,652	3,437	1,668	380.3	159.0	64.7	65.4	104.2
MEAN	18.0	27.3	30.5	17.5	59.0	111	55.6	12.3	5.30	2.09	2.11	3.47
MAX	72	42	35	24	160	304	83	29	8.0	3.0	4.3	6.6
MIN	8.4	18	25	15	15	40	29	2.4	3.0	1.3	1.0	2.1
CFSM	.33	.49	.55	.32	1.07	2.01	1.01	.22	.10	.04	.04	.06
IN.	.38	.55	.64	.37	1.11	2.32	1.12	.26	.11	.04	.04	.07

CAL YR 1970 TOTAL 7,650.06 MEAN 21.0 MAX 139 MIN .26 CFSM .38 IN 5.16
WTR YR 1971 TOTAL 10,396.80 MEAN 28.5 MAX 304 MIN 1.0 CFSM .52 IN 7.01

PEAK DISCHARGE (BASE, 160 CFS)

DATE	TIME	GHT	DISCHARGE
02-22	—	—	about 160
02-28	—	—	about 170
03-17	1000	17.45	360

04147000 Holloway Reservoir near Otisville, Mich.

LOCATION.—Lat 43°07'15", long 83°29'45", in NW¼ sec.11, T.8 N., R.8 E., Genesee County, in gatehouse on right side of Holloway Dam on Flint River, 3.5 miles southeast of Otisville.

DRAINAGE AREA.—526 sq mi.

PERIOD OF RECORD.—March 1954 to current year.

GAGE.—Water-stage recorder. Datum of gage is at mean sea level (levels by city of Flint).

EXTREMES.—Current year: Maximum contents, 741,000,000 cu ft June 15 (elevation, 754.67 ft); minimum, 63,500,000 cu ft Sept. 20, 21 (elevation, 740.30 ft).
Period of record: 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.—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 at 755 ft, three 20-foot radial gates with sill elevation of 745 ft, and 2 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 sewage dilution for city of Flint.

COOPERATION.—Reservoir elevations furnished by city of Flint.

REVISIONS.—WSP 2111: Drainage area.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Elevation (feet)	Contents (millions of cubic feet)	Change in contents during month	
			Millions of cubic feet	Equivalent in cfs
Sept. 30	750.80	461	—	—
Oct. 31	749.35	374	-87	-32.5
Nov. 30	751.27	489	+115	+44.4
Dec. 31	751.27	489	0	0
Calendar year 1970	—	—	+17	-.5
Jan. 31	750.80	461	-28	-10.5
Feb. 28	752.07	542	+81	+33.5
Mar. 31	750.01	414	-128	-47.8
Apr. 30	752.52	573	+159	+61.3
May 31	754.40	719	+146	+54.5
June 30	754.07	693	-26	-10.0
July 31	751.77	521	-172	-64.2
Aug. 31	748.92	351	-170	-63.5
Sept.30	740.39	65.1	-285.9	-110.3
Water year 1970-71	—	—	-395.9	-12.6

04147500 Flint River near Otisville, Mich.

LOCATION.—Lat 43°06'40", long 83°31'10", in SE¼ sec.9, T.8 N., R.8 E., Genesee County, on left bank 20 ft downstream from bridge on State Highway 15, 1.5 miles downstream from Holloway Reservoir, 3.5 miles upstream from Power-Cullen drain, and 3.8 miles south of Otisville.

DRAINAGE AREA.—531 sq mi.

PERIOD OF RECORD.—October 1952 to current year.

GAGE.—Water-stage recorder. Datum of gage is 721.39 ft above mean sea level.

AVERAGE DISCHARGE.—19 years, 259 cfs (6.62 inches per year), adjusted for storage since 1954.

EXTREMES.—Current year: Maximum discharge, 2,750 cfs Mar. 18 (gage height, 12.30 ft); minimum, 32 cfs July 23 (gage height, 2.25 ft). Period of record: Maximum discharge, 6,150 cfs Apr. 1, 1960 (gage height, 14.97 ft); minimum, 4.3 cfs Oct. 28, 1960 (gage height, 1.81 ft).

REMARKS.—Records good. Flow regulated by Holloway Reservoir 1.5 miles above station (see preceding page).

REVISIONS.—WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	102	135	220	187	122	1,540	723	91	96	93	95	153
2	58	135	242	179	102	1,700	829	91	96	93	98	251
3	59	130	272	174	73	1,710	824	91	96	93	106	401
4	59	121	267	177	74	1,580	817	91	96	93	109	533
5	59	121	253	179	117	1,370	810	91	96	93	107	559
6	65	119	262	182	161	1,200	740	91	97	92	107	607
7	74	119	246	190	160	1,190	553	92	96	92	107	630
8	75	121	234	193	161	1,180	472	93	98	92	106	610
9	108	122	235	185	161	1,130	445	93	99	91	106	532
10	138	121	231	176	161	1,090	402	94	98	91	101	429
11	137	133	278	167	161	1,030	403	95	99	91	65	64
12	137	161	250	160	173	735	405	95	100	91	105	62
13	135	180	223	155	192	543	412	95	98	91	105	60
14	140	189	224	146	199	641	410	95	99	91	105	59
15	137	180	218	143	259	716	409	96	98	98	105	59
16	137	173	206	139	405	796	411	98	98	107	104	59
17	137	173	219	135	488	1,720	412	98	98	107	103	58
18	137	168	236	132	482	2,650	412	99	99	106	103	58
19	137	165	241	128	481	2,650	317	100	99	113	103	54
20	200	167	253	125	500	2,290	169	100	99	121	103	52
21	296	167	251	124	490	1,910	216	100	99	124	104	52
22	294	161	243	122	486	1,620	221	100	99	110	104	52
23	292	161	268	122	547	1,480	169	100	99	70	103	52
24	292	180	282	122	641	1,430	171	100	99	102	104	52
25	290	175	261	122	651	1,370	172	100	98	101	104	52
26	289	173	252	123	812	1,110	173	98	98	101	106	52
27	287	178	249	122	1,180	648	127	98	98	106	104	52
28	283	187	237	122	1,380	649	90	96	98	101	110	52
29	226	192	225	122	------	652	91	96	136	68	115	52
30	135	215	211	123	------	652	91	96	153	96	114	52
31	135	------	197	122	------	653	------	96	------	95	114	------
TOTAL	5,050	4,722	7,486	4,600	10,819	39,635	11,896	2,969	3,032	3,013	3,225	5,810
MEAN	163	157	241	148	386	1,279	397	95.8	101	97.2	104	194
MAX	296	215	282	193	1,380	2,650	829	100	153	124	115	630
MIN	58	119	197	122	73	543	90	91	96	68	65	52
MEAN+	130	201	241	138	420	1,231	458	150	91.0	33.0	40.5	83.7
CFSM+	.24	.38	.45	.26	.79	2.32	.86	.28	.17	.062	.076	.16
IN+	.28	.42	.52	.30	.82	2.67	.96	.33	.19	.07	.09	.18

CAL YR 1970 TOTAL 72,874 MEAN 200 MAX 810 MIN 58 MEAN+ 200 CFSM+ .38 IN+ 5.10
WTR YR 1971 TOTAL 102,257 MEAN 280 MAX 2,650 MIN 52 MEAN+ 267 CFSM+ .50 IN+ 6.83
+Adjusted for change in contents in Holloway Reservoir.

04147990 Butternut Creek near Genesee, Mich.

LOCATION.—Lat 43°08'09", long 83°35'57", in NE¼ NE¼ sec.2, T.8 N., R.7 E., Genesee County, on right bank 10 ft downstream from bridge on Frances Road, 2.3 miles upstream from mouth, and 2.0 miles northeast of Genesee.

DRAINAGE AREA.—34.5 sq mi.

PERIOD OF RECORD.—January 1970 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 738 ft (from topographic map). Prior to June 11, 1970, nonrecording gage at same site and datum.

EXTREMES.—Maximum discharge, 238 cfs Mar. 15 (gage height, 8.39 ft); minimum, 1.5 cfs Aug. 8, 9 (gage height, 1.56 ft).
Period of record: Maximum discharge, 238 cfs Mar. 15, 1971 (gage height, 8.39 ft); minimum, 1.5 cfs Aug. 8, 9, 1971 (gage height, 1.56 ft).

REMARKS.—Records good except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	5.2	11	6.5	4.2	90	39	12	4.4	2.3	1.9	2.6
2	3.8	5.1	9.4	6.5	4.3	75	41	12	5.0	2.2	1.9	2.3
3	3.6	8.5	10	7.0	4.5	65	33	12	6.7	2.1	2.0	2.2
4	3.4	30	22	7.5	5.0	55	26	11	5.6	2.1	2.0	2.1
5	3.3	18	16	9.5	10	50	23	11	5.0	2.4	2.2	1.9
6	3.1	11	14	10	25	45	21	11	4.8	3.0	2.2	2.7
7	3.1	8.8	13	9.5	20	40	20	9.7	4.7	2.6	2.0	3.1
8	3.0	7.1	8.2	9.0	20	35	18	9.2	4.5	2.3	2.0	2.9
9	3.3	6.5	8.0	8.0	17	30	17	8.6	4.2	2.2	1.9	2.5
10	4.7	8.9	8.5	7.5	16	25	17	8.2	3.9	2.1	2.4	2.4
11	4.2	9.2	9.0	7.0	15	23	16	7.8	3.7	2.0	2.7	2.2
12	3.2	8.1	9.0	6.5	13	23	15	8.3	3.6	1.9	2.3	2.3
13	3.1	7.2	9.0	6.5	11	22	56	8.6	4.9	2.0	2.2	2.1
14	7.3	6.6	9.5	6.0	10	44	44	8.0	5.2	2.0	2.2	2.2
15	9.2	6.4	9.5	5.5	9.5	215	31	7.4	4.7	1.9	2.2	2.1
16	5.3	6.1	10	5.5	9.0	159	25	7.1	3.8	2.0	2.3	2.0
17	4.5	6.0	10	5.5	9.0	126	23	6.7	3.1	1.9	2.2	2.0
18	5.7	6.0	11	5.0	13	102	24	6.2	2.9	2.0	2.2	2.0
19	5.6	6.2	12	5.0	30	91	20	6.0	2.9	2.3	2.2	2.0
20	6.6	7.8	13	5.0	85	93	18	7.7	2.8	2.2	2.2	2.6
21	6.1	9.1	14	5.0	100	74	16	7.4	3.8	2.1	2.2	2.4
22	5.9	7.8	13	4.7	120	68	15	6.5	3.9	2.0	2.2	2.2
23	5.2	7.5	11	4.7	110	65	13	6.1	3.3	2.0	2.2	2.0
24	4.6	7.0	10	4.7	110	50	13	5.9	3.0	2.0	1.9	2.4
25	4.4	6.3	9.0	4.6	110	42	13	7.3	2.9	2.0	2.7	2.1
26	4.1	5.7	8.5	4.5	120	39	12	7.2	2.8	2.0	3.9	2.3
27	4.0	6.1	8.0	4.3	140	37	11	6.7	2.8	2.1	3.7	2.6
28	4.0	8.3	7.5	4.3	110	40	12	6.2	2.6	2.1	2.9	2.6
29	4.2	11	7.0	4.2	------	42	12	5.7	2.4	2.1	2.6	2.5
30	5.2	13	7.0	4.2	------	37	12	5.4	2.3	2.1	2.4	2.3
31	5.4	------	6.5	4.2	------	35	------	4.7	------	2.0	2.4	------
TOTAL	142.5	260.5	323.6	187.9	1,250.5	1,937	656	247.6	116.2	66.0	72.3	69.6
MEAN	4.60	8.68	10.4	6.06	44.7	62.5	21.9	7.99	3.87	2.13	2.33	2.32
MAX	9.2	30	22	10	140	215	56	12	6.7	3.0	3.9	3.1
MIN	3.0	5.1	6.5	4.2	4.2	22	11	4.7	2.3	1.9	1.9	1.9
CFSM	.13	.25	.30	.18	1.30	1.81	.63	.23	.11	.06	.07	.07
IN.	.15	.28	.35	.20	1.35	2.09	.71	.27	.13	.07	.08	.08

CAL YR 1970 TOTAL 4,022.1 MEAN 11.0 MAX 130 MIN 2.4 CFSM .32 IN 4.34
WTR YR 1971 TOTAL 5,329.7 MEAN 14.6 MAX 215 MIN 1.9 CFSM .42 IN 5.75

PEAK DISCHARGE (BASE, 120 CFS)

DATE	TIME	GHT	DISCHARGE
02-22	—	—	about 130
02-27	—	—	about 130
03-15	0800	8.39	238

04148140 Kearsley Creek near Davison, Mich.

LOCATION.--Lat 43°02'01", long 83°34'53", in NE¼ sec.12, T.7 N., R.7 E., Genesee County, on right bank 10 ft upstream from bridge on State Highway 21, 1.4 miles downstream from Black Creek, and 3.3 miles west of Davison.

DRAINAGE AREA.--99.6 sq mi.

PERIOD OF RECORD.--October 1965 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 760 ft (from topographic map).

AVERAGE DISCHARGE.--6 years, 57.2 cfs (7.80 inches per year).

EXTREMES.--Current year: Maximum discharge, 604 cfs Mar. 15 (gage height, 9.67 ft); minimum, 3.1 cfs Sept. 12 (gage height 2.74 ft).
Period of record: Maximum discharge, 707 cfs Feb. 2, 1968 (gage height, 10.29 ft); minimum, 2.7 cfs July 9, 1966; minimum gage height, 2.69 ft Sept. 12, 1969.

REMARKS.--Records fair except those for the winter period, which are poor. Some diurnal fluctuation caused by small dams, and occasional diversion for sprinkler irrigation above station.

REVISIONS.--WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	30	90	37	25	257	115	63	19	9.1	5.9	8.4
2	34	32	89	35	25	250	116	58	22	11	6.3	8.9
3	27	45	87	35	25	240	112	56	20	11	5.4	8.7
4	22	61	88	40	25	220	108	53	16	9.5	5.3	7.0
5	19	61	84	45	30	186	104	44	26	9.1	4.8	8.4
6	15	71	70	50	70	184	99	40	37	11	4.6	8.7
7	15	82	39	55	80	159	97	37	31	12	5.3	8.7
8	13	85	35	50	80	137	81	31	29	8.1	4.8	7.8
9	12	72	30	48	75	130	78	27	26	8.8	5.5	7.2
10	13	52	25	45	67	111	76	41	21	8.8	5.7	9.0
11	11	45	16	40	60	105	76	48	18	7.9	8.1	8.1
12	13	49	33	35	55	103	73	50	15	7.9	7.1	3.6
13	13	54	68	33	55	103	92	47	23	12	6.9	10
14	50	53	50	32	55	175	93	48	22	11	7.1	6.8
15	33	52	50	31	60	568	98	48	18	8.9	6.7	7.2
16	35	50	55	30	60	448	107	48	18	11	6.0	6.2
17	53	47	55	30	65	429	102	46	16	11	4.8	3.9
18	55	41	60	30	70	441	96	38	14	8.5	4.7	19
19	63	38	60	30	100	401	83	27	11	9.1	4.0	22
20	55	43	65	29	200	283	79	28	10	8.3	5.1	26
21	56	47	70	28	300	218	70	26	12	7.9	60	19
22	57	57	80	28	350	215	69	20	8.8	6.7	13	17
23	55	69	75	27	330	192	66	19	7.1	5.8	9.5	11
24	52	78	70	26	300	156	57	22	7.1	4.5	7.2	5.5
25	50	70	65	26	320	148	55	28	6.3	4.4	9.2	7.2
26	41	59	60	25	350	137	61	22	5.8	4.8	9.7	17
27	41	61	60	25	400	123	58	24	6.0	5.2	17	19
28	38	74	55	25	285	114	59	18	7.4	4.9	9.1	12
29	32	83	50	25	------	113	60	16	7.0	7.2	7.5	6.6
30	32	94	45	25	------	109	61	15	8.3	5.6	7.9	4.8
31	28	------	40	25	------	114	------	20	------	5.1	8.5	------
TOTAL	1,075	1,755	1,819	1,045	3,917	6,569	2,501	1,108	487.8	256.1	272.7	314.7
MEAN	34.7	58.5	58.7	33.7	140	212	83.4	35.7	16.3	8.26	8.80	10.5
MAX	63	94	90	55	400	568	116	63	37	12	60	26
MIN	11	30	16	25	25	103	55	15	5.8	4.4	4.0	3.6
CFSM	.35	.59	.59	.34	1.41	2.13	.84	.36	.16	.08	.09	.11
IN.	.40	.66	.68	.39	1.46	2.45	.93	.41	.18	.10	.10	.12

CAL YR 1970 TOTAL 17,161.8 MEAN 47.0 MAX 238 MIN 5.4 CFSM .47 IN 6.41
WTR YR 1971 TOTAL 21,120.3 MEAN 57.9 MAX 568 MIN 3.6 CFSM .58 IN 7.89

PEAK DISCHARGE (BASE, 250 CFS)

DATE	TIME	GHT	DISCHARGE
02-22	--	--	about 370
02-27	--	--	about 430
03-15	1200	9.67	604

04148160 Gilkey Creek near Flint, Mich.

LOCATION.--Lat 43°01'27", long 83°37'32", in NE¼ SW¼ sec.10, T.7 N., R.7 E., Genesee County, on right bank 25 ft downstream from bridge on extension of Arapaho Street, 5.1 miles upstream from mouth, and 3.5 miles east of Flint.

DRAINAGE AREA.--6.29 sq mi.

PERIOD OF RECORD.--January 1970 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 750 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 104 cfs Mar. 15 (gage height, 4.80 ft); maximum gage height, 5.20 ft Feb. 19 (backwater from ice); minimum discharge, 0.02 cfs Sept. 16, 19, 25; minimum gage height, 0.58 ft Aug. 20.
Period of record: Maximum discharge, 114 cfs Apr. 21, 1970 (gage height, 5.60 ft); no flow on many days during 1970.

REMARKS.--Records fair except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.32	.36	1.1	.50	.35	7.0	5.6	1.6	.34	.20	.20	.12
2	.36	.92	.88	.50	.35	5.0	6.8	1.5	1.6	.15	.12	.12
3	.56	3.7	1.1	.50	.35	3.5	5.4	1.2	.70	.12	.28	.12
4	.36	5.7	1.5	1.0	.40	2.5	4.1	1.1	.46	.12	.42	.12
5	.32	2.0	1.0	1.9	1.1	2.2	3.6	1.1	7.3	1.1	.46	.10
6	.48	1.0	.76	1.2	1.3	2.2	3.3	.94	4.6	.66	.38	.38
7	.48	.84	.60	1.0	1.3	2.2	3.3	.76	1.5	.25	.38	.08
8	.40	.68	.60	.80	1.2	2.2	3.0	.70	.88	.22	.22	.04
9	1.2	.60	.64	.60	1.1	2.2	3.0	.66	.62	.22	.22	.04
10	2.4	1.1	.64	.50	1.0	1.9	2.7	.62	.54	.15	.42	.04
11	.68	.72	.56	.45	.90	2.1	2.4	.66	.46	.10	.25	.04
12	.52	.64	.64	.42	.80	2.0	2.7	1.2	.38	.08	.15	.05
13	.44	.64	.70	.41	.80	1.9	16	.70	.91	.74	.10	.04
14	15	.48	.80	.40	.90	29	12	.76	.50	.30	.08	.04
15	3.8	.48	.80	.40	1.0	87	7.4	1.0	.50	1.3	.12	.04
16	.96	.44	.84	.35	3.0	26	5.6	1.0	.50	1.3	.12	.02
17	.60	.48	.96	.35	6.0	15	5.6	.82	.30	1.0	.10	.05
18	.44	.60	1.2	.35	16	9.8	4.9	.70	.28	.34	.08	.04
19	.36	.48	4.2	.35	45	11	3.8	.63	.28	.46	.05	.03
20	.44	1.8	5.4	.35	50	11	3.3	.46	.25	.30	.04	1.8
21	.92	1.1	3.6	.35	35	8.5	2.8	.42	.28	.30	39	.42
22	.64	.80	1.5	.35	30	9.3	2.2	.42	.28	.22	3.4	.08
23	.44	.60	1.2	.35	30	10	2.0	.38	.28	.15	.82	.08
24	.36	.52	1.0	.35	30	8.5	2.1	.61	.28	.12	.50	.04
25	.28	.44	.84	.35	35	7.6	1.7	.94	.25	.15	1.1	.02
26	.18	.40	.80	.35	47	6.6	1.5	.54	.25	.22	6.1	1.3
27	.32	.40	.70	.30	22	5.7	1.4	.46	.18	.30	4.7	2.5
28	.18	3.3	.70	.30	8.0	6.3	1.7	.42	.20	.43	.76	.66
29	.32	2.3	.70	.30	------	6.3	1.8	.38	.20	.30	.25	.12
30	.96	1.8	.60	.30	------	5.0	1.4	.34	.18	.30	.20	.04
31	.48	------	.60	.35	------	4.9	------	.30	------	.28	.15	------
TOTAL	35.20	35.32	37.16	15.98	369.85	304.4	123.1	23.32	25.28	11.88	61.17	8.57
MEAN	1.14	1.18	1.20	.52	13.2	9.82	4.10	.75	.84	.38	1.97	.29
MAX	15	5.7	5.4	1.9	50	87	16	1.6	7.3	1.3	39	2.5
MIN	.18	.36	.56	.30	.35	1.9	1.4	.30	.18	.08	.04	.02
CFSM	.18	.19	.19	.08	2.10	1.56	.65	.12	.13	.06	.31	.05
IN.	.21	.21	.22	.09	2.19	1.80	.73	.14	.15	.07	.36	.05

CAL YR 1970 TOTAL 505.90 MEAN 1.39 MAX 70 MIN 0 CFSM .22 IN 2.99
WTR YR 1971 TOTAL 1,051.23 MEAN 2.88 MAX 87 MIN .02 CFSM .46 IN 6.22

PEAK DISCHARGE (BASE, 40 CFS)

DATE	TIME	GHT	DISCHARGE	DATE	TIME	GHT	DISCHARGE
02-20	--	--	about 95	06-05	2000	2.45	40
02-25	--	--	about 90	08-21	0100	4.23	93
03-15	1100	4.80	104	08-26	1800	2.60	44

04148200. Swartz Creek near Holly, Mich.

LOCATION.—Lat 42°49'39", long 83°37'42", in SW¼ sec.15, T.5 N., R.7 E., Oakland County, on right bank 25 ft downstream from bridge on Elliott Road and 2.4 miles north of Holly.

DRAINAGE AREA.—12.0 sq mi.

PERIOD OF RECORD.—January 1956 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 905 ft (from topographic map).

AVERAGE DISCHARGE.—15 years, 6.81 cfs (7.71 inches per year).

EXTREMES.—Current year: Maximum discharge, 64 cfs Mar. 15 (gage height, 3.25 ft); minimum, 0.19 cfs Aug. 22 (gage height, 1.47 ft). Period of record: Maximum discharge, 91 cfs Feb. 4, 1968 (gage height, 3.69 ft); minimum, 0.10 cfs on many days in 1963, 1964, and 1965.

REMARKS.—Records good except those for the winter period, which are poor.

REVISIONS.—WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	6.8	12	7.1	4.0	46	19	8.3	2.5	.62	.50	.39
2	3.3	6.9	11	7.2	4.0	39	21	8.1	2.7	.63	.37	.38
3	2.9	9.5	11	7.2	4.0	32	20	7.6	2.6	.59	.39	.37
4	2.8	15	12	8.7	5.0	27	18	7.1	2.5	.55	.35	.50
5	2.7	16	12	9.0	10	22	15	6.7	2.4	.82	.32	.98
6	2.3	14	11	8.0	11	22	14	6.3	2.8	1.3	.31	1.6
7	2.2	13	9.8	7.5	10	24	13	5.9	3.4	1.1	.30	1.0
8	2.1	11	8.9	7.0	9.5	24	12	5.5	3.0	.90	.28	.85
9	2.4	10	8.8	6.5	8.5	28	11	5.3	2.7	.82	.28	.80
10	3.0	11	9.0	5.4	8.0	20	11	4.9	2.4	.72	.63	.62
11	3.0	11	9.0	5.7	7.3	18	10	4.8	2.2	.60	1.1	.59
12	3.1	10	9.0	6.3	7.0	16	9.8	5.1	2.1	.50	.83	.58
13	3.6	9.3	9.0	6.0	6.8	16	16	4.9	2.7	.46	.63	.59
14	11	8.6	9.0	5.6	6.8	31	20	4.7	2.7	.42	.51	.55
15	18	8.2	9.0	5.7	7.0	63	18	4.4	2.3	.43	.43	.49
16	18	7.7	9.0	4.9	7.0	63	15	4.1	2.0	.56	.36	.39
17	16	7.4	9.0	4.9	7.5	60	15	3.9	1.8	.66	.30	.43
18	13	7.4	9.5	4.6	8.0	54	15	3.7	1.6	.69	.25	.41
19	12	7.4	13	4.6	8.5	49	13	3.5	1.5	.68	.22	.41
20	10	10	14	4.6	20	44	12	3.2	1.4	.61	.22	.80
21	10	11	14	4.6	40	38	11	2.9	1.4	.55	.22	.90
22	9.5	11	13	4.6	43	34	9.7	2.6	1.4	.50	.24	.80
23	8.6	9.5	13	4.4	41	32	8.9	2.4	1.3	.45	.53	.74
24	7.8	8.4	12	4.4	35	28	8.7	2.5	1.2	.42	.48	.68
25	7.2	7.7	11	2.4	39	25	8.5	3.6	1.1	.41	.47	.68
26	6.7	7.4	10	5.8	40	23	8.2	4.2	.90	.46	.61	1.1
27	6.3	8.2	9.5	4.1	52	22	7.8	4.2	.82	.56	.63	1.8
28	5.9	12	9.0	4.0	49	22	7.8	3.4	.74	.57	.62	2.0
29	5.9	13	8.5	4.0	------	22	8.4	2.7	.65	.59	.66	2.0
30	7.0	13	8.0	4.0	------	20	8.3	2.5	.52	.57	.54	1.8
31	7.2	------	7.5	4.0	------	19	------	2.4	------	.59	.44	------
TOTAL	217.1	301.4	320.5	172.8	498.9	983	385.1	141.4	57.33	19.33	14.02	25.23
MEAN	7.00	10.0	10.3	5.57	17.8	31.7	12.8	4.56	1.91	.62	.45	.84
MAX	18	16	14	9.0	52	63	21	8.3	3.4	1.3	1.1	2.0
MIN	2.1	6.8	7.5	2.4	4.0	16	7.8	2.4	.52	.41	.22	.37
CFSM	.58	.83	.86	.46	1.48	2.64	1.07	.38	.16	.05	.04	.07
IN.	.67	.93	.99	.54	1.55	3.05	1.19	.44	.18	.06	.04	.08

CAL YR 1970 TOTAL 2,797.27 MEAN 7.66 MAX 36 MIN .84 CFSM .64 IN 8.67
WTR YR 1971 TOTAL 3,136.11 MEAN 8.59 MAX 63 MIN .22 CFSM .72 IN 9.72

04148300 Swartz Creek at Flint, Mich.

LOCATION.--Lat 42°59'16", long 83°43'57", in NW¼ NW¼ sec.26, T.7 N., R.6 E., Genesee County, on right bank 6 feet downstream from bridge on south Ballenger Highway, in Flint, 3.6 miles upstream from mouth.

DRAINAGE AREA.--115 sq mi.

PERIOD OF RECORD.--January 1970 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 730 ft (from topographic map). Prior to Sept. 4, 1970, nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum discharge, 759 cfs Mar. 15 (gage height, 7.46 ft; maximum gage height, 8.40 ft Feb. 20 (backwater from ice); minimum discharge, 1.2 cfs Aug. 19 (gage height, 1.16 ft).
Period of record: Maximum discharge, 759 cfs Mar. 15, 1971 (gage height, 7.46 ft); maximum gage height, 8.40 ft Feb. 20, 1971 (backwater from ice); minimum discharge, 1.2 cfs Aug. 19, 1971 (gage height, 1.16 ft).

REMARKS.--Records good except those for the winter period, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	38	102	55	27	346	138	52	14	5.8	3.2	2.8
2	17	48	91	50	27	310	142	48	16	3.8	2.4	2.8
3	15	84	88	50	28	266	129	43	15	3.2	2.0	3.0
4	14	152	94	55	40	252	114	39	13	2.6	1.8	2.8
5	13	136	88	60	70	255	104	38	17	30	1.6	3.2
6	12	97	80	60	75	227	99	36	33	15	1.5	4.3
7	11	76	70	55	75	203	94	34	25	6.8	1.5	3.0
8	11	65	65	50	70	185	90	33	24	2.8	1.4	2.4
9	12	62	64	50	60	180	86	32	17	3.6	1.4	2.2
10	28	85	61	45	55	170	79	31	15	3.6	4.5	2.4
11	16	82	62	40	50	160	74	31	13	2.8	4.9	2.4
12	14	73	65	35	50	144	74	34	11	2.8	2.0	3.2
13	14	67	70	32	47	135	164	30	90	5.6	1.6	2.4
14	130	62	80	31	47	306	184	29	52	3.0	2.4	2.2
15	117	58	83	30	47	729	148	26	27	31	1.6	2.0
16	70	54	85	30	50	594	121	25	17	35	1.6	1.8
17	50	52	85	30	55	418	117	24	15	13	1.5	3.4
18	41	51	90	30	70	342	114	23	12	6.6	1.4	3.0
19	36	49	90	30	100	317	100	32	11	6.8	1.3	3.0
20	39	67	100	30	300	346	90	27	9.6	4.7	2.4	15
21	45	73	100	30	330	296	80	23	8.7	3.8	8.7	4.9
22	45	68	100	30	370	278	73	22	7.9	3.2	4.5	3.2
23	43	64	95	30	350	290	66	22	7.1	2.8	3.8	2.8
24	41	40	90	30	300	233	63	21	6.8	3.2	2.0	2.4
25	38	45	85	30	320	211	56	28	5.8	12	2.0	2.2
26	36	54	80	29	350	195	52	20	6.1	28	13	10
27	36	59	75	28	500	180	48	18	5.4	6.8	12	17
28	33	119	70	28	402	176	53	17	4.5	6.3	3.8	8.1
29	40	128	65	28	------	171	52	16	3.6	5.1	2.4	6.1
30	45	117	60	28	------	153	47	15	6.6	4.0	2.0	4.3
31	41	------	60	27	------	141	------	14	------	3.2	2.0	------
TOTAL	1,121	2,225	2,493	1,166	4,265	8,209	2,851	883	509.1	266.9	98.2	128.3
MEAN	36.2	74.2	80.4	37.6	152	265	95.0	28.5	17.0	8.61	3.17	4.28
MAX	130	152	102	60	500	729	184	52	90	35	13	17
MIN	11	38	60	27	27	135	47	14	3.6	2.6	1.3	1.8
CFSM	.31	.65	.70	.33	1.32	2.30	.83	.25	.15	.07	.03	.04
IN.	.36	.72	.81	.38	1.38	2.66	.92	.29	.16	.09	.03	.04

CAL YR 1970 TOTAL 19,150.4 MEAN 52.5 MAX 528 MIN 3.5 CFSM .46 IN 6.19
WTR YR 1971 TOTAL 24,215.5 MEAN 66.3 MAX 729 MIN 1.3 CFSM .58 IN 7.83

PEAK DISCHARGE (BASE, 450 CFS)

DATE	TIME	GHT	DISCHARGE
02-27	-	-	about 550
03-15	1200	7.46	759

04148400 Thread Creek near Flint, Mich.

LOCATION.—Lat 42°58'30", long 83°38'09", in SE¼ SE¼ sec.28, T.7 N., R.7 E., Genesee County, on left bank 20 ft downstream from bridge on Bristol Road, 6.0 miles upstream from mouth, and 4.0 miles southeast of Flint.

DRAINAGE AREA.—55.6 sq mi.

PERIOD OF RECORD.—January 1970 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 770 ft (from topographic map). Prior to May 13, 1970, nonrecording gage at same site and datum.

EXTREMES.—Current year: Maximum discharge, 601 cfs Mar. 14 (gage height, 6.27 ft); no flow Aug. 7, 8, 10; minimum gage height, 0.45 ft Aug. 8, 10.
Period of record: Maximum discharge, 601 cfs Mar. 14 (gage height, 6.27 ft); no flow Aug. 7, 8, 10, 1971; minimum gage height, 0.45 ft Aug. 8, 10, 1971.

REMARKS.—Records good except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.5	13	40	15	10	140	52	22	5.7	1.6	1.4	1.6
2	7.5	15	38	15	10	120	53	21	6.0	1.7	1.1	1.3
3	6.1	24	35	15	10	100	52	19	6.1	1.2	1.3	1.0
4	5.8	44	36	16	10	90	49	19	6.3	.92	1.4	1.1
5	5.5	35	34	20	30	80	46	18	6.7	2.4	1.0	1.6
6	5.0	40	29	23	40	75	41	16	25	7.6	.62	1.9
7	4.4	42	27	21	30	70	38	15	13	4.0	0	1.6
8	4.2	36	25	20	27	65	36	14	17	2.5	0	1.0
9	4.2	30	24	18	24	60	34	13	9.5	2.0	.10	.74
10	9.7	29	23	17	22	55	33	13	7.7	1.5	0	.86
11	4.7	24	23	16	20	50	32	12	5.8	1.4	4.1	.80
12	5.0	24	24	15	20	50	31	14	5.5	1.0	1.8	.80
13	5.2	23	24	15	20	111	60	13	24	2.1	2.2	1.7
14	53	20	25	14	20	254	58	13	10	1.2	1.8	1.4
15	28	19	25	13	20	388	59	10	7.3	3.7	1.5	1.1
16	28	18	26	13	20	333	60	10	6.1	10	1.3	1.4
17	40	18	27	12	20	232	57	9.9	4.9	3.6	1.1	1.9
18	39	19	30	12	25	165	49	9.4	4.2	2.6	1.3	1.9
19	30	17	35	12	60	129	44	8.7	3.4	2.4	.74	1.2
20	22	27	40	11	100	111	41	7.5	3.5	2.3	.68	7.4
21	21	24	40	11	150	92	36	6.6	3.0	1.4	1.5	5.1
22	17	28	40	11	170	98	32	6.8	1.8	.86	.92	3.5
23	16	27	35	11	140	95	27	6.8	1.0	.45	4.7	3.4
24	15	25	31	11	130	82	25	6.5	1.7	.45	1.4	3.4
25	14	25	28	10	130	75	23	9.6	2.1	.56	1.7	2.8
26	12	20	25	10	150	68	21	9.4	2.0	1.1	3.3	5.4
27	11	21	22	10	200	60	20	10	2.2	.86	4.5	13
28	10	36	20	10	180	60	19	9.4	1.2	.68	2.3	6.1
29	11	35	18	10	------	58	22	7.8	.34	2.2	2.1	4.9
30	15	39	17	10	------	56	21	7.0	.45	1.7	1.9	4.7
31	13	------	16	10	------	54	------	6.1	------	1.6	1.6	------
TOTAL	470.8	797	882	427	1,788	3,476	1,171	363.5	193.49	67.58	49.36	84.60
MEAN	15.2	26.6	28.5	13.8	63.9	112	39.0	11.7	6.45	2.18	1.59	2.82
MAX	53	44	40	23	200	388	60	22	25	10	4.7	13
MIN	4.2	13	16	10	10	50	19	6.1	.34	.45	0	.74
CFSM	.27	.48	.51	.25	1.15	2.01	.70	.21	.12	.04	.03	.05
IN.	.31	.53	.59	.29	1.20	2.33	.78	.24	.13	.05	.03	.06

CAL YR 1970 TOTAL 7,528.40 MEAN 20.6 MAX 172 MIN 1.5 CFSM .37 IN 5.04
WTR YR 1971 TOTAL 9,770.33 MEAN 26.8 MAX 388 MIN 0 CFSM .48 IN 6.54

PEAK DISCHARGE (BASE, 200 CFS).—Feb. 27 (time unknown) about 230 cfs; Mar. 14 (2200) 601 cfs (6.27 ft).

04148500 Flint River near Flint, Mich.

LOCATION.—Lat 43°02'20", long 83°46'10", in SW¼ sec.4, T.7 N., R.6 E., Genesee County, on left bank on grounds of sewage-treatment plant, 1.2 miles upstream from Pirnie Creek, 1.8 miles downstream from Flint, and 5.0 miles downstream from Swartz Creek.

DRAINAGE AREA.—954 sq mi.

PERIOD OF RECORD.—September 1903 to March 1904 (gage heights only), August 1932 to current year. Gage-height records for flood seasons collected in this vicinity 1911-32, 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.—39 years, 533 cfs (7.59 inches per year), adjusted for storage since 1954.

EXTREMES.—Current year: Maximum discharge, 4,710 cfs Mar. 15 (gage height, 10.38 ft); minimum, 62 cfs Sept. 24 (gage height, 2.37 ft).
Period of record: 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 (see sta 04147000). Occasional diversion for industrial use. Since Dec. 17, 1967, flow contains up to 50 cfs as sewage effluent which originates outside the basin.

REVISIONS (WATER YEARS).—WSP 954: 1941. WSP 1337: 1933-34 (M), 1935-37. WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	396	213	527	329	215	2,220	940	336	200	266	163	218
2	347	396	514	392	221	2,180	1,080	333	242	173	173	263
3	301	385	559	378	210	2,070	1,140	326	242	157	183	294
4	277	559	620	444	188	1,950	1,120	315	213	155	185	343
5	249	541	518	492	811	1,820	1,110	312	245	312	188	440
6	180	460	563	444	527	1,690	1,120	301	392	266	188	600
7	157	280	492	413	440	1,560	838	287	301	190	190	577
8	155	399	496	432	410	1,440	772	273	270	180	190	586
9	168	514	480	424	392	1,350	762	252	242	180	180	595
10	343	432	480	403	382	1,320	696	249	221	178	200	436
11	239	329	484	378	385	1,280	675	252	210	178	230	92
12	233	406	424	361	389	1,220	706	315	205	178	170	113
13	357	389	509	340	368	888	1,090	266	357	210	180	157
14	756	326	468	333	354	1,350	1,020	256	312	183	200	89
15	536	364	420	319	389	4,340	910	239	245	227	190	88
16	428	417	420	305	460	3,560	866	230	221	287	180	89
17	326	399	500	284	655	2,470	872	230	213	263	200	161
18	287	389	532	280	750	2,640	839	230	208	165	193	133
19	364	392	572	252	1,290	3,220	811	301	195	193	190	119
20	396	396	762	277	2,380	3,410	655	294	185	185	215	357
21	392	361	685	273	2,360	2,970	496	227	190	183	970	536
22	518	298	595	263	1,620	2,350	665	210	193	185	273	527
23	527	403	577	270	1,370	2,090	610	198	190	185	252	195
24	413	444	514	256	1,210	1,870	492	239	190	168	236	82
25	420	444	532	256	1,260	1,770	399	305	185	170	270	190
26	500	420	505	259	1,680	1,690	249	236	175	291	378	428
27	468	280	600	178	2,360	1,280	468	227	165	175	452	456
28	448	448	480	249	2,400	994	420	218	170	173	284	163
29	392	581	452	249	------	1,000	233	210	175	188	233	149
30	392	523	464	239	------	838	230	198	224	165	198	137
31	396	------	413	221	------	1,050	------	195	------	168	168	------
TOTAL	11,361	12,188	16,157	9,993	25,476	59,880	22,284	8,060	6,776	6,177	7,502	8,613
MEAN	366	406	521	322	910	1,932	743	260	226	199	242	287
MAX	756	581	762	492	2,400	4,340	1,140	336	392	312	970	600
MIN	155	213	413	178	188	838	230	195	165	155	163	82
MEAN+	334	450	521	312	944	1,884	804	314	216	135	178	177
CFSM+	.35	.47	.55	.33	.99	1.97	.84	.33	.23	.14	.19	.19
IN+	.40	.53	.63	.38	1.03	2.28	.94	.38	.25	.16	.22	.21

CAL YR 1970 TOTAL 158,773 MEAN 435 MAX 1,580 MIN 155 MEAN+ 434 CFSM+ .45 IN+ 6.18
WTR YR 1971 TOTAL 194,467 MEAN 533 MAX 4,340 MIN 82 MEAN+ 520 CFSM+ .55 IN+ 7.40
+Adjusted for change in contents in Holloway Reservoir.

04148720 Brent Run near Montrose, Mich.

LOCATION.—Lat 43°10'12", long 83°50'03", in SE¼ NE¼ sec.23, T.9 N., R.5 E., Genesee County, on right bank 10 ft downstream from bridge on Morrish Road, 0.8 mile upstream from Central-Stagler Drain, 3.0 miles upstream from mouth, and 3.1 miles east of Montrose.

DRAINAGE AREA.—18.3 sq mi.

PERIOD OF RECORD.—January 1970 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 655 ft (from topographic map). Prior to Aug. 26, 1970, nonrecording gage at same site and datum.

EXTREMES.—Maximum discharge, 698 cfs Mar. 15 (gage height, 6.15 ft); maximum gage height, 7.08 ft Mar. 15 (backwater from ice); minimum discharge, 2.6 cfs Aug. 9, 17 (gage heignt, 1.01 ft).
Period of record: Maximum discharge, 698 cfs Mar. 15, 1971 (gage height, 6.15 ft); maximum gage height, 7.08 ft Mar. 15, 1971 (backwater from ice); minimum discharge, 2.6 cfs Aug. 9, 17, 1971 (gage height, 1.01 ft).

REMARKS.—Records good except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.9	6.0	11	6.0	5.0	70	11	7.3	4.3	4.3	3.3	6.2
2	4.5	5.1	8.8	6.0	4.5	45	11	8.0	4.4	5.0	3.0	6.0
3	4.7	14	8.2	6.5	4.5	35	10	7.1	6.5	4.5	3.3	6.0
4	5.3	40	15	8.0	4.5	30	8.6	6.0	6.0	3.8	4.4	5.8
5	4.1	28	17	10	6.0	25	7.1	6.5	4.8	4.0	3.7	5.6
6	3.9	11	12	20	25	30	7.7	6.7	5.3	9.9	3.6	6.2
7	3.9	6.6	9.5	15	22	40	9.0	6.7	9.0	8.0	3.7	26
8	3.9	5.3	6.2	12	18	25	8.4	6.4	6.2	5.5	3.4	11
9	4.1	4.5	6.4	10	15	20	8.6	6.4	5.3	5.0	3.0	7.1
10	5.8	6.0	7.7	9.0	11	20	8.8	5.5	4.8	5.1	3.0	6.0
11	17	12	8.7	8.0	9.0	20	7.3	5.3	4.7	4.7	8.0	5.8
12	6.6	5.8	8.8	7.5	8.0	20	7.5	7.1	4.7	3.8	9.0	5.8
13	4.9	4.5	9.5	7.0	8.0	20	22	11	6.5	3.8	5.0	5.8
14	15	6.6	9.0	6.5	8.0	70	28	7.5	9.9	9.4	4.4	5.3
15	64	6.9	9.5	6.4	8.0	500	12	6.9	6.5	5.3	4.4	5.6
16	14	8.2	9.5	6.2	8.0	159	9.2	6.7	5.1	6.4	4.1	5.1
17	8.2	6.9	9.5	6.0	8.0	34	8.8	5.8	5.0	7.3	3.2	5.1
18	6.6	5.6	9.4	6.0	10	19	11	5.6	4.7	8.8	3.7	5.5
19	5.8	6.4	12	5.5	40	16	8.0	6.5	4.4	4.7	4.0	5.6
20	5.3	6.6	15	5.5	100	29	7.3	11	4.3	5.0	4.5	5.6
21	7.6	7.8	18	5.5	170	19	7.1	9.4	4.0	5.0	5.6	20
22	13	11	15	5.5	150	16	7.3	6.4	3.6	4.1	9.2	7.7
23	6.4	7.0	12	5.5	80	21	6.9	6.7	4.3	3.8	9.0	6.4
24	5.6	5.1	10	5.5	60	16	6.9	5.1	4.3	4.1	8.6	5.8
25	5.3	5.3	8.0	5.0	50	12	6.7	10	4.4	4.1	8.6	5.6
26	4.7	6.0	6.6	5.0	100	11	6.0	14	4.3	3.5	12	6.7
27	4.5	7.7	6.0	5.0	170	11	5.3	7.5	4.1	6.0	36	17
28	4.7	10	5.9	5.0	130	12	6.5	6.2	3.5	4.3	30	18
29	5.1	19	6.0	5.0	------	12	7.3	5.6	3.3	3.8	9.4	7.3
30	10	13	6.0	5.0	------	12	7.7	4.8	3.8	4.8	6.7	6.0
31	12	------	6.0	5.0	------	11	------	4.4	------	3.6	6.0	------
TOTAL	271.4	287.9	302.2	224.1	1,232.5	1,380	279.0	220.1	152.0	161.4	225.8	241.6
MEAN	8.75	9.60	9.75	7.23	44.0	44.5	9.30	7.10	5.07	5.21	7.28	8.05
MAX	64	40	18	20	170	500	28	14	9.9	9.9	36	26
MIN	3.9	4.5	5.9	5.0	4.5	11	5.3	4.4	3.3	3.5	3.0	5.1
CFSM	.48	.52	.53	.40	2.40	2.43	.51	.39	.28	.28	.40	.44
IN.	.55	.59	.61	.46	2.51	2.81	.57	.45	.31	.33	.46	.49

CAL YR 1970 TOTAL 3,498.1 MEAN 9.58 MAX 85 MIN 3.6 CFSM .52 IN 7.11
WTR YR 1971 TOTAL 4,978.0 MEAN 13.6 MAX 500 MIN 3.0 CFSM .74 IN 10.12

PEAK DISCHARGE (BASE, 80 CFS)

DATE	TIME	GHT	DISCHARGE
10-15	1500	2.69	92
02-21	—	—	about 200
02-27	—	—	about 200
03-15	0800	6.15	698

04149000 Flint River near Fosters, Mich.

LOCATION.—Lat 43°18'30", long 83°57'13", in SE¼ SE¼ sec.35, T.11 N., R.4 E., Saginaw County, on left bank 20 ft downstream from bridge on State Highway 13, 2 miles west of Fosters and 6.5 miles downstream from Silver Creek. Records include flow of Birch Run.

DRAINAGE AREA.—1,189 sq mi, includes that of Birch Run above State Highway 13.

PERIOD OF RECORD.—October 1939 to current year. 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.—Water-stage recorder. Altitude of gage is 600 ft (from topographic map). Prior to Oct. 1, 1969, nonrecording gage at site 2.2 miles upstream at datum 582.22 ft above mean sea level.

AVERAGE DISCHARGE.—32 years, 672 cfs (8.15 inches per year).

EXTREMES.—Current year: Maximum discharge, 6,400 cfs Mar. 15 (gage height, 14.71 ft); maximum gage height, 15.70 ft Feb. 21, backwater from ice; minimum discharge, 75 cfs Sept. 25 (gage height, 1.72 ft).
Period of record: Maximum discharge, 19,000 cfs Apr. 7, 1947 (including flow bypassing gage); maximum gage height, 18.6 ft Feb. 2, 1968, site and datum then in use; minimum discharge observed, 27 cfs Aug. 6, 1941.
Flood of March 1904 reached a stage of 18.4 ft (from U. S. Weather Bureau data), site and datum then in use.

REMARKS.—Records fair except those for the winter period, which are poor. 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. WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	489	403	623	500	270	2,900	1,250	326	219	313	165	120
2	498	330	621	400	270	2,800	1,290	385	224	224	155	226
3	442	544	592	450	270	2,740	1,340	385	313	166	160	213
4	396	888	708	500	260	2,480	1,330	376	256	155	173	268
5	363	1,100	756	550	250	2,300	1,280	367	232	168	173	351
6	334	780	513	600	1,000	2,100	1,250	361	228	517	177	519
7	266	539	863	550	700	1,940	1,180	343	313	256	182	599
8	236	405	956	550	550	1,690	890	332	217	198	180	645
9	232	529	703	550	500	1,610	888	319	268	190	169	544
10	278	647	529	500	480	1,590	863	305	260	190	175	532
11	414	515	558	490	470	1,570	793	303	238	182	209	270
12	330	472	546	470	470	1,520	768	317	230	175	224	124
13	313	491	405	450	470	1,310	1,010	363	288	171	162	87
14	580	474	635	440	450	1,090	1,330	319	372	228	177	171
15	1,110	369	498	420	450	4,750	1,130	307	303	177	196	95
16	770	453	550	400	500	5,580	987	292	258	405	169	80
17	570	458	600	370	600	4,360	940	286	228	238	175	86
18	410	444	673	350	800	3,710	963	286	217	275	181	172
19	403	416	664	340	1,200	3,920	903	292	225	180	196	147
20	503	421	833	320	2,000	4,280	853	394	212	213	175	123
21	565	453	981	340	3,000	4,130	633	354	175	207	671	442
22	493	361	796	330	2,300	3,630	671	307	200	202	466	573
23	652	347	750	320	1,800	3,180	693	286	175	196	270	403
24	611	451	700	330	1,600	2,760	642	274	196	169	238	186
25	414	472	650	320	1,500	2,430	561	311	190	180	228	75
26	484	430	650	320	2,000	2,180	430	356	177	177	296	246
27	601	437	650	300	2,500	1,900	347	290	189	250	501	428
28	537	389	750	230	3,000	1,430	580	270	159	182	462	387
29	508	501	600	300	------	1,360	430	250	173	171	259	200
30	460	750	550	300	------	1,320	322	288	160	186	226	162
31	544	------	550	290	------	1,240	------	247	------	151	198	------
TOTAL	14,806	15,269	20,453	12,580	29,660	79,800	26,547	9,891	6,895	6,692	7,388	8,474
MEAN	478	509	660	406	1,059	2,574	885	319	230	216	238	282
MAX	1,110	1,100	981	600	3,000	5,580	1,340	394	372	517	671	645
MIN	232	330	405	230	250	1,090	322	247	159	151	155	75
CFSM	.40	.43	.56	.34	.89	2.16	.74	.27	.19	.18	.20	.24
IN.	.46	.48	.64	.39	.93	2.50	.83	.31	.22	.21	.23	.27

CAL YR 1970 TOTAL 189,578 MEAN 519 MAX 2,280 MIN 190 CFSM .44 IN 5.93
WTR YR 1971 TOTAL 238,455 MEAN 653 MAX 5,580 MIN 75 CFSM .55 IN 7.46

04149500 Flint River near Alicia, Mich.

LOCATION.—Lat 43°18'40", long 84°02'00", in SE¼ sec.31, T.11 N., R.4 E., Saginaw County, on left bank 100 ft downstream from the Prairie Farms Association flood-pumping station, 2.8 miles north of Alicia, and 4 miles upstream from mouth.

PERIOD OF RECORD.—November 1948 to current year (gage heights only).

GAGE.—Water-stage recorder. Datum of gage is 577.00 ft above mean sea level.

EXTREMES.—Current year: Maximum gage height, 10.22 ft Mar. 17; minimum, 1.97 ft Nov. 23.
Period of record: Maximum gage height, 13.70 ft Apr. 3, 1960; minimum, less than 1.5 ft during many days in 1949, 1958, 1959, 1963, 1964, 1966-69.

REMARKS.—Records represent stages in the Shiawassee Flats area.

MEAN GAGE HEIGHT, IN FEET, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.03	3.85	3.79	3.79	3.15	9.09	5.81	4.01	4.45	4.53	4.14	4.42
2	3.33	4.41	3.45	3.52	3.15	8.87	6.03	4.46	4.32	4.80	4.20	4.18
3	3.86	4.65	4.45	3.82	3.16	8.48	6.09	4.53	4.21	4.45	4.49	4.15
4	3.83	5.42	5.59	3.67	3.16	7.98	6.30	4.18	4.28	4.21	4.61	4.10
5	3.66	5.95	4.65	3.39	3.15	7.37	6.17	4.24	4.57	4.36	4.49	4.16
6	3.58	5.87	4.89	3.80	3.15	6.84	5.74	4.47	4.12	4.37	4.36	4.17
7	3.68	5.72	4.83	3.84	3.16	6.60	5.38	4.31	4.19	4.35	4.42	4.20
8	3.67	5.21	4.05	3.85	3.20	6.13	5.16	4.25	4.54	4.16	4.31	4.29
9	3.57	4.62	3.95	3.71	3.21	5.81	4.97	4.31	4.75	4.46	4.19	4.69
10	3.10	4.18	4.07	3.53	3.21	5.52	5.20	4.18	4.56	4.63	3.93	4.24
11	4.13	4.44	4.63	3.72	3.18	5.28	4.90	4.02	4.30	5.02	4.50	4.35
12	3.78	4.35	4.48	3.79	3.15	5.07	4.67	3.91	4.25	4.52	4.55	4.76
13	3.92	4.71	3.95	3.75	3.39	4.82	5.13	4.15	4.45	3.85	4.41	4.56
14	4.17	5.08	3.66	3.40	3.42	4.49	5.78	4.21	4.59	4.50	4.55	4.32
15	5.22	4.89	3.92	3.63	3.36	7.71	5.99	3.72	4.46	4.33	5.04	4.48
16	4.99	3.81	3.89	3.67	3.16	9.79	5.81	4.09	4.41	4.12	4.50	4.43
17	4.57	3.84	3.98	3.49	2.90	10.16	5.41	4.09	4.29	4.73	4.40	4.33
18	4.23	3.71	3.86	3.62	3.07	10.13	5.35	3.83	4.17	4.57	4.37	4.53
19	4.29	3.57	3.83	3.47	3.70	9.94	5.17	3.89	4.36	4.71	4.17	4.46
20	4.06	3.70	4.08	3.43	6.54	9.62	4.89	3.78	4.16	4.45	4.37	4.02
21	3.91	3.39	4.60	3.25	8.79	9.15	4.91	4.42	4.74	4.14	4.40	4.23
22	3.96	3.64	4.65	3.45	8.82	8.57	5.03	4.37	4.42	3.87	4.50	4.26
23	3.97	2.67	4.32	3.24	8.23	8.02	4.59	4.15	4.24	4.28	4.98	3.84
24	3.90	3.99	3.94	3.47	7.94	7.53	4.71	3.83	4.60	4.64	4.51	4.28
25	3.91	3.37	4.06	3.41	7.73	7.04	4.46	3.05	4.63	4.35	4.37	4.13
26	3.79	3.28	4.02	3.41	8.20	6.64	4.42	3.97	4.64	4.27	4.86	4.22
27	3.73	3.88	4.03	3.70	8.96	6.36	4.34	4.57	4.32	4.49	4.77	4.07
28	3.41	4.26	3.96	3.48	9.15	6.06	4.31	4.34	4.21	3.77	4.56	3.80
29	3.34	3.55	4.02	3.32		5.91	4.27	4.29	4.21	4.40	4.35	4.07
30	3.80	3.94	3.89	3.28	------	5.72	4.26	4.21	4.15	4.59	4.50	4.13
31	3.78	------	3.87	3.16	------	5.74	------	4.96	------	4.15	4.64	------

04150000 South Branch Cass River near Cass City, Mich.

LOCATION.—Lat 43°34'01", long 83°06'43", in SW¼ NW¼ sec.7, T.13 N., R.12 E., Sanilac County, on left bank 1.5 miles downstream from bridge on State Highway 53, 3.9 miles southeast of Cass City, 4.2 miles upstream from confluence with North Branch.

DRAINAGE AREA.—251 sq mi.

PERIOD OF RECORD.—October 1948 to current year. Monthly discharge only for some periods, published in WSP 1307. Prior to October 1963, published as East Branch Cass River near Cass City.

GAGE.—Water-stage recorder. Datum of gage is 719.5 ft above mean sea level. Prior to Nov. 8, 1952, nonrecording gage at site 1.5 miles upstream at different datum.

AVERAGE DISCHARGE.—23 years, 117 cfs (6.33 inches per year).

EXTREMES.—Current year: Maximum discharge, 4,560 cfs Mar. 15 (gage height, 12.51 ft); minimum, 3.1 cfs Aug. 22 (gage height, 1.73 ft).
Period of record: Maximum discharge, 6, 400 cfs Mar. 28, 1967 (gage height, 14.86 ft); minimum, 0.2 cfs Sept. 20-23, 1955, Aug. 19, 20, 1958.

REMARKS.—Records good except those for winter periods, which are fair.

REVISIONS (WATER YEARS).—WSP 1337: 1949-50. WSP 1707: 1951-53, 1959.

Rating tables (gage height, in feet and discharge, in cubic feet per second)
(Shifting-control method used Oct. 29 to Dec. 6, Apr. 1, 2;
stage-discharge relation affected by ice Nov. 24, 25,
Dec. 7, 8, Dec. 12 to Mar. 13, Mar. 18 to Mar. 31)

Oct. 1 to Mar. 5

2.0	12	4.0	330
2.2	25	5.0	590
2.5	56	7.0	1,250

Mar. 6 to Sept. 30

1.6	2.2	3.5	220
1.7	3.3	5.0	550
1.8	5.2	7.0	1,160
1.9	8.0	9.0	2,180
2.0	12	13.0	4,910
2.1	18		
2.3	34		
2.6	70		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	44	131	50	15	1,250	719	61	17	6.5	4.3	8.0
2	38	31	105	50	15	1,000	818	70	19	6.3	4.1	7.5
3	35	342	91	52	15	750	472	71	23	6.0	4.2	7.6
4	32	594	430	55	15	620	276	62	28	5.7	4.1	6.8
5	28	290	272	62	16	500	210	56	22	5.7	3.9	6.3
6	25	148	136	68	17	400	189	52	18	6.6	3.9	6.1
7	22	87	110	68	19	340	198	48	17	6.8	4.0	7.3
8	21	55	72	58	21	300	201	43	17	7.8	3.7	6.7
9	19	40	79	52	24	250	193	41	16	7.9	3.5	5.8
10	20	39	105	47	26	220	182	39	15	7.1	3.5	5.2
11	19	43	96	45	28	200	154	38	13	5.5	3.5	4.9
12	19	40	94	43	28	190	142	40	11	4.9	3.7	4.8
13	20	37	92	40	28	190	261	44	50	5.0	3.9	4.5
14	90	33	90	38	28	206	304	42	88	4.7	4.1	4.3
15	362	31	90	37	28	1,840	189	39	46	4.6	4.4	4.1
16	213	31	94	35	28	4,460	140	37	28	4.7	4.2	4.0
17	125	30	96	32	30	3,000	120	37	19	4.7	3.9	4.1
18	87	29	100	31	32	1,800	128	35	14	4.3	3.6	4.0
19	64	28	120	29	35	1,000	118	36	11	4.7	3.3	4.0
20	51	31	135	27	45	800	99	36	10	5.0	3.2	5.0
21	59	41	120	25	60	600	88	34	9.3	5.0	3.3	6.9
22	90	43	105	24	150	520	80	34	8.6	4.8	3.6	6.4
23	80	31	88	23	340	480	71	32	7.9	4.7	4.2	6.8
24	63	29	74	22	320	440	66	30	7.6	4.5	4.6	6.9
25	50	27	70	21	300	380	70	36	7.1	4.4	6.4	5.8
26	42	25	70	19	320	350	67	38	7.1	4.5	14	5.5
27	36	33	66	19	450	340	62	36	7.1	4.3	23	5.2
28	31	67	62	18	950	400	59	32	6.6	4.2	15	5.2
29	28	103	58	17	------	460	63	28	6.1	4.4	15	5.2
30	41	171	54	16	------	560	64	23	6.1	4.5	13	5.5
31	64	------	51	16	------	320	------	20	------	4.5	9.8	------
TOTAL	1,922	2,573	3,356	1,139	3,383	24,166	5,803	1,270	555.5	164.3	188.9	170.4
MEAN	62.0	85.8	108	36.7	121	780	193	41.0	18.5	5.30	6.09	5.68
MAX	362	594	430	68	950	4,460	818	71	88	7.9	23	8.0
MIN	19	25	51	16	15	190	59	20	6.1	4.2	3.2	4.0
CFSM	.25	.34	.43	.15	.48	3.11	.77	.16	.07	.02	.02	.02
IN.	.28	.38	.50	.17	.50	3.58	.86	.19	.08	.02	.03	.03

CAL YR 1970 TOTAL 28,654.2 MEAN 78.5 MAX 1,290 MIN 4.4 CFSM .31 IN 4.25
WTR YR 1971 TOTAL 44,691.1 MEAN 122 MAX 4,460 MIN 3.2 CFSM .49 IN 6.62

PEAK DISCHARGE (BASE, 1,100 CFS).—Mar. 1 (time unknown) 1,600 cfs; Mar. 15 (2200) 4,560 cfs (12.51 ft).

04150500 Cass River at Cass City, Mich.

LOCATION.—Lat 43°35'03", long 83°10'34", in NE¼ NE¼ sec.4, T.13 N., R.11 E., Tuscola County, on left bank 600 ft downstream from bridge on Cemetery Road, 0.3 mile downstream from confluence of North and South Branches, and 1.1 miles south of Cass City.

DRAINAGE AREA.—370 sq mi, approximately.

PERIOD OF RECORD.—October 1947 to current year. 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. Prior to Nov. 14, 1952, nonrecording gage at site 600 ft upstream at present daum.

AVERAGE DISCHARGE.—24 years, 190 cfs (6.97 inches per year).

EXTREMES.—Current year: Maximum discharge, 5,160 cfs Mar. 16 (gage height, 12.86 ft); minimum, 3.4 cfs Aug. 21.
Period of record: Maximum discharge, 8,460 cfs Mar. 20, 1948 (gage height, 15.80 ft, from graph based on gage readings); minimum, 0.50 cfs Sept. 26, 1948.

REMARKS.—Records good except those for winter periods, which are fair.

REVISIONS (WATER YEARS).—WSP 1337: 1949-50. WSP 1727: 1948(M), 1950.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	98	97	225	105	28	2,200	1,280	140	39	12	5.8	16
2	80	81	192	105	27	1,800	1,480	152	39	12	5.5	15
3	70	348	176	105	27	1,400	1,140	148	47	11	6.0	14
4	63	830	574	110	27	1,100	830	135	53	10	5.3	13
5	57	520	486	115	28	860	620	125	46	10	5.1	12
6	50	359	332	130	35	660	490	118	40	9.9	4.7	12
7	45	277	240	145	42	560	439	107	37	9.9	4.7	12
8	42	209	200	130	46	470	413	98	62	11	4.6	12
9	38	166	189	120	50	420	401	90	58	11	4.2	12
10	39	155	218	110	54	370	393	86	67	10	4.0	9.8
11	39	154	209	100	56	340	355	81	59	8.8	4.1	8.8
12	39	141	200	95	58	320	330	84	45	7.4	3.9	8.2
13	38	129	190	88	57	310	442	86	62	7.1	4.3	7.1
14	80	116	190	82	56	340	525	82	92	6.9	4.4	6.4
15	400	108	190	76	56	1,790	388	78	64	6.4	5.1	6.2
16	287	100	195	72	58	5,010	320	76	43	6.5	5.2	5.9
17	202	93	200	66	62	4,020	271	75	33	6.9	4.9	5.2
18	174	90	210	62	67	2,710	262	72	26	6.4	4.3	5.2
19	142	87	230	58	76	1,870	241	69	22	7.0	3.9	5.0
20	114	88	270	54	150	1,340	215	69	19	7.1	3.7	7.3
21	111	97	300	50	350	1,130	195	62	18	7.1	3.6	8.6
22	132	102	240	47	540	977	174	57	17	7.0	4.4	9.1
23	125	95	190	44	650	976	157	53	16	6.8	5.7	9.4
24	105	92	160	42	580	853	147	52	15	6.7	5.6	10
25	94	86	145	39	540	690	151	77	16	6.1	7.1	9.3
26	82	77	150	37	530	572	146	81	15	6.2	15	8.8
27	73	86	140	34	950	553	138	74	15	5.9	23	7.7
28	64	120	135	33	2,100	696	138	69	14	5.5	18	7.6
29	66	168	120	32	------	1,090	143	62	13	6.0	19	7.6
30	81	246	115	30	------	1,140	141	53	12	6.0	20	9.4
31	110	------	110	29	------	1,040	------	46	------	6.1	18	------
TOTAL	3,140	5,317	6,721	2,345	7,300	37,607	12,365	2,657	1,104	246.7	233.1	280.6
MEAN	101	177	217	75.6	261	1,213	412	85.7	36.8	7.96	7.52	9.35
MAX	400	830	574	145	2,100	5,010	1,480	152	92	12	23	16
MIN	38	77	110	29	27	310	138	46	12	5.5	3.6	5.0
CFSM	.27	.48	.59	.20	.71	3.28	1.11	.23	.10	.02	.02	.03
IN.	.32	.53	.68	.24	.73	3.78	1.24	.27	.11	.02	.02	.03

CAL YR 1970 TOTAL 52,916.0 MEAN 145 MAX 1,650 MIN 10 CFSM .39 IN 5.32
WTR YR 1971 TOTAL 79,316.4 MEAN 217 MAX 5,010 MIN 3.6 CFSM .59 IN 7.97

PEAK DISCHARGE (BASE, 1,400 CFS)

DATE	TIME	GHT	DISCHARGE
03-01	—	—	about 2,600
03-16	1600	12.86	5,160
04-02	1200	8.56	1,560

04150800 Cass River at Wahjamega, Mich.

LOCATION.--Lat 43°27'02", long 83°26'29", in NW¼ NW¼ sec.20, T.12 N., R.9 E., Tuscola County, on right bank 90 ft upstream from bridge on Chambers Road, on grounds of Caro State Hospital at Wahjamega, 1.9 miles downstream from Michigan Sugar Co. dam, and 40 miles upstream from mouth.

DRAINAGE AREA.--637 sq mi.

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 650 ft (from topographic map). Prior to June 19, 1969, nonrecording gage at bridge 90 ft downstream at present datum.

EXTREMES.--Current year: Maximum discharge, 7,610 cfs Mar. 16 (gage height, 16.91 ft); minimum, 22 cfs Aug. 9, 10, 16, 17, 18, 19, 20, 21, 22, (all or part of the day).
Period of record: Maximum discharge, 7,610 cfs Mar. 16, 1971 (gage height, 16.91 ft); minimum, 22 cfs Sept. 22, 1969, Aug. 9, 10, 16, 17, 18, 19, 20, 21, 22, 1971.

REMARKS.--Records good except those for the winter period, which are fair. Some regulation by dam at Michigan Sugar Co., 1.9 miles above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Dec. 7, 8, 16, 17, 21-23, 29, 30, Jan. 8 to Feb. 20, Mar. 8-10).

2.8	20	5.0	470
3.0	34	7.0	1,140
3.2	60	10.0	2,570
4.0	220	14.0	4,900
		16.0	6,700

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	258	298	515	228	98	4,340	1,980	298	118	44	25	45
2	226	268	437	224	96	3,270	2,330	305	116	40	25	41
3	204	679	392	226	94	2,670	2,120	305	122	39	26	42
4	190	1,750	752	228	94	2,100	1,480	282	134	38	26	40
5	174	1,350	1,040	256	96	1,500	1,120	258	132	38	25	40
6	160	916	673	305	105	1,340	913	246	120	44	24	54
7	148	698	450	328	115	1,150	801	228	110	44	24	52
8	136	551	400	270	125	880	756	212	104	44	23	44
9	132	437	390	240	140	800	734	196	122	44	22	41
10	136	410	405	220	160	720	724	186	114	41	22	36
11	132	416	437	210	170	668	689	176	118	40	24	35
12	132	402	385	200	170	617	644	178	112	38	24	34
13	132	362	437	190	170	608	717	184	122	35	23	31
14	231	315	449	180	165	671	969	180	132	35	23	31
15	800	290	392	175	165	2,500	899	166	146	34	23	31
16	760	268	400	170	170	6,460	710	158	118	33	23	30
17	485	254	430	160	170	6,590	614	150	96	33	23	29
18	378	244	449	150	175	4,530	593	144	82	31	23	29
19	318	240	494	145	180	3,370	563	138	74	32	23	28
20	262	242	756	140	200	2,380	491	156	62	32	23	34
21	268	265	640	135	556	1,820	440	150	59	32	23	39
22	292	265	500	130	953	1,640	395	136	53	28	24	35
23	292	252	400	125	1,120	1,660	360	126	50	27	28	33
24	256	216	345	125	1,020	1,480	335	130	49	28	29	32
25	236	210	310	120	983	1,270	332	210	47	27	30	31
26	224	212	325	115	1,100	1,060	335	210	46	27	59	33
27	218	212	310	110	2,320	1,000	310	196	45	24	90	32
28	200	250	288	110	4,540	1,160	298	176	44	24	80	32
29	204	342	250	105	------	1,680	305	160	42	26	62	30
30	242	464	235	105	------	1,960	310	144	42	26	52	31
31	305	------	230	100	------	1,760	------	130	------	26	49	------
TOTAL	8,131	13,078	13,916	5,525	15,450	63,654	23,267	5,914	2,731	1,054	1,000	1,075
MEAN	262	436	449	178	552	2,053	776	191	91.0	34.0	32.3	35.8
MAX	800	1,750	1,040	328	4,540	6,590	2,330	305	146	44	90	54
MIN	132	210	230	100	94	608	298	126	42	24	22	28
CFSM	.41	.68	.70	.28	.87	3.22	1.22	.30	.14	.05	.05	.06
IN.	.47	.76	.81	.32	.90	3.72	1.36	.35	.16	.06	.06	.06

CAL YR 1970 TOTAL 116,274 MEAN 319 MAX 4,550 MIN 33 CFSM .50 IN 6.79
WTR YR 1971 TOTAL 154,795 MEAN 424 MAX 6,590 MIN 22 CFSM .67 IN 9.04

PEAK DISCHARGE (BASE, 2,400 CFS)

DATE	TIME	GHT	DISCHARGE
02-28	2130	14.21	5,030
03-16	2030	16.91	7,610
04-02	2100	9.71	2,420

04151500 Cass River at Frankenmuth, Mich.
(International hydrological decade station)

LOCATION.--Lat 43°19'40", long 83°44'53", in NW¼ SE¼ sec.27, T.11 N., R.6 E., Saginaw County, on right bank 2,000 ft below dam in Frankenmuth, 3,600 ft above highway bridge on Dehmel Road, 3.4 miles upstream from Dead Creek, and 17 miles upstream from mouth.

DRAINAGE AREA.--848 sq mi.

PERIOD OF RECORD.--February 1908 to March 1909, July 1935 to September 1936, June 1939 to current year.

GAGE.--Water-stage recorder. Datum of gage is 583.96 ft above mean sea level (levels by Michigan Department of Natural Resources). February 1908 to March 1909, nonrecording gage at site 2,000 ft upstream at datum 1.81 ft lower. July 18 to Sept. 11, 1935, nonrecording gage, Sept. 12, 1935, to Sept. 30, 1936, and June 20, 1939, to Sept. 30, 1949, water-stage recorder, at site 3,600 ft downstream at datum 0.04 ft higher.

AVERAGE DISCHARGE.--33 years (1935-36, 1939-71), 452 cfs (7.24 inches per year).

EXTREMES.--Current year: Maximum discharge, 8,460 cfs Mar. 17 (gage height, 19.16 ft); minimum, 22 cfs Aug. 22.
Period of record: Maximum discharge, 17,700 cfs Mar. 18, 1942 (gage height, 20.88 ft), site and datum then in use; maximum gage height, 23.37 ft Feb. 3, 1968 (backwater from ice); minimum daily discharge, about 1.5 cfs Aug. 6, 1944.

REMARKS.--Records good except those for winter periods, which are fair. Occasional regulation by dams above station. Prior to 1950, regulation at low and medium flows by mill above station. Records of suspended sediment loads for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1307: 1936 (M), 1940 (M). WSP 1727: 1952. WSP 1911: 1952.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Dec. 21 to Mar. 13, Mar. 21-26)

3.0	20	11.0	2,060
3.2	32	15.0	4,200
3.8	94	19.0	8,200
5.0	272		
7.0	740		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	382	423	720	320	140	5,000	1,980	388	153	61	32	62
2	331	390	665	310	135	4,000	2,350	398	146	61	33	57
3	306	588	582	310	135	3,500	2,390	398	155	55	38	54
4	273	2,010	706	310	130	2,500	1,820	374	159	50	37	55
5	249	2,140	1,270	350	140	2,000	1,400	342	160	52	35	54
6	226	1,440	1,080	400	150	1,800	1,160	318	152	63	33	52
7	209	1,080	690	420	170	1,500	1,020	293	137	66	31	73
8	191	845	612	380	190	1,300	942	274	129	61	29	70
9	178	688	578	340	220	1,100	901	256	125	58	28	58
10	182	645	555	310	240	1,000	876	239	140	53	28	53
11	188	662	600	300	240	900	831	227	131	47	32	47
12	179	632	582	280	240	850	772	232	137	44	33	45
13	181	582	580	270	230	840	929	242	137	44	30	45
14	341	505	640	260	225	1,100	1,220	237	154	42	27	44
15	1,020	445	585	240	230	4,510	1,170	220	170	41	25	41
16	1,160	408	570	230	235	6,680	918	205	167	41	25	39
17	803	382	654	220	240	7,990	801	192	133	41	24	37
18	589	362	634	210	250	6,290	798	179	112	39	24	36
19	485	350	699	205	400	4,440	726	175	98	40	24	36
20	410	360	1,010	200	960	3,190	644	183	87	41	24	46
21	406	412	900	190	1,200	2,200	576	195	80	41	24	57
22	439	410	720	180	1,300	2,000	528	180	78	37	23	61
23	431	384	600	175	1,600	1,800	470	163	70	32	26	56
24	404	334	520	170	1,600	1,700	431	162	67	35	31	52
25	359	292	450	165	1,500	1,500	420	225	67	35	34	47
26	321	294	440	160	1,600	1,300	417	296	64	33	60	51
27	308	300	450	155	2,500	1,270	391	269	65	32	120	54
28	286	358	400	150	4,000	1,320	374	243	62	35	120	55
29	278	468	370	150	------	1,670	394	213	60	38	99	54
30	333	635	340	145	------	2,080	401	188	57	37	82	51
31	404	------	320	140	------	1,980	------	169	------	34	70	------
TOTAL	11,852	18,824	19,522	7,645	20,200	79,310	28,050	7,675	3,452	1,389	1,281	1,542
MEAN	382	627	630	247	721	2,558	935	248	115	44.8	41.3	51.4
MAX	1,160	2,140	1,270	420	4,000	7,990	2,390	398	170	66	120	73
MIN	178	292	320	140	130	840	374	162	57	32	23	36
CFSM	.45	.74	.74	.29	.85	3.02	1.10	.29	.14	.05	.05	.06
IN.	.52	.83	.86	.34	.89	3.48	1.23	.34	.15	.06	.06	.07

CAL YR 1970 TOTAL 160,670 MEAN 440 MAX 5,620 MIN 56 CFSM .52 IN 7.05
WTR YR 1971 TOTAL 200,742 MEAN 550 MAX 7,990 MIN 23 CFSM .65 IN 8.81

PEAK DISCHARGE (BASE, 3,500 CFS).--Mar. 1 (0800) 5,200 cfs (18.06 ft); Mar. 17 (0900) 8, 460 cfs (19.16 ft).

04152500 Tobacco River at Beaverton, Mich.

LOCATION.—Lat 43°52'43", long 84°28'18", in NW¼ SE¼ sec.7, T.17 N., R.1 W., Gladwin County, on left bank 15 ft downstream from bridge on Glidden Road, 1 mile downstream from dam at Beaverton, and 2 miles upstream from Venison Creek.

DRAINAGE AREA.—487 sq mi.

PERIOD OF RECORD.—July 1948 to current year.

GAGE.—Water-stage recorder. Datum of gage is 683.27 ft above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.—23 years, 365 cfs (10.18 inches per year).

EXTREMES.—Current year: Maximum discharge, 2,720 cfs Apr. 2 (gage height, 7.74 ft); minimum, 114 cfs Sept. 17 (gage height, 1.94 ft). Period of record: Maximum discharge, 7,680 cfs July 9, 1957 (gage height, 12.95 ft); minimum, 5.6 cfs July 12, 13, 14, 1959, Aug. 21, 1961; minimum daily, 5.9 cfs July 12, 13, 1959.

REMARKS.—Records good except those for winter periods, which are fair. Prior to Feb. 21, 1961, regulation at all stages by power-plant 1 mile above station; occasional regulation since.

REVISIONS (WATER YEARS).—WSP 1307: 1948 (M).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Dec. 28 to Jan. 1, Jan. 7-9, 12-19, Jan. 28 to Feb. 16, Mar. 3, 4, 9-11)

2.0	124	6.0	1,600
3.0	335	8.0	2,900
4.0	680		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	219	335	401	330	290	1,040	1,550	479	278	171	169	155
2	242	332	518	321	290	1,030	2,360	496	279	170	169	155
3	228	884	578	332	280	800	2,090	470	507	165	167	157
4	213	1,440	1,090	332	280	740	1,530	381	336	160	167	159
5	196	1,210	1,190	367	280	707	1,090	363	280	164	165	165
6	198	577	743	431	290	642	1,030	351	304	170	159	175
7	204	517	392	400	300	591	1,310	358	317	164	155	180
8	202	455	429	380	320	496	1,670	355	507	164	153	176
9	227	401	431	360	340	480	2,130	337	306	166	150	168
10	583	421	394	334	360	460	1,990	329	250	169	153	164
11	953	462	404	357	390	450	1,670	295	258	165	158	164
12	516	481	410	340	400	440	1,590	299	244	160	170	163
13	342	375	411	320	400	427	2,160	313	241	160	171	164
14	460	336	402	310	390	537	2,500	315	244	164	166	164
15	402	331	346	300	370	883	1,790	313	244	166	162	163
16	353	320	326	290	370	1,440	1,180	308	248	169	158	158
17	314	285	382	290	374	1,760	978	303	249	174	154	134
18	282	326	397	290	367	1,570	987	298	235	176	151	125
19	271	402	390	290	366	1,290	803	298	229	178	149	138
20	264	372	403	288	439	1,070	754	313	222	181	142	183
21	258	511	353	316	784	902	730	329	214	213	140	194
22	256	505	357	319	866	681	627	317	210	158	138	182
23	253	506	362	342	767	738	466	303	207	163	139	174
24	249	436	352	308	734	624	450	306	201	165	140	156
25	243	369	334	304	707	575	469	477	199	170	145	152
26	226	355	351	311	671	551	428	512	208	170	154	169
27	226	343	290	304	857	529	402	361	207	168	163	180
28	232	343	300	300	1,040	456	439	328	179	167	170	234
29	320	351	310	290	------	505	516	299	170	168	169	297
30	414	382	320	280	------	774	486	289	171	168	164	280
31	396	------	330	280	------	962	------	286	------	166	158	------
TOTAL	9,742	14,363	13,696	10,016	13,322	24,150	36,175	10,781	7,744	5,232	4,868	5,228
MEAN	314	479	442	323	476	779	1,206	348	258	169	157	174
MAX	953	1,440	1,190	431	1,040	1,760	2,500	512	507	213	171	297
MIN	196	285	290	280	280	427	402	286	170	158	138	125
CFSM	.64	.98	.91	.66	.98	1.60	2.48	.71	.53	.35	.32	.36
IN.	.74	1.10	1.05	.77	1.02	1.84	2.76	.82	.59	.40	.37	.40

CAL YR 1970 TOTAL 137,131 MEAN 376 MAX 3,110 MIN 138 CFSM .77 IN 10.47
WTR YR 1971 TOTAL 155,317 MEAN 426 MAX 2,500 MIN 125 CFSM .87 IN 11.86

04153500 Salt River near North Bradley, Mich.

LOCATION.--Lat 43°42'10", long 84°28'14", in NE¼ SE¼ sec.7, T.15 N., R.1 W., Midland County, on right bank 200 ft upstream from bridge on North Saginaw Road, 0.5 mile upstream from Bluff Creek, 1.1 miles southeast of North Bradley, and 7 miles upstream from mouth.

DRAINAGE AREA.--138 sq mi.

PERIOD OF RECORD.—June 1934 to September 1971 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 616.01 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to Mar. 26, 1942, nonrecording gage at site 100 ft downstream, Mar. 27, 1942, to July 7, 1954, nonrecording gage at bridge 200 ft downstream, and July 8, 1954, to Sept. 30, 1959, water-stage recorder at present site, at datum 2.00 ft higher.

AVERAGE DISCHARGE.--37 years, 77.7 cfs (7.65 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,780 cfs Apr. 2 (gage height, 12.55 ft); minimum, 4.1 cfs Aug. 23,24.
Period of record: Maximum discharge, 8,200 cfs Mar. 20, 1948 (gage height, 14.95 ft, from graph based on gage readings, site and datum then in use), from rating curve extended above 4,400 cfs; minimum observed, 1.1 cfs Aug. 14, 1944 (gage height, 0.21 ft, site and datum then in use).

REMARKS.--Records good except those for the winter period, which are poor.

REVISIONS (WATER YEARS).--WSP 1337: 1936-39, 1940 (M), 1943 (M), 1949-50.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	33	48	47	21	320	1,200	61	28	10	6.7	6.2
2	11	33	108	48	22	300	1,710	64	29	10	6.7	6.2
3	10	270	92	49	22	270	1,300	59	36	10	6.7	6.2
4	10	670	485	49	22	220	850	53	35	10	6.7	6.2
5	10	383	561	49	22	180	540	50	30	10	6.2	7.2
6	9.0	175	218	49	23	150	345	47	25	11	5.8	9.0
7	10	117	138	49	25	140	406	45	24	10	5.8	10
8	10	84	100	48	28	120	402	41	28	9.0	5.3	10
9	23	69	86	47	31	105	353	40	33	9.0	5.3	7.6
10	145	77	86	45	34	94	258	38	25	8.5	4.9	7.2
11	230	95	79	43	36	84	196	37	22	8.1	5.8	7.6
12	71	81	79	41	37	78	176	37	21	7.6	5.8	8.5
13	45	69	78	39	37	72	433	36	25	8.1	6.7	8.5
14	50	59	74	37	37	72	543	35	53	8.1	5.8	7.6
15	130	53	72	36	37	82	262	34	53	9.0	5.8	7.2
16	68	47	70	34	38	150	192	34	36	10	6.2	6.7
17	45	42	68	33	39	260	169	34	24	10	5.8	5.8
18	36	40	67	32	40	510	172	33	20	8.5	5.3	6.2
19	29	40	65	31	43	380	144	35	18	10	4.9	6.2
20	26	49	62	30	46	270	122	33	16	10	4.9	8.5
21	25	134	60	29	80	220	111	32	16	9.0	4.4	8.5
22	25	98	58	28	230	180	94	31	16	7.6	4.4	8.1
23	23	76	57	27	190	160	82	31	14	7.2	4.4	7.2
24	22	54	56	27	165	135	76	34	14	7.2	4.4	6.7
25	20	50	54	26	155	115	69	48	14	6.7	7.2	6.7
26	20	47	53	26	145	105	65	49	14	6.7	8.5	7.6
27	19	44	52	25	150	105	60	41	13	6.7	16	7.6
28	18	48	50	24	220	110	61	38	12	6.7	12	11
29	22	50	49	23	------	140	68	36	11	8.1	10	21
30	34	80	48	22	------	170	63	34	10	8.1	8.5	18
31	39	------	47	21	------	350	------	31	------	7.2	6.7	------
TOTAL	1,247.0	3,167	3,220	1,114	1,975	5,647	10,522	1,251	715	268.1	203.6	251.0
MEAN	40.2	106	104	35.9	70.5	182	351	40.4	23.8	8.65	6.57	8.37
MAX	230	670	561	49	230	510	1,710	64	53	11	16	21
MIN	9.0	33	47	21	21	72	60	31	10	6.7	4.4	5.8
CFSM	.29	.77	.75	.26	.51	1.32	2.54	.29	.17	.06	.05	.06
IN.	.34	.85	.87	.30	.53	1.52	2.84	.34	.19	.07	.05	.07

CAL YR 1970 TOTAL 28,594.8 MEAN 78.3 MAX 2,240 MIN 5.3 CFSM .57 IN 7.71
WTR YR 1971 TOTAL 29,580.7 MEAN 81.0 MAX 1,710 MIN 4.4 CFSM .59 IN 7.97

PEAK DISCHARGE (BASE, 800 CFS).--Apr. 2 (2030) 1,780 cfs (12.55 ft).

04154000 Chippewa River near Mount Pleasant, Mich.

LOCATION.—Lat 43°37'32", long 84°42'28", in NW¼ NW¼ sec.8, T.14 N., R.3 W., Isabella County, on right bank 12 ft downstream from bridge on South Leaton Road, 3.8 miles northeast of Mount Pleasant, and 36 miles upstream from mouth.

DRAINAGE AREA.—416 sq mi.

PERIOD OF RECORD.—October 1930 to September 1931, October 1932 to current year. 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 (levels by Michigan Department of Natural Resources). Prior to Oct. 21, 1938, nonrecording gage at site 30 ft upstream at present datum.

AVERAGE DISCHARGE.—40 years, 291 cfs (9.50 inches per year).

EXTREMES.—Current year: Maximum discharge, 1,510 cfs Apr. 14 (gage height, 7.09 ft); minimum, 80 cfs July 17.
Period of record: 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, 2.70 ft Oct. 8, 1966.

REMARKS.—Records good except those for the winter periods, which are fair. Diurnal fluctuation below 750 cfs caused by power-plant at Mount Pleasant prior to 1962, occasional regulation at low flow since. Since July 30, 1968 occasional regulation from control structures on lake outlets.

REVISIONS (WATER YEARS).—WSP 744: Drainage area. WSP 1337: 1931, 1933-40, 1945, 1948-49.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-3, June 11 to Sept. 16; stage-discharge relation affected by ice Dec. 7, Dec. 25 to Feb. 20, Mar. 8, 9)

2.4	78	4.0	435
3.0	166	7.0	1,470

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	166	246	305	270	185	605	1,010	380	237	134	93	119
2	165	246	331	270	185	527	1,260	367	240	128	93	120
3	167	465	323	270	185	473	1,240	368	244	120	94	122
4	165	657	545	270	190	436	1,050	355	267	119	92	125
5	164	563	538	270	190	413	935	346	273	123	92	137
6	171	483	443	280	195	446	933	330	265	123	93	156
7	174	421	350	280	200	445	993	320	264	118	93	158
8	174	362	331	290	210	380	1,050	308	257	113	93	149
9	183	332	325	270	230	350	1,120	300	235	114	95	143
10	576	336	314	260	240	371	1,140	290	224	108	93	140
11	364	325	317	250	250	374	1,150	268	221	102	100	138
12	292	332	324	240	260	356	1,150	264	211	97	100	137
13	261	320	307	240	260	343	1,280	268	212	98	97	135
14	343	303	300	230	260	346	1,450	261	204	97	94	131
15	338	285	289	230	260	696	1,310	251	194	89	97	132
16	285	273	310	220	270	1,130	1,210	239	186	90	97	128
17	267	264	283	220	280	1,060	1,060	235	177	86	94	127
18	253	255	287	210	300	984	932	241	167	83	95	126
19	239	251	293	210	350	903	766	238	160	91	94	130
20	231	269	303	205	500	832	645	241	158	90	97	139
21	231	318	295	200	573	728	581	232	156	92	95	140
22	228	306	286	200	488	653	527	224	144	91	96	140
23	224	313	282	195	455	602	483	219	140	94	110	141
24	221	287	299	190	401	566	449	224	139	90	114	139
25	216	271	290	190	388	511	425	244	138	94	117	137
26	210	262	290	190	395	480	405	248	137	96	121	145
27	206	260	290	190	625	471	386	257	137	96	133	148
28	206	264	290	185	713	491	387	263	140	96	126	154
29	227	274	280	185	------	606	390	258	137	99	124	170
30	246	302	270	185	------	656	378	247	134	93	123	172
31	249	------	260	185	------	765	------	243	------	91	118	------
TOTAL	7,442	9,845	9,950	7,080	9,038	17,999	26,095	8,529	5,798	3,155	3,173	4,178
MEAN	240	328	321	228	323	581	870	275	193	102	102	139
MAX	576	657	545	290	713	1,130	1,450	380	273	134	133	172
MIN	164	246	260	185	185	343	378	219	134	83	92	119
CFSM	.58	.79	.77	.55	.78	1.40	2.09	.66	.46	.25	.25	.33
IN.	.67	.88	.89	.63	.81	1.61	2.33	.76	.52	.28	.28	.37

CAL YR 1970 TOTAL 100,902 MEAN 276 MAX 1,270 MIN 102 CFSM .66 IN 9.02
WTR YR 1971 TOTAL 112,282 MEAN 308 MAX 1,450 MIN 83 CFSM .74 IN 10.04

PEAK DISCHARGE (BASE, 1,000 CFS)

DATE	TIME	GHT	DISCHARGE
03-16	0800	6.19	1,190
04-02	2000	6.73	1,380
04-14	0300	7.09	1,510

04154500 Chippewa River near Midland, Mich.

LOCATION.--Lat 43°35'40", long 84°22'10", in NE¼ NE¼ sec.24, T.14 N., R.1 W., Midland County, on upstream side of bridge on Meridian Road, 5.3 miles upstream from Pine River, 6.5 miles southwest of Midland, and 8.6 miles upstream from mouth.

DRAINAGE AREA.--597 sq mi.

PERIOD OF RECORD.--October 1947 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.--Nonrecording gage and crest-stage gage. Datum of gage is 612.35 ft above mean sea level(levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--24 years, 424 cfs (9.64 inches per year).

EXTREMES.--Current year: Maximum discharge, 2,340 cfs Apr. 2 (gage height, 4.46 ft); maximum gage height, 6.27 ft Mar. 1 (backwater from ice); minimum discharge, 68 cfs Aug. 20.
Period of record: Maximum discharge, 8,510 cfs Mar. 20, 1948 (gage height, 9.85 ft, 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.
Maximum stage known since at least 1904, 15.65 ft in March 1904, from information from Michigan State Highway Department (discharge 16,000 cfs, from rating curve extended above 9,000 cfs).

REMARKS.--Records good except those for the winter period, which are poor. Diurnal fluctuation below 750 cfs caused by powerplant at Mount Pleasant prior to 1962, occasional regulation at low flow since. Since July 30, 1968, occasional regulation from control structures on lake outlets.

REVISIONS (WATER YEARS).--WSP 1307: 1949 (M). WSP 1337: 1950.

Rating table (gage height, in feet,and discharge, in cubic feet per second)
(Shifting-control method used May 20 to Sept. 28; stage-discharge relation affected by ice Dec. 16-18, Dec. 21 to Mar. 26)

1.7	75	3.0	880
2.2	280	5.0	2,930
2.6	530		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	250	368	522	420	260	1,000	2,010	506	245	142	126	96
2	226	368	522	400	260	840	2,320	498	255	134	126	92
3	214	691	562	400	260	740	2,250	490	260	134	122	103
4	206	1,500	817	400	260	650	1,830	466	260	130	122	100
5	206	1,590	1,220	400	270	580	1,450	450	286	134	103	106
6	206	1,270	961	400	280	530	1,320	444	286	142	100	150
7	206	997	736	400	300	500	1,330	432	280	154	100	158
8	198	763	673	400	320	470	1,380	420	260	154	103	158
9	194	628	538	390	350	460	1,420	402	245	142	96	130
10	346	610	514	380	370	450	1,440	396	222	146	110	125
11	781	655	506	360	380	430	1,400	379	230	134	106	122
12	763	628	514	350	380	430	1,400	352	235	130	106	118
13	628	578	514	340	390	450	1,610	352	226	130	106	110
14	646	514	466	330	390	500	2,000	352	275	138	114	110
15	1,040	458	474	320	400	800	1,880	335	296	154	92	100
16	979	432	470	320	420	1,700	1,610	324	255	126	100	96
17	718	402	460	310	440	1,500	1,430	308	230	122	100	96
18	530	390	450	300	470	1,400	1,370	308	214	130	86	96
19	426	384	438	290	540	1,200	1,200	302	202	138	82	89
20	368	414	450	290	800	1,100	988	302	202	170	78	110
21	346	570	450	280	960	1,000	880	286	202	158	86	122
22	346	602	450	280	800	940	781	275	194	146	82	118
23	330	522	440	280	700	900	682	250	186	158	82	118
24	308	458	440	280	600	860	619	250	178	162	103	118
25	296	432	450	280	580	830	578	280	178	146	118	118
26	280	390	450	270	560	800	546	286	174	158	118	122
27	275	384	450	270	800	781	514	286	178	158	122	130
28	265	390	450	260	1,050	844	506	291	170	162	166	146
29	286	402	450	260	------	1,150	514	291	166	162	134	158
30	346	450	450	260	------	1,460	514	265	162	158	126	178
31	384	------	440	260	------	1,630	------	255	------	138	110	------
TOTAL	12,593	18,240	16,727	10,180	13,590	26,925	37,772	10,833	6,752	4,490	3,325	3,593
MEAN	406	608	540	328	485	869	1,259	349	225	145	107	120
MAX	1,040	1,590	1,220	420	1,050	1,700	2,320	506	296	170	166	178
MIN	194	368	438	260	260	430	506	250	162	122	78	89
CFSM	.68	1.02	.90	.55	.81	1.46	2.11	.58	.38	.24	.18	.20
IN.	.78	1.14	1.04	.63	.85	1.68	2.35	.68	.42	.28	.21	.22

CAL YR 1970 TOTAL 150,790 MEAN 413 MAX 2,090 MIN 106 CFSM .69 IN 9.40
WTR YR 1971 TOTAL 165,020 MEAN 452 MAX 2,320 MIN 78 CFSM .76 IN 10.28

04155000 Pine River at Alma, Mich.

LOCATION.--Lat 43°22'46", long 84°39'20", in SW¼ SE¼ sec.34, T.12 N., R.3 W., Gratiot County, on right bank 270 ft downstream from Superior Street Bridge on grounds of Municipal Water Works in Alma, 0.6 mile downstream from municipal reservoir, and 38 miles upstream from mouth.

DRAINAGE AREA.--288 sq mi.

PERIOD OF RECORD.--October 1930 to current year. 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. Prior to Dec. 10, 1930, nonrecording gage at Superior Street Bridge at different datum. Dec. 10, 1930, to June 15, 1938, nonrecording gage at site 70 ft downstream from bridge and June 16 to October 25, 1938, nonrecording gage at bridge at present datum.

AVERAGE DISCHARGE.--41 years, 201 cfs (9.48 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,610 cfs Dec. 6 (gage height, 7.02 ft); minimum, 17 cfs May 21.
Period of record: Maximum discharge, 4,400 cfs Mar. 19, 1948 (gage height, 10.81 ft); minimum daily, 0.40 cfs Sept. 6, 1964, caused by closing of dam during construction of waterworks.

REMARKS.--Records good except those for winter periods, which are fair. Occasional regulation caused by dam 0.6 mile above station and by variable backwater from powerplant at St. Louis 5.2 miles below station. Since July 1965, about 2.5 cfs diverted above station for municipal and industrial use; sewage effluent is returned below station.

REVISIONS (WATER YEARS).--WSP 744: Drainage area. WSP 1307: 1945(M). WSP 1337: 1931, 1932, 1932-34(M), 1936, 1939, 1945, 1949.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-10, Oct. 29 to Nov. 11; stage-discharge relation affected by ice Dec. 21 to Feb. 14, Mar. 9)

0.9	38	4.0	480
1.4	82	5.0	730
2.0	154	7.0	1,600

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	280	326	390	195	110	761	748	269	149	60	51	73
2	260	347	378	200	110	724	768	265	154	58	55	73
3	240	583	403	200	110	634	760	262	150	68	59	69
4	200	712	501	210	115	577	750	260	155	63	61	73
5	170	780	470	210	130	468	692	250	163	62	59	80
6	174	846	544	210	160	485	616	239	153	67	54	126
7	178	754	402	205	180	456	566	227	158	71	49	124
8	173	620	404	200	210	420	529	223	142	69	48	134
9	180	533	374	195	220	400	511	214	152	66	54	116
10	436	508	345	190	240	366	507	202	140	62	59	101
11	567	474	339	180	240	374	510	194	126	61	58	89
12	812	445	326	175	235	364	520	186	117	57	60	80
13	766	428	321	170	230	354	683	176	137	63	62	83
14	1,100	413	313	170	225	384	679	173	147	59	58	76
15	913	391	293	165	222	1,120	664	174	171	66	61	72
16	798	368	263	160	221	1,150	667	170	143	63	57	50
17	707	342	284	160	222	1,010	625	164	122	56	59	63
18	614	325	315	155	219	1,030	565	154	104	59	53	68
19	523	307	334	150	250	913	512	166	101	58	43	70
20	452	334	341	150	430	741	481	159	98	57	49	82
21	399	354	300	145	587	690	453	80	86	61	57	81
22	363	382	270	140	540	614	416	140	79	58	52	96
23	319	368	250	140	496	590	378	159	79	58	48	84
24	308	368	240	135	487	532	337	157	82	57	60	70
25	295	330	235	130	512	497	308	181	82	55	63	71
26	280	299	230	130	594	459	294	192	75	55	66	80
27	267	289	220	125	1,220	445	276	193	71	56	83	83
28	259	298	210	120	857	506	272	203	74	60	94	94
29	268	330	205	120	------	646	259	196	67	60	86	97
30	286	371	200	115	------	641	260	177	67	55	78	97
31	307	------	195	115	------	691	------	156	------	61	70	------
TOTAL	12,894	13,225	9,895	5,065	9,372	19,042	15,606	5,961	3,544	1,881	1,866	2,555
MEAN	416	441	319	163	335	614	520	192	118	60.7	60.2	85.2
MAX	1,100	846	544	210	1,220	1,150	768	269	171	71	94	134
MIN	170	289	195	115	110	354	259	80	67	55	43	50
CFSM	1.44	1.53	1.11	.57	1.16	2.13	1.81	.67	.41	.21	.21	.30
IN.	1.67	1.71	1.28	.65	1.21	2.46	2.02	.77	.46	.24	.24	.33

CAL YR 1970 TOTAL 93,777 MEAN 257 MAX 1,100 MIN 55 CFSM .89 IN 12.11
WTR YR 1971 TOTAL 100,906 MEAN 276 MAX 1,220 MIN 43 CFSM .96 IN 13.03

04155500 Pine River near Midland, Mich.

LOCATION.--Lat 43°33'52", long 84°22'09", in SW¼ NW¼ sec.4, T.13 N., R.1 E., Midland County, on left bank at downstream side of bridge on Meridian Road, 7.2 miles southwest of Midland, and 7.8 miles upstream from Chippewa River.

DRAINAGE AREA.--390 sq mi, approximately.

PERIOD OF RECORD.--May 1934 to September 1938, February 1948 to current year.

GAGE.--Water-stage recorder. Datum of gage is 623.94 ft above mean sea level. Prior to Sept. 30, 1938, nonrecording gages at same site at datum 5.55 ft lower. Feb. 3, 1948, to Dec. 13, 1951, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.--27 years, 276 cfs (9.61 inches per year).

EXTREMES.--Current year: Maximum discharge, 2,190 cfs Oct. 15 (gage height, 6.74 ft); maximum gage height, 10.09 ft Mar. 16 (backwater from ice); minimum discharge, 30 cfs Aug. 22, 23.
Period of record: Maximum discharge, 6,360 cfs Mar. 20, 1948 (gage height, 10.00 ft, from graph based on gage readings); maximum gage height, 12.08 ft Feb. 2, 1968 (backwater from ice); minimum discharge not determined.

REMARKS.--Records good except those for winter periods, which are fair. Regulation at low and medium stages by powerplant at St. Louis. Some diversion above station for irrigation.

REVISIONS (WATER YEARS).--WSP 1207: Drainage area. WSP 1307: 1935 (M). WSP 1337: 1936-38, 1948-49.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	372	379	498	240	210	1,250	1,150	287	172	69	69	79
2	318	412	515	250	210	1,000	1,160	307	145	89	90	74
3	305	864	493	250	230	860	1,030	292	169	67	54	53
4	213	1,370	753	240	270	760	948	273	168	41	77	80
5	237	1,290	783	230	300	680	898	283	163	74	70	51
6	222	1,160	650	225	320	620	820	268	167	88	82	92
7	187	1,130	600	230	340	580	738	262	156	68	71	150
8	149	963	520	240	350	540	685	230	183	84	71	150
9	187	787	470	240	360	500	648	220	136	77	65	161
10	317	731	440	230	360	480	604	236	153	86	50	137
11	676	725	420	230	360	460	599	220	144	74	43	110
12	835	629	410	220	350	450	598	216	133	71	84	109
13	1,030	590	390	220	330	450	872	213	156	70	86	99
14	1,580	546	380	220	310	500	968	197	163	68	71	93
15	2,000	518	350	210	300	1,100	835	174	171	67	90	99
16	1,330	467	350	210	290	1,500	794	176	190	64	49	97
17	1,060	442	360	200	290	1,400	813	174	164	82	55	116
18	915	368	390	200	290	1,300	813	173	129	74	66	77
19	749	396	410	195	300	1,200	676	176	118	57	48	45
20	652	391	420	190	450	950	588	209	93	74	79	80
21	566	512	410	190	700	860	544	176	101	77	46	97
22	513	445	380	185	720	800	513	97	109	66	31	116
23	471	450	340	180	680	750	474	96	95	79	31	80
24	409	417	320	180	660	680	423	181	84	50	67	122
25	375	420	300	180	660	650	390	176	86	72	46	101
26	334	390	290	180	710	615	282	181	101	62	36	92
27	327	348	280	180	1,100	637	325	196	104	72	81	82
28	317	326	270	185	1,550	733	311	202	83	51	72	105
29	322	361	260	190	------	1,110	322	199	70	80	116	116
30	364	466	250	195	------	1,130	278	202	86	93	91	125
31	370	------	240	200	------	1,090	------	192	------	91	86	------
TOTAL	17,702	18,293	12,942	6,515	13,000	25,635	20,099	6,484	3,992	2,237	2,073	2,988
MEAN	571	610	417	210	464	827	670	209	133	72.2	66.9	99.6
MAX	2,000	1,370	783	250	1,550	1,500	1,160	307	190	93	116	161
MIN	149	326	240	180	210	450	278	96	70	41	31	45
CFSM	1.46	1.56	1.07	.54	1.19	2.12	1.72	.54	.34	.19	.17	.26
IN.	1.69	1.74	1.23	.62	1.24	2.45	1.92	.62	.38	.21	.20	.29

CAL YR 1970 TOTAL 124,810 MEAN 342 MAX 2,000 MIN 67 CFSM .88 IN 11.90
WTR YR 1971 TOTAL 131,960 MEAN 362 MAX 2,000 MIN 31 CFSM .93 IN 12.59

PEAK DISCHARGE (BASE, 1,200 CFS)

DATE	TIME	GHT	DISCHARGE
10-15	0500	6.74	2,190
11-04	2300	5.70	1,420
02-28	0400	8.37	1,600
03-16	2000	10.09	1,550
03-29	2400	4.94	1,260

04156000 Tittabawassee River at Midland, Mich.

LOCATION.—Lat 43°35'43", long 84°14'08", in NW¼ NE¼ sec.28, T.14 N., R.2 E., Midland County, on right bank 2,000 ft downstream from dam at Dow Chemical Co. powerplant in Midland, 0.7 mile upstream from Bullock Creek, 1.4 miles downstream from Chippewa River, and 23 miles upstream from mouth.

DRAINAGE AREA.—2,400 sq mi. approximately.

PERIOD OF RECORD.—March 1936 to current year. Gage-height records for flood seasons collected in this vicinity 1910-26, 1928, and since 1946 are continued in reports of U. S. Weather Bureau.

GAGE.—Water-stage recorder. Datum of gage is 580.28 ft above mean sea level. Prior to Sept. 30, 1955, at datum 10.00 ft higher.

AVERAGE DISCHARGE.—35 years, 1,569 cfs (8.88 inches per year), adjusted for diversion.

EXTREMES.—Current year: Maximum discharge, 10,500 cfs Mar. 18 (gage height, 21.01 ft); minimum, 204 cfs Aug. 11 (gage height, 9.55 ft); minimum daily, 214 cfs Aug. 18.
Period of record: Maximum discharge, 34,000 cfs Mar. 21, 1948 (gage height, 29.50 ft); minimum, 39 cfs Oct. 12, 1942; minimum daily, 111 cfs Aug. 21, 1949; minimum gage height, 9.04 ft Aug. 19, 1954, caused by bridge construction above station.
Maximum stage known since at least 1907, 29.7 ft Mar. 28, 1916, from information by U.S. Weather Bureau (discharge, 34,800 cfs).

REMARKS.—Records good. Water is diverted from river a short distance above station for industrial use. Small part returned to river at gage; small part returned to river a quarter of a mile below station; remainder returned 1 mile below. Extremes and daily discharges not adjusted for diversion. Prior to May 20, 1970, discharge below 4,000 cfs regulated by dam 2,000 ft above station; fixed-crest dam since.

REVISIONS (WATER YEARS).—WSP 1054: 1945. WSP 1144: 1948.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

9.5	190	19.0	8,290
11.0	965	21.0	10,500
14.0	3,200		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	938	1,020	2,240	938	684	6,750	7,310	1,220	895	386	245	418
2	718	1,100	2,960	712	888	6,250	8,800	930	1,000	298	355	419
3	574	2,440	3,030	728	916	5,550	10,000	1,440	1,030	362	374	381
4	508	6,390	3,750	1,220	965	4,620	7,860	1,490	1,100	280	361	298
5	734	6,700	4,660	1,840	1,160	4,170	6,160	1,680	739	248	318	276
6	624	5,150	4,560	1,390	921	4,090	4,970	1,660	518	373	313	328
7	718	4,500	3,590	1,360	657	4,040	5,710	1,660	669	388	237	586
8	580	2,290	3,050	1,240	1,140	3,910	6,430	1,020	996	371	225	583
9	740	2,180	1,940	888	1,540	3,020	7,140	692	1,340	492	309	465
10	728	2,480	1,930	674	1,550	3,240	7,340	1,070	972	308	325	454
11	1,380	2,610	2,100	1,160	1,600	3,070	5,870	1,270	741	273	315	328
12	2,080	2,650	1,450	1,530	1,570	3,080	5,300	1,170	560	327	302	288
13	2,510	3,030	987	1,500	970	1,670	7,020	1,030	435	321	322	392
14	2,990	1,480	1,610	1,210	602	1,320	9,270	922	633	324	249	384
15	4,370	1,180	1,580	1,340	591	4,210	8,760	753	851	406	233	360
16	3,700	1,480	1,620	866	987	8,520	5,510	571	781	379	333	382
17	2,160	1,550	1,950	630	1,470	10,400	4,840	700	749	280	240	513
18	1,560	1,350	1,880	772	1,490	10,200	4,800	1,150	663	271	214	317
19	1,670	1,600	1,250	982	1,550	9,200	4,300	1,050	492	364	503	253
20	1,680	1,760	1,070	1,090	1,510	8,030	3,770	1,150	330	490	552	361
21	1,250	1,530	1,650	1,340	2,160	5,770	3,430	1,210	671	410	329	381
22	1,180	1,360	2,070	1,160	2,660	4,860	3,220	687	468	363	278	402
23	987	1,900	1,880	872	3,600	4,560	3,070	409	308	429	258	426
24	767	2,240	1,710	574	3,740	4,230	2,860	694	459	365	308	521
25	740	2,800	932	888	3,790	4,000	1,500	1,090	575	246	353	289
26	822	1,500	624	1,110	3,930	3,700	1,610	1,400	424	338	337	251
27	921	1,550	662	932	5,160	3,700	1,970	1,540	294	390	373	248
28	1,030	1,210	1,130	960	6,730	3,830	1,870	1,450	436	415	309	593
29	1,330	872	1,760	894	------	4,780	1,940	802	533	364	295	600
30	1,680	1,640	1,630	718	------	5,740	1,860	612	351	411	545	735
31	1,270	------	1,590	525	------	6,240	------	583	------	364	415	------
TOTAL	42,939	69,542	62,845	32,043	54,531	156,750	154,490	33,105	20,013	11,036	10,125	12,232
MEAN	1,385	2,318	2,027	1,034	1,948	5,056	5,150	1,068	667	356	327	408
MAX	4,370	6,700	4,660	1,840	6,730	10,400	10,000	1,680	1,340	492	552	735
MIN	508	872	624	525	591	1,320	1,500	409	294	246	214	248
+	90.5	80.4	77.0	76.0	80.4	85.5	84.4	84.8	92.7	91.5	85.8	84.8
MEAN‡	1,476	2,398	2,104	1,110	2,028	5,142	5,234	1,153	760	448	413	493
CFSM‡	.62	1.00	.88	.46	.84	2.14	2.18	.48	.32	.19	.17	.21
IN‡	.71	1.11	1.01	.53	.88	2.47	2.43	.55	.35	.22	.20	.23

CAL YR 1970 TOTAL 579,608 MEAN 1,588 MAX 11,300 MIN 264 MEAN‡ 1,676 CFSM‡ .70 IN‡ 9.48
WTR YR 1971 TOTAL 659,651 MEAN 1,807 MAX 10,400 MIN 214 MEAN‡ 1,892 CFSM‡ .79 IN‡ 10.70

PEAK DISCHARGE (BASE, 7000 CFS)

DATE	TIME	GHT	DISCHARGE
11-05	0400	18.11	7,310
02-28	2130	17.89	7,090
03-18	0330	21.01	10,500
04-03	0930	20.81	10,300
04-14	0900	20.04	9,430

+ Diversion in cubic feet per second, for industrial use; furnished by Dow Chemical Co.

‡ Adjusted for diversion made by Dow Chemical Co.

04157000 Saginaw River at Saginaw, Mich.

LOCATION.--Lat 43°26'00", long 83°56'30", in sec.24, T.12 N., R.4 E., Saginaw County, on upstream side of Genesee Street Bridge on Saginaw, 3.8 miles downstreat from Tittabawassee River and 18.1 miles upstream from mouth.

DRAINAGE AREA.--6,060 sq mi, approximately.

PERIOD OF RECORD.--1904, 1908-9, 1912-13, 1916, 1918-19, 1929-30, and 1942 (flood discharge for certain periods only) in WSP 1084; December 1942 to current year (high-water periods only); no high water 1944, 1949, 1953, 1955, 1958, 1961, 1963, 1964, 1966. 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.--Nonrecording gage. Datum of gage is 565.11 ft above mean sea level, International Great Lakes datum. Auxiliary water-stage recorder on right bank at Essexville 15 miles downstream.

EXTREMES.--Current year: Maximum discharge, 22,000 cfs Mar. 19 (gage height, 17.16 ft).
Period of record: Maximum discharge, 68,000 cfs Mar. 29, 1904 (gage height, 24.9 ft).

REMARKS.--Records good. Considerable diversion through metropolitan area of Saginaw.

COOPERATION.--Gage readings at base gage furnished by U. S. Weather Bureau. Auxiliary gage-height record furnished by Corps of Engineers.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15						14,300						
16						17,300						
17						20,500						
18						21,900						
19						21,900						
20						20,900						
21						18,000						
22						15,700						
23						13,700						
24						12,000						
25						11,500						
26												
27												
28												
29												
30					------							
31		------			------		------		------			------

04158500 Pigeon River near Owendale, Mich.

LOCATION.--Lat 43°45'49", long 83°14'46", in NW¼ SE¼ sec.36, T.16 N., R.10 E., Huron County, on left bank 600 ft downstream from bridge on Kilmanagh Road, 2.5 miles downstream from confluence of East and West Branches, and 2.5 miles northeast of Owendale.

DRAINAGE AREA.--55 sq mi, approximately.

PERIOD OF RECORD.--October 1952 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 645 ft (from topographic map). Prior to June 10, 1954, nonrecording gage at site 600 ft upstream at same datum.

AVERAGE DISCHARGE.--19 years, 28.0 cfs (6.91 inches per year).

EXTREMES.--Current year: Maximum discharge, 670 cfs Mar. 16 (gage height, 10.42 ft); minimum daily, 0.5 cfs Aug. 15, 21. Period of record: Maximum discharge, 2,550 cfs Mar. 25, 1954 (gage height, 10.75 ft), from rating curve extended above 1,200 cfs; minimum, 0.1 cfs July 31, Aug. 1, 1964.

REMARKS.--Records good except those for the winter period and those below 1.0 cfs, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	45	31	21	7.0	300	199	27	12	4.9	3.3	.80
2	9.2	44	29	22	7.0	250	244	29	12	4.5	2.5	1.8
3	9.2	98	28	22	7.0	180	124	28	18	4.1	3.3	3.7
4	8.3	127	98	24	7.0	140	69	24	20	3.7	4.1	2.7
5	7.8	70	80	26	8.0	120	64	23	15	4.5	3.3	2.5
6	7.4	54	50	28	8.0	100	63	21	14	5.3	2.2	3.1
7	7.4	48	40	28	8.0	88	67	18	13	4.1	1.5	4.1
8	7.8	40	31	26	10	76	66	17	40	2.9	1.2	4.9
9	11	38	29	25	10	66	62	17	29	2.9	1.2	3.3
10	14	39	31	23	10	58	60	16	17	2.5	1.5	2.9
11	15	39	33	21	10	55	52	16	13	2.5	1.5	2.9
12	15	36	32	20	10	56	47	19	12	2.5	1.2	2.9
13	16	34	33	18	10	60	60	18	11	3.7	1.0	2.9
14	36	32	34	16	10	150	57	18	10	2.9	.80	2.2
15	53	29	32	15	10	350	44	15	9.6	2.5	.50	1.8
16	45	28	34	14	12	520	38	14	8.8	2.5	1.0	1.0
17	35	26	35	14	15	460	34	12	8.3	4.9	1.0	1.0
18	31	24	35	13	22	340	36	12	7.4	4.1	.80	1.2
19	29	22	38	12	47	250	34	12	7.4	5.3	.80	1.0
20	28	23	48	11	77	180	31	16	7.4	4.9	.80	2.2
21	29	24	45	10	90	140	28	15	7.8	4.1	.50	2.9
22	31	24	40	9.0	105	120	26	14	7.4	2.9	.80	1.8
23	31	24	30	9.0	105	105	24	13	6.5	2.2	1.5	1.2
24	28	20	24	8.0	100	95	25	14	12	3.7	1.8	.80
25	29	19	22	8.0	96	86	29	20	12	3.3	1.2	.80
26	29	18	23	8.0	110	84	29	24	10	2.5	3.3	.80
27	29	18	23	8.0	170	84	26	22	8.8	2.2	15	1.2
28	29	20	22	8.0	340	105	26	19	7.0	2.5	12	1.2
29	33	23	21	7.0	------	204	29	16	6.1	4.5	5.7	1.2
30	42	29	21	7.0	------	149	27	14	5.3	4.1	2.9	1.0
31	47	------	21	7.0	------	111	------	12	------	3.7	1.5	------
TOTAL	753.1	1,115	1,093	488.0	1,421.0	5,082	1,720	555	367.8	110.9	79.70	61.80
MEAN	24.3	37.2	35.3	15.7	50.8	164	57.3	17.9	12.3	3.58	2.57	2.06
MAX	53	127	98	28	340	520	244	29	40	5.3	15	4.9
MIN	7.4	18	21	7.0	7.0	55	24	12	5.3	2.2	.50	.80
CFSM	.44	.68	.64	.29	.92	2.98	1.04	.33	.22	.07	.05	.04
IN.	.51	.75	.74	.33	.96	3.44	1.16	.38	.25	.08	.05	.04

CAL YR 1970 TOTAL 10,508.60 MEAN 28.8 MAX 1,050 MIN 2.9 CFSM .52 IN 7.11
WTR YR 1971 TOTAL 12,847.30 MEAN 35.2 MAX 520 MIN .50 CFSM .64 IN 8.69

PEAK DISCHARGE (BASE, 500 CFS).--Mar. 16 (0330) 670 cfs (10.42 ft).

04159500 Black River near Fargo, Mich.
(International hydrological decade station)

LOCATION.--Lat 43°05'32", long 82°37'05", in NW¼ sec.32, T.8 N., R.16 E., St. Clair County, on left bank 20 ft downstream from bridge on Norman Road, 2.1 miles east of Fargo, 5.3 miles upstream from Mill Creek, and 12 miles northwest of Port Huron.

DRAINAGE AREA.--480 sq mi.

PERIOD OF RECORD.--February 1944 to current year.

GAGE.--Water-stage recorder. Datum of gage is 613.75 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to July 9, 1954, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--27 years, 267 cfs (7.55 inches per year).

EXTREMES.--Current year: Maximum discharge, 5,860 cfs Mar. 15 (gage height, 11.92 ft); maximum gage height, 13.15 ft Feb. 27 (backwater from ice); minimum discharge, 9.3 cfs Aug. 24 (gage height, 1.67 ft).
Period of record: 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 (backwater from ice); minimum discharge observed, 1.8 cfs Sept. 18, 19, 1946.

REMARKS.--Records good except those for the winter period, which are poor. Records of suspended sediment loads for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1307: 1950 (M). WSP 1627: 1956-58. WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	53	274	90	48	3,300	1,120	134	50	23	22	24
2	43	67	222	90	50	2,300	1,420	135	51	21	18	20
3	38	190	185	90	55	1,800	1,290	139	56	20	16	17
4	34	808	381	94	70	1,500	737	132	60	19	16	17
5	31	849	453	98	85	1,200	476	122	61	20	16	15
6	31	429	330	100	150	850	386	113	56	23	15	17
7	28	267	206	98	200	750	373	105	48	20	15	18
8	27	183	140	90	250	600	384	100	50	20	14	14
9	25	135	130	85	270	500	386	94	54	20	14	14
10	24	113	130	80	260	450	373	89	52	20	13	13
11	23	103	130	76	250	350	332	87	44	17	15	13
12	23	98	130	72	220	315	302	87	41	16	14	13
13	22	91	130	70	180	296	366	86	40	16	13	13
14	60	83	140	68	170	662	612	87	40	17	13	13
15	240	79	140	66	160	4,590	477	86	42	17	13	13
16	216	76	150	64	150	4,780	349	84	48	17	13	12
17	145	73	150	62	150	4,090	293	80	47	16	12	12
18	93	72	160	61	180	3,740	324	79	41	16	12	12
19	68	72	170	60	300	3,000	322	81	38	16	12	12
20	57	81	200	58	600	2,000	269	93	35	16	12	19
21	53	126	300	58	1,700	1,200	231	85	32	16	11	21
22	48	134	330	56	1,800	1,060	202	79	31	16	11	18
23	53	103	250	54	1,700	1,060	176	72	29	16	12	16
24	60	80	180	52	1,600	929	160	67	27	16	10	16
25	55	67	150	50	1,600	767	151	69	27	16	11	16
26	48	67	130	47	1,700	635	148	71	26	16	13	16
27	45	68	120	45	3,000	583	141	76	25	15	22	15
28	43	111	110	45	4,200	695	135	71	24	17	27	14
29	42	250	100	45	------	1,080	133	67	23	17	24	14
30	43	295	95	45	------	1,420	136	62	22	16	23	12
31	43	------	90	45	------	1,190	------	56	------	23	27	------
TOTAL	1,809	5,223	5,806	2,114	21,098	47,692	12,204	2,788	1,220	554	479	459
MEAN	58.4	174	187	68.2	754	1,538	407	89.9	40.7	17.9	15.5	15.3
MAX	240	849	453	100	4,200	4,780	1,420	139	61	23	27	24
MIN	22	53	90	45	48	296	133	56	22	15	10	12
CFSM	.12	.36	.39	.14	1.57	3.20	.85	.19	.08	.04	.03	.03
IN.	.14	.40	.45	.16	1.64	3.70	.95	.22	.09	.04	.04	.04

CAL YR 1970 TOTAL 55,130 MEAN 151 MAX 3,200 MIN 16 CFSM .31 IN 4.27
WTR YR 1971 TOTAL 10 ,446 MEAN 278 MAX 4,780 MIN 10 CFSM .58 IN 7.86

PEAK DISCHARGE (BASE, 3,500 CFS).--Feb. 27 (time and gage height unknown) about 5,000 cfs; Mar. 15 (time unknown) 5,860 cfs (11.92 ft).

04159900 Mill Creek near Avoca, Mich.

LOCATION.--Lat 43°03'16", long 82°44'05", in NW¼ sec.8, T.7 N., R.15 E., St. Clair County, on left bank at downstream side of bridge on Bricker Road, 0.2 mile upstream from Gleason Drain, and 2.3 miles west of Avoca.

DRAINAGE AREA.--169 sq mi.

PERIOD OF RECORD.--April 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is 711.31 ft above mean sea level.

AVERAGE DISCHARGE.--8 years, 76.6 cfs (6.16 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,780 cfs Mar. 15 (gage height, 6.94 ft); maximum gage height, 7.10 ft Feb. 27 (backwater from ice); minimum discharge, 1.0 cfs Aug. 21 (gage height, 0.59 ft).
Period of record: Maximum discharge, 3,540 cfs Feb. 2, 1968; maximum gage height, 8.36 ft Feb. 2, 1968 (backwater from ice); minimum discharge, 0.8 cfs Aug. 9, 10, 11, 1964; minimum gage height, 0.56 ft July 28, 1965.

REMARKS.--Records good except those for the winter period, which are poor.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	21	111	35	19	950	216	55	18	5.2	4.1	5.4
2	9.8	23	95	35	20	800	262	55	18	4.6	3.0	5.4
3	8.3	81	86	35	23	600	253	54	19	9.6	2.4	4.9
4	7.6	222	132	38	27	500	191	51	19	8.7	2.6	4.7
5	7.1	229	136	38	30	400	148	50	19	9.7	2.4	4.6
6	7.0	165	97	38	50	380	125	50	17	10	2.2	5.2
7	7.0	111	90	35	70	320	114	50	16	5.9	2.1	4.5
8	7.6	85	88	35	90	239	108	51	17	5.3	2.2	4.2
9	7.0	73	61	32	95	197	104	52	18	4.6	2.0	3.9
10	9.1	69	60	30	95	182	100	51	16	4.4	2.1	3.8
11	9.1	73	58	28	85	139	89	52	15	4.1	2.7	3.9
12	7.9	68	56	27	75	129	82	51	14	4.1	2.4	3.9
13	7.9	58	56	25	70	111	121	51	19	4.5	2.2	3.5
14	80	45	58	25	60	229	214	54	21	3.9	2.2	3.5
15	100	42	60	25	55	1,350	200	51	20	3.8	1.9	3.3
16	89	42	64	25	52	1,670	153	49	16	3.6	2.0	3.2
17	65	40	66	24	52	1,470	128	45	13	3.9	2.0	3.3
18	48	39	65	23	60	1,050	129	42	11	3.4	1.8	3.3
19	36	37	70	23	100	689	120	45	9.5	3.0	1.7	3.3
20	31	45	90	23	200	590	104	45	8.0	3.0	1.9	9.1
21	30	62	120	22	500	523	89	37	6.7	2.9	1.5	9.8
22	28	68	130	21	650	446	79	35	6.0	2.5	1.6	6.0
23	27	56	100	21	700	386	72	34	5.9	2.1	3.3	5.6
24	24	39	80	20	700	321	67	33	6.3	2.3	3.7	5.5
25	22	38	60	19	650	262	62	30	5.4	2.4	4.8	5.6
26	21	36	50	17	700	216	60	30	5.0	3.0	3.3	6.6
27	20	34	48	17	900	196	56	29	5.4	3.0	9.5	6.1
28	19	63	45	17	1,100	204	54	29	4.7	2.5	14	5.8
29	19	101	40	17	------	243	55	32	4.6	2.5	7.9	5.0
30	21	121	40	17	------	252	55	29	4.2	2.8	8.0	5.1
31	21	------	37	18	------	220	------	22	------	6.6	7.0	------
TOTAL	807.4	2,186	2,349	805	7,228	15,264	3,610	1,344	377.7	137.9	110.5	148.0
MEAN	26.0	72.9	75.8	26.0	258	492	120	43.4	12.6	4.45	3.56	4.93
MAX	100	229	136	38	1,100	1,670	262	55	21	10	14	9.8
MIN	7.0	21	37	17	19	111	54	22	4.2	2.1	1.5	3.2
CFSM	.15	.43	.45	.15	1.53	2.91	.71	.26	.07	.03	.02	.03
IN.	.18	.48	.52	.18	1.59	3.36	.79	.30	.08	.03	.02	.03

CAL YR 1970 TOTAL 21,677.6 MEAN 59.4 MAX 859 MIN 3.4 CFSM .35 IN 4.77
WTR YR 1971 TOTAL 34,367.5 MEAN 94.2 MAX 1,670 MIN 1.5 CFSM .56 IN 7.56

PEAK DISCHARGE (BASE, 900 CFS).--Feb. 27 (time and gage-height unknown) about 1,200 cfs; Mar. 15 (2400) 1,780 cfs (6.94 ft).

04160570 North Branch Belle River at Imlay City, Mich.

LOCATION.--Lat 43°01'49", long 83°04'02", in SW¼ NW¼ sec.16, T.7 N., R.12 E., Lapeer County, on left bank 12 ft upstream from bridge on State Highway 21, and 0.6 mile northeast of Imlay City.

DRAINAGE AREA.--18.0 sq mi.

PERIOD OF RECORD.--August 1965 to current year.

GAGE.--Water-Stage recorder and concrete control. Altitude of gage is 800 ft (from topographic map).

AVERAGE DISCHARGE.--6 years, 9.82 cfs (7.41 inches per year).

EXTREMES.--Current year: Maximum discharge, 174 cfs Mar. 15 (gage height, 7.12 ft); minimum, 0.12 cfs Aug. 19, 20 (gage height, 3.02 ft).
Period of record: Maximum discharge, 212 cfs Feb. 2, 1968 (gage height, 8.12 ft); minimum, 0.06 cfs July 25, 26, 27, 1966, Aug. 15, 1967; minimum gage height, 2.96 ft July 25, 26, 27, 1966.

REMARKS.--Records good except those for the winter period, which are fair. Some diversion by pumping for sprinkler irrigation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	6.6	19	5.8	2.9	108	33	7.9	1.9	3.9	.49	1.1
2	3.3	7.3	15	5.6	3.1	83	37	7.7	3.3	2.4	.46	1.1
3	3.1	27	13	5.6	3.5	65	29	6.9	4.5	2.1	.57	1.1
4	2.7	61	30	5.8	3.8	52	22	6.2	3.3	1.8	.43	1.1
5	2.4	49	22	6.0	4.5	40	18	5.7	2.9	2.4	.41	1.0
6	2.3	32	10	6.4	6.0	33	17	5.1	4.3	3.0	.44	1.0
7	2.2	20	7.4	6.0	7.5	34	17	4.7	5.0	1.6	.35	1.0
8	2.2	13	7.4	5.8	8.2	40	16	4.2	4.8	1.1	.37	.93
9	2.2	11	7.6	5.4	8.1	40	16	3.8	4.0	.88	.31	.83
10	2.6	12	8.0	5.0	8.0	35	16	3.7	3.3	.66	.32	.75
11	2.6	12	10	4.5	8.0	32	14	3.6	3.0	.52	.67	.75
12	2.8	10	11	4.2	7.8	27	13	4.3	2.6	.42	.48	.80
13	3.3	9.1	11	3.9	7.8	23	28	4.0	3.1	.71	.43	.83
14	61	8.1	11	3.8	7.8	44	30	3.7	3.5	.53	.27	.77
15	58	7.8	11	3.8	8.0	156	21	3.3	3.6	.41	.30	.70
16	34	7.1	10	3.7	8.5	143	17	3.1	3.6	.49	.31	.66
17	19	7.1	10	3.6	10	83	16	2.6	3.8	.48	.26	.85
18	11	7.0	10	3.6	12	63	17	2.4	3.9	.36	.23	.87
19	7.9	6.9	14	3.5	30	56	14	2.3	3.8	.54	.21	.85
20	6.8	16	19	3.5	123	52	12	2.4	4.1	.52	.24	4.9
21	8.3	21	23	3.4	135	45	11	2.3	4.5	.43	.65	4.9
22	7.5	15	17	3.4	127	40	10	2.1	4.6	.45	.85	2.8
23	6.7	12	13	3.3	123	37	9.1	2.2	4.5	.56	.81	2.2
24	6.0	9.2	12	3.1	115	33	8.8	3.0	4.6	.45	.64	1.9
25	5.4	7.0	10	3.0	111	30	9.0	4.4	4.6	.52	4.0	1.6
26	4.9	6.7	9.0	2.9	126	27	8.3	3.8	4.0	.71	2.5	3.0
27	4.7	9.1	8.0	2.7	143	27	7.4	3.5	3.4	.66	3.8	4.1
28	4.5	21	7.0	2.6	135	30	7.8	3.1	2.8	.72	2.4	4.2
29	4.8	24	6.8	2.6	------	36	8.7	2.6	6.2	.71	1.9	3.3
30	8.2	25	6.4	2.6	------	32	7.9	2.3	4.9	.72	1.6	2.5
31	7.6	------	6.0	2.7	------	30	------	2.0	------	.66	1.3	------
TOTAL	301.6	480.0	374.6	127.8	1,293.5	1,576	491.0	118.9	116.4	31.41	28.00	52.39
MEAN	9.73	16.0	12.1	4.12	46.2	50.8	16.4	3.84	3.88	1.01	.90	1.75
MAX	61	61	30	6.4	143	156	37	7.9	6.2	3.9	4.0	4.9
MIN	2.2	6.6	6.0	2.6	2.9	23	7.4	2.0	1.9	.36	.21	.66
CFSM	.54	.89	.67	.23	2.57	2.82	.91	.21	.22	.06	.05	.10
IN.	.62	.99	.77	.26	2.67	3.26	1.01	.25	.24	.06	.06	.11

CAL YR 1970 TOTAL 3,242.86 MEAN 8.88 MAX 61 MIN .58 CFSM .49 IN 6.70
WTR YR 1971 TOTAL 4,991.60 MEAN 13.7 MAX 156 MIN .21 CFSM .76 IN 10.32

PEAK DISCHARGE (BASE, 60 CFS)

DATE	TIME	GHT	DISCHARGE
10-14	1500	4.92	81
11-04	1400	4.59	64
02-21	1900	6.34	143
02-26	2100	6.34	143
03-15	2100	7.12	174

04160600 Belle River at Memphis, Mich.

LOCATION.--Lat 42°54'03", long 82°46'09", in NW¼ SE¼ sec.35, T.6 N., R.14 E., St. Clair County, on right bank, at downstream side of bridge on State Highway 19 at Memphis.

DRAINAGE AREA.--151 sq mi.

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 720 ft (from topographic map).

AVERAGE DISCHARGE.--9 years, 67.9 cfs (6.11 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,230 cfs Mar. 15 (gage height, 6.71 ft); maximum gage height, 8.24 ft Feb. 21 (backwater from ice); minimum discharge, 3.8 cfs Aug. 17 (gage height, 1.20 ft).
Period of record: Maximum discharge, 4,070 cfs Feb. 2, 1968; maximum gage height, 8.88 ft Feb. 1, 1968 (backwater from ice); minimum discharge, 3.1 cfs Mar. 10, 1964 (gage height, 1.19 ft).
Flood of April 1947 reached a stage of about 9 ft, from information by local residents.

REMARKS.--Records good except those for the winter period, which are poor.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	49	185	57	28	700	153	59	22	10	8.9	7.8
2	25	46	151	56	30	550	160	59	23	9.1	7.3	8.0
3	21	81	126	56	33	450	178	57	23	7.6	6.9	7.6
4	18	270	218	57	40	350	138	52	26	6.7	5.8	7.6
5	17	424	250	60	50	270	108	42	30	10	5.3	7.3
6	16	332	170	62	80	213	105	40	27	8.1	5.0	7.0
7	14	205	119	60	110	215	118	39	25	7.9	4.7	6.9
8	14	144	117	55	140	200	113	40	30	8.7	4.3	6.7
9	13	110	85	50	150	175	108	43	27	8.1	8.2	6.5
10	13	94	81	47	150	161	104	45	23	6.3	7.7	6.7
11	14	99	88	44	140	131	98	47	20	5.8	6.2	6.5
12	15	97	79	41	120	128	90	50	18	5.9	6.9	6.3
13	15	86	89	40	110	118	111	55	18	5.8	6.0	6.1
14	22	74	90	39	100	268	187	60	17	5.5	6.1	6.2
15	219	67	102	38	90	922	184	61	16	5.2	5.3	5.5
16	353	62	139	37	85	1,080	142	62	15	5.1	5.0	5.8
17	258	57	138	37	85	873	122	62	14	5.4	4.0	6.4
18	152	55	101	36	85	661	126	62	13	5.3	4.9	7.0
19	107	55	115	36	150	364	121	64	12	4.6	5.4	9.0
20	79	68	187	35	500	318	104	66	11	5.2	7.2	12
21	64	179	225	34	700	319	93	58	11	5.2	9.1	12
22	65	171	178	34	1,000	277	83	51	10	4.4	8.7	13
23	62	126	147	33	900	284	75	45	9.1	5.0	9.3	13
24	54	86	105	31	850	246	68	36	8.5	6.0	14	11
25	47	77	85	30	800	186	65	30	8.4	7.0	17	9.2
26	42	73	80	28	750	164	62	33	8.0	7.8	17	9.8
27	37	62	75	27	900	158	58	34	7.2	6.3	13	11
28	35	109	70	26	850	166	57	32	6.8	7.5	10	12
29	33	200	66	26	------	191	58	30	6.8	8.8	9.1	13
30	34	207	62	26	------	187	60	28	6.7	8.4	8.2	12
31	44	------	60	27	------	158	------	25	------	13	8.0	------
TOTAL	1,935	3,765	3,783	1,265	9,026	10,483	3,249	1,467	492.5	215.7	244.5	258.9
MEAN	62.4	126	122	40.8	322	338	108	47.3	16.4	6.96	7.89	8.63
MAX	353	424	250	62	1,000	1,080	187	66	30	13	17	13
MIN	13	46	60	26	28	118	57	25	6.7	4.4	4.0	5.5
CFSM	.41	.83	.81	.27	2.13	2.24	.72	.31	.11	.05	.05	.06
IN.	.48	.93	.93	.31	2.22	2.58	.80	.36	.12	.05	.06	.06

CAL YR 1970 TOTAL 27,501.8 MEAN 75.3 MAX 735 MIN 5.3 CFSM .50 IN 6.78
WTR YR 1971 TOTAL 36,184.6 MEAN 99.1 MAX 1,080 MIN 4.0 CFSM .66 IN 8.91

PEAK DISCHARGE (BASE, 600 CFS)

DATE	TIME	GHT	DISCHARGE
02-21	--	--	about 1,200
02-27	--	--	about 1,000
03-15	2300	6.71	1,230

04160800 Sashabaw Creek near Drayton Plains, Mich.

LOCATION.--Lat 42°43'12", long 83°21'13", in SE¼ sec.26, T.4 N., R.9 E., Oakland County, on right bank 25 ft upstream from bridge on Maybee Road, 1.1 miles upstream from mouth, and 2.5 miles northeast of Drayton Plains.

DRAINAGE AREA.--20.9 sq mi.

PERIOD OF RECORD.--October 1959 to current year.

GAGE.--Water-stage recorder. Metal V-notch weir Aug. 30, 1961 to Mar. 6, 1968. Altitude of gage is 970 ft (from topographic map).

AVERAGE DISCHARGE.--12 years, 10.2 cfs (6.63 inches per year).

EXTREMES.--Current year: Maximum discharge, 63 cfs Feb. 27 (gage height, 3.71 ft); minimum, 0.82 cfs Sept. 23; minimum gage height, 1.77 ft July 23.
Period of record: Maximum discharge, 138 cfs June 26, 1968 (gage height, 4.22 ft); maximum gage height, 4.23 ft Feb. 2, 1968; minimum discharge, 0.2 cfs on many days during 1961, 1963, 1964, 1965, 1966; minimum gage height, 1.59 ft Aug. 1, 2, 1960.

REMARKS.--Records good except those for the winter period, which are poor.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	9.4	18	15	12	45	35	18	7.9	4.3	2.5	2.0
2	6.2	9.9	16	15	12	40	37	17	9.5	4.2	2.1	2.8
3	5.6	15	14	15	12	38	34	16	8.9	4.0	2.2	2.8
4	5.2	19	17	16	12	36	31	16	7.9	4.2	2.6	2.6
5	5.6	19	14	17	31	35	29	16	6.9	4.6	2.7	2.5
6	5.6	16	19	16	45	35	29	15	7.1	4.8	2.1	2.7
7	5.0	14	11	15	30	40	29	14	6.8	4.0	2.1	2.4
8	4.5	13	9.9	16	25	35	28	12	5.9	3.4	1.8	2.3
9	4.4	12	11	15	21	32	27	12	5.2	3.5	1.9	2.1
10	4.8	14	11	15	20	31	26	12	4.9	3.3	2.8	2.1
11	4.4	13	14	14	19	30	25	12	3.3	3.1	3.2	1.9
12	4.0	12	14	13	18	30	25	13	5.1	2.9	2.6	2.0
13	4.2	11	14	13	17	30	31	12	5.7	2.9	2.3	2.0
14	24	11	14	13	17	40	33	12	6.3	3.0	2.9	1.8
15	22	10	18	12	17	55	30	12	6.2	3.3	3.1	1.8
16	17	9.7	15	12	17	55	27	9.7	5.7	3.3	2.8	1.6
17	15	9.7	16	12	20	50	28	9.5	5.2	3.3	3.5	1.3
18	12	9.7	16	12	30	45	28	8.9	4.8	3.0	2.9	1.2
19	11	9.4	17	11	45	39	26	8.8	4.6	2.2	2.5	1.2
20	10	15	19	11	49	40	25	11	3.8	1.8	2.6	1.8
21	13	15	19	12	48	37	23	10	3.7	1.5	1.7	1.5
22	12	14	19	11	43	36	22	9.9	4.0	1.8	1.4	1.0
23	11	13	17	11	34	35	20	9.0	3.8	1.7	1.9	.89
24	10	12	17	11	26	33	19	9.5	3.4	1.9	3.3	1.3
25	10	11	16	11	28	32	19	12	3.7	1.9	2.0	1.6
26	9.4	11	16	11	36	30	19	11	2.8	3.2	2.7	2.5
27	8.5	13	16	11	59	31	19	11	3.5	3.0	5.8	3.3
28	8.1	19	15	11	47	33	19	10	4.0	2.6	3.5	2.8
29	8.3	19	15	11	------	35	19	9.0	4.1	2.6	3.3	3.6
30	11	19	15	11	------	33	18	7.8	3.8	3.0	3.0	3.1
31	10	------	16	12	------	33	------	7.5	------	3.2	2.3	------
TOTAL	288.4	397.8	478.9	401	790	1,149	780	363.6	158.5	95.5	82.1	62.49
MEAN	9.30	13.3	15.4	12.9	28.2	37.1	26.0	11.7	5.28	3.08	2.65	2.08
MAX	24	19	19	17	59	55	37	18	9.5	4.8	5.8	3.6
MIN	4.0	9.4	9.9	11	12	30	18	7.5	2.8	1.5	1.4	.89
CFSM	.45	.64	.74	.62	1.35	1.78	1.24	.56	.25	.15	.13	.10
IN.	.51	.71	.85	.71	1.41	2.05	1.39	.65	.28	.17	.15	.11

CAL YR 1970 TOTAL 3,973.60 MEAN 10.9 MAX 39 MIN 1.9 CFSM .52 IN 7.07
WTR YR 1971 TOTAL 5,047.29 MEAN 13.8 MAX 59 MIN .89 CFSM .66 IN 8.98

PEAK DISCHARGE (BASE, 45 CFS)

DATE	TIME	GHT	DISCHARGE
02-06	0400	3.51	51
02-21	1300	3.51	51
02-27	1500	3.71	63
03-15	unknown	unknown	about 60

04160900 Clinton River near Drayton Plains, Mich.

LOCATION.--Lat 42°39'37", long 83°23'25", in NE¼ sec.21, T.3 N., R.9 E., Oakland County, on left bank 14 ft downstream from bridge on State Highway 59, 1.0 mile downstream from State fish hatchery, and 2.0 miles south of Drayton Plains.

DRAINAGE AREA.--79.2 sq mi.

PERIOD OF RECORD.--October 1959 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 940 ft (from topographic map). Jan. 29 to July 9, 1964, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--12 years, 43.7 cfs (7.49 inches per year).

EXTREMES.--Current year: Maximum discharge, 149 cfs Mar. 19 (gage height, 3.81 ft); minimum daily, 8.0 cfs Sept. 11-18. Period of record: Maximum discharge, 175 cfs June 30, 1968 (gage height, 4.65 ft); minimum, 2.4 cfs May 31, 1961; minimum gage height, 1.23 ft Jan. 4, 1961.

REMARKS.--Records good except those for periods of no gage-height record, which are poor. Some regulation and occasional diversion for lake level control at many lakes above station. Records of water temperatures for the current year are published in Part 2 of this report.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	62	78	60	38	118	122	57	31	22	11	9.0
2	46	66	77	60	38	120	121	53	26	21	11	9.0
3	51	67	79	60	35	122	121	60	25	23	11	9.0
4	51	71	78	75	45	122	119	48	26	21	11	9.0
5	50	70	77	70	50	120	122	48	28	23	14	9.0
6	49	70	73	65	55	120	127	47	33	22	14	9.0
7	48	71	74	60	57	123	114	43	31	21	13	9.0
8	47	71	74	60	60	122	113	48	22	20	12	9.0
9	46	71	69	60	60	122	109	37	22	20	12	9.0
10	46	72	66	60	61	122	102	34	22	20	12	8.5
11	43	73	76	60	62	120	100	30	22	19	12	8.0
12	42	75	76	60	67	118	97	25	24	19	11	8.0
13	41	76	76	60	67	118	96	21	25	17	8.2	8.0
14	53	75	74	55	67	122	95	23	25	14	8.2	8.0
15	51	74	75	50	67	126	97	23	24	15	8.2	8.0
16	52	71	75	45	67	132	92	25	23	14	8.7	8.0
17	55	70	72	40	72	138	92	26	23	10	10	8.0
18	57	69	71	40	86	143	91	25	23	9.2	11	8.0
19	60	67	70	40	91	148	90	25	23	9.6	10	9.0
20	61	71	71	40	92	148	94	26	25	11	10	12
21	64	70	75	40	97	146	97	27	26	11	10	10
22	64	69	76	40	102	144	86	27	27	11	10	9.0
23	64	68	80	40	104	143	80	28	27	11	11	9.0
24	63	69	80	40	105	142	75	30	26	11	12	9.0
25	62	71	78	40	108	141	74	30	24	10	20	9.5
26	60	74	78	40	110	137	71	26	26	11	25	11
27	60	76	75	40	112	129	69	26	27	10	19	15
28	58	79	75	40	113	125	66	28	30	12	15	12
29	60	78	70	40	------	122	63	30	33	12	10	11
30	62	78	65	38	------	123	60	31	24	12	9.0	11
31	62	------	65	38	------	122	------	36	------	11	9.0	------
TOTAL	1,671	2,144	2,298	1,556	2,088	3,998	2,855	1,043	773	472.8	368.3	281.0
MEAN	53.9	71.5	74.1	50.2	74.6	129	95.2	33.6	25.8	15.3	11.9	9.37
MAX	64	79	80	75	113	148	127	60	33	23	25	15
MIN	41	62	65	38	35	118	60	21	22	9.2	8.2	8.0
CFSM	.68	.90	.94	.63	.94	1.63	1.20	.42	.33	.19	.15	.12
IN.	.78	1.01	1.08	.73	.98	1.88	1.34	.49	.36	.22	.17	.13

CAL YR 1970 TOTAL 18,720.9 MEAN 51.3 MAX 99 MIN 9.9 CFSM .65 IN 8.79
WTR YR 1971 TOTAL 19,548.1 MEAN 53.6 MAX 148 MIN 8.0 CFSM .68 IN 9.18

NOTE.--No gage-height record Dec. 23 to Feb. 1, Aug. 19 to Sept. 28.

04161000 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., Oakland County, 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.

PERIOD OF RECORD.--May 1935 to June 1939 and February to September 1940 (published as "at Pontiac"), October 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 846.50 ft above mean sea level. Prior to October 1940, nonrecording gage at site 3.3 miles upstream at datum 876.01 feet above mean sea level.

AVERAGE DISCHARGE.--18 years (1935-38, 1956-71), 85.8 cfs (9.47 inches per year).

EXTREMES.--Current year: Maximum discharge, 490 cfs Feb. 20 (gage height, 3.10 ft); minimum, 29 cfs Sept. 19 (gage height, 0.98 ft). Period of record: Maximum discharge, 1,400 cfs June 25, 1968 (gage height, 4.88 ft); minimum observed, 4.8 cfs Sept. 4, 1936, site then in use.

REMARKS.--Records good. Some regulation by many lakes above station. Flow includes waste from city of Pontiac water supply, most of which is obtained from sources outside the basin.

REVISIONS (WATER YEARS).--WSP 1307: 1937 (M). WSP 1507: Drainage area at former site.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	130	104	144	116	77	215	231	95	43	54	34	39
2	142	130	142	118	78	213	234	89	61	42	36	41
3	140	144	153	116	80	208	218	93	46	35	36	43
4	125	145	155	149	89	208	204	99	45	34	38	40
5	111	116	138	136	335	208	201	98	45	62	37	36
6	102	113	127	125	145	215	208	98	56	55	38	36
7	101	109	130	120	121	229	208	98	50	46	38	42
8	101	106	132	121	114	215	206	92	50	43	35	42
9	102	111	132	118	111	218	197	89	46	42	38	41
10	109	136	140	114	111	218	190	87	49	38	48	40
11	87	111	136	116	116	223	184	62	49	35	59	36
12	80	109	125	118	125	215	182	59	45	38	43	32
13	52	108	125	114	114	226	231	55	42	39	42	35
14	50	106	129	113	104	297	204	56	44	38	41	37
15	48	109	120	111	116	294	176	75	46	37	36	36
16	57	106	123	84	118	250	182	81	46	37	36	36
17	72	106	132	71	144	245	199	86	47	36	41	37
18	78	102	140	74	197	239	182	60	48	33	42	34
19	80	102	159	72	321	267	174	54	46	35	42	31
20	87	178	144	80	378	259	182	49	41	35	45	121
21	106	138	134	80	229	242	182	44	53	35	41	54
22	84	130	134	80	194	248	178	40	52	35	41	43
23	81	129	134	78	210	250	174	36	52	36	48	41
24	80	121	123	75	208	250	172	51	52	35	46	39
25	78	96	118	80	234	245	164	53	52	32	70	36
26	78	81	113	80	264	242	163	44	47	44	130	42
27	78	104	114	72	273	237	161	42	41	37	168	113
28	102	155	120	86	218	231	157	41	46	36	61	58
29	116	147	123	81	------	231	104	38	49	34	39	50
30	134	144	121	75	------	234	98	35	56	35	41	46
31	108	------	120	72	------	229	------	35	------	39	41	------
TOTAL	2,899	3,596	4,080	3,045	4,824	7,301	5,546	2,034	1,445	1,212	1,531	1,357
MEAN	93.5	120	132	98.2	172	236	185	65.6	48.2	39.1	49.4	45.2
MAX	142	178	159	149	378	297	234	99	61	62	168	121
MIN	48	81	113	71	77	208	98	35	41	32	34	31
CFSM	.76	.98	1.07	.80	1.40	1.92	1.50	.53	.39	.32	.40	.37
IN.	.88	1.09	1.23	.92	1.46	2.21	1.68	.62	.44	.37	.46	.41

CAL YR 1970 TOTAL 37,240 MEAN 102 MAX 245 MIN 31 CFSM .83 IN 11.26
WTR YR 1971 TOTAL 38,870 MEAN 106 MAX 378 MIN 31 CFSM .86 IN 11.76

PEAK DISCHARGE (BASE, 350 CFS)

DATE	TIME	GHT	DISCHARGE
02-05	0900	3.03	462
02-20	0100	3.10	490
03-14	1800	2.99	446
08-27	1800	2.84	386

04161100 Galloway Creek near Auburn Heights, Mich.

LOCATION.--Lat 42°40'02", long 83°12'02", in SE¼ sec.18, T.3 N., R.11 E., Oakland County, on right bank 12 ft downstream from wooden bridge on Oakland University property, and 2.7 miles northeast of Auburn Heights.

DRAINAGE AREA.--17.9 sq mi.

PERIOD OF RECORD.--October 1959 to current year.

GAGE.--Water-stage recorder. Concrete control since Aug. 20, 1960. Altitude of gage is 830 ft (from topographic map).

AVERAGE DISCHARGE.--12 years, 8.10 cfs (6.15 inches per year).

EXTREMES.--Current year: Maximum discharge, 68 cfs Mar. 15 (gage height, 4.39 ft); maximum gage height, 4.64 ft Feb. 19 (backwater from ice); minimum discharge, 0.04 cfs Oct. 28; minimum gage height, 1.66 ft Oct. 9.
Period of record: Maximum discharge, 368 cfs June 25, 1968 (gage height, 6.27 ft); minimum, 0.01 cfs on several days during July and August, 1964; minimum gage height, 0.82 ft Aug. 1, 1960.

REMARKS.--Records poor.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	3.5	12	5.0	3.0	52	22	6.2	3.6	1.7	1.3	.84
2	1.5	5.4	11	5.0	3.5	52	25	6.1	5.0	1.1	1.1	.81
3	1.6	12	10	5.0	4.5	45	21	5.9	3.4	1.0	1.2	.85
4	.95	14	14	5.5	6.0	35	18	5.3	2.6	1.0	1.1	.86
5	.83	12	12	6.0	8.0	32	16	5.0	2.4	2.5	.90	.79
6	1.5	9.6	11	6.0	11	28	14	4.7	3.2	2.2	.85	.91
7	1.2	8.0	7.8	5.5	13	25	13	4.4	3.3	1.3	.76	.86
8	.99	6.5	7.1	5.5	15	23	13	4.3	2.6	1.4	.73	.77
9	.90	6.3	7.5	5.0	15	22	13	4.1	2.1	1.5	.77	.74
10	1.1	8.7	7.6	4.8	14	21	12	3.9	1.7	1.5	.99	.81
11	1.1	7.0	8.0	4.5	13	20	11	3.9	1.6	1.4	1.4	.83
12	2.3	6.1	9.0	4.2	11	19	11	4.4	1.5	1.5	.92	.86
13	2.5	5.2	9.0	4.0	10	20	16	4.1	1.8	1.6	.83	.88
14	9.4	4.2	8.5	3.7	9.0	35	16	4.0	1.4	1.6	.73	.90
15	9.1	4.2	8.0	3.5	9.0	66	14	4.0	1.3	1.8	.67	.80
16	7.0	3.5	7.5	3.3	9.0	56	12	4.3	1.1	1.8	.68	.72
17	5.4	3.0	8.0	3.3	10	52	12	4.2	.98	1.9	.61	.81
18	4.8	2.9	8.5	3.2	15	42	12	4.1	1.0	1.8	.53	.73
19	4.8	3.0	10	3.1	22	40	11	5.2	1.0	2.0	.55	.80
20	4.1	12	13	3.0	27	40	9.5	5.7	1.1	2.0	.55	5.6
21	6.0	11	15	3.0	26	40	8.7	4.4	1.2	1.8	.48	1.7
22	5.0	8.9	13	3.0	25	38	7.8	4.2	1.2	1.6	.57	1.0
23	4.2	7.5	10	3.0	25	36	7.0	4.0	1.3	1.6	.83	1.0
24	3.3	6.2	8.0	3.0	28	37	6.6	4.9	1.3	1.9	.54	.89
25	2.8	5.4	7.5	3.0	33	33	6.2	5.7	1.1	1.8	.60	.92
26	3.1	5.1	7.0	3.0	38	29	5.8	4.8	1.2	2.3	5.2	1.9
27	2.1	7.7	6.5	3.0	45	24	5.5	4.4	1.1	1.6	2.7	5.7
28	1.3	15	6.0	3.0	49	24	6.2	4.2	.97	1.5	1.2	2.0
29	1.7	14	5.5	3.0	------	25	6.5	4.0	1.1	1.5	.82	1.1
30	4.9	13	5.5	3.0	------	22	6.3	3.9	1.6	1.4	.77	.94
31	3.9	------	5.0	3.0	------	20	------	3.7	------	1.7	.81	------
TOTAL	101.27	230.9	278.5	122.1	497.0	1,053	358.1	142.0	54.75	51.3	31.69	38.32
MEAN	3.27	7.70	8.98	3.94	17.8	34.0	11.9	4.58	1.83	1.65	1.02	1.28
MAX	9.4	15	15	6.0	49	66	25	6.2	5.0	2.5	5.2	5.7
MIN	.83	2.9	5.0	3.0	3.0	19	5.5	3.7	.97	1.0	.48	.72
CFSM	.18	.43	.50	.22	.99	1.90	.66	.26	.10	.09	.06	.07
IN.	.21	.48	.58	.25	1.03	2.19	.74	.30	.11	.11	.07	.08

CAL YR 1970 TOTAL 3,270.70 MEAN 8.96 MAX 57 MIN .83 CFSM .50 IN 6.80
WTR YR 1971 TOTAL 2,958.93 MEAN 8.11 MAX 66 MIN .48 CFSM .45 IN 6.15

PEAK DISCHARGE (BASE, 90 CFS).--No peak above base.

04161500 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., Oakland County, 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.--38.5 sq mi.

PERIOD OF RECORD.--September 1955 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 940 ft (from topographic map).

AVERAGE DISCHARGE.--16 years, 22.0 cfs (7.76 inches per year).

EXTREMES.--Current year: Maximum discharge, 170 cfs Mar. 3, 17; maximum gage height, 4.43 ft Sept. 22, caused by construction downstream; minimum daily discharge, 2.6 cfs June 12.
Period of record: Maximum discharge, 359 cfs Feb. 4, 1968 (gage height, 3.50 ft); maximum gage height, 4.43 ft Sept. 22, 1971, caused by construction downstream, minimum discharge 1.2 cfs June 28, July 13, 14, 15, 1959.

REMARKS.--Records fair except those for periods of no gage-height record, which are poor. Occasional regulation by Lake Orion.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	32	37	27	18	161	57	31	18	8.1	9.5	6.2
2	27	17	37	25	18	169	64	31	5.9	8.1	9.0	6.2
3	25	4.8	37	25	18	168	69	31	4.6	8.6	8.0	7.6
4	23	4.0	40	25	17	162	68	30	12	7.2	7.2	7.2
5	21	3.2	38	25	37	134	65	29	12	7.6	7.2	5.9
6	20	3.0	36	25	36	116	59	28	14	12	13	5.9
7	19	2.9	34	25	36	116	55	27	17	14	11	5.3
8	18	2.9	31	25	36	101	52	25	15	14	11	4.8
9	18	2.9	30	25	35	82	50	24	25	13	10	6.2
10	18	3.4	28	24	34	72	48	22	16	12	10	8.1
11	17	3.0	35	24	33	66	45	18	12	9.6	9.1	8.4
12	17	3.2	37	23	32	56	44	14	2.6	8.6	8.6	8.1
13	17	3.5	36	22	32	49	45	13	3.4	8.6	7.6	6.7
14	28	4.2	34	21	32	62	48	12	3.2	7.2	8.1	5.6
15	24	5.2	31	20	31	68	48	10	3.0	7.2	7.2	6.2
16	25	6.8	30	20	29	98	45	11	4.0	7.6	5.9	5.6
17	25	8.0	30	20	29	152	45	13	22	8.6	3.5	7.2
18	26	11	29	20	28	150	45	10	10	7.6	7.6	8.1
19	28	15	30	19	28	140	44	8.0	9.1	7.5	7.6	7.2
20	33	25	31	19	29	130	42	7.0	8.1	7.5	7.2	11
21	34	27	30	19	32	120	40	24	9.1	7.5	4.0	6.7
22	34	28	32	19	37	100	37	19	5.0	7.6	2.8	15
23	33	29	33	19	51	95	35	13	3.2	6.2	3.2	5.9
24	33	28	32	19	69	87	34	15	3.1	6.2	5.3	6.2
25	32	28	32	19	68	85	33	16	3.1	9.0	4.4	5.9
26	32	27	32	19	88	80	32	16	3.1	12	13	9.0
27	31	29	32	19	100	75	31	17	3.4	11	9.1	15
28	31	33	31	19	131	70	31	19	3.7	11	8.6	14
29	31	34	30	19	------	65	31	32	5.3	11	8.1	13
30	32	36	29	19	------	60	31	25	7.6	10	7.2	11
31	32	------	27	18	------	52	------	21	------	10	7.6	------
TOTAL	813	460.0	1,011	667	1,164	3,141	1,373	611.0	263.5	286.1	241.6	239.2
MEAN	26.2	15.3	32.6	21.5	41.6	101	45.8	19.7	8.78	9.23	7.79	7.97
MAX	34	36	40	27	131	169	69	32	25	14	13	15
MIN	17	2.9	27	18	17	49	31	7.0	2.6	6.2	2.8	4.8
CFSM	.68	.40	.85	.56	1.08	2.62	1.19	.51	.23	.24	.20	.21
IN.	.79	.44	.98	.64	1.12	3.03	1.33	.59	.25	.28	.23	.23

CAL YR 1970 TOTAL 9,354.0 MEAN 25.6 MAX 104 MIN 2.2 CFSM .66 IN 9.04
WTR YR 1971 TOTAL 10,270.4 MEAN 28.1 MAX 169 MIN 2.6 CFSM .73 IN 9.92

PEAK DISCHARGE (BASE, 90 CFS).--Mar. 3 (1200) 170 cfs (3.26 ft); Mar. 17 (1400) 170 cfs (3.38 ft).

NOTE.--No gage-height record Jan. 3 to Feb. 2, Apr. 8 to May 20.

04161540 Paint Creek at Rochester, Mich.

LOCATION.--Lat 42°41'18", long 83°08'35", in NW¼ SE¼ sec.10, T.3 N., R.11 E., Oakland County, on right bank at upstream side of bridge on Ludlow Street in Rochester, and 1.5 miles upstream from mouth.

DRAINAGE AREA.--70.9 sq mi.

PERIOD OF RECORD.--October 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 755.11 ft above mean sea level.

AVERAGE DISCHARGE.--12 years, 42.7 cfs (8.18 inches per year).

EXTREMES.--Current year: Maximum discharge, 315 cfs Feb. 27; maximum gage height, 4.53 ft Feb. 5 (backwater from ice); minimum daily discharge, 7.8 cfs Aug. 23, 24; minimum gage height, 1.45 ft June 28.
Period of record: Maximum discharge, 918 cfs Feb. 1, 1968; maximum gage height, 5.95 ft Feb. 10, 1965 (backwater from ice); minimum discharge, 3.9 cfs Aug. 3, 1966; minimum gage height, 1.26 ft Sept. 16, 1960.

REMARKS.--Records poor. Occasional regulation by Lake Orion.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	60	65	50	35	190	106	55	17	15	19	15
2	43	60	70	50	35	178	115	55	26	16	17	14
3	42	60	70	50	35	166	112	54	19	15	16	14
4	40	55	70	60	40	157	106	51	27	13	15	14
5	38	50	70	60	100	144	100	50	26	15	9.6	13
6	37	45	65	58	90	139	97	49	28	20	13	12
7	36	40	60	55	75	141	93	46	26	20	15	12
8	36	35	55	50	65	133	88	44	26	20	14	13
9	36	35	55	48	60	121	85	41	33	20	14	13
10	36	40	50	46	55	112	81	37	24	19	14	15
11	36	43	60	44	50	109	75	25	23	18	16	15
12	36	41	65	42	50	103	72	25	20	17	14	15
13	37	39	65	41	48	100	84	25	15	15	13	15
14	51	38	60	40	46	112	84	23	14	13	13	14
15	57	37	58	39	45	196	79	17	15	13	14	13
16	50	37	55	38	45	229	76	23	14	14	13	13
17	46	39	53	37	45	188	78	33	26	16	9.3	13
18	44	40	54	37	45	196	78	23	20	15	8.9	15
19	50	42	55	37	90	196	75	16	22	14	13	15
20	60	45	55	36	183	196	70	31	20	15	13	31
21	60	50	58	36	190	171	67	31	20	15	11	22
22	60	55	60	35	136	160	63	29	18	14	8.2	18
23	60	55	60	35	129	149	60	25	16	13	7.8	17
24	60	50	60	35	125	131	59	28	15	15	7.8	16
25	60	50	58	35	133	125	56	32	11	22	10	15
26	60	50	58	35	168	117	56	31	12	23	24	22
27	55	50	55	35	291	112	54	30	11	22	24	29
28	55	60	55	35	238	112	55	29	11	21	20	26
29	55	65	55	35	------	111	57	44	14	20	17	22
30	55	65	55	35	------	103	55	38	15	20	16	20
31	60	------	50	35	------	100	------	25	------	20	16	------
TOTAL	1,494	1,431	1,834	1,304	2,647	4,497	2,336	1,065	584	528	435.6	501
MEAN	48.2	47.7	59.2	42.1	94.5	145	77.9	34.4	19.5	17.0	14.1	16.7
MAX	60	65	70	60	291	229	115	55	33	23	24	31
MIN	36	35	50	35	35	100	54	16	11	13	7.8	12
CFSM	.68	.67	.84	.59	1.33	2.05	1.10	.49	.28	.24	.20	.24
IN.	.78	.75	.96	.68	1.39	2.36	1.23	.56	.31	.28	.23	.26

CAL YR 1970 TOTAL 16,927.0 MEAN 46.4 MAX 151 MIN 15 CFSM .65 IN 8.88
WTR YR 1971 TOTAL 18,656.6 MEAN 51.1 MAX 291 MIN 7.8 CFSM .72 IN 9.79

PEAK DISCHARGE (BASE, 200 CFS)

DATE	TIME	GHT	DISCHARGE
02-21	0200	3.92	256
02-27	1800	4.10	315
03-16	0400	3.90	250

04161580 Stony Creek near Romeo, Mich.

LOCATION.--Lat 42°48'03", long 83°05'25", in SW¼ sec.31, T.5 N., R.12 E., Macomb County, on right bank, at upstream side of bridge on Romeo Road, and 4.0 miles west of Romeo.

DRAINAGE AREA.--25.6 sq mi.

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 861.64 ft above mean sea level.

AVERAGE DISCHARGE.--7 years, 14.2 cfs (7.53 inches per year).

EXTREMES.--Current year: Maximum discharge, 123 cfs Mar. 17 (gage height, 3.41 ft); minimum, 1.3 cfs Aug. 19 (gage height, 1.34 ft).
Period of record: Maximum discharge, 229 cfs Feb. 1, 1968 (gage height, 4.53 ft); maximum gage height, 4.56 ft Feb. 10, 1965; minimum discharge, 0.92 cfs Oct. 5, 9, 1967; minimum gage height, 1.28 ft July 27, 28, 1965.

REMARKS.--Records good except those for the winter period, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	11	17	13	7.0	89	51	18	4.0	3.9	2.7	2.2
2	13	12	15	12	7.0	88	54	18	6.1	3.7	2.2	2.0
3	12	23	20	12	7.0	70	50	15	6.0	3.4	2.2	2.1
4	11	25	23	15	8.0	60	44	12	5.5	3.3	2.1	1.9
5	9.9	23	17	15	18	49	38	11	4.9	4.2	2.0	1.8
6	9.0	19	13	15	19	46	36	13	5.6	5.3	1.9	1.8
7	8.6	17	8.6	14	19	46	34	12	6.3	4.5	1.8	1.8
8	8.3	14	9.0	13	19	45	33	11	5.1	4.0	1.8	1.8
9	7.8	13	10	12	19	42	31	9.3	4.7	3.5	1.9	1.8
10	8.3	17	11	11	17	39	30	8.3	4.4	3.1	1.8	1.8
11	7.7	15	12	11	17	37	27	8.0	6.3	2.8	2.2	1.7
12	6.6	14	21	11	17	35	26	8.8	6.5	2.5	2.2	1.9
13	6.9	16	23	10	16	35	32	8.4	8.0	2.2	1.8	2.1
14	19	14	23	10	14	47	31	8.1	6.6	2.1	1.9	2.1
15	21	13	22	10	13	87	32	7.4	6.7	2.2	1.8	2.0
16	13	11	22	9.5	13	109	30	6.7	5.4	2.3	1.9	1.8
17	9.5	11	21	9.5	13	107	27	5.8	4.5	2.5	1.8	2.0
18	13	11	21	9.0	13	83	27	5.1	5.7	2.8	1.8	1.9
19	13	10	20	8.5	20	73	23	5.3	5.0	2.7	1.5	1.8
20	12	21	20	8.0	45	73	19	5.8	4.6	2.5	1.7	5.4
21	15	22	20	8.0	46	66	16	5.4	4.2	2.3	1.9	5.8
22	15	18	20	8.0	42	62	18	5.2	4.0	2.2	2.0	3.2
23	11	14	19	8.0	45	60	22	4.9	3.7	2.0	2.0	2.6
24	11	11	18	8.0	50	58	19	6.0	3.5	2.0	2.1	2.3
25	12	10	17	8.0	54	50	19	7.6	3.8	2.0	1.9	2.3
26	11	9.7	17	8.0	62	45	17	6.5	3.6	2.7	3.3	3.4
27	9.7	13	17	8.0	78	44	15	6.1	3.4	3.3	3.8	5.8
28	9.3	23	16	8.0	83	47	17	5.4	3.1	2.6	3.3	5.6
29	9.7	20	15	8.0	------	52	20	4.8	3.0	2.3	2.8	3.9
30	14	19	14	8.0	------	50	19	4.5	3.1	2.4	2.2	3.1
31	12	------	14	7.5	------	47	------	4.3	------	2.9	2.2	------
TOTAL	352.3	469.7	535.6	316.0	781.0	1,841	857	257.7	147.3	90.2	66.5	79.7
MEAN	11.4	15.7	17.3	10.2	27.9	59.4	28.6	8.31	4.91	2.91	2.15	2.66
MAX	21	25	23	15	83	109	54	18	8.0	5.3	3.8	5.8
MIN	6.6	9.7	8.6	7.5	7.0	35	15	4.3	3.0	2.0	1.5	1.7
CFSM	.45	.61	.68	.40	1.09	2.32	1.12	.32	.19	.11	.08	.10
IN.	.51	.68	.78	.46	1.13	2.68	1.25	.37	.21	.13	.10	.12

CAL YR 1970 TOTAL 4,701.7 MEAN 12.9 MAX 53 MIN 1.5 CFSM .50 IN 6.83
WTR YR 1971 TOTAL 5,794.0 MEAN 15.9 MAX 109 MIN 1.5 CFSM .62 IN 8.42

PEAK DISCHARGE (BASE, 100 CFS).--Mar. 1 (1300) 108 cfs (3.34 ft); Mar. 17 (1200) 123 cfs (3.41 ft).

04161790 Stony Lake near Washington, Mich.

LOCATION.--Lat 42°42'58", long 83°05'58", in SE¼ sec.31, T.4 N., R.12 E., Macomb County, on left bank 1,000 ft east of bridge over dam on Stony Creek, and 2.7 miles west of Washington.

DRAINAGE AREA.--68.0 sq mi.

PERIOD OF RECORD.--February 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is 790.00 ft above mean sea level (levels by Huron-Clinton Metropolitan Authority). Gage readings have been converted to elevations above mean sea level.

EXTREMES.--Current year: Maximum contents, 4,992 acre-ft Apr. 18 (elevation, 802.2 ft); minimum, 4,047 acre-ft Jan. 29 (elevation 800.3 ft).
Period of record: Maximum contents, 5,349 acre-ft Apr. 19, 1967, June 26, 1968 (elevation, 802.9 ft); minimum recorded, 1,758 acre-ft Nov. 21, 1967 (elevation, 794.7 ft).

REMARKS.--Reservoir is formed by an earth-fill dam with concrete spillway completed in 1962. The spillway section includes a drum gate with minimum crest elevation of 796 ft, maximum of 802 ft, and 2 sluices, one on each side with valve controls (capable of draining lake). The reservoir began filling February 1963. Lake is used for recreational purposes.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Elevation (feet)	Contents (Acre-feet)	Change in contents during month (Acre-feet)	Change in contents during month Equivalent in cfs
Sept. 30	801.9	4,840	-	-
Oct. 31	801.5	4,640	-200	-3.3
Nov. 30	800.4	4,096	-544	-9.1
Dec. 31	800.4	4,096	0	0
Calender year 1970	-	-	+1,232	+1.7
Jan. 31	800.3	4,047	-49	-.8
Feb. 28	800.9	4,341	+294	+5.3
Mar. 31	800.6	4,194	-147	-2.4
Apr. 30	802.1	4,941	+747	+12.6
May 31	802.0	4,890	-51	-.8
June 30	801.9	4,840	-50	-.8
July 31	801.8	4,790	-50	-.8
Aug. 31	802.0	4,890	+100	+1.6
Sept 30	802.1	4,941	+51	+.9
Water year 1970-71	-	-	+101	+.1

04161800 Stony Creek near Washington, Mich.

LOCATION.--Lat 42°42'55", long 83°05'31", in SW1/4 sec.31, T.4 N., R.12 E., Macomb County, on left bank 15 ft downstream from bridge on Mt. Vernon Road, 500 ft downstream from Stony Lake Dam, and 2.9 miles west of Washington.

DRAINAGE AREA.--68.2 sq mi.

PERIOD OF RECORD.--July 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is 772.59 ft above mean sea level (levels by Huron-Clinton Metropolitan Authority).

AVERAGE DISCHARGE.--13 years, 33.7 cfs (6.73 inches per year), adjusted for storage since 1963.

EXTREMES.--Current year: Maximum discharge, 204 cfs Mar. 16 (gage height, 4.86 ft); minimum, 4.0 cfs Aug. 16 (gage height, 1.98 ft).
Period of record: Maximum discharge, 427 cfs Feb. 2, 1968 (gage height, 5.86 ft); maximum gage height, 6.71 ft Mar. 6, 1959 (backwater from ice); minimum discharge, 0.9 cfs July 10, 1963; minimum gage height, 1.84 ft July 31, 1964; minimum daily discharge, 1.3 cfs July 31, Aug. 1, 1964.

REMARKS.--Records good. Occasional diurnal fluctuation caused by mills above station prior to February 1963; occasional regulation by Stony Lake since (see sta 04161790).

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	40	53	33	18	170	89	45	13	9.8	5.1	10
2	22	36	50	32	17	159	59	48	17	9.5	5.0	8.6
3	23	42	49	31	17	150	40	43	19	6.0	5.6	7.9
4	22	66	57	38	19	123	67	37	19	5.6	6.3	7.7
5	21	67	53	39	44	103	40	36	18	7.4	5.3	7.4
6	21	56	48	39	47	100	27	37	19	12	4.8	7.2
7	21	50	39	37	48	105	45	33	19	10	4.8	7.2
8	21	42	36	34	48	88	54	31	20	10	4.7	6.9
9	20	55	31	31	48	73	36	27	17	10	4.6	7.2
10	20	65	31	28	44	76	39	26	12	11	4.6	7.0
11	18	50	50	27	41	73	45	25	11	13	5.2	7.0
12	17	44	36	28	42	65	44	25	12	6.3	4.3	7.0
13	18	55	51	27	42	61	52	22	22	6.3	4.2	7.4
14	32	57	50	26	35	72	52	21	23	6.3	4.8	4.8
15	37	41	48	25	33	147	52	20	19	5.9	5.3	5.9
16	36	32	48	24	33	197	50	21	16	6.0	4.1	5.0
17	34	30	50	24	34	192	50	19	14	7.5	4.1	6.9
18	31	28	49	23	33	170	50	18	12	6.2	4.1	6.3
19	30	49	50	22	45	159	50	21	11	9.1	4.1	5.5
20	31	68	51	21	81	142	50	31	11	6.2	4.1	9.8
21	37	57	52	20	119	123	54	28	12	5.9	4.4	15
22	36	50	52	20	119	119	50	23	8.9	5.9	4.7	15
23	33	45	50	20	117	116	48	17	8.2	5.9	5.1	14
24	32	39	47	20	111	106	45	17	8.9	5.9	4.3	12
25	30	75	42	21	109	97	44	21	9.5	5.8	4.5	11
26	28	61	43	22	125	90	40	21	7.4	5.7	9.1	13
27	61	49	43	20	179	83	36	21	6.9	5.7	30	19
28	54	54	41	18	183	82	42	19	6.9	5.7	26	24
29	39	52	39	19	------	83	42	18	6.3	5.6	21	24
30	63	55	37	20	------	86	43	17	6.9	5.2	17	19
31	56	------	35	19	------	87	------	17	------	5.5	15	------
TOTAL	965	1,510	1,411	808	1,831	3,497	1,435	805	405.9	226.9	236.2	308.7
MEAN	31.1	50.3	45.5	26.1	65.4	113	47.8	26.0	13.5	7.32	7.62	10.3
MAX	63	75	57	39	183	197	89	48	23	13	30	24
MIN	17	28	31	18	17	61	27	17	6.3	5.2	4.1	4.8
MEAN+	27.8	41.2	45.5	25.3	70.7	111	60.4	25.2	12.7	6.52	9.22	11.2
CFSM+	.41	.60	.67	.37	1.04	1.63	.89	.37	.19	.096	.14	.16
IN+	.47	.67	.77	.43	1.08	1.88	.99	.43	.21	.11	.16	.18

CAL YR 1970 TOTAL 12,579.2 MEAN 34.5 MAX 120 MIN 4.5 MEAN+ 36.2 CFSM+ .53 IN+ 7.21
WTR YR 1971 TOTAL 13,439.7 MEAN 36.8 MAX 197 MIN 4.1 MEAN+ 36.9 CFSM+ .54 IN+ 7.34

+Adjusted for change in contents in Stony Lake.

04162900 Big Beaver Creek near Warren, Mich.

LOCATION.--Lat 42°32'31", long 83°02'52", in NW¼ SW¼ sec.33, T.2 N., R.12 E., Macomb County, on left bank between bridges on Mound Road, 1.0 mile north of Warren, and 2.0 miles upstream from mouth.

DRAINAGE AREA.--23.5 sq mi.

PERIOD OF RECORD.--October 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is 598.80 ft above mean sea level (Macomb County benchmark). Prior to Aug. 26, 1960, nonrecording gage and crest-stage gage at same site and datum.

AVERAGE DISCHARGE.--13 years, 12.7 cfs (7.34 inches per year).

EXTREMES.--Current year: Maximum discharge, about 390 cfs Feb. 20 (gage height, 11.16 ft, backwater from ice); minimum, 0.30 cfs July 22, 23, Aug. 16 (gage height, 4.58 ft).
Period of record: Maximum discharge, 1,240 cfs June 26, 1968 (gage height, 14.45 ft); minimum, no flow on several days in June and July 1962, caused by unusual regulation above gage; minimum natural discharge, 0.1 cfs several days each year in 1959-62.

REMARKS.--Records poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	2.0	8.4	1.8	.90	30	13	3.0	.66	1.8	3.3	2.2
2	1.8	6.8	5.3	1.8	.90	24	22	2.6	6.5	1.4	1.1	1.7
3	4.9	24	5.5	2.0	1.0	20	15	2.6	4.4	1.1	1.1	2.8
4	5.9	24	21	5.0	1.9	19	11	2.8	2.8	.81	1.4	10
5	5.4	11	8.9	6.0	116	18	9.9	2.4	1.3	10	1.2	3.5
6	5.7	4.2	4.2	3.3	70	20	9.3	2.8	1.7	21	2.1	2.3
7	2.9	2.6	2.8	2.5	40	36	9.0	2.3	2.4	4.8	1.2	2.2
8	.85	1.6	2.7	2.0	18	25	8.7	1.7	4.7	2.0	.79	1.8
9	1.6	1.5	3.2	1.7	10	26	10	1.6	2.9	2.6	.60	1.7
10	4.8	9.4	3.2	1.5	9.0	17	14	1.5	1.2	.98	1.2	4.1
11	1.0	5.9	3.5	1.3	8.5	17	5.3	1.7	.90	.49	5.9	3.5
12	.73	2.4	3.7	1.2	8.0	16	5.1	1.8	1.2	.52	3.5	1.8
13	2.7	1.7	4.0	1.1	8.0	24	11	1.8	1.3	.60	1.6	1.6
14	13	1.4	4.5	1.0	8.0	55	15	1.6	1.3	.78	.79	2.0
15	9.7	2.4	5.0	1.0	8.0	73	9.3	1.4	1.1	.99	.60	1.7
16	2.4	2.0	6.0	.90	8.5	36	7.5	1.8	1.1	1.3	.45	1.7
17	1.2	1.6	7.3	.90	12	24	8.0	1.2	1.1	.94	.50	3.5
18	.65	1.5	8.0	.90	35	20	8.5	1.0	1.7	.92	.60	3.3
19	.50	1.4	10	.90	70	29	6.0	2.0	1.8	.57	.60	2.1
20	.70	25	15	.90	250	37	5.3	7.3	1.9	.54	.65	32
21	7.1	13	10	.90	140	24	4.5	4.4	2.0	.55	1.2	23
22	3.2	4.1	7.0	.90	50	25	4.2	2.3	1.7	.49	.97	4.4
23	1.3	2.6	5.5	.90	35	23	3.5	1.0	2.0	.45	3.9	1.6
24	.97	2.4	4.5	.90	30	22	4.8	1.3	2.3	2.0	2.1	1.7
25	1.1	2.1	3.8	.90	28	19	3.7	5.0	1.8	1.2	2.0	1.4
26	2.1	1.7	3.2	.90	50	17	3.0	2.7	.95	.70	3.0	1.9
27	1.7	7.6	2.8	.90	70	15	3.0	2.0	1.1	.79	26	25
28	.65	28	2.5	.90	30	15	3.0	1.3	1.1	.70	27	17
29	1.3	18	2.2	.90	------	15	3.2	.92	1.5	.60	8.9	3.6
30	6.1	14	2.0	.90	------	13	3.0	.63	1.5	.97	4.8	4.9
31	3.9	------	1.8	.90	------	12	------	.60	------	8.4	4.1	------
TOTAL	97.65	225.9	177.5	47.60	1,116.70	766	238.8	67.05	57.91	70.99	113.15	170.0
MEAN	3.15	7.53	5.73	1.54	39.9	24.7	7.96	2.16	1.93	2.29	3.65	5.67
MAX	13	28	21	6.0	250	73	22	7.3	6.5	21	27	32
MIN	.50	1.4	1.8	.90	.90	12	3.0	.60	.66	.45	.45	1.4
CFSM	.13	.32	.24	.07	1.70	1.05	.34	.09	.08	.10	.16	.24
IN.	.15	.36	.28	.08	1.77	1.21	.38	.11	.09	.11	.18	.27

CAL YR 1970 TOTAL 3,258.38 MEAN 8.93 MAX 219 MIN .50 CFSM .38 IN 5.16
WTR YR 1971 TOTAL 3,149.25 MEAN 8.63 MAX 250 MIN .45 CFSM .37 IN 4.99

PEAK DISCHARGE (BASE, 300 CFS).--Feb. 20 (time unknown) about 390 cfs.

04163400 Plum Brook at Utica, Mich.

LOCATION.--Lat 42°36'05", long 83°04'27", in SE¼ NE¼ sec.7, T.2 N., R.12 E., Macomb County, on left bank at upstream side of bridge on Ryan Road, 1.0 miles southwest of Utica.

DRAINAGE AREA.--16.5 sq mi.

PERIOD OF RECORD.--July 1965 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 625 ft (from topographic map).

AVERAGE DISCHARGE.--6 years,11.3 cfs (9.30 inches per year).

EXTREMES.--Current year: Maximum discharge, about 320 cfs Feb. 20, from correlation with nearby stations; maximum gage height, 6.25 ft Feb. 27 (backwater from ice); minimum discharge, 0.05 cfs Aug. 6, 8; minimum gage height, 1.24 ft July 12.
Period of record: Maximum discharge, 1,160 cfs June 26, 1968 (gage height, 10.36 ft); no flow part of each day July 19, 28, 1966, Aug. 22-28, Sept. 3, 11, 1969; minimum gage height, 1.23 ft Sept. 16, 1967.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, which are poor.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.5	1.1	7.1	3.0	1.3	28	12	4.0	2.0	1.4	1.7	1.0
2	8.6	1.5	5.3	3.0	1.3	20	19	4.4	3.4	1.5	1.8	1.1
3	1.5	8.1	4.8	3.0	1.3	18	14	3.7	3.3	1.5	1.5	1.1
4	.33	9.5	8.5	5.0	1.5	16	11	3.6	2.9	2.1	2.2	.96
5	.24	5.5	5.6	8.0	80	15	9.4	4.0	2.4	4.8	1.7	1.0
6	.16	3.4	4.0	5.0	50	13	12	4.1	2.3	4.8	1.4	.99
7	.13	2.2	3.4	3.5	33	28	9.2	4.1	2.3	3.0	1.1	.90
8	.12	1.8	3.2	2.5	15	26	8.4	3.9	2.3	2.1	1.4	.76
9	.19	1.5	3.6	2.0	10	24	7.7	4.0	1.3	2.1	.82	.91
10	.65	3.4	3.5	1.8	8.0	14	7.4	2.9	1.7	1.6	1.8	.81
11	.77	3.5	4.0	1.6	7.6	13	7.0	3.5	1.8	1.3	3.9	1.2
12	.71	2.5	4.0	1.5	7.0	12	6.7	4.3	1.6	.96	1.5	1.4
13	.87	2.1	4.0	1.5	7.0	20	10	4.4	2.1	1.5	1.1	1.3
14	2.8	1.7	4.1	1.4	7.0	62	14	4.0	1.8	.96	.75	1.3
15	2.7	1.8	6.3	1.4	7.0	95	11	3.2	2.4	1.1	1.1	.97
16	1.0	1.7	4.5	1.3	7.0	51	9.1	2.8	2.0	1.1	.98	1.0
17	.68	1.5	5.5	1.3	10	31	8.6	2.5	1.8	1.7	.92	.72
18	.46	1.6	6.0	1.3	20	20	9.6	2.5	1.9	1.5	1.5	.68
19	.37	1.5	7.0	1.3	90	24	7.7	2.7	2.2	1.5	1.3	.58
20	.42	8.6	6.0	1.3	190	34	7.3	4.9	2.2	2.3	1.2	9.2
21	1.9	7.1	5.0	1.3	100	25	6.4	3.9	2.7	1.8	1.1	4.1
22	1.6	4.1	4.5	1.3	45	22	5.8	3.0	2.0	2.1	1.1	1.8
23	1.0	3.1	4.3	1.3	30	21	5.4	2.9	1.7	2.4	2.4	1.5
24	1.0	3.1	4.0	1.3	25	22	4.7	3.0	1.9	2.6	1.1	1.3
25	.85	2.0	3.8	1.3	22	19	4.4	3.7	1.5	1.6	1.2	1.1
26	.74	2.1	3.5	1.3	35	15	4.3	3.2	1.3	2.1	1.9	1.6
27	.71	3.5	3.3	1.3	60	14	4.0	3.5	1.7	2.6	5.4	5.2
28	.60	14	3.1	1.3	45	16	4.4	3.1	1.2	2.2	5.5	3.3
29	.74	9.9	3.0	1.3	------	15	4.3	2.7	1.2	2.5	1.5	1.4
30	1.6	14	3.0	1.3	------	13	4.3	2.3	1.1	2.1	1.3	.90
31	1.4	------	3.0	1.3	------	11	------	2.4	------	5.2	1.2	------
TOTAL	44.34	127.4	140.9	65.0	916.0	757	249.1	107.2	60.0	66.02	53.37	50.08
MEAN	1.43	4.25	4.55	2.10	32.7	24.4	8.30	3.46	2.00	2.13	1.72	1.67
MAX	9.5	14	8.5	8.0	190	95	19	4.9	3.4	5.2	5.5	9.2
MIN	.12	1.1	3.0	1.3	1.3	11	4.0	2.3	1.1	.96	.75	.58
CFSM	.09	.26	.28	.13	1.98	1.48	.50	.21	.12	.13	.10	.10
IN.	.10	.29	.32	.15	2.07	1.71	.56	.24	.14	.15	.12	.11

CAL YR 1970 TOTAL 2,518.92 MEAN 6.90 MAX 100 MIN .12 CFSM .42 IN 5.68
WTR YR 1971 TOTAL 2,636.41 MEAN 7.22 MAX 190 MIN .12 CFSM .44 IN 5.94

PEAK DISCHARGE (BASE, 200 CFS).--Feb. 20 (time unknown) about 320 cfs.

NOTE:--No gage-height record Feb. 19-21.

04164000 Clinton River near Fraser, Mich.
(International hydrological decade river station)

LOCATION.--Lat 42°34'40", long 82°57'00", in NW¼ sec.20 T.2 N., R.13 E., Macomb County, on left bank 800 ft downstream from bridge on Garfield Road, 2.8 miles north of Fraser, and 4 miles upstream from North Branch.

DRAINAGE AREA.--444 sq mi.

PERIOD OF RECORD.--May 1947 to current year.

GAGE.--Water-stage recorder. Datum of gage is 577.71 ft above mean sea level. Prior to Nov. 17, 1949 nonrecording gage at site 800 ft upstream at same datum.

AVERAGE DISCHARGE.--24 years, 337 cfs (10.31 inches per year).

EXTREMES.--Current year: Maximum discharge, 3,480 cfs Feb. 5 (gage height, 15.44 ft); minimum, 84 cfs Sept. 19, minimum gage height, 5.08 ft July 19.
Period of record: 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 April 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. Records of suspended sediment loads for the current year are published in Part 2 of this report.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	291	314	418	287	266	930	642	303	138	201	152	166
2	303	337	383	309	290	839	706	286	287	168	126	150
3	303	564	391	303	281	777	608	284	210	143	125	149
4	284	499	495	501	259	719	566	285	178	122	128	194
5	267	429	410	481	2,400	675	562	277	168	342	126	170
6	258	343	354	355	881	684	513	282	167	543	126	140
7	252	308	338	331	548	896	528	264	220	209	124	132
8	235	274	342	308	461	740	525	247	237	173	112	145
9	233	262	330	301	403	654	515	230	186	165	115	134
10	235	364	326	316	387	651	476	217	179	155	210	132
11	219	330	364	305	389	642	455	204	165	136	308	129
12	216	287	367	305	467	625	451	182	164	132	173	113
13	218	270	347	243	388	631	525	179	162	143	135	113
14	303	274	372	215	344	780	576	157	163	151	128	131
15	381	299	363	246	352	1,210	499	156	178	155	123	127
16	243	262	343	231	354	1,270	460	166	171	145	126	116
17	226	270	411	238	470	1,020	489	169	159	145	145	114
18	218	257	414	226	679	893	500	171	179	124	142	112
19	218	252	558	210	1,730	933	473	181	163	121	134	99
20	228	573	544	233	2,200	1,010	464	305	151	133	140	538
21	350	465	436	215	1,590	865	465	184	174	132	150	350
22	286	351	409	230	971	804	454	149	178	126	124	170
23	255	325	401	230	1,060	808	418	126	167	127	176	160
24	241	315	383	230	837	783	401	143	164	139	137	150
25	233	298	335	230	777	739	384	225	167	131	145	140
26	233	301	300	230	941	706	374	173	166	160	260	160
27	238	309	331	221	1,270	681	373	158	140	177	732	500
28	279	543	304	231	1,220	656	373	154	131	148	570	220
29	318	471	326	246	------	666	359	152	157	149	217	200
30	359	447	309	247	------	653	324	147	164	137	168	180
31	343	------	310	243	------	631	------	134	------	278	178	------
TOTAL	8,266	10,593	11,714	8,497	22,215	24,571	14,458	6,290	5,233	5,310	5,755	5,334
MEAN	267	353	378	274	793	793	482	203	174	171	186	178
MAX	381	573	558	501	2,400	1,270	706	305	287	543	732	538
MIN	216	252	300	210	259	625	324	126	131	121	112	99
CFSM	.60	.80	.85	.62	1.79	1.79	1.09	.46	.39	.39	.42	.40
IN.	.69	.89	.98	.71	1.86	2.06	1.21	.53	.44	.44	.48	.45

CAL YR 1970 TOTAL 123,647 MEAN 339 MAX 1,990 MIN 116 CFSM .76 IN 10.36
WTR YR 1971 TOTAL 128,236 MEAN 351 MAX 2,400 MIN 99 CFSM .79 IN 10.74

PEAK DISCHARGE (BASE, 2,000 CFS)

DATE	TIME	GHT	DISCHARGE
02-05	1000	15.44	3,480
02-20	0300	14.09	2,520

04164100 East Pond Creek at Romeo, Mich.

LOCATION.--Lat 42°49'21", long 83°01'13", in NE1/4SE1/4 sec.27, T.5 N., R.12 E., Macomb County, on right bank 10 ft upstream from bridge on State Highway 53, and 1.4 miles north of Romeo.

DRAINAGE AREA.--21.8 sq mi.

PERIOD OF RECORD.--September 1958 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 780 ft (from topographic map).

AVERAGE DISCHARGE.--13 years 12.4 cfs (7.72 inches per year).

EXTREMES.--Current year: Maximum discharge, 100 cfs Mar. 15 (gage height, 2.50 ft); maximum recorded gage height, 3.89 ft Feb. 23 (backwater from ice); minimum discharge, 1.4 cfs Aug. 13, 14 (gage height, 0.88 ft).
Period of record: Maximum discharge, 358 cfs Feb. 10, 1965 (gage height, 4.48 ft); maximum gage height, 4.56 ft Mar. 12, 1962 (backwater from ice); minimum discharge, 0.8 cfs July 30, 31, 1964, Aug. 6, 7, 1965; minimum gage height, 0.71 ft July 21, 1959.

REMARKS.--Records good except those for the winter period, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	10	17	11	6.0	70	36	17	6.9	4.1	3.6	3.3
2	11	10	16	11	6.0	70	39	16	9.0	3.8	3.0	3.3
3	9.5	20	16	12	6.0	60	36	15	9.5	3.8	3.0	3.1
4	8.5	24	20	13	7.0	45	34	14	9.0	3.8	2.8	3.1
5	7.6	21	18	13	15	40	31	14	8.5	5.1	2.7	3.1
6	6.9	19	16	13	16	35	30	13	9.5	6.2	2.5	3.0
7	6.2	18	31	12	16	35	28	12	10	4.4	2.3	2.8
8	6.2	18	14	11	16	35	27	11	8.0	4.1	2.4	2.8
9	5.8	18	13	10	16	35	26	11	6.9	3.8	2.2	2.6
10	5.5	20	13	10	15	30	25	10	6.6	3.8	2.1	2.5
11	5.1	19	22	10	15	30	23	10	6.2	3.6	2.3	2.5
12	5.1	19	22	9.0	14	26	22	11	6.2	3.4	1.7	2.5
13	5.8	20	12	9.0	13	25	28	10	9.5	3.3	1.6	2.5
14	13	19	12	9.0	12	42	29	9.5	7.6	2.4	1.7	2.5
15	16	18	25	9.0	12	94	25	9.0	7.3	2.6	1.7	2.3
16	14	16	29	8.0	11	78	24	8.5	6.6	2.8	1.9	2.3
17	16	14	14	8.0	12	75	25	8.5	6.6	2.5	1.8	2.4
18	16	13	14	8.0	13	70	24	8.0	6.2	2.6	1.8	2.4
19	16	12	15	7.0	20	56	21	9.0	5.8	3.1	2.0	2.4
20	16	18	16	7.0	35	54	20	16	5.8	3.0	1.7	8.5
21	18	20	17	7.0	36	48	20	11	4.4	2.7	1.9	11
22	16	16	16	7.0	35	46	18	9.0	3.9	2.5	1.9	6.0
23	14	13	15	7.0	35	45	17	8.5	4.2	2.3	2.1	4.4
24	14	15	15	7.0	40	46	17	9.5	5.1	2.4	3.4	4.0
25	12	25	15	7.0	45	46	16	12	4.8	2.7	2.6	4.0
26	11	12	14	6.8	50	36	16	10	3.8	3.9	5.5	5.9
27	10	14	14	6.6	60	34	15	10	3.8	3.3	11	13
28	9.5	20	13	6.5	65	35	16	9.5	3.6	3.1	7.3	15
29	10	19	13	6.4	------	37	17	8.5	3.3	2.7	4.2	8.7
30	12	18	12	6.2	------	35	16	8.0	3.6	2.4	3.6	6.1
31	10	------	12	6.0	------	34	------	7.6	------	6.2	3.3	------
TOTAL	338.7	518	511	273.5	642.0	1,447	721	336.1	192.2	106.4	91.6	138.0
MEAN	10.9	17.3	16.5	8.82	22.9	46.7	24.0	10.8	6.41	3.43	2.95	4.60
MAX	18	25	31	13	65	94	39	17	10	6.2	11	15
MIN	5.1	10	12	6.0	6.0	25	15	7.6	3.3	2.3	1.6	2.3
CFSM	.50	.79	.76	.40	1.05	2.14	1.10	.50	.29	.16	.14	.21
IN.	.58	.88	.87	.47	1.10	2.47	1.23	.57	.33	.18	.16	.24

CAL YR 1970 TOTAL 5,010.7 MEAN 13.7 MAX 50 MIN 2.5 CFSM .63 IN 8.55
WTR YR 1971 TOTAL 5,315.5 MEAN 14.6 MAX 94 MIN 1.6 CFSM .67 IN 9.07

PEAK DISCHARGE (BASE, 80 CFS).--Mar. 15 (1100) 100 cfs (2.50 ft).

NOTE.--No gage-height record Dec. 26 to Jan. 29.

04164150 North Branch Clinton River near Meade, Mich.

LOCATION.--Lat 42°43'50", long 82°54'23", in NE¼ sec.34, T.4 N., R.13 E., Macomb County, on left bank at downstream side of bridge on 27-Mile Road, 1.9 miles northwest of Meade.

DRAINAGE AREA.--89.6 sq mi.

PERIOD OF RECORD.--Water year 1959-67 (annual maximum), October 1967 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 615 ft (from topographic map). Nov. 6, 1958, to Oct. 12, 1967, crest-stage gage at same site and datum.

EXTREMES.--Current year: Maximum discharge, 1,310 cfs Mar. 15 (gage height, 6.25 ft); maximum gage height, 6.88 ft Feb. 21 (backwater from ice); minimum discharge, 1.4 cfs Aug. 19, 22 (gage height, 0.43 ft).
Period of record: Maximum discharge, 4,380 cfs Feb. 2, 1968 (gage height, 7.53 ft); maximum gage height, 7.85 ft Mar. 13, 1962 (backwater from ice); minimum discharge, 0.2 cfs Aug. 27, 1968; minimum gage height, 0.43 ft Aug. 19, 22, 1971.

REMARKS.--Records good except those for the winter period, which are poor. Occasional regulation at low flow by mill pond above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	27	69	30	19	400	126	43	20	8.3	12	8.9
2	25	27	59	30	21	320	156	43	23	8.9	7.7	8.9
3	22	45	53	30	24	250	146	40	38	8.0	6.7	7.4
4	21	96	77	31	30	220	114	38	34	7.2	6.1	8.0
5	18	111	86	33	45	180	98	35	26	8.6	5.6	8.0
6	16	77	58	35	60	160	92	33	24	16	5.0	7.4
7	15	55	55	33	75	150	88	32	30	17	4.8	7.4
8	15	44	50	31	90	140	84	30	30	11	4.1	7.0
9	14	40	44	29	90	120	80	27	22	9.2	3.6	7.0
10	14	43	44	27	85	110	77	26	19	7.4	2.9	5.2
11	12	51	43	26	75	105	73	27	16	7.4	3.8	5.0
12	12	45	51	24	65	98	69	27	16	7.4	4.8	6.1
13	14	42	54	23	55	94	78	27	22	5.6	4.8	6.1
14	26	40	52	21	52	204	121	26	26	5.6	3.8	5.9
15	77	38	45	20	52	903	100	26	22	6.1	2.9	5.9
16	77	37	43	20	52	936	82	26	19	5.0	2.9	5.2
17	43	34	42	19	60	366	76	24	15	5.2	2.1	5.4
18	38	34	54	19	90	239	85	24	15	5.4	1.7	5.4
19	34	32	65	18	180	211	76	25	14	4.8	1.8	5.4
20	32	42	88	18	420	282	66	42	14	5.6	2.0	13
21	35	84	100	18	700	226	61	34	14	5.0	2.1	30
22	39	66	77	18	720	191	56	27	12	3.6	2.1	22
23	34	49	70	17	550	233	50	24	12	3.2	4.7	13
24	30	46	60	17	400	194	47	24	11	3.9	4.3	10
25	27	58	50	17	500	220	46	34	12	3.8	5.4	9.5
26	25	39	40	17	600	138	43	35	11	6.0	46	10
27	24	38	37	17	730	135	42	29	11	8.6	74	21
28	23	63	35	17	600	143	43	26	8.0	8.3	35	31
29	22	87	33	17	------	160	46	24	7.2	6.7	19	23
30	25	81	31	17	------	148	44	22	5.2	5.9	12	14
31	29	------	30	18	------	126	------	20	------	12	10	------
TOTAL	865	1,571	1,695	707	6,440	7,402	2,365	920	548.4	226.7	303.7	322.1
MEAN	27.9	52.4	54.7	22.8	230	239	78.8	29.7	18.3	7.31	9.80	10.7
MAX	77	111	100	35	730	936	156	43	38	17	74	31
MIN	12	27	30	17	19	94	42	20	5.2	3.2	1.7	5.0
CFSM	.31	.58	.61	.25	2.57	2.67	.88	.33	.20	.08	.11	.12
IN.	.36	.65	.70	.29	2.67	3.07	.98	.38	.23	.09	.13	.13

CAL YR 1970 TOTAL 18,401.8 MEAN 50.4 MAX 525 MIN 3.9 CFSM .56 IN 7.64
WTR YR 1971 TOTAL 23,365.9 MEAN 64.0 MAX 936 MIN 1.7 CFSM .71 IN 9.70

PEAK DISCHARGE (BASE, 600 CFS)

DATE	TIME	GHT	DISCHARGE
02-21	--	--	about 850
02-28	--	--	850
03-15	2300	6.25	1310

04164300 East Branch Coon Creek at Armada, Mich.

LOCATION.--Lat 42°50'45", long 82°53'06", in NE¼ sec.23, T.5 N., R.13 E., Macomb County, on right bank 10 ft downstream from bridge on Prospect Street in Armada.

DRAINAGE AREA.--13.0 sq mi.

PERIOD OF RECORD.--October 1958 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 735 ft (from topographic map).

AVERAGE DISCHARGE.--13 years, 5.14 cfs (5.37 inches per year).

EXTREMES.--Current year: Maximum discharge, 160 cfs Mar. 15, from correlation with nearby stations; maximum gage height, 5.21 ft Mar. 1 (backwater from ice); minimum discharge, 0.04 cfs July 18, 22, 23 (gage height, 1.19 ft).
Period of record: Maximum discharge, 751 cfs Apr. 17, 1967 (gage height, 6.14 ft); no flow Jan. 25 to Feb. 10, 1961, result of freezeup.

REMARKS.--Record good except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.70	.79	6.2	1.5	.50	50	11	1.6	.45	.13	1.3	.25
2	.57	.95	4.5	1.5	.60	40	20	1.4	1.5	.10	.53	.25
3	.45	2.1	3.9	1.5	.60	25	12	1.4	1.9	.09	.31	.22
4	.36	7.3	10	1.5	.70	17	6.9	1.4	.93	.09	.24	.24
5	.33	13	13	1.5	.90	14	5.3	1.3	.76	.31	.24	.23
6	.27	7.7	4.1	1.5	1.5	12	4.8	1.1	.72	.20	.27	.21
7	.25	4.1	4.3	1.4	2.0	11	4.6	1.1	.75	.11	.22	.22
8	.24	2.9	2.9	1.2	3.0	9.0	4.7	1.0	.63	.11	.20	.29
9	.20	2.3	2.8	1.1	3.5	8.0	4.4	.95	.49	.11	.14	.26
10	.17	2.2	2.6	1.0	4.0	8.0	3.9	.98	.38	.10	.18	.20
11	.20	2.2	1.9	.90	4.0	7.0	3.4	.94	.33	.09	.23	.28
12	.20	2.3	2.3	.80	4.0	6.0	3.2	.86	.34	.09	.21	.17
13	.24	2.0	2.7	.80	3.5	6.0	6.8	1.2	.32	.11	.18	.18
14	1.2	1.8	2.7	.70	3.0	20	11	1.4	.34	.11	.17	.19
15	1.2	1.7	2.8	.70	3.0	90	7.0	.91	.28	.12	.21	.15
16	3.3	1.6	2.7	.70	2.5	60	5.1	.83	.27	.11	.11	.12
17	2.3	1.5	2.9	.70	2.5	31	4.6	.57	.21	.08	.12	.11
18	1.3	1.4	3.8	.60	2.5	18	4.8	.54	.22	.07	.14	.11
19	.95	1.4	4.8	.60	3.0	22	4.1	.63	.19	.13	.20	.14
20	.89	2.4	8.0	.60	3.0	25	3.7	1.2	.16	.14	.26	.86
21	1.2	6.5	13	.60	3.5	22	3.2	1.2	.18	.09	.39	.31
22	.99	5.9	8.0	.50	4.0	21	2.9	.85	.15	.06	.28	.23
23	.84	3.3	4.5	.50	4.5	18	2.6	.75	.15	.06	.23	.22
24	.80	2.6	3.5	.50	5.0	14	2.5	.75	.14	.15	.16	.21
25	.75	2.0	3.0	.50	6.0	15	2.6	.91	.13	.15	.12	.22
26	.68	1.8	2.5	.50	7.0	16	2.2	.91	.13	.37	2.2	.35
27	.64	2.1	2.0	.50	13	17	2.1	.83	.13	.18	1.6	.87
28	.62	3.5	2.0	.50	80	22	2.0	.67	.11	.18	1.2	.58
29	.63	8.4	1.5	.50	------	22	1.9	.57	.09	.18	.56	.40
30	.92	8.2	1.5	.50	------	14	1.7	.38	.12	.30	.35	.37
31	.87	------	1.5	.50	------	10	------	.42	------	.74	.28	------
TOTAL	24.26	105.94	131.9	26.40	171.30	670.0	155.0	29.55	12.50	4.86	12.83	8.44
MEAN	.78	3.53	4.25	.85	6.12	21.6	5.17	.95	.42	.16	.41	.28
MAX	3.3	13	13	1.5	80	90	20	1.6	1.9	.74	2.2	.87
MIN	.17	.79	1.5	.50	.50	6.0	1.7	.38	.09	.06	.11	.11
CFSM	.06	.27	.33	.07	.47	1.66	.40	.07	.03	.01	.03	.02
IN.	.07	.30	.38	.08	.49	1.92	.44	.08	.04	.01	.04	.02

CAL YR 1970 TOTAL 1,456.93 MEAN 3.99 MAX 143 MIN .10 CFSM .31 IN 4.17
WTR YR 1971 TOTAL 1,352.98 MEAN 3.71 MAX 90 MIN .06 CFSM .29 IN 3.87

PEAK DISCHARGE (BASE, 100 CFS).--Feb.28 (time unknown) about 140 cfs; Mar. 15 (time unknown) about 160 cfs.

04164360 East Branch Coon Creek near New Haven, Mich.

LOCATION.--Lat 42°45'46", long 82°50'57", in NW¼ sec.19, T.4 N., R.14 E., Macomb County, on left bank at downstream side of bridge on 29-Mile Road, 3.4 miles northwest of New Haven.

DRAINAGE AREA.--36.1 sq mi.

PERIOD OF RECORD.--Water years 1959-67 (annual maximum and occasional low flow measurements), October 1967 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 630 ft (from topographic map). Nov. 6, 1958, to Nov. 10 1967, crest-stage gage at same site and datum.

EXTREMES.--Current year: Maximum discharge, 360 cfs Mar. 15, based on correlation with nearby stations; maximum gage height, 7.72 ft Feb. 27 (backwater from ice); no flow on many days; minimum gage height, 1.78 ft July 24-30.
Period of record: Maximum discharge, 2,360 cfs Feb. 1, 1968 (gage height, 8.46 ft); no flow at times most years.

REMARKS.--Records good except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.7	12	2.0	.70	150	26	6.0	.88	.01	0	.34
2	1.1	1.7	9.4	2.0	.80	100	42	5.9	1.3	0	.12	.26
3	.74	3.1	7.3	2.0	.90	70	35	5.5	2.2	0	.20	.20
4	.62	6.3	12	2.0	1.0	50	22	5.2	3.8	0	.17	.20
5	.53	12	13	2.0	1.5	40	18	4.8	2.4	0	.10	.17
6	.49	14	6.0	2.0	2.0	35	16	4.5	1.8	.12	.06	.17
7	.45	8.6	5.0	2.0	3.0	30	15	4.1	1.9	.93	.04	.14
8	.38	5.5	4.0	2.0	4.0	25	14	3.8	1.5	.26	.01	.10
9	.34	4.2	3.5	1.5	5.0	25	13	3.3	1.3	.10	0	.06
10	.34	3.8	3.5	1.5	6.0	25	12	3.0	1.1	0	0	.06
11	.26	3.3	3.0	1.5	6.0	20	11	2.8	.93	0	0	.04
12	.26	3.0	2.5	1.1	5.0	20	9.6	2.8	.84	0	0	.02
13	.38	2.8	3.0	1.0	5.0	20	12	2.8	1.2	0	0	.01
14	.66	2.6	3.5	1.0	4.5	25	20	2.5	.93	0	0	.01
15	2.6	2.5	4.0	1.0	4.0	250	19	2.2	.79	0	0	.02
16	1.5	2.3	4.5	1.0	3.5	196	14	2.1	.53	0	0	.04
17	2.5	2.1	5.4	.90	3.5	85	13	2.0	.41	0	0	.04
18	2.8	2.0	6.0	.90	3.5	50	14	1.8	.38	0	0	.04
19	1.7	2.0	8.0	.90	4.0	45	12	1.8	.26	0	0	.01
20	1.4	3.2	12	.80	4.5	70	10	2.2	.17	0	0	.14
21	1.5	5.7	18	.80	5.0	60	8.9	2.8	.10	0	0	1.9
22	1.7	8.8	14	.80	6.0	60	7.9	2.4	.12	0	0	1.2
23	1.5	7.3	8.0	.70	6.0	50	7.1	1.8	.04	0	0	.45
24	1.2	4.7	6.0	.70	8.0	50	6.6	1.7	.06	0	0	.30
25	.93	3.8	4.5	.70	9.0	40	6.4	2.0	.06	0	0	.23
26	.84	3.1	3.5	.70	10	40	6.3	2.1	.06	0	2.4	.23
27	.88	3.3	3.0	.70	35	38	5.8	2.0	.04	0	16	.42
28	.93	5.7	2.5	.70	220	40	5.7	1.8	.08	0	7.5	6.0
29	.88	7.7	2.0	.70	------	47	5.9	1.5	.02	0	3.0	3.1
30	1.2	12	2.0	.70	------	36	6.0	1.2	.01	0	1.4	1.4
31	1.7	------	2.0	.70	------	24	------	1.0	------	0	.58	------
TOTAL	33.81	148.8	193.1	37.00	367.40	1,816	414.2	89.4	25.21	1.42	31.58	17.30
MEAN	1.09	4.96	6.23	1.19	13.1	58.6	13.8	2.88	.84	.046	1.02	.58
MAX	2.8	14	18	2.0	220	250	42	6.0	3.8	.93	16	6.0
MIN	.26	1.7	2.0	.70	.70	20	5.7	1.0	.01	0	0	.01
CFSM	.03	.14	.17	.03	.36	1.62	.38	.08	.02	.001	.03	.02
IN.	.03	.15	.20	.04	.38	1.87	.43	.09	.03	.001	.03	.02

CAL YR 1970 TOTAL 3,193.63 MEAN 8.75 MAX 274 MIN 0 CFSM .24 IN 3.29
WTR YR 1971 TOTAL 3,175.22 MEAN 8.70 MAX 250 MIN 0 CFSM .24 IN 3.27

PEAK DISCHARGE (BASE, 400 CFS).--No peak above base.

04164500 North Branch Clinton River near Mount Clemens, Mich.

LOCATION.--Lat 42°37'45", long 82°53'25", in SW¼ sec.35, T.3 N., R.13 E., Macomb County, on left bank 30 ft upstream from bridge on State Highway 59, 2 miles north of Mount Clemens, and 3.6 miles upstream from mouth.

DRAINAGE AREA.--199 sq mi.

PERIOD OF RECORD.--May 1947 to current year.

GAGE.--Water-stage recorder. Concrete control since September 1961. Datum of gage is 576.38 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to Nov. 15, 1949, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--24 years, 110 cfs (7.51 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,490 cfs Mar. 16 (gage height, 13.14 ft); maximum gage height, 13.34 ft Feb. 28 (backwater from ice); minimum daily discharge, 1.7 cfs Aug. 19, 20.
Period of record: Maximum discharge, 6,700 cfs Feb. 2, 1968 (gage height, 18.62 ft); minimum, 0.2 cfs Sept. 13, 14, 1954, July 30, 1965; minimum gage height, 3.12 ft Sept. 13, 14, 1954.
Flood of April 5 or 6, 1947, reached a stage of 20.0 ft, from floodmark.

REMARKS.--Records good except those for the winter period, which are poor. Some regulation at times by mill above station.

REVISIONS (WATER YEARS).--WSP 1437: 1948. WSP 1557: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	30	112	36	19	850	190	55	19	5.0	11	14
2	28	29	89	35	21	650	221	55	22	8.0	12	10
3	24	32	72	35	24	500	278	53	24	8.5	5.2	9.3
4	21	65	71	36	27	380	219	50	35	7.5	6.0	7.7
5	19	132	123	38	35	300	155	48	32	7.0	5.5	7.7
6	18	137	109	40	55	270	129	46	27	10	5.0	8.0
7	17	92	69	40	84	250	116	42	25	14	4.5	7.6
8	16	64	68	37	100	230	109	41	27	14	4.5	6.6
9	16	52	62	34	110	210	103	38	26	10	4.0	6.5
10	15	47	53	32	105	180	97	34	21	8.0	3.5	6.5
11	15	51	52	30	95	170	89	33	17	7.0	3.0	5.0
12	14	55	36	29	85	153	83	33	16	7.0	3.5	4.5
13	14	50	52	28	75	153	83	33	17	7.0	4.5	5.5
14	15	47	74	27	70	254	130	32	23	5.5	4.5	5.5
15	27	45	72	26	65	591	163	30	24	5.5	3.5	5.5
16	71	43	55	25	60	1,370	124	30	20	6.0	2.7	5.5
17	61	40	68	25	62	1,010	103	29	17	5.0	2.7	5.0
18	40	38	80	24	80	606	103	28	14	5.0	1.8	5.0
19	35	37	89	24	150	388	106	27	14	5.0	1.7	5.0
20	33	39	151	24	300	388	92	28	14	5.0	1.7	6.0
21	32	59	256	23	700	461	82	40	13	5.0	1.8	12
22	35	106	167	23	1,100	401	75	32	13	4.0	2.0	23
23	38	73	118	22	1,100	357	68	28	12	3.5	2.0	21
24	33	50	99	21	850	404	63	25	12	3.5	4.5	12
25	29	41	60	20	600	354	60	27	11	3.5	4.0	9.0
26	27	46	50	19	700	270	58	34	11	4.0	5.7	9.0
27	25	45	47	18	900	236	56	32	11	6.0	85	11
28	23	49	43	18	1,100	230	54	28	10	8.0	95	20
29	23	87	40	18	------	257	53	25	8.0	8.0	49	28
30	24	119	38	18	------	274	54	23	7.0	6.0	27	20
31	27	------	36	18	------	227	------	21	------	6.0	18	------
TOTAL	849	1,800	2,511	843	8,672	12,374	3,316	1,080	542.0	207.5	384.8	301.4
MEAN	27.4	60.0	81.0	27.2	310	399	111	34.8	18.1	6.69	12.4	10.0
MAX	71	137	256	40	1,100	1,370	278	55	35	14	95	28
MIN	14	29	36	18	19	153	53	21	7.0	3.5	1.7	4.5
CFSM	.14	.30	.41	.14	1.56	2.01	.56	.17	.09	.03	.06	.05
IN.	.16	.34	.47	.16	1.62	2.31	.62	.20	.10	.04	.07	.06

CAL YR 1970 TOTAL 28,870.2 MEAN 79.1 MAX 1,010 MIN 3.9 CFSM .40 IN 5.40
WTR YR 1971 TOTAL 32,880.7 MEAN 90.1 MAX 1,370 MIN 1.7 CFSM .45 IN 6.15

PEAK DISCHARGE (BASE, 1,200 CFS)

DATE	TIME	GHT	DISCHARGE
02-22	--	--	about 1,200
02-28	--	--	1,200
03-16	1500	13.14	1,490

04164800 Middle Branch Clinton River at Macomb, Mich.

LOCATION.--Lat 42°42'23", long 82°57'33", in SW¼ sec.5, T.3 N., R.13 E., Macomb County, on left bank at downstream side of bridge on Romeo Plank Road, 0.4 miles north of Macomb.

DRAINAGE AREA.--41.0 sq mi.

PERIOD OF RECORD.--Water years 1959-62, 1969 (annual maximum and occasional low flow measurements), October 1962 to September 1968, October 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is 603.23 ft above mean sea level (levels by Corps of Engineers). Oct. 28, 1958, to Nov. 14, 1962, and Oct. 12, 1968, to Dec. 17, 1969, crest-stage gage at same site and datum.

AVERAGE DISCHARGE.--8 years, 20.5 cfs (6.79 inches per year).

EXTREMES.--Current year: Maximum discharge, 530 cfs Mar. 15, based on correlation with nearby stations; minimum, 0.10 cfs July 22 (gage height, 4.70 ft).
Period of record: Maximum discharge, 1,580 cfs June 26, 1968; maximum gage height, 16.16 ft Mar. 12, 1962 (backwater-from ice); minimum discharge, 0.10 cfs July 22, 1971; minimum gage height, 4.68 ft July 11, 1964.

REMARKS.--Records good except those for the winter period, and those for period of no gage-height record, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	5.3	15	9.5	6.0	110	37	11	3.2	4.2	2.3	2.2
2	3.7	5.8	13	9.0	6.5	90	49	11	8.5	2.0	1.7	2.3
3	3.4	17	13	9.0	8.0	75	35	9.4	7.2	1.2	1.5	2.3
4	3.1	19	28	9.5	10	65	30	8.5	5.8	.90	1.5	2.3
5	2.9	12	18	10	14	55	28	8.0	4.8	4.6	1.5	2.2
6	2.9	8.6	14	10	20	50	27	7.6	6.7	10	1.1	2.0
7	2.9	7.4	12	10	25	42	26	6.7	8.5	2.8	.82	2.0
8	2.7	6.5	10	9.0	27	40	25	6.2	6.2	2.0	.82	1.9
9	2.9	6.5	11	8.5	26	37	25	5.5	5.8	1.9	.66	1.5
10	2.9	11	10	8.0	25	33	23	5.5	4.5	1.4	.66	1.5
11	2.9	10	12	7.5	22	31	20	5.8	4.5	.90	.90	1.5
12	3.1	9.5	15	7.0	18	29	20	6.7	4.5	.82	1.1	1.5
13	3.7	7.4	16	6.5	16	28	33	5.8	8.0	.74	.66	1.5
14	13	6.5	15	6.4	16	70	34	5.1	4.8	.66	.42	1.9
15	9.5	6.9	14	6.2	16	270	27	4.5	3.2	.50	.50	1.7
16	5.8	6.9	14	6.0	16	280	25	4.5	2.0	.74	.58	1.7
17	5.3	6.9	14	5.8	20	100	25	5.5	1.5	.90	.58	1.5
18	5.0	6.9	17	5.7	27	70	29	6.7	1.5	.66	.42	1.2
19	5.0	6.9	24	5.5	50	65	23	6.7	1.5	.74	.34	1.1
20	5.3	21	32	5.4	150	80	21	14	1.4	1.2	.26	7.2
21	7.8	16	27	5.3	210	65	18	6.2	1.4	.74	.34	5.9
22	6.9	12	25	5.2	220	53	17	5.1	1.5	.42	.42	2.3
23	5.8	10	20	5.0	160	56	15	4.5	1.2	.34	.34	2.3
24	5.6	19	17	5.0	120	49	14	5.1	1.2	.40	.42	2.2
25	5.3	21	15	5.0	150	42	14	8.5	.82	.40	.50	2.3
26	5.3	8.2	13	5.0	190	39	13	5.8	.90	1.7	25	2.8
27	5.3	11	11	5.0	210	38	11	5.5	1.1	1.9	33	6.9
28	5.0	25	11	5.0	150	42	12	5.1	.90	1.1	8.0	5.1
29	5.3	20	10	5.2	------	41	13	4.8	.66	.90	3.8	3.2
30	7.4	19	9.5	5.4	------	36	11	3.8	.66	.90	2.8	2.5
31	6.1	------	9.5	5.6	------	33	------	3.2	------	8.2	2.3	------
TOTAL	155.5	349.2	485.0	211.2	1,928.5	2,114	700	202.3	104.44	55.86	95.24	76.5
MEAN	5.02	11.6	15.6	6.81	68.9	68.2	23.3	6.53	3.48	1.80	3.07	2.55
MAX	13	25	32	10	220	280	49	14	8.5	10	33	7.2
MIN	2.7	5.3	9.5	5.0	6.0	28	11	3.2	.66	.34	.26	1.1
CFSM	.12	.28	.38	.17	1.68	1.66	.57	.16	.08	.04	.07	.06
IN.	.14	.32	.44	.19	1.75	1.92	.64	.18	.09	.05	.09	.07

CAL YR 1970 TOTAL 5,011.70 MEAN 13.7 MAX 178 MIN 1.6 CFSM .33 IN 4.55
WTR YR 1971 TOTAL 6,477.74 MEAN 17.7 MAX 280 MIN .26 CFSM .43 IN 5.88

PEAK DISCHARGE (BASE, 300 CFS)

DATE	TIME	GHT	DISCHARGE
02-21	--	--	about 420
02-27	--	--	420
03-15	unknown	unknown	530

NOTE.--No gage height record Feb. 7 to Mar. 21.

04165500 Clinton River at Mount Clemens, Mich.

LOCATION.--Lat 42°35'45", long 82°54'35", Macomb County, on left bank 20 ft downstream from bridge on Moravian Drive, 0.2 mile downstream from North Branch, and 0.5 mile west of Mount Clemens.

DRAINAGE AREA.--734 sq mi.

PERIOD OF RECORD.--May 1934 to current year.

GAGE.--Water-stage recorder. Datum of gage is 570.43 ft above mean sea level. May 10, 1934, to Jan. 11, 1939, nonrecording gage at same site and datum. Auxiliary gage is a water-stage recorder on right bank 2.0 miles downstream from base gage at same datum. Mar. 15, 1938, to Jan. 3, 1952, auxiliary nonrecording gage 1.6 miles downstream of base gage at same datum.

AVERAGE DISCHARGE.--37 years, 485 cfs (8.97 inches per year).

EXTREMES.--Current year: Maximum discharge, 4,500 cfs Feb. 5 (gage height, 11.01 ft); minimum not determined; minimum daily, 110 cfs Sept. 18, 19; minimum gage height, 4.65 ft Jan. 31.
Period of reccord: Maximum discharge, 21,200 cfs Apr. 6, 1947 (gage height, 23.55 ft, from floodmark); minimum not determined; minimum gage height, 2.72 ft Nov. 29, 1963.

REMARKS.--Records fair.

REVISIONS (WATER YEARS).--WSP 1084: 1943, 1945-46. WSP 1437: 1935, 1936 (M), 1937-39, 1949 (M), 1950. WSP 1557: Drainage area. WSP 1727: 1952 (M), 1954 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	340	349	500	339	280	2,320	870	370	169	210	180	180
2	330	367	470	327	300	1,770	950	350	320	180	140	160
3	330	645	470	335	300	1,430	900	350	250	140	130	160
4	310	577	580	493	300	1,180	800	340	220	150	130	200
5	300	559	530	604	2,630	982	750	340	210	350	130	170
6	280	467	450	449	1,170	948	700	330	200	550	130	150
7	270	402	400	430	711	1,280	650	310	250	300	120	140
8	260	349	400	400	580	1,170	650	290	260	200	120	150
9	250	335	390	370	521	952	640	270	210	180	120	140
10	250	417	380	350	500	876	600	250	200	160	200	140
11	240	406	400	330	480	815	560	240	190	150	300	120
12	230	361	400	303	450	765	550	211	180	140	190	120
13	238	323	400	298	400	803	650	234	190	150	140	120
14	309	329	450	301	380	1,210	700	214	190	150	130	130
15	423	352	420	281	360	2,150	650	174	200	160	120	140
16	295	312	403	268	335	2,860	620	165	190	150	130	130
17	291	318	468	248	389	2,210	620	221	180	150	140	120
18	264	300	516	242	673	1,550	620	194	190	130	140	110
19	238	293	659	250	1,880	1,290	600	220	180	120	130	110
20	248	600	767	260	3,220	1,460	570	351	170	130	140	530
21	393	520	577	260	3,260	1,330	560	229	190	140	150	400
22	323	450	548	250	2,100	1,160	540	183	190	130	125	200
23	294	400	519	240	2,200	1,110	520	177	180	130	170	180
24	273	380	478	227	1,910	1,130	480	178	180	140	140	160
25	265	350	405	218	1,720	1,100	450	235	180	130	150	150
26	257	350	372	212	1,960	1,050	450	198	170	160	350	170
27	260	350	392	250	2,690	1,000	440	182	160	180	800	500
28	309	600	360	260	2,780	950	430	172	140	150	580	250
29	350	450	370	270	------	950	420	176	160	150	220	210
30	375	450	363	270	------	950	400	151	180	140	200	190
31	376	------	341	270	------	900	------	145	------	280	190	------
TOTAL	9,171	12,361	14,178	9,605	34,479	39,651	18,340	7,450	5,879	5,580	6,035	5,630
MEAN	296	412	457	310	1,231	1,279	611	240	196	180	195	188
MAX	423	645	767	604	3,260	2,860	950	370	320	550	800	530
MIN	230	293	341	212	280	765	400	145	140	120	120	110
CFSM	.40	.56	.62	.42	1.68	1.74	.83	.33	.27	.25	.27	.26
IN.	.46	.63	.72	.49	1.75	2.01	.93	.38	.30	.28	.31	.29

CAL YR 1970 TOTAL 169,108 MEAN 463 MAX 2,640 MIN 130 CFSM .63 IN 8.57
WTR YR 1971 TOTAL 168,359 MEAN 461 MAX 3,260 MIN 110 CFSM .63 IN 8.53

PEAK DISCHARGE (BASE, 3,000 CFS)

DATE	TIME	GHT	DISCHARGE
02-05	0900	11.01	4,500
02-21	0100	9.74	3,440
02-27	2300	9.20	3,090

NOTE.--Stage-discharge relation indefinite Oct. 1-12, Mar. 25 to May 11, June 2 to Sept. 30.

04166000 River Rouge at Birmingham, Mich.

LOCATION.--Lat 42°32'45", long 83°13'25", in NW¼ sec.36, T.2 N., R.10 E., Oakland County, 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.--36.9 sq mi.

PERIOD OF RECORD.--June 1950 to current year.

GAGE.--Water-stage recorder. Concrete control since July 27, 1962. Datum of gage is 715.94 ft above mean sea level.

AVERAGE DISCHARGE.--21 years, 15.1 cfs (5.56 inches per year).

EXTREMES.--Current year: Maximum daily discharge, 130 cfs Feb. 20; minimum discharge, 0.30 cfs Aug. 9, 21 (gage height, 1.38 ft).
Period of record: Maximum discharge, 1,390 cfs June 26, 1968 (gage height, 8.70 ft); minimum, 0.10 cfs Aug. 8, 9, 1963; minimum gage height, 1.02 ft Oct. 12, 1961.

REMARKS.--Records good except those for periods of no gage-height record, which are fair. Occasional regulation by Quarton Lake above station.

REVISIONS (WATER YEARS).--WSP 1387: 1951-52 (M), WSP 1557: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	6.7	10	5.4	4.5	40	23	12	4.2	1.6	1.2	2.5
2	3.0	9.7	8.9	5.6	4.5	35	22	11	15	1.3	.95	2.8
3	3.5	15	9.7	5.9	4.5	30	21	10	10	.82	.95	2.8
4	3.0	17	10	9.4	5.0	25	20	9.0	6.0	1.3	.95	2.8
5	2.8	12	9.3	10	40	23	19	8.4	6.0	13	.65	2.2
6	2.8	8.9	7.1	7.7	30	22	18	7.9	15	7.9	.80	2.0
7	2.8	7.7	7.1	6.1	23	30	17	7.7	10	4.1	.80	1.7
8	3.0	6.4	6.6	5.4	18	24	16	7.2	8.0	2.6	.95	1.6
9	3.2	6.4	7.1	5.1	16	22	16	6.4	5.5	2.3	.50	1.2
10	3.2	10	7.2	5.2	14	21	16	5.5	3.8	1.7	1.7	1.1
11	3.2	8.5	8.6	5.2	13	20	15	5.3	3.8	1.5	3.0	1.1
12	3.8	7.4	8.6	5.3	11	20	15	7.0	4.0	.94	2.0	.90
13	4.0	6.7	8.3	5.1	10	20	16	5.5	10	1.3	1.6	1.3
14	15	6.1	8.0	5.2	9.5	60	18	5.0	3.8	.65	.95	1.0
15	10	6.4	7.3	5.1	9.0	120	20	5.2	3.7	1.2	.65	1.0
16	6.1	5.8	7.8	5.1	8.5	90	22	4.4	3.8	.97	.95	.92
17	4.8	5.8	8.3	4.8	8.0	70	22	4.7	4.8	1.4	.80	1.0
18	4.2	5.5	8.3	4.5	15	60	21	5.4	3.0	.87	.65	.90
19	3.8	5.1	12	4.5	50	50	19	10	2.8	.83	.50	.80
20	4.5	21	14	4.4	130	40	18	8.0	2.8	.84	.65	24
21	7.4	13	10	4.5	100	35	16	6.0	2.7	.77	.50	12
22	6.4	8.9	8.7	4.7	60	30	15	5.0	2.8	.95	.95	4.3
23	5.1	7.4	9.1	4.8	45	29	14	5.0	2.6	.95	1.6	2.8
24	4.5	6.4	7.4	4.7	35	28	13	5.5	2.7	1.7	.65	2.2
25	4.2	5.8	7.8	4.6	29	24	12	12	2.1	2.2	.95	2.1
26	4.8	6.1	6.7	4.5	35	23	11	7.0	1.7	3.0	4.0	3.6
27	6.1	9.7	7.1	4.5	60	21	10	6.0	1.8	1.7	15	16
28	5.8	21	6.5	4.5	45	25	10	5.5	1.8	1.4	9.3	9.0
29	6.7	15	6.1	4.5	------	35	10	5.0	1.8	1.2	4.5	4.0
30	9.7	13	5.7	4.5	------	30	12	4.7	1.5	1.2	3.0	3.2
31	7.7	------	5.6	4.5	------	25	------	4.5	------	1.4	2.5	------
TOTAL	158.6	284.4	254.9	165.3	832.5	1,127	497	211.8	147.5	63.59	64.15	112.82
MEAN	5.12	9.48	8.22	5.33	29.7	36.4	16.6	6.83	4.92	2.05	2.07	3.76
MAX	15	21	14	10	130	120	23	12	15	13	15	24
MIN	2.8	5.1	5.6	4.4	4.5	20	10	4.4	1.5	.65	.50	.80
CFSM	.14	.26	.22	.14	.80	.99	.45	.19	.13	.06	.06	.10
IN.	.16	.29	.26	.17	.84	1.14	.50	.21	.15	.06	.06	.11

CAL YR 1970 TOTAL 4,409.20 MEAN 12.1 MAX 112 MIN 1.6 CFSM .33 IN 4.45
WTR YR 1971 TOTAL 3,919.56 MEAN 10.7 MAX 130 MIN .50 CFSM .29 IN 3.95

PEAK DISCHARGE (BASE, 180 CFS).--No peak above base.

Note.--No gage-height record Feb. 3 to Mar. 24, Mar. 27 to Apr. 29.

04166100 River Rouge at Southfield, Mich.

LOCATION.--Lat 42°26'52", long 83°17'52", in SW¼ sec.32, T.1 N., R.10 E., Oakland County, on right bank at downstream side of bridge on Beech Road at Southfield, 4.2 miles east of Farmington.

DRAINAGE AREA.--87.9 sq mi.

PERIOD OF RECORD.--April 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is 609.62 ft above mean sea level (city of Southfield benchmark). Prior to Sept. 30, 1958, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--13 years, 47.0 cfs (7.26 inches per year).

EXTREMES.--Current year: Maximum discharge, about 800 cfs Feb. 20 (gage height, 11.19 ft, backwater from ice); minimum, 1.4 cfs Aug. 22; minimum gage height, 1.94 ft Aug. 8.
Period of record: Maximum discharge, 4,900 cfs June 26, 1968 (gage height, 19.04 ft); minimum, 0.1 cfs Aug. 2, 1964 (gage height, 1.15 ft).

REMARKS.--Records good except those for the winter period, which are fair.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	22	40	16	10	120	56	28	10	5.4	4.2	4.7
2	11	36	35	16	10	95	81	29	40	4.8	3.1	4.8
3	10	119	35	18	10	80	62	26	24	3.7	2.8	5.7
4	10	70	110	22	10	70	50	24	17	3.3	2.6	9.9
5	9.8	50	58	30	330	62	43	22	17	37	2.5	13
6	9.3	30	40	25	150	62	42	24	23	81	2.3	7.0
7	9.0	22	30	22	90	100	41	21	27	17	2.1	5.8
8	9.0	20	22	18	40	80	39	19	25	10	1.9	4.9
9	9.6	20	24	15	30	70	37	18	16	7.0	2.0	3.5
10	14	73	26	13	25	60	35	17	13	5.4	2.5	3.0
11	16	61	28	13	22	58	33	14	12	4.6	8.3	2.7
12	15	40	30	12	22	56	32	18	12	3.5	6.1	2.8
13	20	20	27	12	22	60	49	18	19	3.2	3.2	3.0
14	100	20	24	12	22	190	65	14	17	3.0	2.6	2.9
15	62	20	23	12	22	335	46	13	13	5.3	2.3	2.8
16	26	20	23	12	25	190	39	13	11	6.9	2.2	2.6
17	19	20	26	12	30	119	39	12	10	4.6	2.1	2.6
18	16	20	30	12	50	93	41	11	12	3.5	1.9	2.3
19	16	20	40	12	200	108	36	17	9.3	3.3	1.7	2.3
20	16	141	45	12	540	146	32	76	8.9	3.2	1.8	130
21	44	98	40	12	300	110	31	27	9.7	2.8	1.8	56
22	30	40	33	11	150	94	30	20	8.8	2.6	1.7	18
23	17	33	28	11	110	89	29	17	8.3	2.4	4.1	8.1
24	15	30	25	10	100	85	29	22	7.7	4.7	3.5	5.1
25	14	26	22	10	93	79	29	40	7.2	5.5	2.7	4.3
26	16	26	20	10	220	69	27	26	8.2	5.7	23	8.6
27	15	35	19	10	190	63	26	22	8.1	7.9	90	120
28	16	171	18	10	150	62	29	19	6.1	4.6	25	40
29	25	108	17	10	------	62	31	14	4.9	4.5	11	16
30	78	60	16	10	------	56	29	13	5.1	3.8	7.8	8.2
31	30	------	16	10	------	52	------	12	------	4.8	5.1	------
TOTAL	708.7	1,471	970	430	2,973	2,975	1,188	666	410.3	265.0	233.9	500.6
MEAN	22.9	49.0	31.3	13.9	106	96.0	39.6	21.5	13.7	8.55	7.55	16.7
MAX	100	171	110	30	540	335	81	76	40	81	90	130
MIN	9.0	20	16	10	10	52	26	11	4.9	2.4	1.7	2.3
CFSM	.26	.56	.36	.16	1.21	1.09	.45	.24	.16	.10	.09	.19
IN.	.30	.62	.41	.18	1.26	1.26	.50	.28	.17	.11	.10	.21

CAL YR 1970 TOTAL 14,972.5 MEAN 41.0 MAX 380 MIN 4.2 CFSM .47 IN 6.33
WTR YR 1971 TOTAL 12,791.5 MEAN 35.0 MAX 540 MIN 1.7 CFSM .40 IN 5.41

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	GHT	DISCHARGE
02-05	--	--	about 500
02-20	--	--	about 800

04166200 Evans Ditch at Southfield, Mich.

LOCATION.--Lat 42°27'28", long 83°16'03", in SE¼ sec.28, T.1 N., R.10 E., Oakland County, on right bank at Southfield, 20 ft upstream from bridge on Nine-Mile Road, 1.6 miles upstream from mouth, and 5.5 miles east of Farmington.

DRAINAGE AREA.--9.49 sq mi.

PERIOD OF RECORD.--September 1958 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 615.07 ft above mean sea level (city of Southfield bench mark).

AVERAGE DISCHARGE.--13 years, 7.13 cfs (10.20 inches per year).

EXTREMES.--Current year: Maximum discharge, 415 cfs Feb. 19 (gage height, 9.28 ft); maximum gage height, 10.02 ft Feb. 5 (backwater from ice); minimum discharge, 0.47 cfs Oct. 9, 10 (gage height, 5.22 ft).
Period of record: Maximum discharge, 903 cfs June 25, 1968 (gage height, 12.95 ft), from rating curve extended above 410 cfs; minimum, 0.01 cfs Oct. 3, 1967; minimum gage height, 5.08 ft Sept. 13, 1966.

REMARKS.--Records good except those for the winter period, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	1.9	5.9	1.6	1.1	5.9	6.7	2.8	2.4	2.9	1.6	1.2
2	1.2	7.3	4.7	1.6	1.1	5.5	10	2.3	13	1.4	2.0	1.5
3	1.5	13	6.6	1.7	2.0	4.2	4.4	1.7	3.1	1.5	1.5	1.5
4	.84	9.1	20	7.0	6.C	2.7	3.2	1.7	2.1	1.6	1.1	3.3
5	.83	4.9	5.0	4.5	13C	2.3	3.1	1.6	2.C	39	1.1	3.3
6	.75	2.4	3.0	3.0	4C	7.2	3.1	2.9	5.3	30	1.8	3.9
7	.68	1.9	2.4	2.5	3C	23	3.4	1.7	5.7	2.6	1.2	1.7
8	.87	1.5	2.3	2.0	9.4	6.5	3.0	1.5	6.3	2.2	1.2	1.6
9	.59	1.7	2.3	1.5	2.7	4.7	2.8	1.4	2.3	2.0	1.3	1.5
10	1.6	10	2.3	1.4	1.5	5.0	2.4	1.4	1.8	2.0	3.4	1.2
11	1.1	3.5	5.0	1.4	1.8	5.C	2.5	1.5	1.4	1.9	8.8	1.4
12	1.3	1.6	4.5	1.4	3.0	4.9	2.5	1.7	1.4	1.8	1.1	1.3
13	2.4	1.3	3.5	1.4	3.5	11	7.5	1.6	4.2	1.7	.94	1.6
14	23	1.3	3.0	1.4	3.5	28	5.9	1.6	2.8	3.5	1.1	.93
15	5.6	3.4	2.5	1.4	3.5	24	3.2	1.5	1.5	11	1.3	.88
16	1.9	2.9	2.5	1.4	3.4	10	3.4	1.5	1.5	5.0	1.2	.81
17	1.5	2.2	3.5	1.4	42	5.8	4.4	1.5	1.5	4.6	.82	1.2
18	1.3	2.0	3.5	1.4	111	5.0	3.1	1.8	1.6	3.1	.97	1.3
19	1.3	1.8	5.C	1.4	243	16	3.1	8.1	1.4	3.3	1.4	.82
20	2.0	31	4.5	1.4	151	14	2.6	9.4	1.6	2.4	1.3	86
21	12	9.0	4.C	1.3	17	7.2	2.3	2.2	4.3	1.2	1.5	6.6
22	2.3	4.0	3.5	1.3	9.4	6.1	2.0	1.4	1.4	1.3	1.3	2.6
23	1.5	3.4	3.0	1.3	13	6.3	1.7	1.9	1.2	1.2	3.9	3.1
24	1.2	3.2	2.8	1.1	7.4	6.5	1.5	4.6	1.4	3.1	1.1	2.0
25	1.2	3.1	2.5	1.1	13	6.1	1.6	7.4	1.4	1.3	1.4	1.8
26	1.1	3.3	2.3	1.1	2C	4.2	1.5	2.1	4.2	2.3	14	6.2
27	1.3	12	2.2	1.1	21	3.9	1.5	1.7	1.5	1.5	27	64
28	1.3	29	2.C	1.1	7.2	4.3	1.8	1.4	1.5	1.3	2.6	5.9
29	4.0	16	1.9	1.1	------	4.0	2.0	1.2	2.8	1.1	2.8	3.0
30	12	11	1.8	1.1	------	3.5	1.9	1.4	2.4	1.3	1.6	2.1
31	2.5	------	1.7	1.1	------	3.5	------	2.3	------	1.9	1.1	------
TOTAL	92.06	198.7	119.7	53.5	897.5	246.3	98.1	76.8	85.C	141.0	93.43	214.24
MEAN	2.97	6.62	3.86	1.73	32.1	7.95	3.27	2.48	2.83	4.55	3.01	7.14
MAX	23	31	2C	7.0	243	28	10	9.4	13	39	27	86
MIN	.59	1.3	1.7	1.1	1.1	2.3	1.5	1.2	1.2	1.1	.82	.81
CFSM	.31	.70	.41	.18	3.38	.84	.34	.26	.3C	.48	.32	.75
IN.	.36	.78	.47	.21	3.52	.97	.38	.30	.33	.55	.37	.84

CAL YR 1970 TOTAL 2,341.93 MEAN 6.42 MAX 139 MIN .59 CFSM .68 IN 9.18
WTR YR 1971 TOTAL 2,316.33 MEAN 6.35 MAX 243 MIN .59 CFSM .67 IN 9.08

PEAK DISCHARGE (BASE, 200 CFS)

DATE	TIME	GHT	DISCHARGE
02-05	--	--	about 360
02-19	0400	9.28	415
07-05	2200	7.48	212
09-27	1300	7.67	232

04166300 Upper River Rouge at Farmington, Mich.

LOCATION.--Lat 42°27'52", long 83°22'11", in NW1/4 sec.27, T.1 N., R.9 E., Oakland County, on left bank 800 ft downstream from bridge on Shiawassee Road at Farmington.

DRAINAGE AREA.--17.5 sq mi.

PERIOD OF RECORD.--March 1958 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 690.4 ft above mean sea level.

AVERAGE DISCHARGE.--13 years, 9.49 cfs (7.36 inches per year).

EXTREMES.--Current year: Maximum discharge, 260 cfs Feb. 20, from correlation with nearby stations; maximum gage height, 6.60 ft Feb. 25 (backwater from ice); minimum discharge, 0.39 cfs June 30 (gage height, 2.71 ft). Period of record: Maximum discharge, 1,500 cfs June 25, 1968 (gage height, 8.70 ft); minimum, 0.07 cfs Aug. 30, 1966, result of regulation; minimum daily, 0.32 cfs Aug. 10, 1964, Aug. 29, 1966.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, which are poor.

REVISIONS (WATER YEARS).--WSP 1912: 1959 (M), 1960 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	4.2	7.4	3.0	2.0	32	14	5.7	1.9	.92	1.2	1.2
2	1.9	6.7	6.4	3.0	2.0	26	17	5.6	4.9	.92	.91	1.1
3	1.8	11	6.1	3.5	2.0	22	14	5.2	2.9	.78	.98	1.1
4	1.9	8.2	8.6	4.5	10	18	12	4.6	2.4	.73	.82	1.4
5	1.7	6.7	6.1	6.0	90	16	11	4.7	3.8	3.6	.68	1.6
6	1.6	5.1	4.7	5.0	50	18	10	4.8	5.1	3.7	.67	1.6
7	1.6	4.2	4.6	4.5	25	25	10	4.5	4.6	1.4	.63	1.6
8	1.6	3.6	4.3	3.5	12	19	9.3	4.2	3.5	1.0	.56	1.2
9	1.8	3.6	4.6	3.0	8.0	19	9.0	4.0	2.6	.95	.50	.98
10	2.5	6.7	4.7	2.5	6.5	17	8.6	3.7	2.1	.95	.74	.99
11	2.1	6.7	5.6	2.5	6.0	15	8.1	3.3	1.9	.61	1.5	1.2
12	2.0	4.5	5.6	2.5	6.0	14	7.7	3.5	1.6	.54	1.1	1.0
13	2.3	3.9	5.1	2.5	6.0	15	13	3.3	3.0	.61	.80	1.2
14	14	3.6	5.0	2.5	6.0	56	14	3.1	2.5	.56	.64	1.2
15	7.0	3.9	4.5	2.5	6.0	89	11	2.8	2.2	.94	.65	1.2
16	4.2	3.9	4.5	2.5	6.0	47	9.9	2.9	1.8	1.4	.76	1.1
17	3.1	3.9	5.1	2.5	6.0	29	9.4	2.6	1.8	.98	.73	1.1
18	2.9	3.9	5.5	2.5	15	23	9.3	2.1	1.4	.73	.61	1.0
19	2.9	3.9	7.3	2.5	50	26	8.2	2.4	1.4	.64	.56	1.0
20	3.9	15	9.0	2.5	150	31	7.4	2.7	1.4	.74	.57	13
21	6.1	9.4	7.3	2.5	100	25	7.2	2.3	1.5	.73	.68	4.7
22	3.6	7.0	6.0	2.0	45	25	6.6	2.3	1.6	.56	.70	2.4
23	3.1	6.1	5.0	2.0	35	23	6.3	2.2	1.3	.55	.56	2.0
24	2.9	5.8	4.5	2.0	32	21	6.0	3.2	1.3	.72	.74	1.9
25	2.7	5.1	4.0	2.0	30	20	5.8	5.2	1.2	1.0	.65	2.2
26	3.1	5.1	4.0	2.0	60	18	5.7	3.7	1.1	1.3	4.4	3.3
27	2.9	7.4	4.0	2.0	48	17	5.3	3.3	.87	1.4	7.5	18
28	3.1	18	3.5	2.0	38	18	5.6	2.7	.70	.96	2.7	6.0
29	4.8	11	3.5	2.0	------	17	5.9	2.5	.80	1.1	1.8	3.1
30	7.4	9.0	3.0	2.0	------	15	5.6	2.1	.63	1.1	1.3	2.4
31	4.8	------	3.0	2.0	------	14	------	2.0	------	1.6	1.0	------
TOTAL	107.2	197.1	162.5	86.0	852.5	770	272.9	107.2	63.80	33.72	37.64	81.77
MEAN	3.46	6.57	5.24	2.77	30.4	24.8	9.10	3.46	2.13	1.09	1.21	2.73
MAX	14	18	9.0	6.0	150	89	17	5.7	5.1	3.7	7.5	18
MIN	1.6	3.6	3.0	2.0	2.0	14	5.3	2.0	.63	.54	.50	.98
CFSM	.20	.38	.30	.16	1.74	1.42	.52	.20	.12	.06	.07	.16
IN.	.23	.42	.35	.18	1.81	1.64	.58	.23	.14	.07	.08	.17

CAL YR 1970 TOTAL 2,574.90 MEAN 7.05 MAX 70 MIN 1.0 CFSM .40 IN 5.47
WTR YR 1971 TOTAL 2,772.33 MEAN 7.60 MAX 150 MIN .50 CFSM .43 IN 5.89

PEAK DISCHARGE (BASE, 80 CFS)

DATE	TIME	GHT	DISCHARGE
02-05	--	--	about 140
02-20	--	--	about 260
02-26	--	--	about 85
03-14	1900	4.07	126

NOTE: No gage-height record Feb. 1-25.

04166500 River Rouge at Detroit, Mich.

LOCATION.--Lat 42°22'20", long 83°15'20", in SW1/4 sec.27, T.1 S., R.10 E., Wayne County, on right bank 500 ft upstream from bridge on Plymouth Road in Detroit, and 4 miles upstream from Middle River Rouge.

DRAINAGE AREA.--187 sq mi.

PERIOD OF RECORD.--October 1930 to current year. 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. Prior to Oct. 16, 1948, non-recording gage at site 1 mile downstream at datum 4.6 ft lower.

AVERAGE DISCHARGE.--41 years, 106 cfs (7.70 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,520 cfs Feb. 20 (gage height, 12.71 ft); maximum gage height, 13.37 ft Feb. 5 (backwater from ice); minimum discharge, 2.8 cfs Aug. 17, 19 (gage height, 3.44 ft).
Period of record: 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, 1.8 cfs Aug. 1, 2, 1964 (gage height, 3.00 ft).

REMARKS.--Records good except those for the winter period, 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. WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	41	73	26	20	200	111	50	23	38	13	6.9
2	16	57	55	26	20	161	164	49	82	18	12	6.5
3	15	147	53	28	20	131	127	46	54	11	9.7	10
4	14	84	117	101	50	106	103	42	32	10	7.4	8.5
5	14	82	70	124	800	110	93	38	40	98	6.9	30
6	14	52	47	107	600	118	88	45	104	223	8.0	21
7	14	41	42	70	250	258	86	40	74	37	7.0	15
8	14	35	40	36	100	167	82	33	84	18	5.8	9.7
9	15	33	37	29	80	119	78	33	38	13	7.4	8.1
10	24	74	38	25	70	137	77	31	28	9.4	78	6.2
11	24	66	60	25	60	111	72	30	22	7.0	110	6.2
12	22	45	66	25	55	113	70	30	25	5.5	22	8.7
13	31	37	50	25	55	106	101	32	56	4.0	12	7.5
14	114	33	48	24	55	243	134	27	43	4.0	7.7	7.0
15	141	39	40	24	55	644	102	26	30	13	5.6	6.7
16	45	35	47	24	55	384	88	25	25	30	4.3	5.3
17	29	31	66	24	70	216	89	26	22	11	3.8	5.3
18	24	29	66	23	336	168	91	23	25	8.2	3.4	5.6
19	22	30	112	22	1,130	192	81	37	27	5.2	3.2	5.6
20	24	196	164	21	1,460	290	72	129	34	5.5	4.3	281
21	70	146	82	20	822	203	71	44	70	4.9	4.3	158
22	50	61	55	20	338	174	66	30	31	4.9	3.6	36
23	33	44	50	20	256	165	61	26	26	8.6	17	18
24	27	37	47	20	201	156	58	35	26	4.8	9.6	13
25	25	33	45	20	171	147	57	60	25	13	5.3	13
26	23	33	43	20	338	133	55	45	24	15	37	11
27	23	53	40	20	551	123	51	35	30	17	159	319
28	25	208	37	20	325	120	51	31	22	14	38	113
29	39	154	35	20	------	122	53	26	19	9.4	21	38
30	91	115	29	20	------	113	51	21	21	10	11	21
31	61	------	25	20	------	105	------	21	------	13	8.1	------
TOTAL	1,099	2,071	1,779	1,029	8,343	5,535	2,483	1,166	1,162	683.4	645.4	1,200.8
MEAN	35.5	69.0	57.4	33.2	298	179	82.8	37.6	38.7	22.0	20.8	40.0
MAX	141	208	164	124	1,460	644	164	129	104	223	159	319
MIN	14	29	25	20	20	105	51	21	19	4.0	3.2	5.3
CFSM	.19	.37	.31	.18	1.59	.96	.44	.20	.21	.12	.11	.21
IN.	.22	.41	.35	.20	1.66	1.10	.49	.23	.23	.14	.13	.24

CAL YR 1970 TOTAL 30,596.0 MEAN 83.8 MAX 1,140 MIN 14 CFSM .45 IN 6.09
WTR YR 1971 TOTAL 27,196.6 MEAN 74.5 MAX 1,460 MIN 3.2 CFSM .40 IN 5.41

PEAK DISCHARGE (BASE, 1,200 CFS).--Feb. 20 (1000) 1,520 cfs (12.71 ft).

04167000 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., Wayne County, on right bank 200 ft downstream from bridge on Inkster Road, 1.8 miles northeast of Garden City, and 6.0 miles upstream from mouth.

DRAINAGE AREA.--99.9 sq mi.

PERIOD OF RECORD.--October 1930 to September 1933 (published as "at Detroit"), June 1947 to current year. Monthly discharge only for October, November 1930, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 600.95 ft above mean sea level. Nov. 21, 1930 to Sept. 30, 1933, nonrecording gage at site 4.8 miles downstream at datum 17.48 ft lower. June 6, 1947 to Oct. 18, 1948, non-recording gage at site 200 ft upstream at present datum.

AVERAGE DISCHARGE.--27 years, 64.0 cfs (8.70 inches per year).

EXTREMES.--Current year: Maximum discharge, 871 cfs Feb. 20 (gage height, 8.27 ft); minimum, 4.5 cfs Sept. 25, 26 (gage height, 1.53 ft).
Period of record: Maximum discharge, 2,330 cfs June 26, 1968; maximum gage height, 10.50 ft May 10, 1948; minimum discharge, 0.9 cfs Aug. 16, 1956.

REMARKS.--Records good except those for the winter period, which are fair. Occasional regulation by reservoirs above station since 1956.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	20	38	16	10	165	76	25	22	33	11	11
2	12	55	33	16	10	126	87	26	58	21	8.8	11
3	11	50	31	16	11	103	75	24	30	19	9.2	13
4	11	35	35	71	50	87	61	22	23	20	9.5	14
5	10	28	31	41	450	75	54	22	56	110	8.8	21
6	11	23	26	30	250	102	52	27	71	72	8.5	26
7	11	20	21	23	120	160	49	25	52	27	8.5	17
8	11	18	21	19	60	103	47	24	42	19	8.1	14
9	13	19	21	16	40	81	46	21	27	18	7.4	12
10	21	39	22	13	35	82	43	21	22	16	28	12
11	15	25	55	13	32	85	39	21	20	15	45	11
12	17	22	40	13	30	73	39	23	28	13	13	9.2
13	21	20	33	13	30	74	55	22	67	14	8.8	9.2
14	78	19	30	13	30	137	60	21	33	13	9.2	9.5
15	52	23	25	13	30	348	55	21	22	18	8.5	10
16	27	18	24	13	31	311	49	22	20	18	8.1	8.8
17	19	16	36	14	40	192	51	21	19	19	8.5	8.5
18	15	17	32	14	100	130	43	21	18	13	8.5	8.1
19	14	17	49	14	493	150	40	41	18	12	10	8.1
20	19	96	47	13	770	159	39	51	31	11	11	158
21	39	49	35	13	625	126	38	27	54	10	12	52
22	22	32	32	11	300	113	36	23	21	9.5	12	24
23	18	27	30	11	202	112	33	21	18	9.2	14	63
24	16	21	27	10	157	102	32	33	19	14	10	54
25	15	19	25	10	135	88	27	52	23	18	8.8	6.7
26	15	19	24	11	193	82	27	30	24	22	18	8.1
27	15	41	22	11	291	77	26	26	21	14	30	151
28	15	101	20	11	254	76	28	25	21	12	24	21
29	28	72	19	10	------	75	28	24	21	12	15	16
30	47	54	18	10	------	71	24	23	29	12	12	11
31	24	------	17	10	------	64	------	21	------	16	11	------
TOTAL	654	1,015	919	512	4,779	3,729	1,359	806	930	649.7	405.2	798.2
MEAN	21.1	33.8	29.6	16.5	171	120	45.3	26.0	31.0	21.0	13.1	26.6
MAX	78	101	55	71	770	348	87	52	71	110	45	158
MIN	10	16	17	10	10	64	24	21	18	9.2	7.4	6.7
CFSM	.21	.34	.30	.17	1.71	1.20	.45	.26	.31	.21	.13	.27
IN.	.24	.38	.34	.19	1.78	1.39	.51	.30	.35	.24	.15	.30

CAL YR 1970 TOTAL 18,174.6 MEAN 49.8 MAX 595 MIN 7.1 CFSM .50 IN 6.77
WTR YR 1971 TOTAL 16,556.1 MEAN 45.4 MAX 770 MIN 6.7 CFSM .45 IN 6.17

PEAK DISCHARGE (BASE, 700 CFS).--Feb. 20 (1600) 871 cfs (8.27 ft).

04168000 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., Wayne County, on right bank 10 ft downstream from bridge on John Daly Road, 0.6 mile northeast of Inkster, and 4.8 miles upstream from mouth.

DRAINAGE AREA.--83.2 sq mi.

PERIOD OF RECROD.--June 1947 to current year.

GAGE.--Water-stage recorder. Datum of gage is 593.14 ft above mean sea level. Prior to Oct. 20, 1948, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--24 years, 47.6 cfs (7.77 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,010 cfs Feb. 20 (gage height, 9.05 ft); minimum, 0.72 cfs Oct. 6 (gage height, 2.72 ft).
Period of record: Maximum discharge, 3,600 cfs June 26, 1968 (gage height, 13.62 ft); minimum, 0.2 cfs Sept. 13, 1955, Jan. 23, 1961.

REMARKS.--Records good except those for the winter period, which are poor.

REVISIONS (WATER YEARS).--WSP 1174: 1948 (M), WSP 1437: 1949. WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	6.0	24	4.7	2.1	98	46	11	5.2	2.7	1.8	1.3
2	1.6	22	17	5.0	2.2	81	62	10	21	2.7	1.3	1.3
3	1.2	18	18	5.2	2.5	67	56	9.6	8.5	2.4	1.1	1.4
4	1.4	12	15	20	34	57	42	9.1	6.6	2.3	1.1	1.8
5	.92	7.4	12	13	400	51	36	9.3	12	21	1.2	2.0
6	.83	5.7	8.6	9.0	207	62	31	11	21	17	1.2	16
7	1.3	5.1	7.4	7.0	98	136	30	9.4	15	6.3	1.2	4.9
8	1.4	4.0	6.3	6.0	51	101	28	8.5	14	3.8	1.2	2.1
9	2.5	5.0	7.0	4.4	31	69	26	8.1	6.5	2.9	1.1	1.4
10	5.1	17	8.2	3.6	28	63	24	8.2	5.6	2.5	18	1.4
11	1.8	8.7	15	3.5	25	60	22	7.6	5.1	2.0	23	1.7
12	2.2	8.7	12	3.0	35	57	21	8.0	4.9	1.6	2.9	1.6
13	6.7	5.8	10	2.8	29	56	27	8.0	20	1.4	2.1	1.5
14	24	5.5	8.0	2.7	30	102	33	7.7	7.5	1.4	1.7	1.1
15	13	8.9	7.0	2.6	30	482	29	7.4	6.7	1.4	1.5	1.2
16	5.9	4.9	7.0	2.5	26	251	24	6.6	5.9	2.2	1.3	1.2
17	3.2	4.4	10	2.5	67	117	26	6.6	5.7	1.8	1.2	1.3
18	2.3	4.3	9.0	2.5	135	92	23	7.0	4.7	1.6	1.2	1.3
19	1.7	4.7	13	2.5	567	99	21	19	4.2	1.4	1.3	1.4
20	4.4	49	13	2.4	888	168	20	15	4.2	1.2	1.5	52
21	15	23	10	2.4	506	105	17	8.3	11	1.2	1.4	11
22	4.0	12	9.0	2.6	165	88	15	6.4	3.7	1.2	1.3	4.4
23	3.5	7.4	9.0	2.8	128	80	14	5.5	2.7	1.3	1.3	2.1
24	2.9	6.3	8.0	2.5	106	69	13	8.6	3.1	2.3	1.2	1.5
25	2.4	5.0	7.0	2.7	98	62	11	24	3.1	2.4	1.1	1.2
26	2.3	4.4	7.0	2.5	170	57	10	12	5.3	11	14	3.5
27	2.5	16	6.0	2.5	273	51	10	8.9	3.3	5.1	12	101
28	2.9	56	6.0	2.5	149	50	11	7.0	2.5	1.8	2.9	40
29	12	51	6.3	2.5	------	51	12	6.2	2.3	1.6	1.7	14
30	17	35	5.7	2.5	------	47	10	5.6	2.8	1.6	1.3	4.7
31	6.5	------	5.4	2.3	------	41	------	5.4	------	3.5	1.3	------
TOTAL	154.15	423.2	306.9	132.7	4,282.8	2,970	750	285.0	224.1	112.6	106.4	281.3
MEAN	4.97	14.1	9.90	4.28	153	95.8	25.0	9.19	7.47	3.63	3.43	9.38
MAX	24	56	24	20	888	482	62	24	21	21	23	101
MIN	.83	4.0	5.4	2.3	2.1	41	10	5.4	2.3	1.2	1.1	1.1
CFSM	.06	.17	.12	.05	1.84	1.15	.30	.11	.09	.04	.04	.11
IN.	.07	.19	.14	.06	1.91	1.33	.34	.13	.10	.05	.05	.13

CAL YR 1970 TOTAL 8,805.55 MEAN 24.1 MAX 516 MIN .83 CFSM .29 IN 3.94
WTR YR 1971 TOTAL 10,029.15 MEAN 27.5 MAX 888 MIN .83 CFSM .33 IN 4.48

PEAK DISCHARGE (BASE, 900 CFS).--Feb. 20 (2000) 1,010 cfs (9.05 ft).

04169500 Huron River at Commerce, Mich.

LOCATION.--Lat 42°35'25", long 83°29'05", in NE¼ SE¼ sec.10, T.2 N., R.8 E., Oakland County, on downstream left abutment of bridge on Commerce Road, 10 ft upstream from Hayes Creek, and 0.2 miles east of Commerce. Records include flow of Hayes Creek.

DRAINAGE AREA.--57.3 sq mi, includes that of Hayes Creek.

PERIOD OF RECORD.--March 1946 to current year.

GAGE.--Nonrecording gage. Datum of gage is 910.00 ft above mean sea level.

AVERAGE DISCHARGE.--25 years, 36.0 cfs (8.53 inches per year).

EXTREMES.--Current year: Maximum discharge, 97 cfs Mar. 15 (gage height, 2.10 ft); minimum, 4.3 cfs July 21 (gage height, 0.86 ft).
Period of Record: 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, 3.9 cfs Aug. 8, 1966; minimum gage height, 0.52 ft July 16, 1962.

REMARKS.--Records good. Some regulation by dams operated for lake level control at outlets of Pontiac, Oxbow, and Union Lakes.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	24	46	39	25	83	81	49	13	8.0	5.8	5.4
2	21	25	46	37	25	78	81	49	14	8.5	5.8	5.4
3	22	32	48	37	25	77	83	48	15	8.8	5.9	5.4
4	22	35	47	40	30	73	79	44	15	9.2	5.9	5.4
5	22	35	45	39	54	70	76	41	15	10	5.6	5.4
6	22	36	45	36	47	71	74	37	16	9.2	5.3	11
7	22	35	45	36	46	75	73	32	17	9.6	5.3	9.2
8	24	35	45	36	45	75	71	27	16	11	5.4	8.0
9	23	35	46	35	48	78	70	24	15	9.6	5.6	6.9
10	24	36	47	36	47	77	68	22	14	8.2	5.3	6.9
11	22	36	51	35	46	76	66	21	13	6.9	6.9	6.4
12	21	35	51	35	48	75	64	21	12	5.6	6.4	6.2
13	21	35	51	33	49	75	70	22	12	5.2	6.2	6.2
14	35	32	49	32	46	85	67	23	12	5.2	5.9	6.2
15	33	32	49	30	45	96	65	23	12	5.2	5.8	6.2
16	30	32	49	29	43	95	64	23	12	5.2	5.8	6.2
17	26	32	48	28	43	94	62	24	11	5.0	5.2	6.2
18	26	32	48	26	44	91	60	21	9.9	5.0	5.2	5.9
19	24	33	49	24	57	93	58	21	9.2	5.2	5.2	5.9
20	22	40	49	25	76	93	57	21	8.8	5.0	5.4	11
21	25	40	48	24	77	91	56	19	8.5	4.4	5.8	8.2
22	24	40	48	24	75	89	56	17	7.5	4.8	5.8	7.7
23	24	42	49	23	75	89	55	15	5.9	4.7	5.6	7.2
24	23	40	49	23	73	89	55	16	5.4	4.7	5.3	7.2
25	22	40	48	24	73	88	54	17	5.9	4.8	5.3	7.2
26	22	41	44	27	81	86	53	16	5.9	6.9	6.9	7.2
27	22	42	43	24	85	85	51	15	5.6	6.9	8.8	13
28	22	48	43	21	85	84	50	15	5.4	5.6	7.7	12
29	25	48	43	22	------	84	50	14	6.4	5.6	6.7	11
30	26	48	40	24	------	83	49	13	7.2	5.6	5.9	11
31	25	------	37	24	------	82	------	13	------	5.8	5.6	------
TOTAL	742	1,096	1,446	928	1,513	2,580	1,918	763	325.6	205.4	183.3	227.1
MEAN	23.9	36.5	46.6	29.9	54.0	83.2	63.9	24.6	10.9	6.63	5.91	7.57
MAX	35	48	51	40	85	96	83	49	17	11	8.8	13
MIN	20	24	37	21	25	70	49	13	5.4	4.4	5.2	5.4
CFSM	.42	.64	.81	.52	.94	1.45	1.12	.43	.19	.12	.10	.13
IN.	.48	.71	.94	.60	.98	1.67	1.25	.50	.21	.13	.12	.15

CAL YR 1970 TOTAL 11,283.6 MEAN 30.9 MAX 73 MIN 5.8 CFSM .54 IN 7.33
WTR YR 1971 TOTAL 11,927.4 MEAN 32.7 MAX 96 MIN 4.4 CFSM .57 IN 7.74

0417000 Huron River at Milford, Mich.

LOCATION.--Lat 42°34'44", long 83°37'36", in NE¼ sec.16, T.2 N., R.7 E., Oakland County, on left bank 40 ft downstream from bridge on General Motors Road, 0.5 mile downstream from Sherwood Creek, and 0.5 mile west of Milford.

DRAINAGE AREA.--132 sq mi.

PERIOD OF RECORD.--September 1948 to current year.

GAGE.--Water-stage recorder. Datum of gage is 880.00 ft above mean sea level. Prior to Apr. 1, 1970, at site 240 ft upstream at same datum.

AVERAGE DISCHARGE.--23 years, 92.4 cfs (9.51 inches per year).

EXTREMES.--Current year: Maximum discharge, 261 cfs Mar. 16 (gage height, 6.42 ft); minimum, 16 cfs May 21 (gage height, 3.96 ft). Period of record: Maximum discharge, 645 cfs Apr. 5, 1950; maximum gage height, 8.26 ft June 28, 1968; minimum daily discharge, 7.2 cfs Sept. 18, 1963.

REMARKS.--Records good except those for period of no gage-height record, which are fair. Flow below about 300 cfs regulated by powerplant 1.5 miles above station prior to May 20, 1957; occasional regulation for lake level control since.

REVISIONS (WATER YEARS).--WSP 1337: 1952 (m). WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	63	83	109	85	62	215	178	94	44	29	22	39
2	59	86	104	84	60	201	184	93	45	22	25	40
3	55	107	105	83	60	193	177	91	47	22	25	39
4	51	111	110	82	64	180	168	87	51	19	21	39
5	49	106	104	82	145	170	165	85	51	23	20	40
6	48	98	94	81	143	165	161	83	58	29	19	42
7	49	96	90	80	130	165	155	78	61	29	18	43
8	50	92	88	80	120	170	152	73	53	27	23	44
9	52	91	90	80	110	170	145	70	49	26	3	44
10	57	98	95	80	104	165	143	66	42	31	[illegible]	44
11	53	98	107	78	101	160	132	64	39	31	24	42
12	49	93	108	77	104	160	133	59	40	23	29	40
13	51	90	108	75	105	160	144	53	53	20	24	38
14	130	86	108	72	100	160	147	50	54	20	24	36
15	127	85	110	70	99	180	141	47	50	31	25	32
16	102	84	109	67	97	230	134	47	44	25	27	28
17	87	82	109	65	100	225	133	47	38	22	26	29
18	76	81	110	64	109	220	133	45	35	20	25	30
19	70	82	111	64	163	215	124	40	34	20	24	30
20	89	105	115	64	223	210	118	39	37	20	24	28
21	106	114	110	64	250	200	115	27	40	25	26	46
22	98	100	107	63	236	200	110	35	36	19	28	44
23	91	91	105	63	206	190	107	33	32	18	29	38
24	85	89	98	62	189	190	104	35	30	23	30	35
25	79	89	98	63	183	188	103	50	29	22	28	33
26	74	87	95	61	200	184	100	53	32	25	30	35
27	72	97	94	63	232	182	100	51	31	23	32	52
28	68	118	93	64	227	181	96	52	31	22	35	63
29	72	118	92	62	------	181	98	53	25	28	38	55
30	82	116	90	64	------	179	98	50	26	30	38	46
31	77	------	87	63	------	174	------	48	------	24	38	------
TOTAL	2,271	2,873	3,153	2,205	3,922	5,763	3,998	1,798	1,237	748	820	1,194
MEAN	73.3	95.8	102	71.1	140	186	133	58.0	41.2	24.1	26.5	39.8
MAX	130	118	115	85	250	230	184	94	61	31	38	63
MIN	48	81	87	61	60	160	96	27	25	18	18	28
CFSM	.56	.73	.77	.54	1.06	1.41	1.01	.44	.31	.18	.20	.30
IN.	.64	.81	.89	.62	1.11	1.62	1.13	.51	.35	.21	.23	.34

CAL YR 1970 TOTAL 31,120 MEAN 85.3 MAX 209 MIN 26 CFSM .65 IN 8.77
WTR YR 1971 TOTAL 29,982 MEAN 82.1 MAX 250 MIN 18 CFSM .62 IN 8.45

NOTE.--No gage-height record Mar. 4-24, and Aug. 12 to Sept. 21.

04170500. 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., Livingston County, 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.--148 sq mi.

PERIOD OF RECORD.--August 1948 to current year.

GAGE.--Water-stage recorder. Datum of gage is 868.00 ft above mean sea level.

AVERAGE DISCHARGE.--23 years, 105 cfs (9.63 inches per year).

EXTREMES.--Current year: Maximum discharge, 282 cfs Feb. 22, Mar. 16; maximum gage height, 2.77 ft Nov. 17; minimum discharge, 6.4 cfs Apr. 20 (gage height, 0.66 ft).
Period of record: Maximum discharge, 1,080 cfs Dec. 29, 1950 (gage height, 5.05 ft), from rating curve extended above 600 cfs by logarithmic plotting; minimum, 2.6 cfs May 27, 1963 (gage height, 0.53 ft).

REMARKS.--Records good. Occasional regulation by Kent Lake.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73	128	142	104	77	253	210	90	55	34	25	48
2	72	121	170	104	77	240	213	93	56	32	26	46
3	70	124	216	104	77	227	213	89	56	26	29	47
4	69	129	176	110	84	211	205	83	54	22	31	48
5	66	126	150	111	133	203	197	82	58	30	27	52
6	66	162	138	110	150	203	189	86	63	43	22	65
7	68	203	129	108	151	216	181	80	65	37	23	69
8	69	157	122	105	145	213	174	76	62	34	23	66
9	68	135	119	100	135	202	100	73	61	34	27	62
10	73	131	119	97	129	200	66	36	51	34	27	55
11	75	129	133	96	124	195	98	11	46	32	37	56
12	72	126	131	93	126	194	80	21	48	24	29	50
13	73	168	128	89	126	184	62	30	62	17	28	43
14	128	172	126	89	125	190	100	38	65	18	31	37
15	139	139	124	87	124	238	119	39	62	20	34	33
16	125	124	126	84	122	275	80	45	58	22	33	33
17	112	170	125	86	125	277	34	45	51	27	33	37
18	103	218	124	83	129	266	72	43	46	25	31	36
19	98	163	125	76	164	259	55	42	43	25	26	32
20	98	146	125	76	227	254	7.0	42	41	19	33	51
21	110	146	126	77	266	248	14	41	46	18	36	56
22	111	178	125	77	280	242	42	39	42	18	35	58
23	110	184	124	79	269	240	59	38	38	18	39	51
24	105	152	119	79	245	234	72	39	37	21	33	48
25	101	135	118	80	229	230	82	43	34	20	36	47
26	97	128	115	79	226	227	87	51	34	25	39	51
27	96	166	115	77	245	222	90	55	33	27	43	72
28	91	211	112	80	256	220	87	55	33	24	48	76
29	94	175	110	80	------	219	89	55	32	26	48	77
30	131	158	107	82	------	219	90	56	30	28	49	69
31	157	------	105	80	------	216	------	59	------	27	49	------
TOTAL	2,920	4,604	4,024	2,782	4,566	7,017	3,167.0	1,675	1,462	807	1,030	1,571
MEAN	94.2	153	130	89.7	163	226	106	54.0	48.7	26.0	33.2	52.4
MAX	157	218	216	111	280	277	213	93	65	43	49	77
MIN	66	121	105	76	77	184	7.0	11	30	17	22	32
CFSM	.64	1.03	.88	.61	1.10	1.53	.72	.36	.33	.18	.22	.35
IN.	.73	1.16	1.01	.70	1.15	1.76	.80	.42	.37	.20	.26	.39

CAL YR 1970 TOTAL 36,587.0 MEAN 100 MAX 218 MIN 30 CFSM .68 IN 9.20
WTR YR 1971 TOTAL 35,625.0 MEAN 97.6 MAX 280 MIN 7.0 CFSM .66 IN 8.95

04172000 Huron River near Hamburg, Mich.

LOCATION.--Lat 42°27'55", long 83°48'00", in sec.24, T.1 N., R.5 E., Livingston County, 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.--308 sq mi.

PERIOD OF RECORD.--October 1951 to current year.

GAGE.--Water-stage recorder. Datum of gage is 850.00 ft above mean sea level (levels by Michigan Department of Natural Resources). Prior to Aug. 12, 1953, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--20 years, 196 cfs (8.64 inches per year).

EXTREMES.--Current year: Maximum discharge, 610 cfs Feb. 23 (gage height, 6.21 ft); minimum, 41 cfs July 26, Aug. 9, 10; minimum gage height, 3.31 ft Sept. 19.
Period of record: Maximum discharge, 1,560 cfs May 15, 1956; maximum gage height, 8.46 ft June 30, 1968; minimum discharge, 32 cfs July 2, 3, 1965; minimum gage height, 3.16 ft Aug. 1-3, 1964.

REMARKS.--Records good except those for the winter period, which are fair. Occasional regulation by Kent Lake, 11 miles above station.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	127	207	269	160	120	482	392	194	99	72	48	70
2	124	200	247	160	130	480	390	194	103	71	46	69
3	121	201	240	160	130	460	388	192	103	68	45	68
4	116	205	274	160	140	424	383	183	101	65	46	69
5	112	208	276	150	170	401	372	174	100	68	47	68
6	111	204	248	160	240	378	358	174	103	81	46	70
7	110	212	215	160	290	378	346	172	108	83	44	74
8	111	242	199	160	280	372	333	171	109	83	43	76
9	113	241	188	160	270	361	323	164	107	81	42	75
10	124	224	182	160	250	356	271	158	102	78	42	72
11	126	208	188	150	240	346	234	130	97	74	48	70
12	127	197	200	150	230	335	234	113	93	70	50	67
13	129	189	204	148	210	323	228	106	103	64	50	65
14	196	202	202	144	200	323	232	107	111	58	52	61
15	262	223	195	135	190	374	250	108	113	56	51	57
16	282	207	193	132	170	451	264	110	109	58	53	52
17	276	184	195	130	160	546	237	112	103	59	54	51
18	247	195	192	130	145	594	207	115	95	58	55	51
19	216	241	194	140	184	596	214	117	89	58	56	50
20	197	255	199	140	278	588	190	113	86	55	57	60
21	199	238	198	140	385	559	157	109	86	51	59	71
22	203	224	198	138	544	541	152	104	85	48	60	78
23	199	227	193	133	606	523	160	99	82	46	61	79
24	189	237	186	130	582	502	172	98	81	44	61	75
25	181	224	190	126	534	485	178	104	78	42	63	72
26	170	203	180	123	488	465	183	108	75	44	65	72
27	160	197	180	120	468	444	187	112	73	45	67	89
28	152	226	180	120	470	429	192	109	72	44	70	103
29	150	268	170	120	------	415	192	107	71	45	71	106
30	157	281	170	120	------	401	192	103	69	45	72	97
31	179	------	170	120	------	394	------	101	------	48	69	------
TOTAL	5,166	6,570	6,315	4,379	8,104	13,726	7,611	4,061	2,806	1,862	1,693	2,137
MEAN	167	219	204	141	289	443	254	131	93.5	60.1	54.6	71.2
MAX	282	281	276	160	606	596	392	194	113	83	72	106
MIN	110	184	170	120	120	323	152	98	69	42	42	50
CFSM	.54	.71	.66	.46	.94	1.44	.82	.43	.30	.20	.18	.23
IN.	.62	.79	.76	.53	.98	1.66	.92	.49	.34	.22	.20	.26

CAL YR 1970 TOTAL 69,380 MEAN 190 MAX 449 MIN 64 CFSM .62 IN 8.38
WTR YR 1971 TOTAL 64,430 MEAN 177 MAX 606 MIN 42 CFSM .57 IN 7.78

04172500 Portage River near Pinckney, Mich.

LOCATION.--Lat 42°25'40", long 83°57'35", in SW¼ sec.34, T.1 N., R.4 E., Livingston County, on right upstream abutment of bridge on Tiplady Road, 2 miles upstream from Little Portage Lake, and 2.2 miles southwest of Pinckney.

DRAINAGE AREA.--79.1 sq mi.

PERIOD OF RECORD.--November 1944 to September 1971 (discontinued as a continuous-record station; converted to a crest-stage partial-record station). Prior to October 1963, published as Portage Creek near Pinckney.

GAGE.--Nonrecording gage. Datum of gage is 860.38 ft above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--27 years, 48.3 cfs (8.29 inches per year).

EXTREMES.--Current year: Maximum discharge, 152 cfs Mar. 2 (gage height, 3.74); minimum, 0.80 cfs July 31, Aug. 14, 21 (gage height, 0.60 ft).
Period of record: Maximum discharge, 529 cfs Apr. 9, 10, 1947 (gage height, 5.72 ft); minimum, 0.48 cfs Sept. 11, 15, 1967; minimum gage height, 0.56 ft Oct. 5, 1946.

REMARKS.--Records good except those for the winter period, which are fair. Regulation by Hiland Lake 2.5 miles above station.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	50	70	47	25	151	111	56	24	13	1.1	1.3
2	30	51	72	46	26	152	112	55	25	7.1	1.5	1.2
3	27	56	71	45	26	147	109	54	25	8.5	1.5	1.2
4	25	58	79	46	28	147	105	52	24	10	1.4	1.3
5	23	60	76	48	32	141	102	51	23	11	1.4	1.3
6	22	60	74	47	40	145	101	51	22	13	1.8	1.3
7	21	60	71	45	50	140	96	50	22	6.8	1.8	1.3
8	19	59	71	43	57	139	94	50	21	6.4	1.5	2.0
9	18	58	70	41	64	137	93	35	21	5.4	1.3	1.8
10	23	63	69	38	67	123	92	23	20	5.7	1.3	1.5
11	23	63	73	36	66	120	92	21	14	5.6	1.4	1.6
12	23	63	73	35	51	113	92	27	14	5.4	1.2	1.5
13	23	62	72	33	47	88	88	32	20	5.4	1.0	1.4
14	43	62	72	31	45	100	87	31	25	5.0	.80	1.4
15	38	62	72	31	43	121	83	30	11	1.4	1.3	1.3
16	37	61	70	30	43	95	83	30	7.4	3.8	2.0	1.3
17	38	59	71	28	45	127	82	29	7.1	4.4	1.3	1.3
18	37	58	69	27	47	125	82	28	4.1	6.0	.92	1.3
19	37	58	69	26	56	137	81	27	16	7.8	.92	2.0
20	38	60	67	25	70	140	78	25	8.0	11	1.0	3.2
21	38	61	66	25	84	140	76	25	3.8	17	.80	2.0
22	42	61	67	24	100	139	73	24	8.5	7.1	.90	1.8
23	42	61	67	24	115	137	72	24	12	7.1	1.0	1.8
24	42	60	65	24	125	135	70	24	13	11	1.4	1.6
25	45	59	63	24	128	133	68	26	11	6.0	1.0	2.0
26	52	60	59	24	133	129	65	25	7.8	3.2	1.0	4.0
27	48	62	55	24	148	124	63	24	7.4	1.6	1.2	9.2
28	47	72	53	24	150	120	61	25	7.1	1.5	1.0	3.2
29	50	72	52	24	------	120	60	23	6.4	1.5	1.3	2.6
30	51	72	50	24	------	117	57	23	6.0	1.4	1.6	2.0
31	51	------	48	25	------	113	------	23	------	.80	1.4	------
TOTAL	1,082	1,823	2,076	1,014	1,911	3,995	2,528	1,023	436.6	200.90	39.04	60.7
MEAN	34.9	60.8	67.0	32.7	68.3	129	84.3	33.0	14.6	6.48	1.26	2.02
MAX	52	72	79	48	150	152	112	56	25	17	2.0	9.2
MIN	18	50	48	24	25	88	57	21	3.8	.80	.80	1.2

CAL YR 1970 TOTAL 18,933.60 MEAN 51.9 MAX 128 MIN 3.6 CFSM .66 IN 8.92
WTR YR 1971 TOTAL 16,189.24 MEAN 44.4 MAX 152 MIN .80 CFSM .56 IN 7.62

04173000 Huron River near Dexter, Mich.

LOCATION.--Lat 42°23'10", long 83°54'40", in S½ sec.13, T.1 S., R.4 E., Washtenaw County, on right bank 20 ft downstream from highway bridge on North Territorial Road, 0.5 mile east of Hudson Mills, 2 miles downstream from Portage Lake Outlet, and 4 miles north of Dexter.

DRAINAGE AREA.--522 sq mi.

PERIOD OF RECORD.--August to December 1904 (gage height only), March 1946 to current year. Published as "at Dover" 1904.

GAGE.--Water-stage recorder. Datum of gage is 837.11 ft above mean sea level (levels by Michigan Department of Natural Resources). August to December 1904, nonrecording gage at site 1 mile upstream at different datum. Mar. 5, 1946 to July 30, 1953, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.--25 years, 349 cfs (9.08 inches per year).

EXTREMES.--Current year: Maximum discharge, 1,190 cfs Nov. 21 (gage height, 5.04 ft); minimum, 42 cfs Aug. 29 (gage height, 2.24 ft).
Period of record: Maximum discharge, 3,120 cfs Apr. 9, 1947 (gage height, 8.17 ft, from graph based on gage readings); minimum, 38 cfs Apr. 18, 1966 (gage height, 2.21 ft).

REMARKS.--Records good. Occasional regulation by lake level control operations above station.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	192	302	378	301	180	967	674	429	168	83	53	48
2	241	313	506	293	170	903	779	440	171	98	52	49
3	256	336	533	289	160	903	763	378	167	104	53	50
4	229	355	519	293	170	892	753	338	164	62	52	51
5	210	363	490	301	217	859	549	309	164	75	51	52
6	152	366	475	293	230	837	400	293	161	98	50	54
7	94	368	445	281	297	827	533	313	160	99	49	54
8	119	365	420	269	364	798	861	378	159	96	48	55
9	140	375	386	266	396	693	696	304	160	96	48	56
10	171	396	368	262	405	555	435	181	155	102	48	56
11	172	400	373	259	425	589	334	210	128	123	54	58
12	237	396	378	259	435	584	490	248	115	95	50	59
13	326	386	386	255	425	538	500	248	158	61	50	59
14	347	394	386	251	386	723	504	195	164	61	51	59
15	425	405	382	248	364	861	500	183	164	61	49	59
16	455	386	382	241	355	926	468	195	160	63	49	58
17	441	375	351	241	351	984	410	175	155	66	49	59
18	431	282	334	234	359	990	425	162	147	65	48	58
19	325	203	351	235	430	1,060	445	168	140	65	48	56
20	322	293	364	223	795	1,120	450	168	139	65	49	72
21	381	759	368	220	969	955	450	168	133	65	49	77
22	363	440	378	220	1,060	875	434	162	133	65	48	77
23	351	422	378	217	1,120	882	335	152	133	64	48	79
24	253	404	360	217	1,130	877	285	150	133	63	46	82
25	123	396	350	210	1,120	867	309	161	117	64	45	80
26	250	390	340	213	1,090	849	331	158	111	64	46	85
27	368	387	334	210	1,080	831	342	152	102	64	47	131
28	332	391	330	200	1,050	743	351	145	92	63	48	237
29	317	400	321	195	------	659	360	186	76	60	47	206
30	313	349	317	190	------	635	358	190	75	59	49	74
31	305	------	305	180	------	599	------	178	------	57	48	------
TOTAL	8,641	11,397	11,988	7,566	15,533	25,381	14,524	7,117	4,204	2,326	1,522	2,250
MEAN	279	380	387	244	555	819	484	230	140	75.0	49.1	75.0
MAX	455	759	533	301	1,130	1,120	861	440	171	123	54	237
MIN	94	203	305	180	160	538	285	145	75	57	45	48
CFSM	.53	.73	.74	.47	1.06	1.57	.93	.44	.27	.14	.09	.14
IN.	.62	.81	.85	.54	1.11	1.81	1.04	.51	.30	.17	.11	.16

CAL YR 1970 TOTAL 121,180 MEAN 332 MAX 868 MIN 88 CFSM .64 IN 8.64
WTR YR 1971 TOTAL 112,449 MEAN 308 MAX 1,130 MIN 45 CFSM .59 IN 8.01

04173500 Mill Creek near Dexter, Mich.

LOCATION.--Lat 42°18'00", long 83°53'55", in SW¼ sec.18, T.2 S., R.5 E., Washtenaw County, on left bank 12 ft downstream from bridge on Parker Road, 2.5 miles south of Dexter, and 4 miles upstream from mouth.

DRAINAGE AREA.--128 sq mi.

PERIOD OF RECORD.--February 1952 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 850 ft (from topographic map). Prior to May 23, 1958, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--19 years, 70.8 cfs (7.51 inches per year).

EXTREMES.--Current year: Maximum discharge, 800 cfs Feb. 20, from correlation with nearby stations; maximum gage height, 11.8 ft (from flood mark) probably occurred Feb. 20 (backwater from ice); minimum discharge,13 cfs Aug. 22, 23, 25, 26; minimum gage height, 5.37 ft Sept. 9, 10, 15, 16, 18.
Period of record: Maximum discharge, 1,500 cfs June 26, 1968 (gage height, 12.95 ft); minimum, 7.3 cfs Dec. 13, 1963; minimum gage height, 4.94 ft Dec. 13, 1963, Feb. 22, 1964.

REMARKS.--Records good except those for the winter period and those for periods of no gage-height record, which are fair.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	73	125	66	38	213	133	62	31	22	16	14
2	35	67	105	64	38	177	156	62	40	21	15	14
3	34	97	90	62	40	151	137	60	38	20	15	15
4	33	94	111	60	45	140	116	58	33	19	16	15
5	32	96	100	58	120	118	108	56	31	22	15	14
6	32	83	98	56	230	130	105	61	32	35	14	15
7	31	71	90	55	210	189	101	58	34	34	14	15
8	31	63	62	54	180	146	99	55	32	23	14	15
9	33	60	70	52	160	140	99	53	31	21	14	14
10	58	105	78	50	140	121	98	51	29	20	14	14
11	61	106	99	49	130	114	94	49	28	18	20	15
12	62	87	125	48	125	102	92	48	28	18	17	15
13	52	76	109	37	120	91	105	47	61	18	15	15
14	150	67	103	45	120	227	126	45	66	17	15	15
15	218	65	94	44	120	606	109	44	49	19	15	15
16	145	61	89	43	120	489	99	43	39	22	15	15
17	100	59	90	42	120	273	101	41	34	20	14	15
18	83	58	92	41	160	183	104	40	31	18	14	15
19	72	56	97	40	300	161	95	39	29	18	14	15
20	67	100	140	40	730	177	89	39	28	18	14	20
21	83	124	160	40	690	149	84	36	32	17	14	21
22	79	97	140	40	500	144	78	35	28	16	13	18
23	72	75	105	40	400	132	73	34	26	16	13	17
24	65	70	98	40	350	116	69	36	26	17	14	17
25	62	61	90	40	300	113	66	48	25	16	13	16
26	58	54	86	40	284	115	64	46	26	21	13	18
27	56	69	80	40	426	124	63	41	24	20	16	85
28	54	185	78	39	268	132	64	38	23	17	15	78
29	67	181	74	38	------	148	65	35	22	17	14	43
30	101	155	70	38	------	129	64	33	21	17	14	32
31	86	------	68	38	------	123	------	31	------	17	14	------
TOTAL	2,148	2,615	3,016	1,439	6,464	5,373	2,856	1,424	977	614	453	645
MEAN	69.3	87.2	97.3	46.4	231	173	95.2	45.9	32.6	19.8	14.6	21.5
MAX	218	185	160	66	730	606	156	62	66	35	20	85
MIN	31	54	62	37	38	91	63	31	21	16	13	14
CFSM	.54	.68	.76	.36	1.80	1.35	.74	.36	.25	.15	.11	.17
IN.	.62	.76	.88	.42	1.88	1.56	.83	.41	.28	.18	.13	.19

CAL YR 1970 TOTAL 30,502 MEAN 83.6 MAX 613 MIN 22 CFSM .65 IN 8.86
WTR YR 1971 TOTAL 28,024 MEAN 76.8 MAX 730 MIN 13 CFSM .60 IN 8.14

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	GHT	DISCHARGE
02-20	--	--	about 800
03-15	1500	10.08	630

NOTE.--No gage-height record Dec. 20 to Jan. 27, Feb. 10-26.

04174500 Huron River at Ann Arbor, Mich.

LOCATION.--Lat 42°17'10", long 83°44'00", in NW1/4 sec.28, T.2 S., R.6 E., Washtenaw County, on left bank 100 ft upstream from bridge on Wall Street in Ann Arbor, 0.7 mile downstream from Argo Dam, and 4.2 miles upstream from Geddes Dam.

DRAINAGE AREA.--729 sq mi.

PERIOD OF RECORD.--February 1904 to current year. 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 (levels by Michigan Department of Natural Resources). February 1904 to December 1914 at Geddes Dam, 4.2 miles downstream, and January 1914 to September 1947, at Barton Dam, 2.6 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.--67 years, 439 cfs (8.18 inches per year) adjusted for diversion since 1955.

EXTREMES.--Current year: Maximum discharge, 3,030 cfs Feb. 20 (gage height, 15.58 ft); minimum, 23 cfs Aug. 20; minimum gage height, 11.48 ft Dec. 3; minimum daily discharge, 25 cfs Aug. 19.
Period of record: 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 except those for the winter period and those for periods of no gage-height record, which are fair. 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 prior to May 1962, and since by occasional lake-level control operations above station.

REVISIONS (WATER YEARS).--WSP 874: 1938. WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	222	486	644	379	280	1,350	800	520	176	110	72	35
2	236	503	467	392	270	1,170	900	520	269	120	68	34
3	330	715	646	380	260	1,100	900	450	166	130	72	36
4	314	452	761	406	345	1,030	900	400	249	80	70	38
5	229	453	705	401	1,070	1,050	700	370	158	100	69	37
6	305	491	632	345	1,080	1,000	500	370	206	120	68	38
7	128	425	656	326	926	1,000	700	400	245	120	66	38
8	95	692	555	325	815	950	1,000	450	180	120	65	56
9	208	359	399	312	580	800	800	350	144	120	65	68
10	264	506	501	339	594	700	500	230	176	130	83	48
11	257	497	543	341	528	700	400	305	187	150	62	46
12	259	660	573	327	542	700	600	226	172	100	62	46
13	447	435	573	310	530	700	600	360	180	80	60	49
14	538	603	550	317	500	900	600	191	314	80	59	59
15	727	532	518	300	437	1,000	600	272	214	80	58	72
16	749	684	521	295	408	1,100	560	226	150	82	61	78
17	589	479	519	293	421	1,200	500	284	196	82	60	85
18	605	476	457	277	542	1,200	520	191	191	82	49	84
19	522	385	490	286	1,410	1,300	540	237	128	82	25	82
20	355	296	559	288	2,590	1,300	540	245	127	82	30	109
21	588	590	562	272	2,440	1,100	540	191	234	82	39	74
22	459	859	532	270	1,840	1,100	520	187	153	80	39	74
23	493	701	520	271	1,680	1,000	400	214	137	80	38	73
24	438	651	494	263	1,540	1,000	350	199	140	80	38	75
25	226	462	547	265	1,460	1,000	400	226	140	80	38	76
26	228	536	500	273	1,550	959	410	230	130	80	41	95
27	515	612	456	290	1,700	946	410	222	130	80	38	352
28	530	645	409	300	1,550	921	410	172	120	77	36	317
29	516	695	431	283	------	796	410	155	100	76	35	444
30	346	710	401	286	------	781	450	269	95	75	35	402
31	480	------	395	280	------	704	------	199	------	74	34	------
TOTAL	12,198	16,590	16,516	9,692	27,952	30,557	17,460	8,861	5,207	2,914	1,635	3,120
MEAN	393	553	533	313	998	986	582	286	174	94.0	52.7	104
MAX	749	859	761	406	2,590	1,350	1,000	520	314	150	83	444
MIN	95	296	395	263	260	700	350	155	95	74	25	34
MEAN+	406	564	543	323	1,007	995	592	300	191	113	74.3	120
CFSM+	.56	.77	.74	.44	1.38	1.36	.81	.41	.26	.16	.10	.16
IN+	.64	.86	.86	.51	1.44	1.57	.91	.47	.29	.18	.12	.18

CAL YR 1970 TOTAL 165,763 MEAN 454 MAX 1,240 MIN 60 MEAN+ 472 CFSM+ .65 IN+ 8.79
WTR YR 1971 TOTAL 152,702 MEAN 418 MAX 2,590 MIN 25 MEAN+ 432 CFSM+ .59 IN+ 8.04

\+ Adjusted for diversion for municipal supply; record furnished by City of Ann Arbor.

NOTE.--No gage-height record Apr. 1 to May 10, and June 24 to July 27.

04175550 Stony Creek at Oakville, Mich.

LOCATION.--Lat 42°05'05", long 83°34'43", in SE¼ SE¼ sec.34, T.4 S., R.7 E., Washtenaw County, at left downstream side of bridge on Tuttle Hill Road, 300 feet downstream from Paint Creek, and 0.2 mile northeast of Oakville.

DRAINAGE AREA.--68.0 sq mi.

PERIOD OF RECORD.--January 1970 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 650 ft (from topographic map). Prior to July 31, 1970, nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum discharge, about 440 cfs Feb. 20 from correlation with nearby stations; maximum gage height, 8.31 ft Feb. 20 (backwater from ice); minimum discharge 2.7 cfs Aug. 24 (gage height, 1.00 ft).
Period of record: Maximum discharge, 450 cfs (revised) May 24, 1970 (gage height, 7.30 ft); maximum gage height, 8.31 ft Feb. 20, 1971 (backwater from ice); minimum discharge, 2.7 cfs Aug. 24, 1971 (gage height, 1.00 ft).

REMARKS.--Records good except those for the winter period, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.1	15	32	14	7.9	63	49	19	12	5.0	5.1	3.6
2	7.8	15	27	14	8.0	54	79	18	16	4.8	3.7	4.3
3	7.7	21	23	13	8.4	47	63	17	16	4.7	3.7	5.1
4	7.7	19	28	13	10	45	50	17	13	4.0	3.7	5.6
5	7.5	17	25	13	45	42	44	17	12	6.1	3.6	6.4
6	7.3	16	21	12	140	42	42	20	17	10	3.8	7.2
7	7.2	15	24	12	100	104	40	20	17	7.8	4.0	10
8	7.2	14	19	12	70	65	37	18	16	6.5	3.7	6.5
9	7.2	14	19	11	56	55	35	16	13	6.4	3.4	5.4
10	8.8	18	19	11	50	48	32	15	11	5.0	4.3	5.3
11	9.7	20	26	11	45	41	30	15	10	4.7	8.0	5.3
12	9.3	17	42	10	40	42	29	15	12	4.3	6.1	5.0
13	10	15	32	10	39	45	30	15	35	3.6	4.7	5.4
14	14	14	28	10	38	96	46	14	84	4.7	4.4	5.4
15	22	15	25	9.5	37	318	41	14	36	4.7	4.3	5.3
16	15	15	22	9.0	37	201	36	14	23	6.7	4.4	5.3
17	12	14	20	9.0	38	90	33	14	17	5.7	4.0	5.4
18	12	14	20	8.8	43	71	33	13	14	5.1	3.7	5.3
19	11	14	21	8.5	60	73	30	13	12	5.0	3.7	5.3
20	11	19	28	8.5	370	100	27	19	11	4.7	3.8	9.2
21	13	27	25	8.4	250	75	26	16	10	4.3	3.6	14
22	15	20	23	8.3	150	66	23	14	9.8	3.7	3.4	8.6
23	13	16	21	8.3	94	63	21	14	9.0	3.7	3.2	7.5
24	12	17	20	8.2	100	56	21	14	8.6	4.0	3.2	7.3
25	12	15	19	8.2	106	51	20	23	8.1	4.4	3.3	7.5
26	13	16	18	8.1	140	49	19	20	7.3	6.1	3.5	8.6
27	13	17	17	8.0	174	47	18	17	7.0	6.7	3.8	15
28	13	40	16	8.0	84	50	19	16	6.5	5.4	4.0	34
29	14	42	16	8.0	------	53	20	14	5.9	5.3	3.6	25
30	17	46	15	7.9	------	47	19	13	5.3	4.8	3.4	15
31	17	------	15	7.9	------	45	------	12	------	5.6	3.2	------
TOTAL	354.5	577	706	308.6	2,340.3	2,244	1,012	496	474.5	163.5	124.3	258.8
MEAN	11.4	19.2	22.8	9.95	83.6	72.4	33.7	16.0	15.8	5.27	4.01	8.63
MAX	22	46	42	14	370	318	79	23	84	10	8.0	34
MIN	7.2	14	15	7.9	7.9	41	18	12	5.3	3.6	3.2	3.6
CFSM	.17	.28	.34	.15	1.23	1.06	.50	.24	.23	.08	.06	.13
IN.	.19	.32	.39	.17	1.28	1.23	.55	.27	.26	.09	.07	.14

CAL YR 1970 TOTAL 10,171.0 MEAN 27.9 MAX 338 MIN 5.6 CFSM .41 IN 5.56
WTR YR 1971 TOTAL 9,059.5 MEAN 24.8 MAX 370 MIN 3.2 CFSM .36 IN 4.96

PEAK DISCHARGE (BASE, 300 CFS).--Feb. 20 (time unknown) about 440 cfs; Mar. 15 (2100) 349 cfs (6.87 ft).

04175600 River Raisin near Manchester, Mich.

LOCATION.--Lat 42°10'05", long 84°04'34", in NE1/4SE1/4 sec.33, T.3 S., R.3 E., Washtenaw County, on left bank 8 feet downstream from bridge on Sharon Valley Road, and 2.5 miles northwest of Manchester.

DRAINAGE AREA.--132 sq mi.

PERIOD OF RECORD.--January 1970 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 900 ft (from topographic map). Prior to July 30, 1970, nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum discharge, about 350 cfs Feb. 20 (gage height, 6.1 ft, from floodmark, backwater from ice); minimum discharge, 7.5 cfs Sept. 13 (gage height, 1.33 ft).
Period of record: Maximum discharge, about 350 cfs Feb. 20, 1971 (gage height, 6.1 ft, from floodmark, backwater from ice); minimum discharge, 7.5 cfs Sept. 13, 1971 (gage height, 1.33 ft).

REMARKS.--Records good except those for the winter period, which are fair. Occasional regulation by many dams above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	98	176	66	38	303	158	63	38	17	17	9.5
2	33	92	158	64	39	296	212	62	48	17	16	10
3	28	102	146	62	41	260	193	61	50	17	16	10
4	25	112	145	60	46	268	169	60	48	17	16	11
5	24	112	138	60	60	230	158	59	54	19	16	11
6	25	107	147	58	250	226	137	64	119	24	16	11
7	26	100	108	56	240	238	137	67	106	23	16	11
8	26	91	137	54	220	230	136	65	80	22	18	11
9	28	88	116	52	200	233	136	62	65	22	11	11
10	53	116	108	52	180	210	132	59	52	21	12	11
11	61	126	116	50	160	195	121	58	46	24	13	11
12	53	114	135	50	150	184	78	58	41	15	13	15
13	51	108	133	48	140	177	116	58	41	17	13	8.0
14	94	101	133	48	130	198	145	55	39	15	13	9.5
15	154	99	136	46	130	273	125	53	41	14	12	10
16	123	96	136	45	130	281	116	51	37	15	12	10
17	106	92	121	45	130	255	109	46	36	18	12	10
18	96	89	119	43	140	244	112	47	32	16	12	11
19	86	85	125	42	160	238	112	48	32	15	11	12
20	82	106	135	41	340	238	110	48	33	14	12	15
21	91	133	126	40	330	230	106	45	28	14	11	17
22	95	136	110	40	310	224	99	40	29	15	10	16
23	90	116	100	39	300	219	94	36	29	15	10	16
24	92	82	95	38	285	206	90	32	29	14	9.5	15
25	90	84	90	38	290	197	74	49	28	14	9.5	14
26	84	94	85	38	310	191	71	60	27	19	9.2	17
27	79	101	80	38	330	186	71	55	26	19	9.5	33
28	79	154	80	38	327	185	79	48	24	17	9.8	44
29	89	169	75	38	------	186	71	44	19	17	9.8	33
30	106	178	70	38	------	178	67	41	17	17	9.8	29
31	104	------	68	38	------	149	------	39	------	17	9.8	------
TOTAL	2,207	3,281	3,647	1,465	5,406	6,928	3,534	1,633	1,294	540	384.9	452.0
MEAN	71.2	109	118	47.3	193	223	118	52.7	43.1	17.4	12.4	15.1
MAX	154	178	176	66	340	303	212	67	119	24	18	44
MIN	24	82	68	38	38	149	67	32	17	14	9.2	8.0
CFSM	.54	.83	.89	.36	1.46	1.69	.89	.40	.33	.13	.09	.11
IN.	.62	.92	1.03	.41	1.52	1.95	1.00	.46	.36	.15	.11	.13

CAL YR 1970 TOTAL 33,487.0 MEAN 91.7 MAX 273 MIN 11 CFSM .69 IN 9.44
WTR YR 1971 TOTAL 30,771.9 MEAN 84.3 MAX 340 MIN 8.0 CFSM .64 IN 8.67

PEAK DISCHARGE (BASE, 280 CFS).--Feb. 20 (time unknown) about 350 cfs; Mar. 15 (2400) 293 cfs (5.17 ft).

04175700 River Raisin near Tecumseh, Mich.

LOCATION.—Lat 41°56'35", long 83°56'45", in NE¼ sec.21, T.6 S., R.4 E., Lenawee County, on right bank 12 ft downstream from bridge on North Raisin Center Highway, 3.4 miles upstream from South Branch River Raisin, and 4.5 miles south of Tecumseh.

DRAINAGE AREA.—267 sq mi.

RECORDS AVAILABLE.—September 1956 to current year.

GAGE.—Water-stage recorder. Datum of gage is 707.0 ft above mean sea level.

AVERAGE DISCHARGE.—15 years, 163 cfs (8.29 inches per year).

EXTREMES.—Current year: Maximum discharge, about 1,400 cfs Feb. 21, on basis of correlation with adjacent stations; maximum gage height, 11.00 ft Feb. 21, from floodmark, caused by backwater from ice; minimum discharge, 20 cfs Sept. 3 (gage height, 3.33 ft); minimum daily, 20 cfs Sept. 3.
Period of record: Maximum discharge, 2,920 cfs June 26, 1968 (gage height, 12.66 ft); minimum, 6.4 cfs Aug. 26, 1964 (gage height, 2.57 ft); minimum daily, 8.3 cfs Oct. 30, 1965.

REMARKS.—Records good except those for the winter period, which are fair. Diurnal fluctuation caused by powerplant 5.5 miles above station prior to June 27, 1968.

REVISIONS.—WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80	138	304	130	75	675	265	120	86	56	39	22
2	78	131	286	120	75	612	264	118	94	53	37	22
3	76	135	263	120	80	535	292	118	96	51	37	20
4	72	139	252	115	100	480	310	121	96	50	38	22
5	67	145	201	115	150	432	275	124	94	50	36	32
6	65	137	159	110	300	410	247	134	105	56	36	33
7	64	131	234	110	400	474	228	132	141	54	36	35
8	64	124	174	105	430	451	212	135	161	52	35	33
9	67	119	164	100	420	400	216	155	161	52	33	31
10	88	147	167	100	400	366	220	145	149	51	36	31
11	84	188	179	95	350	363	210	122	123	50	44	31
12	92	153	215	95	300	327	182	115	107	47	38	31
13	104	147	207	90	280	305	172	110	103	45	35	34
14	127	138	204	90	270	369	189	107	103	45	35	34
15	197	136	197	85	250	660	186	106	101	42	34	35
16	198	139	193	80	240	684	202	102	95	44	33	33
17	183	141	181	80	240	618	193	100	91	45	34	33
18	145	125	184	75	250	550	185	97	80	44	33	32
19	134	122	189	75	300	491	178	94	64	42	32	31
20	126	145	241	75	500	465	175	93	71	42	32	47
21	132	188	217	75	1,200	451	171	93	74	42	33	45
22	133	187	205	75	1,100	428	167	91	73	40	33	42
23	128	179	195	75	800	391	162	88	69	37	32	41
24	122	129	179	75	760	377	159	86	68	41	31	39
25	118	165	164	75	750	354	150	99	66	41	31	38
26	120	135	155	75	760	334	144	99	64	41	32	43
27	120	136	150	70	760	316	132	102	63	42	29	45
28	113	233	140	70	720	307	129	102	61	42	27	58
29	119	309	140	70	------	305	130	98	59	42	24	80
30	140	336	130	70	------	304	127	94	57	42	23	52
31	144	------	130	70	------	289	------	90	------	42	23	------
TOTAL	3,500	4,777	5,999	2,765	12,260	13,523	5,872	3,390	2,775	1,423	1,031	1,105
MEAN	113	159	194	89.2	438	436	196	109	92.5	45.9	33.3	36.8
MAX	198	336	304	130	1,200	684	310	155	161	56	44	80
MIN	64	119	130	70	75	289	127	86	57	37	23	20
CFSM	.42	.60	.73	.33	1.64	1.63	.73	.41	.35	.17	.12	.14
IN.	.49	.67	.84	.39	1.71	1.88	.82	.47	.39	.20	.14	.15

CAL YR 1970 TOTAL 63,604 MEAN 174 MAX 878 MIN 50 CFSM .65 IN 8.86
WTR YR 1971 TOTAL 58,420 MEAN 160 MAX 1,200 MIN 20 CFSM .60 IN 8.14

PEAK DISCHARGE (BASE, 700 CFS)

DATE	TIME	GHT	DISCHARGE
02-21	--	--	about 1,400
03-15	2200	8.97	715

04176000 River Raisin near Adrian, Mich.

LOCATION.—Lat 41°54'15", long 83°58'50", in NW¼ sec.5, T.7 S., R.4 E., Lenawee County, 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.—463 sq mi.

PERIOD OF RECORD.—October 1953 to current year. 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.

AVERAGE DISCHARGE.—18 years, 286 cfs (8.39 inches per year).

EXTREMES.—Current year: Maximum discharge, about 2,800 cfs Feb. 21, on basis of correlation with adjacent stations; maximum gage height, 14.0 ft Feb. 21, from floodmark, caused by backwater from ice; minimum discharge not determined; minimum daily 41 cfs Sept. 2, 3.
Period of record: Maximum discharge, 5,580 cfs Apr. 30, 1956 (gage height, 14.87 ft), from rating curve extended above 4,000 cfs by logarithmic plotting; minimum, 18 cfs Aug. 10, 1964 (gage height, 1.33 ft); minimum daily, 25 cfs Oct. 26, 1965.

REMARKS.—Records good except those for the winter period, which are fair. Diurnal fluctuation caused by powerplant at Tecumseh, 11 miles above station, prior to June 27, 1968.

REVISIONS.—See PERIOD OF RECORD. WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	129	232	888	230	125	1,350	481	189	120	74	62	42
2	95	213	689	220	130	1,040	503	186	151	69	58	41
3	91	211	548	210	135	839	542	185	141	66	58	41
4	87	208	543	205	150	676	541	185	138	64	59	43
5	82	221	513	200	210	646	493	187	129	71	58	45
6	81	208	425	195	400	602	448	228	141	85	57	53
7	80	197	364	190	600	715	421	211	176	76	56	56
8	80	188	343	185	800	743	408	215	192	73	55	55
9	86	180	308	180	750	598	397	226	190	74	53	54
10	130	209	299	175	700	591	392	215	177	70	57	53
11	114	281	320	170	600	552	377	188	151	70	84	52
12	121	283	408	165	550	509	368	176	138	64	68	50
13	138	252	454	160	500	483	263	168	132	64	60	48
14	196	227	410	155	470	593	341	172	132	63	57	47
15	274	221	356	150	440	1,110	356	169	127	66	55	47
16	323	206	348	150	420	1,560	338	163	117	80	54	48
17	380	221	343	145	420	1,400	323	154	111	73	53	50
18	215	196	332	140	430	1,010	306	144	105	63	51	48
19	189	191	346	140	550	773	294	137	85	65	50	53
20	177	239	503	140	1,000	704	280	137	92	72	49	90
21	182	357	553	135	2,500	682	270	134	97	69	50	82
22	184	425	459	135	2,500	647	260	128	97	64	51	69
23	183	370	389	130	1,900	607	250	121	91	60	52	66
24	178	261	347	130	1,300	565	242	126	91	67	52	64
25	168	268	291	130	1,320	528	228	172	88	64	50	59
26	169	226	280	130	1,380	501	219	155	84	64	45	64
27	168	231	270	130	1,570	498	204	156	81	67	43	93
28	163	486	260	125	1,560	507	204	151	79	67	48	89
29	179	730	250	125	------	509	204	140	76	68	48	111
30	211	928	250	125	------	509	198	130	74	66	46	104
31	237	------	240	125	------	493	------	123	------	66	44	------
TOTAL	5,090	8,666	12,329	4,925	23,410	22,540	10,151	5,171	3,603	2,124	1,683	1,817
MEAN	164	289	398	159	836	727	338	167	120	68.5	54.3	60.6
MAX	380	928	888	230	2,500	1,560	542	228	192	85	84	111
MIN	80	180	240	125	125	483	198	121	74	60	43	41
CFSM	.35	.62	.86	.34	1.81	1.57	.73	.36	.26	.15	.12	.13
IN.	.41	.70	.99	.40	1.88	1.81	.82	.42	.29	.17	.14	.15

CAL YR 1970 TOTAL 113,060 MEAN 310 MAX 1,430 MIN 70 CFSM .67 IN 9.08
WTR YR 1971 TOTAL 101,509 MEAN 278 MAX 2,500 MIN 41 CFSM .60 IN 8.16

PEAK DISCHARGE (BASE, 1,400 CFS)

DATE	TIME	GHT	DISCHARGE
02-21	—	—	about 2,800
02-27	2100	10.92	1,630
03-16	1100	10.85	1,600

04176400 Saline River near Saline, Mich.

LOCATION.—Lat 42°07'50", long 83°46'35", in SE¼ sec.13, T.4 S., R.5 E., Washtenaw County, on right bank 20 ft downstream from bridge on Maple Road, and 2.8 miles south of Saline.

DRAINAGE AREA.—94.6 sq mi.

PERIOD OF RECORD.—October 1965 to current year.

GAGE.—Water-stage recorder. Altitude of gage is 720 ft (from topographic map).

AVERAGE DISCHARGE.—6 years, 60.2 cfs (8.64 inches per year).

EXTREMES.—Current year: Maximum discharge, about 550 cfs Feb. 20 (gage height, 11.17 ft, backwater from ice); minimum 6.4 cfs Aug. 21, 22; minimum gage height, 3.50 ft Sept. 18, 19.
Period of record: Maximum discharge, 3,990 cfs June 26, 1968 (gage height, 13.37 ft); minimum, 5.4 cfs Oct. 9, 12, 1966; minimum gage height, 3.26 ft July 24, 1966.

REMARKS.—Records fair. Slight regulation for lake level control. Pumpage for irrigation diverts an indeterminate amount of water. Flow contains City of Saline sewage effluent which originates as ground water.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	21	102	25	15	220	60	29	16	19	9.4	7.9
2	15	23	72	24	16	170	65	29	24	17	9.9	9.2
3	15	26	64	24	16	150	70	28	17	16	9.6	8.9
4	14	25	61	23	18	130	75	28	16	16	9.4	9.4
5	14	25	56	23	25	110	65	30	21	32	9.7	9.2
6	13	23	49	22	200	100	55	28	55	30	9.0	11
7	13	22	46	21	180	100	50	26	35	19	8.6	9.5
8	12	21	44	21	150	140	50	25	23	18	7.4	9.0
9	16	22	42	20	120	110	50	24	18	18	8.1	7.9
10	19	31	41	20	100	100	50	23	13	15	9.6	8.2
11	14	28	43	19	90	90	50	23	11	14	11	8.3
12	14	27	55	18	80	88	45	23	19	14	7.4	8.1
13	16	25	54	18	70	85	40	22	55	14	7.3	8.9
14	50	25	50	17	65	85	42	22	51	13	7.0	8.7
15	42	25	42	17	60	410	45	21	28	19	6.9	8.6
16	26	23	34	16	52	300	45	21	20	19	7.5	8.3
17	22	23	37	16	52	160	45	20	16	14	7.7	8.8
18	19	23	35	16	53	140	42	19	12	12	7.3	8.1
19	18	23	36	16	60	130	40	19	13	13	7.3	7.8
20	17	39	50	15	500	120	40	19	12	12	7.5	22
21	20	45	58	15	350	105	38	18	19	11	7.0	13
22	18	36	48	15	300	100	36	18	14	10	6.8	11
23	17	31	43	15	240	94	35	17	15	10	7.0	9.7
24	16	26	34	15	200	85	33	21	15	13	7.0	9.7
25	16	25	33	15	200	80	32	28	14	10	7.5	10
26	16	25	31	15	312	75	32	22	18	22	7.9	12
27	16	31	30	15	411	70	31	21	17	14	7.8	37
28	16	95	29	15	350	70	31	19	17	12	7.7	18
29	21	113	28	15	------	65	30	18	17	12	7.3	14
30	25	126	27	15	------	62	30	16	18	11	7.2	12
31	22	------	26	15	------	60	------	15	------	11	7.2	------
TOTAL	588	1,053	1,400	556	4,285	3,804	1,352	692	639	480	248.0	334.2
MEAN	19.0	35.1	45.2	17.9	153	123	45.1	22.3	21.3	15.5	8.00	11.1
MAX	50	126	102	25	500	410	75	30	55	32	11	37
MIN	12	21	26	15	15	60	30	15	11	10	6.8	7.8
CFSM	.20	.37	.48	.19	1.62	1.30	.48	.24	.23	.16	.08	.12
IN.	.23	.41	.55	.22	1.69	1.50	.53	.27	.25	.19	.10	.13

CAL YR 1970 TOTAL 17,771.0 MEAN 48.7 MAX 602 MIN 12 CFSM .51 IN 6.99
WTR YR 1971 TOTAL 15,431.2 MEAN 42.3 MAX 500 MIN 6.8 CFSM .45 IN 6.07

PEAK DISCHARGE (BASE, 380 CFS)

DATE	TIME	GHT	DISCHARGE
02-20	—	—	about 550
02-27	1500	8.32	438
03-15	1900	8.85	507

04176500 River Raisin near Monroe, Mich.
(International hydrological decade station)

LOCATION.—41°57'40", long 83°31'55", Monroe County, 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.

DRAINAGE AREA.—1,042 sq mi.

PERIOD OF RECORD.—September 1937 to current year. 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. Prior to Oct. 1, 1953, at site 9 miles downstream at datum 46.26 ft lower.

AVERAGE DISCHARGE.—34 years, 675 cfs (8.80 inches per year).

EXTREMES.—Current year: Maximum discharge, 5,550 cfs Feb. 23 (gage height, 7.55 ft); maximum gage height, 7.92 ft Feb. 27, backwater from ice; minimum discharge, 34 cfs Sept. 2, 3, (gage height, 1.85 ft).
Period of record: 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 the winter period, which are fair. Diurnal fluctuation caused by powerplants above station prior to June 27, 1968. Records of suspended sediment loads for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).—WSP 954: 1938-40 (m), 1941, WSP 1437: 1939, 1948. WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	195	311	1,400	330	200	3,070	885	283	185	88	64	36
2	207	356	1,460	320	200	2,650	990	271	195	78	62	36
3	207	365	1,370	310	200	2,120	1,040	263	195	74	60	35
4	178	342	1,170	300	250	1,620	998	263	255	72	56	37
5	154	333	976	300	350	1,220	920	263	279	76	52	39
6	147	320	826	290	600	1,050	838	311	275	74	52	44
7	141	303	742	280	1,000	1,280	766	295	283	70	52	50
8	138	295	616	270	1,100	1,300	706	329	295	76	48	58
9	138	287	550	270	1,200	1,250	646	333	342	82	46	54
10	141	295	500	260	1,300	1,100	605	329	307	78	52	54
11	141	295	485	260	1,200	955	570	329	283	74	56	52
12	174	311	570	250	1,000	892	540	320	271	72	52	46
13	203	365	580	240	900	850	535	303	255	72	54	44
14	231	390	622	240	800	1,130	535	275	243	68	66	42
15	299	365	605	230	750	2,390	505	263	271	66	66	40
16	395	338	580	220	700	2,830	545	251	231	70	56	40
17	475	324	545	220	680	2,900	535	231	199	68	50	50
18	495	307	545	220	680	2,760	505	219	174	74	44	46
19	440	303	575	210	700	2,410	480	211	150	82	44	42
20	370	320	892	210	3,000	2,070	440	223	138	76	50	56
21	324	338	976	200	5,000	1,660	425	207	120	80	50	60
22	299	415	950	200	4,800	1,460	410	195	111	88	54	66
23	295	515	850	200	5,440	1,330	380	185	114	46	48	80
24	295	550	700	200	4,660	1,210	360	181	117	64	42	82
25	287	490	600	200	3,660	1,100	342	199	106	66	39	74
26	279	395	500	190	3,580	998	324	207	98	62	37	72
27	267	375	470	190	3,500	927	315	263	98	66	42	84
28	263	510	420	190	3,250	899	311	267	94	68	48	86
29	267	748	390	190	------	920	295	239	90	68	40	103
30	271	1,190	370	190	------	913	287	219	92	64	37	106
31	275	------	350	190	------	892	------	203	------	66	36	------
TOTAL	7,991	12,051	22,185	7,370	50,700	48,156	17,033	7,930	5,866	2,228	1,555	1,714
MEAN	258	402	716	238	1,811	1,553	568	256	196	71.9	50.2	57.1
MAX	495	1,190	1,460	330	5,440	3,070	1,040	333	342	88	66	106
MIN	138	287	350	190	200	850	287	181	90	46	36	35
CFSM	.25	.39	.69	.23	1.74	1.49	.55	.25	.19	.07	.05	.05
IN.	.29	.43	.79	.26	1.81	1.72	.61	.28	.21	.08	.06	.06

CAL YR 1970 TOTAL 208,451 MEAN 571 MAX 3,190 MIN 80 CFSM .55 IN 7.44
WTR YR 1971 TOTAL 184,779 MEAN 506 MAX 5,440 MIN 35 CFSM .49 IN 6.60

PEAK DISCHARGE (BASE, 3,500 CFS).—Feb. 23 (1300), 5,550 cfs (7.55 ft).

04184500 Bean Creek at Powers, Ohio

LOCATION.--Lat 41°40'39", long 84°13'56", in NE¼ sec.24, T.9 S., R.1 E., Fulton County, on right bank at downstream side of bridge on U.S. Highway 20, 1 mile east of Powers, 2.2 miles upstream from Iron Creek, 3 miles downstream from Silver Creek, and 5.2 miles east of Fayette.

DRAINAGE AREA.--206 sq mi.

PERIOD OF RECORD.--October 1940 to current year.

GAGE.--Water-stage recorder. Datum of gage is 722.57 ft above mean sea level. Prior to Jan. 18, 1941, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--31 years, 158 cfs (10.42 inches per year).

EXTREMES.--Current year: Maximum discharge, about 3,200 cfs Feb. 22; minimum daily, 6.0 cfs Sept. 1.
Period of record: Maximum discharge, 4,250 cfs Apr. 29, 1956 (gage height, 13.82 ft); minimum, 5.0 cfs Aug. 9, 1964.

REMARKS.--Records good except those for the winter period and periods of no gage-height record which are poor. Water-quality records for current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1307: 1948(M). WSP 1912: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	90	524	76	29	721	160	70	44	21	15	6.0
2	32	82	394	72	28	571	220	69	62	20	14	8.0
3	30	81	311	70	27	421	216	67	70	19	13	11
4	28	84	300	72	30	314	189	65	61	18	12	16
5	27	82	297	80	1,000	278	167	63	53	17	14	15
6	26	82	231	74	1,610	250	152	78	106	19	14	19
7	26	78	182	68	1,400	418	144	102	110	24	13	15
8	25	73	160	62	1,100	320	138	95	84	23	12	14
9	26	70	147	58	840	245	136	84	67	21	12	13
10	37	96	139	56	640	230	129	76	57	19	12	12
11	58	118	140	54	520	196	123	70	50	21	14	11
12	55	112	212	52	440	178	120	68	172	24	16	10
13	51	105	226	50	360	197	122	68	195	21	13	9.0
14	88	94	201	48	310	416	141	67	176	17	12	8.5
15	232	87	160	46	280	800	138	64	106	15	11	8.0
16	169	84	150	44	260	894	126	61	77	16	10	7.6
17	118	79	140	42	250	699	122	58	62	17	9.5	7.2
18	95	76	141	40	270	468	122	56	52	18	9.0	7.0
19	82	73	188	38	380	359	115	53	45	20	9.0	6.8
20	75	138	366	38	600	383	110	51	40	23	8.2	9.0
21	76	300	276	38	1,200	329	104	48	37	22	7.6	20
22	85	233	203	37	2,700	287	99	46	36	21	7.2	22
23	81	173	171	37	1,900	257	90	44	34	20	8.4	18
24	74	130	149	36	1,400	219	84	46	33	19	9.6	14
25	69	100	118	36	1,100	193	83	70	30	19	9.0	12
26	64	96	110	35	1,000	178	78	78	29	20	8.2	11
27	60	110	100	34	900	170	74	70	28	18	7.4	13
28	60	660	90	33	820	167	74	62	26	17	6.8	16
29	65	930	86	32		172	75	55	24	16	7.0	18
30	94	775	82	31	------	169	74	50	22	15	7.0	17
31	102	------	78	30	------	159	------	46	------	15	6.4	------
TOTAL	2,143	5,291	6,072	1,519	21,394	10,658	3,725	2,000	1,988	595	327.3	374.1
MEAN	69.1	176	196	49.0	764	344	124	64.5	66.3	19.2	10.6	12.5
MAX	232	930	524	80	2,700	894	220	102	195	24	16	22
MIN	25	70	78	30	27	159	74	44	22	15	6.4	6.0
CFSM	.34	.85	.95	.24	3.71	1.67	.60	.31	.32	.09	.05	.06
IN	.39	.96	1.10	.27	3.86	1.92	.67	.36	.36	.11	.06	.07

CAL YR 1970 TOTAL 60,966.0 MEAN 167 MAX 1,200 MIN 19 CFSM .81 IN 11.01
WTR YR 1971 TOTAL 56,086.4 MEAN 154 MAX 2,700 MIN 6.0 CFSM .75 IN 10.13

PEAK DISCHARGE (BASE, 1,200 CFS)

DATE	TIME	GHT	DISCHARGE	DATE	TIME	GHT	DISCHARGE
2-5	2400	10.84	1,970	2-22	Unknown	Unknown	About 3,200

NOTE.--No gage-height record Jan. 8-11, Feb. 8-11, Feb. 19 to Mar. 1, June 26 to Sept. 30.

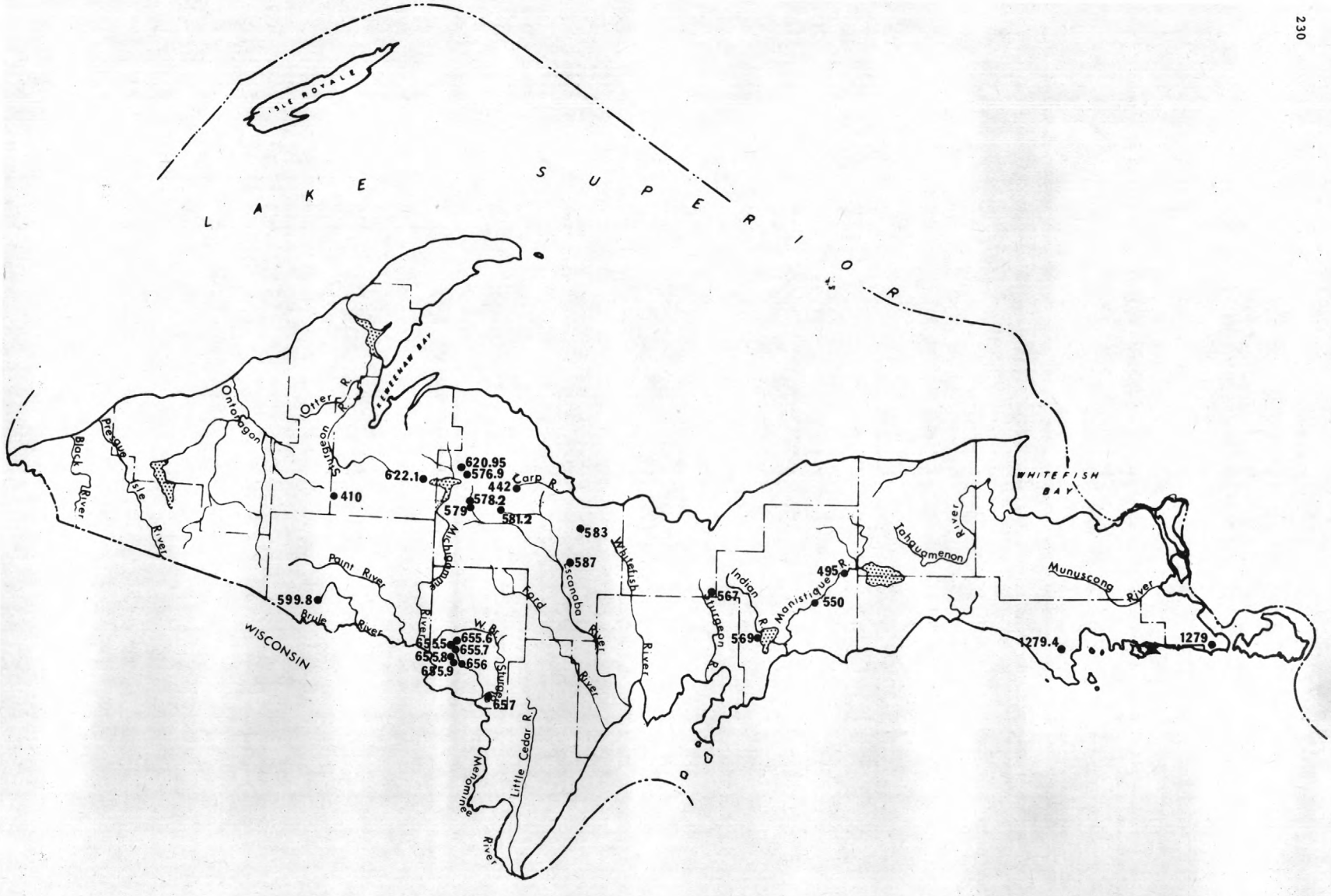

Figure 4.—Map showing identification number and location of partial-record stations in Upper Peninsula of Michigan

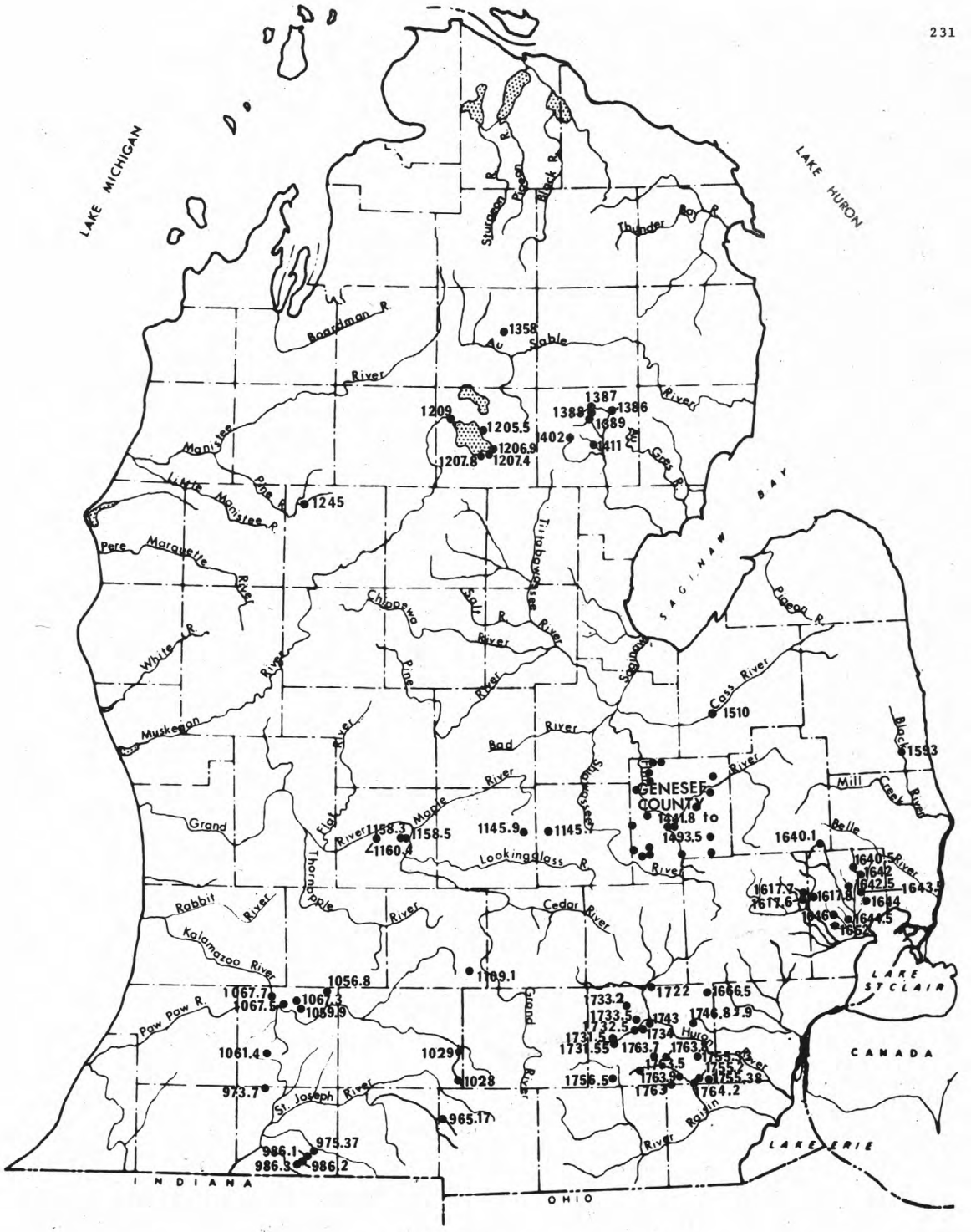

Figure 5.–Map showing identification number and location of partial–record stations in Lower Peninsula of Michigan

As the number of streams in which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected on these partial-record stations are usable in low-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in time of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow partial-record stations 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. 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 the stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1971

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Michigan				
04056700	Blue Lake Outlet near Steuben, Mich.	Lat 46°09'58", long 86°37'34", in SE¼ NW¼ sec.36, T.44 N., R.19 W., Alger County, at bridge on Federal Highway 13, 8.5 miles west of Steuben.	5.11	1969-71	12-09-70 05-06-71 08-09-71	8.99 7.76 6.29
04056900	Big Spring near Manistique, Mich.	Lat 46°00'17", long 86°22'56", in S½ sec.25, T.42 N., R.17 W., Schoolcraft County, at Palms Book State Park, 7 miles northwest of Manistique.		1950-71	11-18-70	30.4
04057690	Middle Branch Escanaba River near Martins Landing, Mich.	Lat 46°31'57", long 87°56'12", in NW¼ NE¼ sec.28, T.48 N., R.29 W., Marquette County, at bridge on abandoned Chicago and North Western Railroad grade, 2.4 miles east of Martins Landing and 1.7 miles northeast of Champion.	16.7	1970-71	11-03-70 12-16-70 04-28-71 06-17-71 09-22-71	22.7 15.6 a86.4 7.11 .67
*04057820	Middle Branch Escanaba River near Greenwood, Mich.	Lat 46°25'12", long 87°47'50", in NW¼ sec.3, T.46 N., R.28 W., Marquette County, at bridge on county highway, 100 feet downstream from Bell Creek, 5 miles southwest of Greenwood.	73.3	1961-71	04-20-71 08-18-71 09-03-71 09-08-71 09-16-71	a865 17.6 14.8 14.1 15.4
04058120	Green Creek near Palmer, Mich.	Lat 46°22'22", long 87°36'21", NW¼ sec.19, T.46 N., R.26 W., Marquette County, at bridge on County Highway 565, 4.5 miles south of Palmer.	8.42	1961-65 1970-71	01-18-71 06-21-71 07-14-71 09-14-71 09-15-71	a17.8 a16.3 a12.0 a 1.68 a 1.43
04058700	Little Lake Outlet at Forsyth, Mich.	Lat 46°16'25", long 87°20'57", in NE¼ NE¼ sec.30, T.45 N., R.24 W., Marquette County, at outlet of Little Lake, 1.0 mile southwest of Forsyth.	9.72	1964-71	12-17-70	4.76
04059980	Stanley Creek near Iron River, Mich.	Lat 46°05'08", long 88°41'12", in NW¼ NE¼ sec.33, T.43 N., R.35 W., Iron County, at culvert on State Highway 73, 1.5 miles downstream from Stanley Lake, 2.2 miles west of Iron River.	3.28	1964-71	10-15-70 01-26-71 05-03-71 07-29-71	1.22 1.92 5.57 1.45
04062095	Dishno Creek near Champion, Mich.	Lat 46°35'30", long 87°59'04", in NW¼ sec.6, T.48 N., R.29 W., Marquette County, at bridge on logging road, 1.2 miles upstream from mouth, 5 miles north of Champion.	18.8	1963-71	10-05-70 12-16-70 06-17-71 08-18-71 09-22-71	10.7 18.7 11.4 1.30 .87
04062210	Spurr River at Three Lakes, Mich.	Lat 46°32'47", long 88°11'11", in NE¼ sec.21, T.48 N., R.31 W., Baraga County, at outlet of Beanfort Lake, 0.8 mile southeast of Three Lakes.	18.8	1971	10-05-70 03-26-71 05-06-71 09-24-71	16.8 21.9 84.5 3.58
04065550	Pine Creek near Randville, Mich.	Lat 45°58'02", long 88°00'28", in SW¼ NW¼ sec.12, T.41 N., R.30 W., Dickinson County, 0.4 mile upstream from Groveland Mine outlet and 2.7 miles southeast of Randville.	1.53	1971	12-29-70 03-03-71 05-03-71 08-06-71	1.19 1.86 3.44 b.5
04065560	Groveland Mine Outlet near Randville, Mich.	Lat 45°58'27", long 88°00'10", in SW¼ SE¼ sec.1, T.41 N., R.30 W., Dickinson County, at overflow weir, 0.5 mile upstream from mouth, 2.9 miles southeast of Randville.	1.60	1971	12-29-70 03-03-71 05-03-71 08-06-71 09-08-71	a6.90 a6.96 a9.23 a2.44 a4.46

See footnotes at end of table p.237.

Discharge measurements made at low-flow partial-record stations during water year 1971--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Michigan--Continued				
04065570	Pine Creek near Merriman, Mich.	Lat 45°56'42", long 87°59'13", in SW¼ SW¼ sec.18, T.41 N., R.29 W., Dickinson County, 500 feet upstream from Mounty's Creek, 3.7 miles northeast of Merriman.	6.98	1971	12-30-70 03-04-71 05-04-71 08-05-71 09-07-71	10.1 10.8 16.0 4.50 6.39
04065580	Mounty's Creek near Merriman, Mich.	Lat 45°56'41", long 87°59'23", in SW¼ SW¼ sec.18, T.41N., R.29 W., Dickinson County, 400 feet upstream from mouth, 3.6 miles northeast of Merriman.	2.96	1971	12-30-70 03-04-71 05-04-71 08-05-71 09-07-71	1.40 2.75 3.64 .05 .08
04065590	Steel Creek near Merriman, Mich.	Lat 45°56'31", long 87°59'33", in NE¼ NE¼ sec.24, T.41 N., R.30 W., Dickinson County, 200 feet upstream from mouth, 3.6 miles northeast of Merriman.	3.52	1971	12-30-70 03-04-71 05-04-71 08-05-71	2.17 2.93 4.06 .85
04065600	Pine Creek near Iron Mountain, Mich.	Lat 45°55'51", long 87°58'18", in SE¼ SE¼ sec.19, T.41 N., R.29 W., Dickinson County, 20 feet upstream from County highway bridge, 9.0 miles northeast of Iron Mountain.	15.0	1971	04-14-71 04-22-71 05-05-71 06-04-71 08-05-71 09-07-71	a114 a62.7 25.7 9.53 5.01 7.87
04065700	Hamilton Creek near Loretto, Mich.	Lat 45°44'51", long 87°49'00", in NW¼ sec.30, T.39 N., R.28 W., Dickinson County, at outlet of Lake Mary, 2.0 miles south of Loretto.	c 15	1964-71	02-04-71 05-03-71 07-02-71	6.13 18.0 8.46
04096517	Hog Creek tributary near Allen, Mich.	Lat 41°57'33", long 84°49'33", in SW¼ SW¼ sec.7, T.6 S., R.4 W., Hillsdale County, at Squires Rd., 0.3 mile upstream from mouth, 3.0 miles west of Allen.	2.61	1969-71	11-10-70 12-10-70 01-04-71 03-19-71 04-05-71 06-07-71 07-15-71 08-24-71 09-07-71	1.52 1.18 1.58 3.12 1.77 12.9 0 0 0
04097537	Perrin Lake Outlet near Sturgis, Mich.	Lat 41°52'14", long 85°25'34", in SW¼ sec.12, T.7 S., R.10 W., St. Joseph County, at Perrin Rd. (Banker St. Rd.), 5.0 miles north of Sturgis.	2.91	1963-71	08-31-71	0
04098610	Sherman Mill Creek near Sturgis, Mich. d/	Lat 41°49'40", long 85°28'42", in SW¼ sec.28, T.7 S., R.10 W., St. Joseph County, at Sherman Rd., 3.7 miles northwest of Sturgis.	3.62	1963-71	08-31-71	5.44
04098620	Sherman Mill Creek near Centerville Mich. e/	Lat 41°49'17", long 85°30'18", in NW¼ sec.32, T.7 S., R.10 W., St. Joseph County, at Shimmel Rd., 4.8 miles northwest of Sturgis.	5.31	1963-71	08-31-71	8.45
04098630	Sherman Mill Creek near White Pigeon, Mich. f/	Lat 41°47'52", long 85°32'10", in S½ sec.36, T.7 S., R.11 W., St. Joseph County, at Klinger Lake Rd., 5.7 miles east of White Pigeon.	9.00	1963-71	08-31-71	8.57
04102800	South Branch Kalamazoo River at Homer, Mich.	Lat 42°08'50", long 84°48'11", in SW¼ sec.5, T.4 S., R.4 W., Calhoun County, at State Highway 60 and 99, at Homer.	139	1971	09-03-71 09-16-71 09-21-71	38.2 34.5 36.6
04102900	South Branch Kalamazoo River at Albion, Mich.	Lat 42°14'25", long 84°44'55", in NW¼ sec.2, T.3 S., R.4 W., Calhoun County, at mouth, at Albion.	151	1971	09-03-71 09-16-71 09-21-71	54.1 50.4 50.8
04105680	Augusta Creek near Hickory Corners, Mich.	Lat 42°24'41", long 85°20'39", in SW¼ sec.3, T.1 S., R.9 W., Kalamazoo County, at AB Ave., 2.8 miles southeast of Hickory Corners.	19.6	1964-71	11-21-70 05-01-71	21.9 17.2
04105990	Comstock Creek near Kalamazoo, Mich.	Lat 42°18'10", long 85°30'16", in NW¼ sec.17, T.2 S., R.10 W., Kalamazoo County, at E. Main St., 4.3 miles east of Kalamazoo.	18.3	1964-71	11-07-70 03-04-71	8.07 10.8
04106140	Portage Creek tributary near Portage, Mich.	Lat 42°11'12", long 85°37'52", in SE¼ sec.19, T.3 S., R.11 W., Kalamazoo County, at R Ave., 2.2 miles southwest of Portage.	2.63	1960-64 1966-71	07-30-71 08-30-71	3.88 2.72

Discharge measurements made at low-flow partial-record stations during water year 1971--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Michigan --Continued				
04106730	Spring Brook near Richland, Mich.	Lat 42°23'01", long 85°31'03", in NW¼ SE¼ sec.18, T.1 S., R.10 W., Kalamazoo County, at CD Ave., 3.0 miles west of Richland.	22.4	1964, 1966-71	11-07-70 03-04-71 05-01-71 07-30-71 08-30-71	7.16 8.73 8.14 6.42 5.46
04106750	Spring Brook near East Cooper, Mich.	Lat 42°21'24", long 85°33'05", in NW¼ sec.25, T.1 S., R.11 W., Kalamazoo County, at Riverview Rd., 0.6 mile north of East Cooper.	31.1	1942, 1964-71	11-21-70 03-04-71 05-01-71	20.7 16.9 18.1
04106770	Kalamazoo River near Cooper Center, Mich.	Lat 42°22'35", long 85°34'47", in SE¼ sec.15, T.1 S., R.11 W., Kalamazoo County, at D Ave., 1.5 miles east of Cooper Center and 5.5 miles north of center of Kalamazoo.	1,248	1965-66, 1969-71	11-07-70 03-05-71 05-01-71	1250 2190 825
04110910	Hobart Drain near Eaton Rapids, Mich.	Lat 42°29'27", long 84°39'35", in NW¼ sec.10, T.1 N., R.3 W., Eaton County, at State Hwy. 99, 1.2 miles south of Eaton Rapids.	3.11	1965-71	07-30-71	.51
04114570	Bear Creek near Ovid, Mich.	Lat 42°59'05", long 84°19'07", in SW¼ sec.23, T.7 N., R.1 E., Shiawassee County, at Krause Rd., 2.5 miles southeast of Ovid.	29.5	1965-69, 1971	11-14-70 05-01-71 08-27-71	16.6 11.4 2.97
04114590	Little Maple River near Laingsburg, Mich.	Lat 42°56'51", long 84°25'31", in SW¼ sec.34, T.7 N., R.1 W., Clinton County, at Shepardville Rd., 5.5 miles northwest of Laingsburg.	11.4	1965-69, 1971	10-24-70 05-01-71 08-27-71	3.05 4.60 1.02
04115830	Libhart Creek near Lyons, Mich.	Lat 42°56'38", long 84°57'45", in NE¼ sec.1, T.6 N., R.6 W., Ionia County, at Reeder Rd., 2.8 miles south of Lyons.	33.0	1965-71	10-31-70 05-01-71 08-31-71	29.4 20.1 6.06
04115850	Little Libhart Creek near Lyons, Mich.	Lat 42°56'38", long 84°57'01", in NW¼ sec.6, T.6 N., R.5 W., Ionia County, at Reeder Rd., 2.8 miles south of Lyons.	14.1	1965-71	10-31-70 05-01-71 08-31-71	8.34 5.94 1.15
04116040	Sessions Creek near Ionia, Mich.	Lat 42°57'21", long 85°07'38", in NW¼ sec.34, T.7 N., R.7 W., Ionia County, at Riverside Drive, 3.5 miles southwest of Ionia.	16.8	1965-71	10-31-70 05-01-71 08-27-71	8.31 9.05 1.86
04120550	"The Cut" near Prudenville, Mich.	Lat 44°21'47", long 84°40'48", in NW¼ NE¼ sec.28, T.23 N., R.3 W., Roscommon County, 1.4 miles downstream from Higgins Lake, 4.7 miles north of Prudenville.	90.0	1971	06-11-71 07-14-71 08-19-71 09-20-71	83.4 35.5 34.1 27.4
04120690	Spring Brook near Prudenville, Mich.	Lat 44°18'37", long 84°38'12', in NE¼ SE¼ sec.11, T.22 N., R.3 W., Roscommon County, 1.1 mile northeast of Prudenville.	1.31	1971	06-11-71 07-14-71 08-19-71 09-20-71	.80 .34 .30 .04
04120740	Denton Creek at Prudenville, Mich.	Lat 44°17'08", long 84°38'07", in SE¼ NE¼ sec.14, T.22 N., R.3 W., Roscommon County, 200 ft downstream from Lake James control structure and 0.5 mile east of Prudenville.	47.3	1971	06-11-71 07-15-71 08-19-71 09-20-71	4.96 .85 a1.04 .84
04120780	Knappen Creek at Prudenville, Mich.	Lat 44°17'58", long 84°39'02", in SW¼ NW¼ sec.14, T.22 N., R.3 W., Roscommon County, at M55 highway culvert, 150 ft upstream from mouth, at Prudenville.	4.60	1971	06-11-71 07-14-71 08-19-71 09-20-71	2.00 a8.97 .47 1.27
04120900	Muskegon River near Houghton Lake Heights, Mich.	Lat 44°24'16", long 84°47'27", in NW¼ NW¼ sec.10, T.23 N., R.4 W., Roscommon County, on right bank at upstream side of bridge on Old 27, 5.4 miles north of Houghton Lake Heights.	222	1971	06-11-71 07-14-71 08-19-71 09-20-71	257 109 89.1 44.4
		Streams tributary to Lake Huron				
04127900	Caribou Creek near Detour Village, Mich.	Lat 45°59'05", long 83°58'56", in SE¼ SW¼ sec. 31, T.42 N., R.4 E., Chippewa County, at bridge on South Rd., 4.7 miles west of Detour Village.	c4	1967-71	10-22-70 05-19-71	b3.0 6.73

Discharge measurements made at low-flow partial-record stations during water year 1971--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Huron--Continued				
04127940	North Fork Carp River near Fibre, Mich.	Lat 46°06'09", long 84°51'02", in SE¼ SW¼ sec.19, T.43 N., R.4 W., Mackinac County, at bridge on Kenneth Rd., 10 miles southwest of Fibre.	c25	1968-71	12-01-70 05-19-71	a62.3 a65.3
04135800	North Branch AuSable River near Lovells, Mich.	Lat 44°43'00", long 84°25'11", in NW¼ SE¼ sec.22, T.27 N., R.1 W., Crawford County, on left bank 200 ft upstream from Kelloggs Bridge, 0.8 mile upstream from Big Creek, and 6.8 miles southeast of Lovells, Mich.	c140	1951, 1953-69 1971	12-16-70 06-02-71 06-11-71	171 211 204
04148560	Mud Creek near Flushing, Mich.	Lat 43°03'26", long 83°49'56", in NW¼ sec.36, T.8 N., R.5 E., Genesee County, at River Rd., 1.2 miles east of Flushing.	8.59	1971	05-11-71 06-30-71 08-18-71	.98 .16 .52
04148613	Cole Creek at Flushing, Mich.	Lat 43°03'34", long 83°51'49", in NW¼ sec.34, T.8 N., R.5 E., Genesee County, at Pierson Rd., 0.6 mile southwest of Flushing.	11.6	1971	05-11-71 06-30-71 08-18-71	.98 .04 .03
* 04148620	Freeman Drain near Montrose, Mich.	Lat 43°07'04", long 83°53'37", in SE¼ sec.5, T.8 N., R.5 E., Genesee County, at Mt. Morris Rd., 4.0 miles south of Montrose.	8.21	1971	05-11-71 06-30-71 08-18-71	.69 .10 .05
04148650	Armstrong Creek near New Lothrop, Mich.	Lat 43°09'33", long 83°51'49", in NE¼ sec.27, T.9 N., R.5 E., Genesee County, at McKenley Rd., 6.1 miles northeast of New Lothrop.	13.3	1971	05-11-71 06-30-71 08-18-71	2.47 .11 .05
04148745	Brent Run at Montrose, Mich.	Lat 43°11'14", long 83°51'50", in NE¼ sec.15, T.9 N., R.5 E., Genesee County, at McKenley Rd., 1.0 mile northeast of Montrose.	35.4	1971	06-30-71 08-18-71	2.12 1.77
04149350	Mistequay Creek near Montrose, Mich.	Lat 43°10'34", long 83°56'33", in NW¼ sec.24, T.9 N., R.4 E., Genesee County, at State Highway 57, 2.5 miles west of Montrose.	97.4	1971	06-30-71 08-18-71	.96 .27
		Streams tributary to St. Clair River				
04159300	Black River near Croswell, Mich.	Lat 43°13'24", long 82°36'49", in SE¼ sec.8, T.9 N., R.16 E., Sanilac County, 3.5 miles south of Croswell.	376	1956-71	10-20-70 11-18-70 12-08-70 07-07-71 08-03-71 09-08-71	34.6 56.6 106 13.1 10.2 11.3
		Streams tributary to Lake St. Clair				
* 04161760	West Branch Stony Creek near Washington, Mich.	Lat 42°43'53", long 83°06'02", in SE¼ sec.25, T.4 N., R.11 E., Oakland County, on Huron-Clinton Metropolitan Park Rd., 3.4 miles west of Washington.	22.5	1965-71	09-02-71	1.04
04161770	Twin Lakes Outlet near Washington, Mich.	Lat. 42°43°57', long 83°05'54", in SE¼ sec.25, T.4 N., R.11 E., Oakland County, on Huron-Clinton Metropolitan Park Rd., 3.2 miles west of Washington.	3.63	1965-71	10-13-70 05-18-71 06-16-71 09-02-71	.60 1.06 .74 .50
04161780	Mouth Vernon Drain near Washington, Mich.	Lat 42°44'01", long 83°05'29", in SW¼ sec.30, T.4 N., R.12 E., Macomb County, on Huron-Clinton Metropolitan Rd., 3.0 miles west of Washington.	1.87	1965-71	10-13-70 06-16-71 09-02-71	.23 .28 .24

Discharge measurements made at low-flow partial-record stations during water year 1971--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Detroit River				
04166650	Johnson Drain near Brookville, Mich.	Lat 42°22'52", long 83°33'18", in SE¼ sec.24, T.1 S., R.7 E., Washtenaw County, at Napier Rd., 1.2 miles east of Brookville.	11.5	1970-71	02-17-71 03-29-71 05-11-71 08-10-71	3.20 11.5 1.28 .16
		Streams tributary to Lake Erie				
04172200	Arms Creek near Hamburg, Mich.	Lat 42°25'16", long 83°52'30", in NE¼ sec.5, T.1 S., R.5 E., Washtenaw County, at Mast Rd., 4.4 miles southwest of Hamburg.	20.9	1967-71	10-20-70 05-27-71 08-10-71	4.77 5.56 1.71
04173150	Mill Creek near Sylvan, Mich.	Lat 42°15'06", long 84°02'02", in SW¼ sec.36, T.2 S., R.3 E., Washtenaw County, at Manchester Rd., 3.3 miles southeast of Sylvan.	11.1	1970-71	02-17-71 03-29-71 05-10-71 08-09-71	7.81 19.7 6.16 2.13
04173155	Mill Creek tributary near Sylvan, Mich.	Lat 42°14'51", long 84°01'46", in NW¼ sec.1, T.3 S., R.3 E., Washtenaw County, at Waldo Rd., 3.7 miles southeast of Sylvan.	23.8	1970-71	02-17-71 03-29-71 05-10-71 08-09-71	9.63 24.2 5.66 2.42
04173250	Mill Creek near Lima Center, Mich.	Lat 42°15'56", long 83°56'45", in NE¼ sec.34, T.2 S., R.4 E., Washtenaw County, at Guenther Rd., 2.2 miles south of Lima Center.	47.3	1967-71	10-21-71 05-26-71 08-10-71	23.1 16.2 8.08
04173320	Letts Creek at Chelsea, Mich.	Lat 42°19'29", long 84°01'15", in NE¼ sec.12, T.2 S., R.3 E., Washtenaw County, at Manchester Rd. (M.52), at Chelsea.	18.8	1970-71	02-17-71 03-29-71 05-10-71 08-09-71	7.83 31.0 7.64 1.66
04173350	North Fork Mill Creek near Lima Center, Mich.	Lat 42°17'15", long 83°56'14", in SW¼ sec.23, T.2 S., R.4 E., Washtenaw County, at Dancer Rd., 1.2 miles southeast of Lima Center.	59.0	1970-71	02-17-71 03-29-71 05-10-71 08-09-71	25.5 84.5 19.4 3.51
04173400	Mill Creek tributary No.2 near Lima Center, Mich.	Lat 42°16'56", long 83°54'24", in NE¼ sec.25, T.2 S., R.4 E., Washtenaw County, at Jerusalem Rd., 2.8 miles southeast of Lima Center.	6.53	1970-71	02-17-71 03-29-71 05-10-71 08-10-71	2.78 9.08 2.01 .47
04174300	Honey Creek near Foster, Mich.	Lat 42°18'34", long 83°48'28", in NE¼ sec.14, T.2 S., R.5 E., Washtenaw County, at Miller Rd., 1.4 miles west of Foster.	22.3	1970-71	02-17-71 03-29-71 05-10-71 08-10-71	6.54 15.4 5.68 1.64
04174680	Fleming Creek at Dixboro, Mich.	Lat 42°19'05", long 83°38'16", in NW¼ sec.17, T.2 S., R.7 E., Washtenaw County, at Ford Rd. (M-153), 1.0 mile east of Dixboro.	15.0	1970-71	02-17-71 03-29-71 05-11-71 08-10-71	4.94 14.5 2.75 .46
04174690	Fleming Creek tributary at Dixboro, Mich.	Lat 42°19'02", long 83°38'46", in NE¼ sec.18, T.2 S., R.7 E., Washtenaw County, at Ford Rd. (M-153), 0.6 mile northeast of Dixboro.	8.08	1970-71	02-17-71 03-29-71 05-11-71 08-10-71	2.68 5.62 .94 .11
04175520	Sugar Creek near Oakville, Mich.	Lat 42°05'54", long 83°36'31", in NE¼ sec.33, T.4 S., R.7 E., Washtenaw County, at Fuller Rd., 1.7 miles northwest of Oakville.	13.5	1970-71	02-17-71 03-29-71 05-10-71 08-10-71	2.29 10.0 1.13 0
04175533	Paint Creek near Lincoln, Mich.	Lat 42°11'18", long 83°36'25", in NE¼ sec.33, T.3 S., R.7 E., Washtenaw County, at Merritt Rd., 2.2 miles north of Lincoln.	17.5	1970-71	03-29-71 05-10-71 08-10-71	9.50 5.30 3.15
04175538	Paint Creek at Oakville, Mich.	Lat 42°05'44", long 83°35'18", in NE¼ sec.34, T.4 S., R.7 E., Washtenaw County, at Liss Rd.. 1.0 mile north of Oakville.	34.9	1970-71	03-29-71 05-10-71 08-10-71	25.6 7.12 1.52

Discharge measurements made at low-flow partial-record stations during water year 1971--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Erie--Continued				
04175650	Iron Creek near Clinton, Mich.	Lat 42°05'37", long 83°59'17", in SW¼ sec.29, T.4 S., R.4 E., Washtenaw County, at Bartlet Rd., 1.7 miles north of Clinton.	28.8	1970-71	03-29-71 06-10-71 08-09-71	39.4 9.05 3.15
04176300	North Macon Creek near Mooreville, Mich.	Lat 42°04'58", long 83°45'06", in NW¼ sec.5, T.5 S., R.6 E., Monroe County, at Hack Rd., 1.7 miles southwest of Mooreville.	14.5	1970-71	03-29-71 05-10-71 08-09-71	8.81 .88 0
04176350	Saline River at Benton, Mich.	Lat 42°08'19", long 83°52'07", in NW¼ sec.17, T.4 S., R.5 E., Washtenaw County, at Feldkamp Rd., 0.7 mile northwest of Benton.	28.8	1970-71	02-17-71 03-29-71 05-10-71 08-10-71	11.9 20.5 5.96 1.39
04176370	Saline River tributary near Saline, Mich.	Lat 42°10'34", long 83°49'17", in SE¼ sec.34, T.3 S., R.5 E., Washtenaw County, at Saline Waterworks Rd., 2.2 miles northwest of Saline.	13.2	1970-71	02-17-71 03-29-71 05-10-71 08-10-71	4.70 10.2 1.85 .17
04176380	Saline River tributary No. 2 at Saline, Mich.	Lat 42°10'37", long 83°47'17", in NW¼ sec.36, T.3 S., R.5 E., Washtenaw County, at Saline Waterworks Rd., 0.8 mile north of Saline.	13.7	1970-71	02-17-71 03-29-71 05-10-71	4.21 9.26 3.16
04176390	Saline River at Saline, Mich.	Lat 42°09'35", long 83°47'01", in SE¼ sec.1, T.4 S., R.5 E., Washtenaw County, at Monroe St., in Saline.	77.6	1965-71	10-08-70 05-26-71 08-09-71	7.81 14.2 6.86
04176420	Saline River at Milan, Mich.	Lat 42°04'38", long 83°40'37", in SW¼ sec.1, T.5 S., R.6 E., Washtenaw County, at U.S. Highway 23, at southeast edge of Milan.	113	1966-71	10-09-70 05-25-71 08-10-71	16.6 33.8 9.12

* Also a crest-stage station.
‡ Operated as a continuous record station.
a Not base flow.
b Field estimate.
c Approximately.
d Published as Thompson Lake Inlet 1963.
e Published as Thompson Lake Outlet 1963.
f Published as Klinger Lake Inlet 1963.

Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry Only the maximum discharge for each water year is given. Information on some lower floods may have been ontained but is not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1971

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Streams tributary to Lake Superior					
04041000	Perch River near Sidnaw, Mich.	Lat 46°31'06", long 88°39'48", in NE¼ sec. 34, T.48 N., R.35 W., Baraga County, at State Highway 28, 2.5 miles east of Sidnaw.	63.1	1913-15‡, 1957-71	4-19-71	10.22	680
04044200	Carp Creek at Ishpeming, Mich.	Lat 46°29'11", long 87°41'21", in NW¼ sec. 9, T.47 N., R.27 W., Marquette County, at bridge on Highway 41A at Ishpeming.	16.5	1970-71	4-18-71	6.29	127
		Streams tributary to Lake Michigan					
04049500	Manistique River at Germfask, Mich.	Lat 46°14'00", long 85°55'40", in SE¼ sec. 4, T.44 N., R.13 W., Schoolcraft County, 600 ft upstream from bridge on State Highway 77, 1.0 mile south of Germfask.	341	1938-70‡ 1971	4-18-71	7.18	1,790
04055000	Manistique River near Blaney, Mich.	Lat 46°05'05", long 86°03'35", in SE¼ sec.28, T.43 N., R.14 W., Schoolcraft County, 40 ft downstream from logging bridge, 0.5 mile downstream from Duck Creek, 7 miles southwest of Blaney.	704	1938-70‡ 1971	4-19-71	18.37	5,780
*04057820	Middle Branch Escanaba River near Greenwood, Mich.	Lat 46°25'12", long 87°47'50", in NW¼ sec.3, T.46 N., R.28 W., Marquette County, at bridge on county highway, 100 ft downstream from Bell Creek and 5 miles southwest of Greenwood.	73.3	1970-71	4-20-71	12.47	861
04057900	Black River near Republic, Mich.	Lat 46°25'08", long 87°53'21", in NW¼ sec.2, T.46 N., R.29 W., Marquette County, at bridge on county Rd., 2.2 miles downstream from Bruce Creek, 4.4 miles east of Republic.	34.4	1961-68‡ 1970-71	4-20-71	4.40	444
04058300	Warner Creek near Palmer, Mich.	Lat 46°24'09", long 87°32'39", in NW¼ sec.10, T.46 N., R.26 W., Marquette County, at bridge on county Rd., 0.1 miles upstream from confluence with Schweitzer Creek, 3.5 miles southeast of Palmer.	14.2	1961-68‡ 1970-71	4-20-71	5.39	213
04097370	Flowerfield Creek at Flowerfield, Mich.	Lat 42°03'50", long 85°39'44", in SW¼ sec.1, T.5 S., R.12 W., St. Joseph County, at Flowerfield Rd., at Flowerfield.	42.6	1964-71	2-22-71	a1.77	78
04124500	East Branch Pine River nr. Tustin, Mich.	Lat 44°06'09", long 85°31'02", in NE¼ NW¼ sec.28, T.20 N., R.10 W., Osceola County, 75 ft downstream from highway bridge, 3.0 miles west of Tustin.	b63	1953-63‡ 1964-71	4-13-71	--	1,000
		Streams tributary to Lake Huron					
04138600	Gamble Creek at Lupton, Mich.	Lat 44°25'25", long 84°01'30", in SW¼ SW¼ sec.36, T.24 N., R.3 E., Ogemaw County, at culvert on Lupton Rd., 0.5 mile south of Lupton.	9.47	1953-56, 1959-71	4-13-71	3.94	80
04138700	Bixby Creek near Rose City, Mich.	Lat 44°26'00", long 84°07'10", in NE¼ NW¼ sec.31, T.24 N., R.3 E., Ogemaw County, at bridge on State Highway 33, 0.9 mile north of Rose City.	2.68	1953-71	4-13-71	3.85	112
04138800	Houghton Creek at Rose City, Mich.	Lat 44°25'15", long 84°06'25", in NE¼ NE¼ sec.6, T.23 N., R.3 E., Ogemaw County, at bridge on Rose City Rd., 0.3 mile east of Rose City.	13.3	1953-71	4-13-71	2.79	318
04138900	Wilkins Creek near Rose City, Mich.	Lat 44°24'15", long 84°06'50", in NE¼ NW¼ sec.7, T.23 N., R.3 E., Ogemaw County, at bridge on State Highway 33, 1.1 miles south of Rose City.	9.15	1953-71	4-13-71	3.10	150

See footnotes at end of table, p. 241.

Annual maximum discharge at crest-stage partial-record stations during water year 1971--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Streams tributary to Lake Huron--Continued					
04140200	Klacking Creek near Selkirk, Mich.	Lat 44°20'00", long 84°08'40", in NE¼ NE¼ sec.2, T.22 N., R.2 E., Ogemaw County, at bridge on Campbell Rd., 4.0 miles northwest of Selkirk.	7.51	1953-71	4-13-71	2.56	129
04141100	Shepards Creek near Selkirk, Mich.	Lat 44°18'20", long 84°05'00", in SE¼ SE¼ sec.8, T.22 N., R.3 E., Ogemaw County, at bridge on Bedtelyon Rd., 1.1 miles southwest of Selkirk.	4.44	1953-71	4-13-71	3.37	70
04144180	Jones Creek near Gaines, Mich.	Lat 42°53'02", long 83°52'27", in SE¼ sec.28, T.6 N., R.5 E., Genesee County, at bridge on Baldwin Rd., 1.7 miles northeast of Gaines.	7.60	1970-71	3-15-71	6.67	112
04144200	Porter Drain near Gaines, Mich.	Lat 42°53'26", long 83°50'59", in SE¼ sec.27, T.6 N., R.5 E., Genesee County, at bridge on Seymour Rd., 3.2 miles east of Gaines.	4.68	1970-71	3-15-71	3.75	50
04144220	Jones Creek at Duffield, Mich.	Lat 42°54'45", long 83°54'27", in SW¼ sec.17, T.6 N., R.5 E., Genesee County, at bridge on Grand Blanc Rd., 1.0 miles south of Duffield.	23.4	1970-71	3-15-71	c7.6	370
04147800	Powers-Cullen Drain near Genesee, Mich.	Lat 43°05'33", long 83°33'31", in SE¼ sec.18, T.8 N., R.8 E., Genesee County, at bridge on Coldwater Rd., 3.3 miles southeast of Genesee.	9.17	1970-71	3-15-71	4.10	220
04147900	Lefler-Scothan Drain near Otisville, Mich.	Lat 43°08'11", long 83°32'27", in NE¼ sec.5, T.8 N., R.8 E., Genesee County, at bridge on Frances Rd., 2.2 miles south of Otisville.	4.90	1970-71	3-15-71	4.21	80
04148120	Kearsley Creek near Atlas, Mich.	Lat 42°57'15", long 83°32'42", in NE¼ sec.5, T.6 N., R.8 E., Genesee County, at bridge on Jordan Rd., 1.2 miles north of Atlas.	55.7	1970-71	3-15-71	7.04	300
04148139	Black Creek near Davison, Mich.	Lat 43°01'28", long 83°33'24", in SE¼ sec.7, T.7 N., R.8 E., Genesee County, at bridge on Irish Rd., 2.0 miles west of Davison.	22.8	1970-71	3-15-71	5.83	220
04148144	Chipmunk Creek near Genesee, Mich.	Lat 43°04'01", long 83°36'59", in SE¼ sec.27, T.8 N., R.7 E., Genesee County, at bridge on Genesee Rd., 3.1 miles south of Genesee.	5.50	1970-71	3-15-71	233	34
04148255	Swartz Creek near Grand Blanc, Mich.	Lat 42°53'09", long 83°41'29", in SE¼ sec.25, T.6 N., R.6 E., Genesee County, at bridge on Baldwin Rd., 4.1 miles southwest of Grand Blanc.	36.0	1970-71	3-15-71	4.70	110
04148260	Swartz Creek near Swartz Creek, Mich.	Lat 42°58'22", long 83°45'43", in SW¼ sec.28, T.7 N., R.6 E., Genesee County, at bridge on Bristol Rd., 3.9 miles east of Swartz Creek.	67.2	1970-71	3-15-71	-	450
04148265	Kimball Drain near Swartz Creek, Mich.	Lat 42°55'15", long 83°49'51", in NE¼ sec.14, T.6 N., R.5 E., Genesee County, at bridge on Morrish Rd., 2.4 miles south of Swartz Creek.	10.6	1970-71	3-15-71	7.08	225
04148270	West Branch Swartz Creek near Swartz Creek, Mich.	Lat 42°58'22", long 83°46'08", in SW¼ sec.28, T.7 N., R.6 E., Genesee County, at bridge on Bristol Rd., 3.2 miles east of Swartz Creek.	40.8	1970-71	3-15-71	d9.56	510
04148410	Thread Creek near Goodrich, Mich.	Lat 42°53'19", long 83°32'10", in SE¼ sec.29, T.6 N., R.8 E., Genesee County, at bridge on Baldwin Rd., 2.4 miles southwest of Goodrich	28.5	1970-71	3-14-71	5.55	188

Annual maximum discharge at crest-stage partial-record stations during water year 1971--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Streams tributary to Lake Huron--Continued					
04148610	Cole Creek near Flushing, Mich.	Lat 43°02'44", long 83°51'06", in SW¼ sec.35, T.8 N., R.5 E., Genesee County, at bridge on Potter Rd., 1.2 miles south of Flushing.	8.51	1970-71	3-15-71	6.33	190
*04148620	Freeman Drain near Montrose, Mich.	Lat 43°07'04", long 83°53'37", in SE¼ sec.5, T.8 N., R.5 E., Genesee County, at bridge on Mt. Morris Rd., 4.0 miles south of Montrose.	8.21	1970-71	3-51-71	6.00	185
04148640	Armstrong Creek near Montrose, Mich.	Lat 43°08'04", long 83°50'03", in SE¼, sec.35, T.9 N., R.5 E., Genesee County, at bridge on Morrish Rd., 4.1 miles southeast of Montrose.	11.0	1970-71	3-15-71	5.91	230
04148740	Central-Stadler Drain near Montrose, Mich.	Lat 43°09'46", long 83°50'14", in SE¼ sec.23, T.9 N., R.5 E., Genesee County, at bridge on Wilson Rd., 3.1 miles east of Montrose.	14.2	1970-71	3-15-71	6.69	200
04148800	Pine Run near Montrose, Mich.	Lat 43°12'42", long 83°48'54", in SE¼ sec.1, T.9 N., R.5 E., Genesee County, at bridge on Elms Rd., 4.7 miles northeast of Montrose.	27.8	1970-71	3-15-71	8.82	600
04148900	Silver Creek near Clio, Mich.	Lat 43°12'54", long 83°45'55", in NW¼ sec.4, T.9 N., R.6 E., Genesee County, at bridge on Weir Rd., 3.0 miles northwest of Clio.	4.01	1970-71	3-15-71	4.19	e85
04149300	Mistequay Creek near Flushing, Mich.	Lat 43°01'31", long 83°54'41", in NE¼ sec.7, T.7 N., R.5 E., Genesee County, at bridge on Duffield Rd., 3.7 miles southwest of Flushing.	17.4	1970-71	3-15-71	8.27	560
04151000	Cass River at Vassar, Mich.	Lat 43°22'15", long 83°34'52", in NW¼ SW¼ sec. sec.7, T.11 N., R.8 E., Tuscola County, at bridge on State Highway 15, in Vassar.	700	1948-70‡, 1971	3-17-71	14.42	8,250
		Streams tributary to Lake St. Clair					
*04161760	West Branch Stony Creek near Washington, Mich.	Lat 42°43'53", long 83°06'02", in SE¼ sec.25, T.4 N., R.11 E., Oakland County, at bridge on Huron-Clinton Metropolitan Park Rd., and 3.4 miles west of Washington.	22.5	1965-71	3-17-71	--	e95
04164010	North Branch Clinton River at Almont, Mich.	Lat 42°54'59", long 83°02'42", in NE¼ sec.28, T.6 N., R.12 E., Lapeer County, at bridge on State Highway 53, at Almont.	9.56	1959-62, 1963-68‡, 1969-71	3-15-71	4.73	255
04164050	North Branch Clinton River near Romeo, Mich.	Lat 42°49'11", long 82°58'35", in NW¼ sec.31, T.5 N., R.13 E., Macomb County, at bridge on 33-Mile Rd., 2.2 miles northeast of Romeo.	49.7	1959-64, 1965-69‡, 1970-71	3-15-71	f	e750
04164200	Coon Creek near Armada, Mich.	Lat 42°47'41", long 82°52'58", in SW¼ sec.1, T.4 N., R.13 E., Macomb County, at bridge on North Rd., 3.4 miles south of Armada.	10.0	1959-65, 1966-70‡, 1971	3-14-71	g	e150
04164250	Tupper Brook at Ray Center, Mich.	Lat 42°45'42", long 82°54'04", in NW¼ sec.23, T.4 N., R.13 E., Macomb County, at bridge on 29-Mile Rd., at Ray Center.	8.62	1959, 1960-64‡, 1965-71	3-14-71	4.89	95
04164350	Highbank Creek near Armada, Mich.	Lat 42°48'24", long 82°51'08", in NW¼ sec.6, T.4 N., R.14 E., Macomb County, at bridge on 32-Mile Rd., 3.0 miles southeast of Armada.	14.9	1959-65, 1966-70‡, 1971	3-14-71	h14.83	230
04164400	Deer Creek near Meade, Mich.	Lat 42°42'39", long 82°51'32", in NW¼ sec.6, T.3 N., R.14 E., Macomb County, at bridge on 25½-Mile Rd., 0.9 mile southeast of Meade.	12.7	1959-60, 1961-65‡, 1966-71	3-15-71	14.44	192
04164450	McBride Drain near Macomb, Mich.	Lat 42°41'14", long 82°55'14", in NE¼ NE¼ sec.16, T.3 N., R.13 E., Macomb County, at bridge on 24-Mile Rd., 2.2 miles southeast of Macomb.	5.79	1960-64‡, 1965-71	3-15-71	j6.52	88

Annual maximum discharge at crest-stage partial-record stations during water year 1971--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Streams tributary to Lake St. Clair--Continued					
04164600	Middle Branch Clinton River near Macomb, Mich.	Lat 42°42'03", long 82°59'44", in SE¼ sec.2, T.3 N., R.12 E., Macomb County, at bridge on Schoenherr Rd., 2.0 miles west of Macomb.	22.2	1959-64 1965-69‡, 1971	3-15-71	k9.49	e280
04165200	Gloede Ditch near Waldenburg, Mich.	Lat 42°37'39", long 82°57'10", in SW¼ sec.32, T.3 N., R.13 E., Macomb County, 2.2 miles South of Wasldenburg.	16.0	1959, 1960-64‡, 1965-71	3-15-71	m14.31	204

* Also a low-flow partial-record station.
‡ Operated as a continuous-record gaging station.
a Maximum gage height, 1.91 ft Sept. 5, 1971 (backwater from aquatic growth).
b Approximately.
c Maximum gage height, 8.49 ft Feb. 27, 1971 (backwater from ice).
d Maximum gage height, 10.08 ft Feb. 27, 1971 (backwater from ice).
e Computed on basis of correlation with other stations.
f Maximum gage height recorded, 5.20 ft Feb. 27, 1971 (backwater from ice).
g Maximum gage height, 5.58 ft Feb. 27, 1971 (backwater from ice).
h Maximum gage height recorded, 14.87 ft Feb. 27, 1971 (backwater from ice).
i Maximum gage height, 5.21 ft Feb. 27, 1971 (backwater from ice).
j Maximum gage height, 7.15 ft Feb. 27, 1971 (backwater from ice).
k Occurred Feb. 27, 1971 (backwater from ice).
m Maximum gage height 16.40 ft Feb. 27, 1971 (backwater from ice).

Measurements at miscellaneous sites

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table. Those that are measurements of base flow are designated by an asterisk (*).

Discharge measurements made at miscellaneous sites during water year 1971

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Superior						
Montreal River	Lake Superior	Lat 46°30'26", long 90°13'47", in SE1/4SW1/4 sec.31, T.48 N., R.47 W., Michigan Meridian, Gogebic County, 0.2 mile above Spring Creek and 4.2 miles northwest of Ironwood, Mich.	80.6	1970	10-15-70	*34.3
Copps Creek	Presque Isle	Lat 46°27'23", long 89°41'22", in SE1/4NW1/4 sec.21, T.47 N., R.43 W., Gogebic County, 0.3 mile upstream from mouth and 5.4 miles north of Marenisco, Mich.			6- 3-71	*2.62
					7-16-71	1.74
					9-17-71	*.05
Little Carp River	Lake Superior	Lat 46°43'12", long 89°49'29", in NE1/4 sec.20, T.50 N., R.44 W., Gogebic County, 500 ft upstream from unnamed tributary, 100 ft downstream from Blowdown Creek and 11.5 miles southwest of White Pine, Mich.			7-16-71	5.30
					9-16-71	*2.50
do	do	Lat 46°43'21", long 89°49'49", in SW1/4SE1/4 sec.17, T.50 N., R.44 W., Gogebic County, at Greenstone Falls, 1000 ft downstream from unnamed tributary, 11.5 miles southwest of White Pine, Mich.			6- 3-71	*20.5
Middle Branch Ontonagon River	Ontonagon River	Lat 46°16'38", long 89°18'33", in SE1/4 sec.21, T.45 N., R.40 W., Gogebic County, 75 ft above mouth of Marathon Creek, 6.0 miles west of Watersmeet, Mich.			6- 3-71	*15.1
					7-18-71	4.62
					9-16-71	*6.06
do	do	Lat 46°16'30", long 89°10'39", in NW1/4 sec.27, T.45 N., R.39 W., Gogebic County, at bridge on U.S. Highway 45, 0.1 mile north of Watersmeet, Mich.	48.0	1967,1969, 1970	6- 3-71	*65.1
					7-15-71	45.1
					9-16-71	*25.6
Deadman Creek	Bond Falls Reservoir	Lat 46°21'47", long 89°00'58", in SE1/4SE1/4 sec.23, T.46 N., R.38 W., Ontonagon County, at culvert on U.S.F.S. Road 169, 8 miles south of Trout Creek, Mich.			6- 2-71	*5.30
					7-15-71	5.22
					9-16-71	2.72
East Branch Ontonagon River	Middle Branch Ontonagon River	Lat 46°28'15", long 88°47'58", in NW1/4 sec.15, T.47 N., R.36 W., Houghton County, 4.5 miles southeast of Kenton, Mich.			6-33-71	*37.3
					7-15-71	43.3
					9-16-71	*21.4
West Branch Sturgeon River	Sturgeon River	Lat 46°44'34", long 88°45'40", in NW1/4SW1/4 sec.12, T.50 N., R.36 W., Houghton County, 1.5 miles south of Alston, Mich.			6- 1-71	*51.2
					7-14-71	18.4
					7-27-71	*14.0
					9-15-71	*12.7
do	do	Lat 46°47'05", long 88°43'16", in NE1/4SE1/4 sec.27, T.51 N., R.35 W., Houghton County, 2 miles northeast of Alston, Mich.			6- 1-71	*69.5
Bart Creek	North Branch Otter River	Lat 46°54'16", long 88°42'52", in NW1/4 sec.14, T.52 N., R.35 W., Houghton County, 4.5 miles southwest of Tapiola, Mich.			6- 1-71	*7.39
					7-14-71	6.22
					7-27-71	*5.58
					9-15-71	*1.63
do	do	Lat 46°53'46", long 88°40'44", in SE1/4SE1/4 sec.13, T.52 N., R.35 W., Houghton County, at bridge on county road, 2.6 miles northwest of Elo, Mich.			6- 1-71	*16.4
					7-14-71	10.8
					7-27-71	*10.2
					9-15-71	*9.29

See footnotes at end of table, p. 258.

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Superior--Continued				
West Branch Otter River	Otter River	Lat 46°46'43", long 88°53'07", in NW1/4NW1/4 sec.33, T.51 N., R.36 W., Houghton County, at old railroad grade crossing, 4.5 miles west of Nisula, Mich.			6- 1-71	*7.07
do	do	Lat 46°46'44", long 88°52'43", in NW1/4NE1/4 sec.33, T.51 N., R.36 W., Houghton County, at trail crossing, 4.2 miles west of Nisula, Mich.			7-14-71 7-27-71 9-15-71	3.45 *2.57 *2.05
do	do	Lat 46°46'44", long 88°52'12", in NE1/4NE1/4 sec.33, T.51 N., R.36 W., Houghton County, at trail crossing, 3.8 miles west of Nisula, Mich.			6- 1-71	*14.8
do	do	Lat 46°47'56", long 88°47'32", in NW1/4SE1/4 sec.19, T.51 N., R.35 W., Houghton County, at bridge on county highway, 2.3 miles north of Nisula, Mich.			6- 1-71	*37.6
Silver Creek	Lake Superior	Lat 46°43'18", long 88°19'50", in NE1/4 sec.20, T.50 N., R.32 W., Baraga County, 0.3 mile upstream from East Branch, and 4.2 miles northeast of Herman, Mich.			9-14-71	*4.24
East Branch Silver Creek	Silver Creek	Lat 46°43'30", long 88°19'38", in SE1/4 sec.17, T.50 N., R.32 W., Baraga County, 0.1 mile above mouth, and 4.5 miles northeast of Herman, Mich.			9-14-71	*1.48
Silver Creek	Lake Superior	Lat 46°48'15", long 88°19'00", in NW1/4 sec.24, T.51 N., R.32 W., Baraga County, at county road, 1.7 miles above mouth, and 4.0 miles south of Aura, Mich.		1964	9-14-71	*13.1
Salmon Trout River	do	Lat 46°50'56", long 87°47'56", in NE1/4 sec.1, T.51 N., R.28 W., Marquette County, at bridge on county road, 4 miles northwest of Big Bay, Mich.	a40	1970	7-13-71 8-17-71 9-15-71	*51.4 *34.0 *33.0
West Branch Chocolay River	Chocolay River	Lat 46°22'32", long 87°16'59", in NE1/4NE1/4 sec.22, T.46 N., R.24 W., Marquette County, at bridge on county road, 2.0 miles west of Skandia, Mich.	a10		6- 2-71 8-17-71 9-13-71	*23.1 *22.3 *23.4
Trout Creek	Cranberry Lake outlet	Lat 46°39'34", long 85°39'25", in SE1/4NE1/4 sec.10, T.49 N., R.11 W., Luce County, at trail crossing, 2 miles southwest of Deer Park, Mich.	a7		6-30-71 8- 4-71	*9.41 *8.80
South Branch Two Hearted River	Two Hearted River	Lat 46°32'27", long 85°41'22", in NE1/4SW1/4 sec.21, T.48 N., R.11 W., Luce County, 15.5 miles northwest of Newberry, Mich.			9-12-71	*41.6
Two Hearted River	Lake Superior	Lat 46°36'23", long 85°36'06", in NW1/4NE1/4 sec.31, T.49 N., R.10 W., Luce County, at County Road 407 at High Bridge, 5 miles south of Deer Park, Mich.		1967	9-12-71 9-13-71	*73.0 *75.4
Dawson Creek	Two Hearted River	Lat 46°34'43", long 85°35'02", in SW1/4SE1/4 sec.5, T.48 N., R.10 W., Luce County, 0.7 mile northeast of Pine Stump Junction, Mich.			9-12-71	*6.13
Two Hearted River	Lake Superior	Lat 46°39'39", long 85°31'23", in NW1/4 sec.11, T.49 N., R.10 W., Luce County, 4.5 miles east of Deer Park, Mich.		1963	9-12-71 9-13-71	*95.0 *96.4

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Superior--Continued				
East Branch Two Hearted River	Two Hearted River	Lat 46°35'33", long 85°26'58", in NE1/4NE1/4 sec.5, T.48 N., R.9 W., Luce County, at abandoned Shamrack Road bridge crossing, 7 miles northeast of Pine Stump Junction, Mich.			7-29-71	*33.1
do	do	Lat 46°38'32", long 85°28'44", in NW1/4SE1/4 sec.18, T.49 N., R.9 W., Luce County, at bridge on County Road 412, 6.5 miles southeast of Deer Park, Mich.			9-12-71 7-29-71	*42.2 *57.6
do	do	Lat 46°39'57", long 85°29'18", in NW1/4NW1/4 sec.7, T.49 N., R.9 W., Luce County, 400 feet above mouth.			9-13-71	*51.9
Tahquamenon River	Whitefish Bay	Lat 46°28'40", long 85°50'40", in SW1/4SW1/4 sec.8, T.47 N., R.12 W., Luce County, at culvert on Trail Road, 11 miles northwest of McMillan, Mich.			7-14-71	*14.7
do	do	Lat 46°27'00", long 85°48'40", in SW1/4SE1/4 sec.21, T.47 N., R.12 W., Luce County, at bridge on Trail Road, 10.5 miles northwest of McMillan, Mich.			7-15-71	*51.2
do	do	Lat 46°24'10", long 85°48'10", in NW1/4NW1/4 sec.10, T.46 N., R.12 W., Luce County, at Skinner's Camp, 7.0 miles northwest of McMillan, Mich.			7-14-71	*80.8
do	do	Lat 46°22'25", long 85°47'00", in NW1/4NW1/4 sec.23, T.46 N., R.12 W., Luce County, at bridge on County Road 442, 2.0 miles north of Donaher, Mich.			9-14-71	*88.8
		Streams tributary to Lake Michigan				
Rock River	Lake Michigan	Lat 46°05'37", long 85°35'30", in NW1/4SW1/4 sec.29, T.43 N., R.10 W., Mackinac County, at culverts on Price Road, 1.8 miles southwest of Engadine, Mich.			7-27-71	*1.65
East Branch Fox River	Fox River	Lat 46°27'55", long 85°56'40", in NW1/4SW1/4 sec.16, T.47 N., R.13 W., Schoolcraft County, at old trout rearing ponds, 8.5 miles north of Seney, Mich.			7-28-71	*38.1
Little Indian River	Indian River	Lat 46°17'48", long 86°38'16", in NE1/4SE1/4 sec.14, T.45 N., R.19 W., Alger County, at culvert on Lost Lake Road, 7.5 miles south of Munising, Mich.	a8		7-29-71	3.88
do	do	Lat 46°16'17", long 86°37'13", in NW1/4 sec.25, T.45 N., R.19 W., Alger County, 1.5 miles below McNeil Lake Outlet and 9.5 miles northwest of Steuben, Mich.	11.7	1957	7-29-71	9.63
Middle Branch Escanaba River	Escanaba River	Lat 46°29'22", long 87°51'28", in NE1/4NW1/4 sec.7, T.47 N., R.28 W., Marquette County at bridge on county highway, 0.1 mile south of Clarksburg, Mich.	47.6		9-14-71	*9.82
do	do	Lat 46°26'09", long 87°48'38", in SW1/4SE1/4 sec.28, T.47 N., R.28 W., Marquette County, 2 miles upstream from mouth of Bell Creek, 4.4 miles southwest of Greenwood, Mich.	a68		9- 3-71 9- 8-71 9-16-71	*13.7 *11.8 *12.9

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Michigan--Continued				
Bell Creek	Middle Branch Escanaba River	Lat 46°25'14", long 87°47'54", in NW1/4NW1/4 sec.3, T.46 N., R.28 W., Marquette County, at mouth, 6.5 miles southeast of Humboldt, Mich.	3.49		8-18-71	*0.78
Middle Branch Escanaba River	Escanaba River	Lat 46°23'46", long 87°42'18", in SE1/4 sec.8, T.46 N., R.27 W., Marquette County, 4.5 miles south of National Mine, Mich.	a168	1963-64	9- 3-71	*48.4
Green Creek	Middle Branch Escanaba River	Lat 46°21'23", long 87°34'31", in SE1/4NE1/4 sec.29, T.46 N., R.26 W., Marquette County, 6 miles south of Palmer, Mich.	a11	1962	6-22-71 9-14-71	*10.1 *3.35
do	do	Lat 46°20'02", long 87°31'58", in SW1/4 sec.35, T.46 N., R.26 W., Marquette County, at bridge on State Highway 35, 4 miles northwest of Princeton, Mich.	13.8	1960-65	6-22-71 9-14-71	*16.0 *5.18
East Branch Escanaba River	Escanaba River	Lat 46°23'21", long 87°31'39", in SE1/4NW1/4 sec.14, T.46 N., R.26 W., Marquette County, 4 miles southeast of Palmer, Mich.	a46	1964	6- 3-71	*36.8
Goose Lake outlet	East Branch Escanaba River	Lat 46°25'58", long 87°30'36", in NW1/4 sec.36, T.47 N., R.26 W., Marquette County, at bridge 3.7 miles east of Palmer, Mich.	21.8	1960-65	6-23-71	*17.1
do	do	Lat 46°24'37", long 87°30'30", in NW1/4SW1/4 sec.1, T.46 N., R.26 W., 4.5 miles southeast of Palmer, Mich.	32.8	1962-64	6- 2-71 6-23-71 9-14-71	*35.5 *24.9 *3.38
East Branch Escanaba River	Escanaba River	Lat 46°20'45", long 87°26'54", in NW1/4NW1/4 sec.33, T.46 N., R.25 W., Marquette County, below O'Neal Creek 2.5 miles southwest of Sands Station, Mich.	109	1964	6- 3-71	*94.0
do	do	Lat 46°19'38", long 87°26'34", in NW1/4 sec.4, T.45 N., R.25 W., Marquette County, above unnamed tributary, 3.0 miles north of Gwinn, Mich.	a111		6- 3-71 8-17-71 9-13-71	*95.5 *30.0 *32.0
Escanaba River	Little Bay de Noc	Lat 46°12'12", long 87°25'56", in SE1/4SE1/4 sec.16, T.44 N., R.25 W., Marquette County, at bridge on county road crossing, 5.0 miles south of Gwinn, Mich.	a380		8-17-71	*85.7
West Branch Escanaba River	Escanaba River	Lat 46°11'45", long 87°45'39", in SW1/4NW1/4 sec.24, T.44 N., R.28 W., Dickinson County, 10 miles north of Ralph, Mich.	a65		6- 2-71 7-12-71 8-17-71 9-17-71	*53.4 *31.1 *25.1 *21.1
Portage Creek	Little Bay de Noc	Lat 45°42'42", long 87°05'36", in SE1/4SW1/4 sec.1, T.38 N., R.23 W., Delta County, at State Highway 35, 0.4 mile upstream from mouth, at Escanaba, Mich.	a30	1968	9-21-71	*6.60
Ford River	Green Bay	Lat 45°58'42", long 87°26'22", in NW1/4SE1/4 sec.4, T.41 N., R.25 W., 3 miles southwest of Watson, Mich.	a230	1968-70	5-14-71	*188
South Branch Ford River	Ford River	Lat 45°55'46", long 87°35'37", in SW1/4SW1/4 sec.20, T.41 N., R.26 W., Menominee County, 0.2 mile east of Helps, Mich.	a9	1969	5-14-71	*5.66

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Michigan--Continued				
West Branch Ford River	Ford River	Lat 45°56'31", long 87°27'08", in NE1/4NE1/4 sec.20, T.41 N., R.25 W., Menominee County, 1.2 miles upstream from mouth, 4 miles north of LaBranch, Mich.	a50	1968-69	5-14-71	*32.9
Ford River	Green Bay	Lat 45°55'52", long 87°21'23", in NW1/4SE1/4 sec.19, T.41 N., R.24 W., Delta County, 3 miles west of Woodlawn, Mich.	a330	1968-69	5-14-71	*258
do	do	Lat 45°51'55", long 87°18'39", in SW1/4NE1/4 sec.18, T.40 N., R.24 W., Delta County, 2 miles upstream from Twenty-four Mile Creek, 6 miles southwest of Cornell, Mich.	a350	1969	5-14-71	*291
Twenty-four Mile Creek	Ford River	Lat 45°51'16", long 87°18'54", in NW1/4NE1/4 sec.19, T.40 N., R.24 W., Delta County, 1 mile upstream from mouth, 4.5 miles northeast of Perronville, Mich.	a9	1969	5-14-71	*9.34
Ten Mile Creek	do	Lat 45°53'36", long 87°30'44", in SE1/4NE1/4 sec.4, T.40 N., R.26 W., Menominee County, at Faunus, Mich.	a8	1969-70	5-14-71	*8.52
do	do	Lat 45°52'23", long 87°28'10", in NE1/4SE1/4 sec.11, T.40 N., R.26 W., Menominee County, 0.3 mile south of LaBranche, Mich.	a19	1969	5-14-71	*16.3
do	do	Lat 45°51'57", long 87°25'42", in NE1/4NE1/4 sec.18, T.40 N., R.25 W., Menominee County, 1,000 feet upstream from unnamed tributary, 2.2 miles southeast of LaBranche, Mich.	a23	1969-70	5-14-71	*20.2
Unnamed tributary	Ten Mile Creek	Lat 45°53'56", long 87°25'43", in SW1/4SW1/4 sec.34, T.41 N., R.25 W., Menominee County, 3.3 miles north of County Highway 569, 2.5 miles northeast of LaBranche, Mich.	a3	1969	5-14-71	*5.26
do	do	Lat 45°52'09", long 87°25'40", in SW1/4SW1/4 sec.8, T.40 N., R.25 W., Menominee County, 1,500 feet upstream from mouth, 2 miles southeast of LaBranche, Mich.	a6	1969-70	5-14-71	*7.26
Ten Mile Creek	Ford River	Lat 45°51'07", long 87°23'13", in NE1/4NE1/4 sec.21, T.40 N., R.25 W., Menominee County, 2 miles north of Whitney, Mich.	a31	1969	5-14-71	*29.0
Big Cedar River	Green Bay	Lat 45°47'00", long 87°31'42", in SW1/4SW1/4 sec.9, T.39 N., R.26 W., Menominee County, 6 miles north of Spaulding, Mich.	a27	1969-70	5-14-71	*24.7
West Branch Big Cedar River	Big Cedar River	Lat 45°46'18", long 87°32'29", in SW1/4SE1/4 sec.17, T.39 N., R.26 W., Menominee County, 5 miles northeast of Hermansville, Mich.	a25	1969-70	5-14-71	*17.3
Forty-seven Mile Creek	do	Lat 45°47'52", long 87°24'28", in SW1/4SW1/4 sec.4, T.39 N., R.25 W., Menominee County, 2.8 miles west of Perronville, Mich.	a18	1969-70	5-14-71	*15.6
East Branch Sturgeon River	Sturgeon River	Lat 45°57'57", long 87°44'30", in SW1/4NW1/4 sec.7, T.41 N., R.27 W., Dickinson County, at bridge on County Road 569, at Foster City, Mich.	106	1969-70	5-14-71	*77.1
Sturgeon River	Menominee River	Lat 45°49'51", long 87°43'37", in NW1/4SE1/4 sec.26, T.40 N., R.28 W., Dickinson County, 4.3 miles north of Waucedah, Mich.	271	1969	5-14-71	*204

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Michigan--Continued				
Kirktown Creek	Galien River	Lat 41°53'10", long 86°30'50", in SW1/4 sec.6, T.7 S., R.19 W., Berrien County, at Sawyer Road, 1.5 miles east of Sawyer, Mich.		1970	12-22-70	*1.04
Galien River	Lake Michigan	Lat 41°52'25", long 86°34'30", in SE1/4 sec.12, T.7 S., R.20 W., Berrien County, at Minnich Road, 1.3 miles southeast of Sawyer, Mich.		1970	12-22-70	*69.0
Unnamed tributary	do	Lat 41°52'45", long 86°37'57", in NE1/4 sec.9, T.7 S., R.20 W., Berrien County, at Birchwood, Mich.		1970	12-22-70	*1.82
do	do	Lat 41°52'40", long 86°36'55", in SE1/4 sec.3, T.6 S., R.20 W., Berrien County, in Shorewood Hills Subdivision, 1.0 mile west of Sawyer, Mich.	a .9	1969-70	12-23-70	*1.37
Painterville Drain	do	Lat 41°55'15", long 86°34'40", in NW1/4 sec.36, T.6 S., R.20 W., Berrien County, 300 ft south of Hildebrandt Road, 2.5 miles north of Sawyer, Mich.	a3.0	1969-70	12-22-70	*.96
do	do	Lat 41°54'05", long 86°36'35", in SW1/4 sec.35, T.6 S., R.20 W., Berrien County, 450 ft upstream from mouth, 1.3 miles northwest of Sawyer, Mich.	a5.0	1969-70	12-22-70	*.73
Unnamed tributary	do	Lat 41°56'45", long 86°33'35", in SE1/4SW1/4 sec.18, T.6 S., R.19 W., Berrien County, 0.1 mile north of Shawnee Road on old U.S. 31, in Bridgeman, Mich.		1970	12-23-70	*.64
Stony Brook Creek	St. Joseph River	Lat 41°56'32", long 84°37'55", in SE1/4SE1/4, sec.15, T.6 S., R.3 W., Hillsdale County, at Hillsdale Road, 1.3 miles north of Hillsdale, Mich.			7- 7-71	1.38
Beebe Creek	do	Lat 41°57'27", long 84°38'20", in NW1/4NE1/4 sec.15, T.6 S., R.3 W., Hillsdale County, at Moore Road, 2.2 miles north of Hillsdale, Mich.			7- 7-71	7.19
St. Joseph River	Lake Michigan	Lat 41°56'08", long 87°38'26", SE1/4 sec.9, T.6 S., R.3 W., Hillsdale County, at Moore Road, 1.9 miles south of Jonesville, Mich.		1967	7- 7-71	2.43
Cook Drain	Paw Paw River	Lat 42°12'50", long 85°49'00", in SW1/4 sec.15, T.3 S., R.13 W., Van Buren County, at 58th Avenue, 1.0 mile west of Mattawan, Mich.		1970	12-30-70	*.64
East Branch Paw Paw River	do	Lat 42°11'18", long 85°48'40", in SE1/4 sec.22, T.3 S., R.13 W., Van Buren County, at 63rd Avenue, 2.0 miles southwest of Mattawan, Mich.	11.4	1962-64, 1966	12-30-70	*11.3
Pipestone Creek	St. Joseph River	Lat 42°04'00", long 86°24'10", in SW1/4 sec.3, T.5 S., R.18 W., Berrien County, at Pipestone Road, 1.3 miles northeast of Kings Landing, Mich.			6-17-71	*17.7
Battle Creek	Kalamazoo River	Lat 42°32'40", long 84°50'10", in SW1/4 sec.24, T.2 N., R.5 W., Eaton County, at Kalamo Road, 1.0 mile southwest of Charlotte, Mich.	a67	1931, 1948-54‡, 1955-56 1963-64	2-12-71	*34.3

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Michigan--Continued				
Unnamed tributary	Sycamore Creek	Lat 42°35'00", long 84°26'30", in SW1/4 sec.4, T.2 N., R.1 W., Ingham County, North Jefferson Avenue, at Mason, Mich.			3-30-71	*2.16
Sycamore Creek	Red Cedar River	Lat 42°35'00", long 84°26'38", in SE1/4 sec.5, T.2 N., R.1 W., Ingham County, 175 feet upstream of waste water treatment plant, at Mason, Mich.	a33	1953	3-30-71	*22.7
Little Maple	Maple River	Lat 42°53'35", long 84°25'16", in SW1/4 sec.22, T.6 N., R.1 W., Clinton County, at Alward Road, 2.8 miles west of Laingsburg, Mich.	a2.43	1966,1968, 1969	10-24-70 5- 1-71 8-27-71	*.68 *1.54 *.48
do	do	Lat 42°55'35", long 84°25'01", in NW1/4 sec.10, T.6 N., R.1 W., Clinton County, at Price Road, 4.8 miles northwest of Laingsburg, Mich.	7.90	1965-66, 1968,1969	10-24-70 5- 1-71 8-27-71	*2.29 *3.24 *.79
do	do	Lat 42°57'27", long 84°25'39", in SE1/4 sec.28, T.7 N., R.1 W., Clinton County, at Taft Road, 3.0 miles south of Shepardsville, Mich.	a15.4	1966,1968, 1969	10-24-70 5- 1-71 8-27-71	*4.35 *6.65 *1.57
Bear Creek	do	Lat 43°09'25", long 84°28'02", in NW1/4 sec.19, T.9 N., R.1 W., Gratiot County, at Roosevelt Road, 1.8 miles south of Ashley, Mich.			3-16-71	394
Butternut Creek	Thornapple River	Lat 42°36'35", long 84°47'00", in NE1/4 sec.33, T.3 N., R.4 W., Eaton County, at McConnell Highway, 4.5 miles northeast of Charlotte, Mich.			8- 6-71	*2.73
Coldwater River	do	Lat 42°45'50", long 85°19'22", in SW1/4 sec.36, T.5 N., R.9 W., Kent County, at Freeport Road, 0.7 mile northwest of Freeport, Mich.	a84		5-18-71	*23.2
Duck Creek	Coldwater River	Lat 42°46'42", long 85°18'36", in NW1/4 sec.36, T.5 N., R.9 W., Kent County, at Freeport Road, 0.8 mile north of Freeport, Mich.	19.0	1964	5-18-71	*7.54
Bear Creek	do	Lat 42°46'52", long 85°20'18", in SE1/4 sec.26, T.5 N., R.9 W., Kent County, at 100th Street, 1.9 miles northwest of Freeport, Mich.			5-18-71	*16.8
Coldwater River	Thornapple River	Lat 42°46'25", long 85°21'05", in SW1/4 sec.34, T.5 N., R.9 W., Kent County, at Baker Street, 2.5 miles northwest of Freeport, Mich.			5-18-71	*55.8
do	do	Lat 42°46'21", long 85°27'28", in SE1/4 sec.35, T.5 N., R.10 W., Kent County, at Whitneyville Road, 3.2 miles southeast of Caledonia, Mich.			5-18-71	*72.6
Sand Creek	Grand River	Lat 43°03'42", long 85°50'48", in NW1/4 sec.27, T.8 N., R.13 W., Ottawa County, at Arthur Street, 1.6 miles northwest of Marne, Mich.			10- 2-70	*6.30
do	do	Lat 43°01'34", long 85°49'50", in SE1/4 sec.34, T.8 N., R.13 W., Ottawa County, at Hayes Road, 0.3 mile southwest of Marne, Mich.			10- 2-70	*11.0

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Michigan--Continued				
Sand Creek	Grand River	Lat 43°00'10", long 85°49'35", in SW1/4SW1/4 sec.11, T.7 N., R.13 W., Ottawa County, at Lincoln Street, 0.8 mile northeast of Tallmadge, Mich.			10- 2-70	*28.4
do	do	Lat 42°59'48", long 85°50'01", in SE1/4 sec.15, T.7 N., R.13 W., Ottawa County, below dam at Tallmadge, Mich.			10- 2-70	*28.0
do	do	Lat 42°58'40", long 85°50'24", in NW1/4 sec.27, T.7 N., R.13 W., at State Highway 45, 1.4 miles southwest of Tallmadge, Mich.		1953-55, 1960	10- 2-70	*33.0
Crockery Lake outlet	North Branch Crockery Creek	Lat 43°10'19", long 85°52'41", in NW1/4 sec.8, T.9 N., R.13 W., Ottawa County, at Truman Road, 0.3 mile west of Harrisburg, Mich.			5-24-71	*2.83
North Branch Crockery Creek	Crockery Creek	Lat 43°11'30", long 85°53'22", in SW1/4 sec.6, T.9 N., R.13 W., Ottawa County, at 40th Avenue, 0.8 mile northwest of Harrisburg, Mich.			5-24-71	*8.98
Crockery Creek	Grand River	Lat 43°13'25", long 85°54'10", in SW1/4 sec.30, T.10 N., R.13 W., Muskegon County, at Laketon Road, 3.0 miles northeast of Ravenna, Mich.			5-24-71	*22.6
do	do	Lat 43°09'41", long 85°57'48", in NW1/4 sec.22, T.9 N., R.14 W., Muskegon County, at Ellis Road, 2.0 miles southwest of Ravenna, Mich.			5-24-71	*39.7
Backus Creek	Muskegon River	Lat 44°21'28", long 84°36'15", in NE1/4 sec.25, T.33 N., R.3 W., Roscommon County, at State Highway 18, 4.7 miles northeast of Prudenville, Mich.			8-19-71	*4.71
Unnamed tributary	do	Lat 44°24'11", long 84°47'09", in SE1/4NW1/4 sec.10, T.23 N., R.4 W., Roscommon County, at culvert on county road, 5.3 miles north of Houghton Lake Heights, Mich.			6-11-71	*2.46
do	Houghton Lake	Lat 44°24'06", long 84°46'11", in SE1/4 NW1/4 sec.11, T.23 N., R.4 W., Roscommon County, at culvert on county road, at campgrounds, 5.1 miles north of Houghton Lake Heights, Mich.			6-11-71	*.33
Sucker Creek	do	Lat 44°24'06", long 84°45'47", in SW1/4NE1/4 sec.11, T.23 N., R.4 W., Roscommon County, at culvert on county road, 5.1 miles north of Houghton Lake Heights, Mich.			6-11-71	*1.08
Unnamed tributary	do	Lat 44°23'37", long 84°45'12", in SW1/4SW1/4 sec.12, T.23 N., R.4 W., Roscommon County, at culvert on county road, 4.7 miles north of Houghton Lake Heights, Mich.			6-11-71	*.16
do	do	Lat 44°23'27", long 84°45'08", in NW1/4NW1/4 sec.13, T.23 N., R.4 W., Roscommon County, at culverts 50 feet apart on county road, 4.5 miles north of Houghton Lake Heights, Mich.			6-11-71	*.25
do	do	Lat 44°22'33", long 84°44'08", in NW1/4NW1/4 sec.19, T.23 N., R.3 W., Roscommon County, at culverts on County Road 300, 5.2 miles northeast of Houghton Lake Heights, Mich.			6-11-71	*.63

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Michigan--Continued				
Unnamed tributary	Houghton Lake	Lat 44°22'04", long 84°41'23", in NW1/4SW1/4 sec.21, T.23 N., R.3 W., Roscommon County, at culverts on County Road 100, 5.2 miles north of Prudenville, Mich.			6-11-71	*.68
do	do	Lat 44°19'33", long 84°38'08", in NE1/4SE1/4 sec.2, T.22 N., R.3 W., Roscommon County, at culvert on County Road 100, at Harvey Marine, 2.1 miles north of Prudenville, Mich.			6-11-71 7-14-71	*10.9 *3.73
do	Muskegon River	Lat 44°22'15", long 84°48'11", in NW1/4SE1/4 sec.21, T.23 N., R.4 W., Roscommon County, at culvert on Old 27, 3.3 miles north of Houghton Lake Heights, Mich.			6-11-71	*.27
Tamarack Creek	Little Muskegon River	Lat 43°25'18", long 85°21'35", in NE1/4 sec.22, T.12 N., R.9 W., Montcalm County, at Masters Road, 1.3 miles southeast of Amble, Mich.			5-11-71	*29.6
do	do	Lat 43°23'42", long 85°25'00", in NW1/4 sec.32, T.12 N., R.9 W., Montcalm County, at Marble Road, 2.6 miles east of Howard City, Mich.			5-11-71	*47.0
do	do	Lat 43°23'42", long 85°30'17", in NE1/4 sec.33, T.12 N., R.10 W., Montcalm County, at State Highway 46, 2.0 miles west of Howard City, Mich.			5-11-71	*56.8
do	do	Lat 43°24'00", long 85°33'35", in SW1/4 sec.30, T.12 N., R.10 W., Montcalm County, at County Line Road, 4.5 miles west of Howard City, Mich.			5-11-71	*106
Mosquito Creek	Muskegon River	Lat 43°17'33", long 86°00'28", in NE1/4 sec.6, T.10 N., R.14 W., Muskegon County, at Swanson Road, 10.5 miles southwest of Bridgeton, Mich.			7-13-71	*1.55
do	do	Lat 43°17'02", long 86°02'30", in SE1/4 sec.2, T.10 N., R.15 W., Muskegon County, 10 miles east of North Muskegon, Mich.			7-13-71	*5.04
do	do	Lat 43°17'10", long 86°06'22", in SE1/4 sec.4, T.10 N., R.15 W., Muskegon County, 8.0 miles east of North Muskegon, Mich.			7-13-71	*5.64
Little South Branch Pere Marquette River	Pere Marquette River	Lat 43°47'07", long 85°45'03", in NW1/4NE1/4 sec.16, T.16 N., R.12 W., Newaygo County, at highway bridge, 7.5 miles south of Idlewild, Mich.			6-24-71	*22.7
do	do	Lat 43°49'02", long 85°48'01", in SE1/4SE1/4 sec.36, T.17 N., R.13 W., Lake County, at highway culverts, 4.8 miles south of Idlewild, Mich.	a90	1970	6-24-71	*53.9
do	do	Lat 43°50'08", long 85°50'27", in NE1/4SE1/4 sec.27, T.17 N., R.13 W., Lake County, at highway bridge, 4.0 miles southwest of Idlewild, Mich.			6-24-71	*64.0
do	do	Lat 43°51'20", long 85°50'28", in NE1/4NE1/4 sec.22, T.17 N., R.13 W., Lake County, at public fishing site, 2.9 miles southwest of Idlewild, Mich.	a100	1970	6-24-71	*69.0

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Michigan--Continued				
Middle Branch Pere Marquette River	Pere Marquette River	Lat 43°05'30", long 85°42'04", in NW1/4NW1/4 sec.24, T.17 N., R.12 W., Lake County, at highway bridge, 3.9 miles southwest of Chase, Mich.			6-24-71	*13.1
do	do	Lat 43°52'25", long 85°43'27", in SE1/4SE1/4 sec.10, T.17 N., R.12 W., Lake County, at highway bridge, 4.5 miles southwest of Chase, Mich.	a30	1966	6-24-71	*17.9
do	do	Lat 43°52'07", long 85°46'29", in SE1/4NW1/4 sec.17, T.17 N., R.12 W., Lake County, at highway culverts, 2 miles southwest of Idlewild, Mich.	a40	1963	6-24-71	*37.8
do	do	Lat 43°51'22", long 85°50'25", in NW1/4NW1/4 sec.23, T.17 N., R.13 W., Lake County, at highway bridge, 2.7 miles south of Baldwin and 2.9 miles southwest of Idlewild, Mich.			6-24-71	*70.7
Pere Marquette River	Lake Michigan	Lat 43°51'27", long 85°51'01", in SW1/4SE1/4 sec.15, T.17 N., R.13 W., Lake County, at public fishing site, 300 ft upstream from bridge on M-37, 2.7 miles south of Baldwin, Mich.	a200	1966	6-24-71	*135
do	do	Lat 43°51'43", long 85°52'51", in NW1/4SW1/4 sec.16, T.17 N., R.13 W., Lake County, at end of North Peacock Trail, 2.8 miles southwest of Baldwin, Mich.			6-24-71	*195
Big Sable River	do	Lat 44°06'59", long 86°12'04", in SE1/4NE1/4 sec.22, T.20 N., R.16 W., Mason County, at highway bridge, 1 mile northeast of Freesoil, Mich.			6-23-71	*107
Manistee River	do	Lat 44°47'59", long 84°05'24", in SE1/4SW1/4 sec.19, T.28 N., R.4 W., Crawford County, at Cameron Bridge, 4.4 miles northwest of Frederic, Mich.	105	1954,1958	6-11-71	*113
do	do	Lat 44°46'16", long 84°50'29", in SE1/4SW1/4 sec.31, T.28 N., R.4 W., Crawford County, at bridge on County Road 612, 4.3 miles west of Frederic, Mich.	115	1954	6-11-71	*131
Pine River	Manistee River	Lat 44°04'34", long 85°37'25", in SE1/4SE1/4 sec.33, T.20 N., R.11 W., Lake County, at public fishing site, 3.9 miles northeast of Luther, Mich.	151	1952	6-23-71	*104
do	do	Lat 44°06'54", long 85°41'04", in NE1/4NE1/4 sec.24, T.20 N., R.12 W., Lake County, and Silver Creek Campground, 5.2 miles north of Luther, Mich.	185		6-23-71	*138
Little Manistee River	Manistee Lake	Lat 44°06'20", long 85°55'38", in SW1/4SE1/4 sec.24, T.20 N., R.14 W., Lake County, at culverts at Johnson Bridge, 2.5 miles south of Irons, Mich.	129	1956	6-23-71	*82.8
do	do	Lat 44°07'47", long 85°59'21", in SW1/4NE1/4 sec.16, T.20 N., R.14 W., Lake County, at highway bridge, 3.7 miles west of Irons, Mich.	140	1956	6-23-71	*99.9
do	do	Lat 45°09'47", long 86°05'07", in SE1/4NE1/4 sec.3, T.20 N., R.15 W., Mason County, at River Drive Picnic Grounds, 2 miles above Nine Mile Bridge, 7.6 miles northeast of Freesoil, Mich.			6-23-71	*141

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Michigan--Continued				
South Branch Boardman River	Boardman River	Lat 44°40'32", long 85°23'12", in NE1/4SW1/4 sec.3, T.26 N., R.9 W., Grand Traverse County, 0.5 mile upstream from confluence with North Branch, and 5.8 miles northwest of South Boardman, Mich.			6-23-71 7-23-71	*50.1 50.3
North Branch Boardman River	do	Lat 44°41'24", long 85°22'02", in NE1/4SW1/4 sec.35, T.27 N., R.9 W., Grand Traverse County, at culvert at North Branch Bridge, 5.4 miles northwest of South Boardman, Mich.			6-23-71 7-23-71	*62.6 50.7
Boardman River	Lake Michigan	Lat 44°40'27", long 85°23'47", in SE1/4SE1/4 sec.4, T.26 N., R.9 W., Grand Traverse County, at Forks Campground, 0.1 mile below confluence at North and South Branch, and 6.1 miles northwest of South Boardman, Mich.			6-23-71	*120
do	do	Lat 44°38'52", long 85°28'53", in NW1/4SE1/4 sec.14, T.26 N., R.10 W., Grand Traverse County, 0.4 mile above Browns Bridge Pond, 2.8 miles northeast of Mayfield, Mich.			6-23-71	*152
Betsie River	do	Lat 44°32'44", long 85°56'14", in SW1/4SW1/4 sec.19, T.25 N., R.13 W., Benzie County, at culverts on County Road 669, 1.2 miles upstream from Little Betsie River, and 1.8 miles north of Thompsonville, Mich.	95.4	1958	6-23-71	*89.3
Little Betsie River	Betsie River	Lat 44°32'05", long 85°54'34", in NE1/4SW1/4 sec.29, T.25 N., R.13 W., Benzie County, 2 miles northeast of Thompsonville, 2 miles northwest of Nessen City, Mich., and 2.5 miles upstream from mouth.	5.94	1958	6-23-71	*9.98
Platte River	Lake Michigan	Lat 44°41'06", long 85°53'18", in SW1/4NE1/4 sec.4, T.26 N., R.13 W., Benzie County, at culverts on Burnt Mill Road, 0.5 mile downstream from Bronson Lake, and 3.5 miles southwest of Lake Ann, Mich.	66.2	1958	6-23-71	*56.6
do	do	Lat 44°38'51", long 85°52'26", in SE1/4SW1/4 sec.15, T.26 N., R.14 W., Benzie County, at Case Bridge on Pioneer Road, 0.5 mile downstream from Carter Creek, and 2 miles southeast of Honor, Mich.	109	1958	6-23-71	*120
Jordan River	do	Lat 45°03'50", long 84°56'51", in NW1/4SE1/4 sec.20, T.31 N., R.5 W., Antrim County, at highway bridge, 4.6 miles west of Elmira, Mich.			6-23-71	*16.6
do	do	Lat 45°03'07", long 84°57'54", in NW1/4SE1/4 sec.30, T.31 N., R.5 W., Antrim County, at roadside park, 0.5 mile upstream from unnamed tributary and 5.5 miles west of Elmira, Mich.	11.5	1968	6-23-71	*50.2
do	do	Lat 45°00'51", long 85°01'44", in NE1/4NE1/4 sec.9, T.30 N., R.6 W., Antrim County, at Pinney Bridge, 4 miles northwest of Alba, Mich.	29.6	1968	6-23-71	*121
do	do	Lat 45°03'37", long 85°04'08", in NW1/4NE1/4 sec.29, T.31 N., R.6 W., Antrim County, at Chestonia Bridge, 7.2 miles southeast of East Jordan, Mich.	50.9	1968	6-23-71	*166

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Huron				
Sturgeon River	Burt Lake	Lat 45°04'19", long 84°38'27", in SW1/4SE1/4 sec.14, T.31 N., R.3 W., Otsego County, at bridge on Poquette Road, 5.2 miles south of Vanderbilt, Mich.	a8.5	1966	6-24-71 7-30-71	*26.3 *28.2
do	do	Lat 45°06'46", long 84°35'50", in SW1/4SE1/4 sec.31, T.32 N., R.2 W., Otsego County, at bridge on Whitmarsh Road, 3.9 miles southeast of Vanderbilt, Mich.	a50	1966	6-24-71 7-30-71	*43.9 *42.2
do	do	Lat 45°08'46", long 84°33'41", in NE1/4SW1/4 sec.21, T.32 N., R.2 W., Otsego County, at bridge on Sturgeon Valley Road, 5.0 miles east of Vanderbilt, Mich.	a65	1966	6-24-71 7-30-71	*51.0 *48.8
do	do	Lat 45°13'55", long 84°35'20", in SW1/4SW1/4 sec.20, T.33 N., R.2 W., Cheboygan County, at bridge on Trowbridge Road, 3.0 miles south of Wolverine, Mich.	a105	1966	6-24-71 7-30-71	*114 *99.2
do	do	Lat 44°16'17", long 84°36'02", in NE1/4NW1/4 sec.7, T.33 N., R.2 W., Cheboygan County, 200 ft upstream from West Branch, in Wolverine, Mich.	a125	1966	6-24-71 7-30-71	*118 *122
West Branch Sturgeon River	Sturgeon River	Lat 45°15'19", long 84°37'58", in NE1/4NE1/4 sec.14, T.32 N., R.3 W., Cheboygan County, at bridge on old U.S. 27, 1.9 miles southwest of Wolverine, Mich.	a70		6-24-71 7-30-71	*72.5 *71.3
do	do	Lat 45°16'19", long 84°36'04", in NE1/4NW1/4 sec.7, T.33 N., R.2 W., Cheboygan County, 15 ft upstream from mouth, in Wolverine, Mich.	a80	1966	6-24-71	*71.8
Sturgeon River	Burt Lake	Lat 45°22'20", long 84°37'27", in NW1/4NW1/4 sec.1, T.34 N., R.3 W., Cheboygan County, at highway bridge, 2.8 miles south of Indian River, Mich., and 4 miles upstream from mouth.	a210	1966	7-30-71 8-21-71	*239 *229
Pigeon River	do	Lat 45°07'42", long 84°30'24", in SW1/4SW1/4 sec.25, T.32 N., R.2 W., Otsego County, at bridge on Old Vanderbilt Road, 7.8 miles east of Vanderbilt, Mich.	a55	1966	6-29-71 8-18-71	*55.5 *52.6
do	do	Lat 45°09'24", long 84°28'00", in SW1/4SW1/4 sec.17, T.32 N., R.1 W., Otsego County, at bridge on Sturgeon Valley Road, 1 mile below Lansing Club Dam, 9.7 miles east of Vanderbilt, Mich.	a60	1966	6-29-71 7-30-71 8-18-71	*40.5 *62.7 *60.0
do	do	Lat 45°10'00", long 84°27'34", in SE1/4NW1/4 sec.17, T.32 N., R.1 W., Otsego County, 2.1 miles below Lansing Club Dam, 10.1 miles east of Vanderbilt, Mich.	a62		6-29-71 8-18-71	*42.8 *62.2
do	do	Lat 45°10'40", long 84°25'32", in NW1/4SW1/4 sec.10, T.32 N., R.1 W., Otsego County, at State Forest Campground, 11.9 miles east of Vanderbilt, Mich.	a65		6-29-71 8-18-71	*45.2 *65.8
do	do	Lat 45°11'55", long 84°26'06", in NW1/4NE1/4 sec.4, T.32 N., R.1 W., Otsego County, 9.6 miles southeast of Wolverine, Mich.	a70		6-29-71 8-18-71	*50.7 *72.1

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Huron--Continued				
Pigeon River	Burt Lake	Lat 45°13'27", long 84°25'44", in NE1/4NE1/4 sec.28, T.33 N., R.1 W., Cheboygan County, at Tin Bridge, 9.3 miles southeast of Wolverine, Mich.	a75	1966	6-29-71 8-18-71	*53.9 *69.8
do	do	Lat 45°16'20", long 84°27'35", in SE1/4SW1/4 sec.5, T.33 N., R.1 W., Cheboygan County, at Red Bridge, 7.1 miles east of Wolverine, Mich.	a90	1966	6-29-71 7-30-71 8-18-71	*62.7 *84.3 *72.7
Little Pigeon River	Pigeon River	Lat 45°16'34", long 89°29'55", in NE1/4SW1/4 sec.1, T.33 N., R.2 W., Cheboygan County, at bridge on Wolverine Road, 5.2 miles east of Wolverine, Mich.	a18	1966	6-29-71 7-30-71 8-18-71	*19.9 *20.6 *16.4
Pigeon River	Burt Lake	Lat 45°19'50", long 84°29'42", in NW1/4NE1/4 sec.24, T.39 N., R.2 W., Cheboygan County, at bridge on Pigeon River Road, 3.0 miles south of Afton, Mich.	a125	1966	6-29-71 8-18-71	*98.8 *104
do	do	Lat 45°24'09", long 84°32'02", in NW1/4NE1/4 sec.27, T.35 N., R.2 W., Cheboygan County, 2.8 miles northwest of Afton, Mich., and 3.5 miles above mouth.	a140	1966	6-29-71 8-18-71	133 *107
Black River	Cheboygan River	Lat 45°07'06", long 84°27'00", in NE1/4SE1/4 sec.32, T.32 N., R.1 W., Otsego County, at public fishing site, 10.7 miles east of Vanderbilt, Mich.	a45	1966	8-18-71	*34.3
do	do	Lat 45°07'37", long 84°24'28", in NW1/4NW1/4 sec.35, T.32 N., R.1 W., Otsego County, at Tin Shanty Bridge, 12.5 miles east of Vanderbilt, Mich.	a50	1966	7-30-71 8-18-71	*37.6 *33.4
do	do	Lat 45°07'35", long 84°23'28", in NE1/4NE1/4 sec.35, T.32 N., R.1 W., Otsego County, 400 ft downstream from Beaver Dam Club, 13.4 miles east of Vanderbilt, Mich.	a52		8-18-71	*34.0
do	do	Lat 45°09'11", long 84°19'24", in NW1/4NW1/4 sec.21, T.32 N., R.1 E., Montmorency County, at Main River Bridge, 14.0 miles south of Tower, Mich.	a80	1966	8-18-71	*59.2
AuSable River	Lake Huron	Lat 44°41'06", long 84°44'44", in SW1/4SW1/4 sec.36, T.27 N., R.4 W., Crawford County, at Pollack Bridge, 2.2 miles northwest of Grayling, Mich.			6-11-71	*66.0
East Branch AuSable River	AuSable River	Lat 44°47'19", long 84°35'47", in SE1/4SW1/4 sec.30, T.28 N., R.2 W., Crawford County, at bridge on County Road 612, 10.3 miles northeast of Grayling, Mich.	18.9	1960	6-11-71	*16.6
do	do	Lat 44°45'26", long 84°37'58", in SW1/4SE1/4 sec.2, T.27 N., R.3 W., Crawford County, at culverts on truck trail, 7.6 miles northeast of Grayling, Mich.	26.7	1960	6-11-71	*27.6
do	do	Lat 44°43'42", long 84°38'38", in NW1/4NW1/4 sec.23, T.27 N., R.3 W., Crawford County, downstream from culverts on truck trail, 5.6 miles northeast of Grayling, Mich.	32.7	1960	6-11-71	*40.4

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Huron--Continued				
East Branch AuSable River	AuSable River	Lat 44°41'57", long 84°41'32", in NW1/4NE1/4 sec.32, T.27 N., R.3 W., Crawford County, 250 ft downstream from unnamed tributary, 2.8 miles north of Grayling, Mich.	60.0	1960	8-19-71	*35.2
AuSable River	Lake Huron	Lat 44°39'57", long 84°39'42", in SE1/4NW1/4 sec.10, T.26 N., R.3 W., Crawford County, 400 ft above State Forest Canoe Campground, 2.6 miles east of Grayling, Mich.			8-19-71	*127
do	do	Lat 44°39'51", long 84°38'52", in SE1/4NE1/4 sec.10, T.26 N., R.3 W., Crawford County, at Bartons Landing, 3.4 miles east of Grayling, Mich., and 109 miles upstream from mouth.			6-11-71	*179
do	do	Lat 44°39'55", long 84°37'38", in SE1/4NE1/4 sec.11, T.26 N., R.3 W., Crawford County, at Keystone Landing, 4.3 miles east of Grayling, Mich., and 108 miles upstream from mouth.			8-21-71	*138
do	do	Lat 44°40'11", long 84°36'24", in NE1/4NE1/4 sec.12, T.26 N., R.3 W., Crawford County, at end of road at Wa-Wa-Sum, 5.3 miles east of Grayling, Mich.			8-19-71	*166
do	do	Lat 44°40'45", long 84°34'39", in SE1/4NW1/4 sec.5, T.26 N., R.2 W., Crawford County, just above Stephens Bridge, 7.0 miles east of Grayling, Mich., and 105 miles upstream from mouth.	a200	1964-67	6-11-71	*236
do	do	Lat 44°39'36", long 84°30'26", in NW1/4SW1/4 sec.12, T.26 N., R.2 W., Crawford County, at Wakely Bridge, 10.5 miles east of Grayling, Mich.			6-11-71	*301
South Branch AuSable River	AuSable River	Lat 44°29'57", long 85°35'12", in SW1/4 sec.5, T.24 N., R.2 W., Roscommon County, at State Highway 144 at Roscommon, Mich.			3- 5-71	154
Unnamed tributary	South Branch AuSable River	Lat 44°29'50", long 84°35'17", in SE1/4 sec.6, T.24 N., R.2 W., Roscommon County, at Main Street, at Roscommon, Mich.			3- 5-71	3.02
South Branch AuSable River	AuSable River	Lat 44°32'21", long 84°34'14", in NW1/4NW1/4 sec.28, T.25 N., R.2 W., Crawford County, at public access site at Deerhart Valley Road, 2.9 miles north of Roscommon, Mich.			6-11-71	*182
do	do	Lat 44°32'27", long 84°33'03", in SE1/4SE1/4 sec.21, T.25 N., R.2 W., Crawford County, at Chase Bridge, 3.6 miles northwest of Roscommon, Mich., and 14.3 miles upstream from mouth.			8-19-71	*89.7
do	do	Lat 44°33'48", long 84°30'21", in SW1/4NW1/4 sec.13, T.25 N., R.2 W., Crawford County, 6.0 miles northeast of Roscommon, Mich.			6-11-71	*221
North Branch AuSable River	do	Lat 44°54'54", long 84°35'54", in SE1/4SW1/4 sec.7, T.29 N., R.2 W., Otsego County, at culverts on Old State Road, 5.4 miles northeast of Waters, Mich.			6-11-71	*16.0

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Huron--Continued				
Turtle Creek	North Branch AuSable River	Lat 44°54'54", long 84°34'21", in SW1/4SE1/4 sec.8, T.29 N., R.2 W., Otsego County, at culverts on Old State Road, 6.6 miles northeast of Waters, Mich.			6-11-71	*7.70
North Branch AuSable River	AuSable River	Lat 44°53'34", long 84°32'54", in SE1/4NE1/4 sec.21, T.29 N., R.2 W., Otsego County, 7 miles northwest of Lovells, Mich.			6-18-71	*74.1
do	do	Lat 44°53'17", long 84°32'33", in SW1/4SW1/4 sec.22, T.29 N., R.2 W., Otsego County, at the Ford, 6.3 miles northwest of Lovells, Mich.			12-16-70 6-11-71	*61.3 *78.7
do	do	Lat 44°50'58", long 84°29'17", in NE1/4SE1/4 sec.1, T.28 N., R.2 W., Crawford County, at public fishing site, 3 miles north of Lovells, Mich.			6-11-71 6-17-71	*125 *117
do	do	Lat 44°48'16", long 84°28'55", in NW1/4SW1/4 sec.19, T.28 N., R.1 W., Crawford County, at bridge on County Road 612, at Lovells, Mich.			12-16-70 6-11-71	*126 *161
do	do	Lat 44°47'03", long 84°28'18", in SE1/4SE1/4 sec.30, T.28 N., R.1 W., Crawford County, at Eamms Landing, 1.6 miles southeast of Lovells, Mich.			8-19-71	*121
Dead AuSable River	do	Lat 44°25'00", long 83°20'12", in SW1/4SW1/4 sec.3, T.23 N., R.9 E., Iosco County, at mouth, at Oscoda, Mich.			5- 4-71	*9.14
East Branch AuGres River	Lake Huron	Lat 44°16'03", long 83°42'32", in SE1/4 sec.28, T.22 N., R.6 E., Iosco County, 300 ft upstream from highway bridge and 400 feet downstream from dam, 2 miles north of National City, Mich.			8-12-71 8-17-71 9-14-71	*43.2 *35.5 *36.8
Ogemaw Creek	West Branch Rifle River	Lat 44°16'21", long 84°13'42", in NE1/4 sec.30, T.22 N., R.2 E., Ogemaw County, 700 feet above Brewery Creek, at West Branch, Mich.			3- 4-71	31.3
Brewery Creek	Ogemaw Creek	Lat 44°16'21", long 84°13'36", in NE1/4 sec.30, T.22 N., R.2 E., Ogemaw County, at mouth, at West Branch, Mich.			3- 4-71	6.30
Marion and Genoa Drain	South Branch Shiawassee River	Lat 42°35'25", long 83°55'54", in SW1/4 sec.1, T.2 N., R.4 E., Livingston County, at Interstate Highway 96, 1.2 miles south of Howell, Mich.			4-26-71 4-30-71 5-10-71 5-14-71	*7.23 *7.32 *6.18 *5.37
Thread Creek	Swartz Creek	Lat 42°49'48", long 83°33'13", in SE1/4 sec.18, T.5 N., R.8 E., Oakland County, at Grange Hall Road, 4.6 miles northeast of Holly, Mich.			6-22-71	*.62
Jose Creek	North Branch Tobacco River	Lat 43°44'13", long 84°44'47", in NW1/4NW1/4 sec.1, T.18 N., R.4 W., Clare County, at culvert on State Highway 61, 3.7 miles southeast of Harrison, Mich.	22.7	1958,1970	8-24-71	*7.09
Mostellar Creek	do	Lat 43°44'13", long 84°44'25", in NW1/4 sec.1, T.18 N., R.4 W., Clare County, at culvert on State Highway 61, 3.8 miles southeast of Harrison, Mich.	28.6	1958,1970	8-24-71	*3.62

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Huron--Continued						
Beaver Creek	North Branch Tobacco River	Lat 43°58'08", long 84°44'35", in NE1/4 sec.12, T.18 N., R.4 W., Clare County, 30 ft upstream from mouth, 4.7 miles southeast of Harrison, Mich.	1.70	1958	8-24-71	*3.25
North Branch Tobacco River	Tobacco River	Lat 43°58'02", long 84°43'14", in NE1/4 sec.12, T.18 N., R.4 W., Clare County, at culvert on Cornwell Avenue, 0.5 mile below Beaver Creek, and 5.2 miles southeast of Harrison, Mich.	32.6	1958,1970	8-24-71	*17.4
do	do	Lat 43°57'41", long 84°42'48", in SE1/4 sec.7, T.18 N., R.3 W., Clare County, at bridge on Rogers Avenue, 6.2 miles southeast of Harrison, Mich.	a35	1958, 1960-62	8-24-71	*18.7
Tittabawassee River	Saginaw River	Lat 43°33'50", long 84°10'53", in NW1/4 sec.1, T.13 N., R.2 E., Midland County, at Smiths Crossing Road, at Mapleton, Mich.	2,448	1965-66	5- 4-71	*1,210
Streams tributary to St. Clair River						
Unnamed tributary	Belle River	Lat 42°58'04", long 83°06'00", in SW1/4 sec.1, T.6 N., R.11 E., Lapeer County, at Bishop Road, 1.7 miles northeast of Dryden, Mich.			9-16-71	b*.10
Belle River	St. Clair River	Lat 42°57'47", long 83°05'45", in SW1/4 sec.6, T.6 N., R.12 E., Lapeer County, at Hollow Corners Road, 1.7 miles northeast of Dryden, Mich.			9-16-71	*.94
do	do	Lat 42°58'20", long 83°05'17", in NE1/4 sec.6, T.6 N., R.12 E., Lapeer County, at Hall Road, 2.6 miles northeast of Dryden, Mich.	16.9	1967	9-16-71	*.33
Streams tributary to Lake Erie						
Huron River	Lake Erie	Lat 42°41'35", long 82°29'56", in NW1/4SE1/4 sec.3, T.3 N., R.8 E., Oakland County, at White Lake Road, 2.5 miles south of Andersonville, Mich.	13.9	1966-68c, 1970	9- 2-71	*.14
South Ore Creek d/	Huron River	Lat 42°29'40", long 83°48'05", in NW1/4 sec.12, T.1 N., R.5 E., Livingston County, at Hamburg Road, 0.5 mile above Ore Lake, and and 2.5 miles southwest of Brighton, Mich.	e33.7	1951-68‡	5-20-71	*15.7
do	do	Lat 42°29'09", long 83°47'50", in NW1/4NE1/4 sec.13, T.1 N., R.5 E., Livingston County, 100 feet above Ore Lake and 3.2 miles southwest of Brighton, Mich.	34.0		5-20-71	*15.9
Dibrova Lake outlet	Ore Lake	Lat 42°29'15", long 83°47'32", in SE1/4SE1/4 sec.12, T.1 N., R.5 E., Livingston County, at Hammel Road, and 3.0 miles southwest of Brighton, Mich.	3.82		5-20-71	*1.03
South Ore Creek	Huron River	Lat 42°28'23", long 83°47'50", in SW1/4SE1/4 sec.13, T.1 N., R.6 E., Livingston County, at culvert, at mouth, 4.0 miles southwest of Brighton, Mich.	39.7		5-20-71	*22.5

Discharge measurements made at miscellaneous sites during water year 1971--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
		Streams tributary to Lake Erie--Continued				
Horseshoe Lake outlet	Huron River	Lat 42°25'19", long 83°46'00", in NW1/4 sec.6, T.1 S., R.6 E., Washtenaw County, at 8-Mile Road, 1.3 miles northwest of Whitmore Lake, Mich.	24.4		10- 6-70	*1.04
do	do	Lat 42°26'50", long 83°48'05", in SW1/4SW1/4 sec.25, T.1 N., R.5 E., Livingston County, at Hamburg Road, at Hamburg, Mich.	29.7	1964	10- 6-70	*1.21
do	do	Lat 42°26'52", long 83°48'07", in SW1/4SW1/4 sec.25, T.1 N., R.5 E., Livingston County, below the waste water treatment plant at Hamburg, Mich.			10- 6-70	*1.52
do	do	Lat 42°27'10", long 83°49'21", in NW1/4 sec.26, T.1 N., R.5 E., Livingston County, at Merrill Road, 1.0 mile west of Hamburg, Mich.	30.7	1970	10- 6-70	*3.49
Paint Creek	Stony Creek	Lat 42°06'50", long 83°34'55", in SE1/4 sec.22, T.4 S., R.7 E., Washtenaw County, at Willow Road, 2.2 miles north of Oakville, Mich.			9- 1-71	*2.57
South Branch River Raisin	River Raisin	Lat 41°55'08", long 84°00'35", in NE1/4SE1/4 sec.25, T.6 S., R.3 E., Lenawee County, at Howell Highway, 2.0 miles northeast of Adrian, Mich.	165	1970	7- 7-71	*18.9

* Base flow.
‡ Operated as a continuous-record gaging station.
a Approximately.
b Field estimate.
c Operated as a low-flow partial-record station.
d Published as Ore Creek.
e Revised.

Low-flow investigations in St. Clair County, Mich.

On Aug. 5, 6, 1971 a series of discharge measurements were made at many selected locations in St. Clair County as part of a water resources investigation. The purpose of the measurements is to determine the occurrence, distribution, and magnitude of dry-weather streamflow. The results, together with continuous streamflow records, ground-water records, and geologic studies are intended as a ground-water reconnaissance aid and an indication of the water-supply potential of the area with particular reference to sustained flow. The measurements are believed to be unaffected by surface runoff due to antecedent precipitation, and thus represent base flow. Records of chemical analyses and water temperatures obtained at the time of this investigation are published in Part 2 of this report.

The drainage areas shown were determined from U. S. Geological Survey topograhic maps having scales of 1:24000 or 1:62,500 and a contour interval of 5, 10 or 20 feet.

Discharge measurements made in St. Clair County, Mich., Aug. 5, 6, 1971

Stream	Location	Drainage area (sq mi)	Discharge (cfs)	Cfs per square mile
Middleton Drain	SE¼ sec.8, T.8 N., R.14 E., at Yale Rd., 2.2 miles west of Yale	a3.0	0	0
Silver Creek	SE¼ sec.11, T.8 N., R.15 E., at Yale Rd., 2.5 miles north of Fargo.	18.5	.08	.004
Lovejoy Drain	SE¼ sec.25, T.8 N., R.13 E., at Norman Rd., 5.7 miles northeast of Capac.	a4.0	0	0
Sheehy Drain	NE¼ sec.27, T.8 N., R.14 E., at Connell Rd., 2.2 miles south of Yale	a6.0	0	0
Mill Creek	SW¼ sec.23, T.8 N., R.14, E., at Wikes Rd., 2.0 miles south of Yale	152	1.87	.01
do	SW¼ sec.36, T.8 N., R.14 E., at Metcalf Rd., at Brockway.	162	2.52	.01
do	Gaging station near Avoca (04159900)	169	2.52	.01
do	NE¼ sec.16, T.7 N., R.15 E., at Kilgore Rd., 1.5 miles south of Avoca.	178	3.59	.02
Odette Drain	SE¼ sec.6, T.7 N., R.16 E., on Kingsley Rd., 2.1 miles southeast of Fargo.	a1.0	0	0
Mill Creek	NW¼ sec.17, T.7 N., R.16 E., 2 miles northeast of Abbottsford (discontinued gaging station 04160000).	185	5.20	.03
Cowhy Drain	NW¼ sec.4, T.6 N., R.15 E., at Webb Rd., 1.9 miles west of Goodells.	10.7	.32	.03
do	SW¼ sec.3, T.6 N., R.15 E., at Center Rd., 0.7 mile west of Goodells	15.8	.50	.03
Neaton Drain	NW¼ sec.12, T.6 N., R.15 E., at Kitchens Rd., 1.2 miles southeast of Goodells	5.30	0	0
Cowhy Drain	NW¼ sec.12, T.6 N., R.15 E., at Castor Rd., 1.4 miles southeast of Goodells.	33.4	.76	.02
Belle River	SE¼ sec.12, T.6 N., R. 13 E., near Lynch Rd., 1.6 miles east of Lesterville.	108	4.69	.04
Belle River tributary	SW¼ sec.7, T.6 N., R.14 E., at end of Hill Rd., 1.0 mile northwest of Riley Center.	a1.5	0	0
Belle River	SE¼ sec.18, T.6 N., R.14 E., at Riley Center Rd., at Riley Center.	133	5.66	.04
do	NE¼ sec.28, T.6 N., R.14 E., near Gilbert Rd., 2.0 miles northwest of Memphis	149	4.80	.03
do	Gaging station at Memphis (04160600).	151	4.88	.03
do	NE¼ sec.12, T.5 N., R.14 E., near Carroll Rd., 1.6 miles southeast of Memphis.	154	6.19	.04
do	SE¼ sec.12, T.5 N., R.14 E., at Weber Rd., 2.2 miles southeast of Memphis	168	5.71	.03
Rattle Run	SE¼ sec.18, T.5 N., R.16 E., at U.S. Hwy. 25, at Rattle Run.	15.9	0	0

a Approximately.

Low-flow investigations in Washtenaw County, Mich.

On Aug. 9, 10, 1971 a series of discharge measurements were made at many selected locations in Washtenaw County as part of a water resources investigation carried on in cooperation with the Washtenaw County Board of Supervisors. The purpose of the measurements is to determine the occurrence, distribution, and magnitude of dry-weather streamflow. The results, together with continuous streamflow records, ground-water records, and geologic studies are intended as a ground-water reconnaissance aid and an indication of the water-supply potential of the area with particular reference to sustained flow. The measurements are believed to be unaffected by surface runoff due to antecedent precipitation, and thus represent base flow. Records of chemical analyses and water temperatures obtained at the time of this investigation are published in Part 2 of this report.

The drainage areas shown were determined from U.S. Geological Survey topographic maps having scales of 1:24000 or 1:62,500 and a contour interval of 5, 10 or 20 feet.

Discharge measurements made in Washtenaw County, Mich., Aug. 9, 10, 1971

Stream	Location	Drainage area (sq mi)	Discharge (cfs)	Cfs per square mile
Winnewanna Lake Outlet	NW¼ sec.32, T.1 S., R.3 E., at Waterloo Rd., 5.0 miles northwest of Chelsea.	1.66	0.22	0.13
Johnson Drain	NE¼ SE¼ sec.15, T.1 S., R.7 E., at Currie Rd., 1.0 mile southwest of Salem.	3.73	0	0
do	SE¼ sec.24, T.1 S., R.7 E., at Napier Rd., 1.2 miles east of Brookville a/.	11.5	.16	.01
Lower River Rouge	SE¼ sec.13, T.2 S., R.7 E., at Napier Rd., 0.6 mile northwest of Cherry Hill	1.74	0	0
Fowler Creek	NW¼ sec.36, T.2 S., R.7 E., at Ridge Rd., 1.0 mile northeast of Willow Run.	7.45	0	0
Tobin Lake Outlet	NE¼ sec.3, T.1 S., R.6 E., at 8-Mile Rd., 2.8 miles east of Whitmore Lake.	7.84	0	0
O'Connor Drain	NE¼ sec.17, T.1 S., R.6 E., at 6-Mile Rd., 1.9 miles southeast of Whitmore Lake.	9.72	0	0
Horseshoe Lake Outlet	NW¼ sec.8, T.1 S., R.6 E., at Whitmore Lake Rd., at Whitmore Lake.	21.2	.02	.001
Arms Creek	NE¼ sec.5, T.1 S., R.5 E., at Mast Rd., 4.4 miles southwest of Hamburg a/.	20.9	1.71	.08
Portage Creek	NE¼ sec.6, T.1 S., R.3 E., at Bowish Rd., 1.5 miles southwest of Williamsville.	16.4	1.08	.07
South Lake Oultet	NE¼ sec.9, T.1 S., R.3 E., at Boyce Rd., 2.0 miles southwest of Unadilla.	15.7	.18	.01
Portage River	SE¼ sec.31, T.1 N., R.4 E., at Glenbrook Rd., 2.8 miles east of Unadilla.	71.6	2.19	.03
do	Gaging station near Pinckney (04172500).	79.1	1.30	.02
Huron River	Gaging station near Dexter (04173000).	527	46.8	.09
Mill Creek	SW¼ sec.36, T.2 S., R.3 E., at Manchester Rd., 3.3 miles southeast of Sylvan a/.	11.1	2.13	.19
Mill Creek tributary	SE¼ sec.7, T.3 S., R.4 E., at Esch Rd., 5.6 miles northeast of Manchester.	11.0	1.55	.14
do	NW¼ sec.1, T.3 S., R.3 E., at Waldo Rd., 3.7 miles southeast of Sylvan a/.	23.8	2.42	.10
Mill Creek tributary	NE¼ sec.35, T.2 S., R.4 E., at Liberty Rd., 2.8 miles southeast of Lima Center.	9.70	.47	.05
Mill Creek	NE¼ sec.26, T.2 S., R.4 E., at Jerusalem Rd., 2.0 miles southeast of Lima Center.	59.8	8.08	.14
North Fork Mill Creek	SE¼ sec.1, T.2 S., R.3 E., at Mckinley Rd., 0.5 mile north of Chelsea.	14.6	.45	.03
Letts Creek	NE¼ sec.12, T.2 S., R.3 E., at State Highway 52, at Chelsea a/.	18.8	1.66	.09
Fourmile Lake Outlet	NW¼ sec.9, T.2 S., R.4 E., at Dexter-Chelsea Rd., 2.5 miles east of Chelsea.	9.89	.01	.001
North Fork Mill Creek	NE¼ sec.21, T.2 S., R.4 E., at Lima Center Rd., 0.2 mile south of Lima Center.	53.0	2.70	.05

Low-flow investigations in Washtenaw County, Mich.

Discharge measurements made in Washtenaw County, Mich., Aug. 9, 10, 1971--Continued

Stream	Location	Drainage area (sq mi)	Discharge (cfs)	Cfs per square mile
North Fork Mill Creek tributary	NE¼ sec.21, T.2 S., R.4 E., at Lima Center Rd., 0.5 mile south of Lima Center.	4.64	0.36	0.08
North Fork Mill Creek	SW¼ sec.23, T.2 S., R.4 E., at Dancer Rd., 1.2 miles southeast of Lima Center a/.	59.0	3.51	.06
Mill Creek tributary	NE¼ sec.25, T.2 S., R.4 E., at Jerusalem Rd., 2.8 miles southeast of Lima Center a/.	8.46	.47	.06
Mill Creek	Gaging station near Dexter (04173500).	130	14.4	.11
do	NW¼ sec.6, T.2 S., R.5 E., at Island Lake Rd., at Dexter.	143	13.1	.09
Huron River	SW¼ sec.32, T.1 S., R.5 E., at Mast Rd., at Dexter.	686	61.8	.09
Huron River tributary	SW¼ sec.2, T.2 S., R.5 E., at Huron River Drive, at Delhi Mills.	8.02	.95	.12
Honey Creek	SE¼ sec.21, T.2 S., R.5 E., at Zeeb Rd., 2.2 miles south of Scio.	8.99	.21	.02
do	NE¼ sec.14, T.2 S., R.5 E., at Miller Rd., 1.4 miles west of Foster a/.	22.4	1.64	.07
Huron River	Gaging station at Ann Arbor (04174500).	736	66.5	.09
Allen Creek	SW¼ sec.21, T.2 S., R.6 E., at Plymouth Rd., at Ann Arbor.	6.99	.22	.03
Pittsfield Drain	SE¼ sec.35, T.2 S., R.6 E., at Huron River Drive, 3.0 miles east of Ann Arbor.	11.0	2.33	.21
Fleming Creek	NW¼ sec.17 T.2 S., R.7 E., at Ford Rd., 1.0 mile east of Dixboro a/.	15.0	.11	.007
Fleming Creek tributary	NE¼ sec.18, T.2 S., R.7 E., at Ford Rd., 0.6 mile northeast of Dixboro a/.	8.08	.46	.06
Fleming Creek	SE¼ sec.25, T.2 S., R.6 E., at Geedes Rd., 0.5 mile north of Geddes.	30.6	3.31	.11
Huron River	NE¼ sec.9, T.3 S., R.7 E., at Michigan Ave., at Ypsilanti.	808	105	.13
Stony Creek	SE¼ sec.21, T.4 S., R.7 E., at Willow Rd., 2.7 miles northwest of Oakville.	6.32	1.05	.17
Sugar Creek	NE¼ sec.23, T.4 S., R.7 E., at Fuller Rd., 1.7 miles northwest of Oakville a/.	13.5	0	0
Paint Creek	NE¼ sec.33, T.3 S., R.7 E., at Merritt Rd., 2.2 miles north of Lincoln a/.	17.5	3.15	.18
do	NE¼ sec.34, T.4 S., R.7 E., at Liss Rd., 1.0 mile north of Oakville a/.	34.9	1.52	.04
Stony Creek	Gaging station near Oakville (04175550).	68.3	3.97	.06
Polzin Drain	SE¼ sec.35, T.4 S., R.7 E., at Torrey Rd., 1.0 mile northeast of Oakville.	7.14	0	0
River Raisin	SW¼ sec.31, T.3 S., R.3 E., at Sharon Valley Rd., 2.0 miles southwest of Sharonville.	121	11.9	.10
River Raisin tributary	SW¼ sec.29, T.3 S., R.3 E., at private road, at Sharonville.	6.14	0	0
River Raisin	Gaging station near Manchester (04175600).	132	11.7	.09
do	SW¼ sec.1 T.4 S., R.3 E., at Austin Rd., at Manchester.	148	19.8	.13

Low-flow investigations in Washtenaw County, Mich.

Discharge measurements made in Washtenaw County, Mich., Aug. 9, 10, 1971--Continued

Stream	Location	Drainage area (sq mi)	Discharge (cfs)	Cfs per square mile
River Raisin tributary	SW¼ sec.8, T.4 S., R.4 E., at Austin Rd., 2.0 miles east of Manchester.	5.54	0.57	0.10
River Raisin	SW¼ sec.17, T.4 S., R.4 E., at Wallace Rd., at Raisin Basin.	161	18.8	.12
do	SE¼ sec.29. T.4 S., R.4 E., at Allen Rd., 1.0 mile north of Clinton.	167	25.4	.15
Iron Creek	NW¼ sec.28, T.4 S., R.3 E., at Sharon Hollow Rd., 4.0 miles southwest of Manchester.	10.5	1.28	.12
do	SW¼ sec.29, T.4 S., R.4 E., at Bartlet Rd., 1.7 miles north of Clinton a/.	28.8	3.15	.11
River Raisin	Gaging station near Tecumseh (04175700).	267	35.0	.13
North Macon Creek	NW¼ sec.5, T.5 S., R.6 E., at Hack Rd., 1.7 miles southwest of Mooreville a/.	14.5	0	0
Saline River	SE¼ sec.14, T.4 S., R.4 E., at McCollum Rd., 2.7 miles east of Raisin Basin.	11.4	.55	.05
do	NW¼ sec.17, T.4 S., R.5 E., at Feldkamp Rd., 0.7 mile northwest of Benton a/.	28.8	1.39	.05
Saline River tributary	NW¼ sec.4, T.4 S., R.5 E., at Austin Rd., 3.5 miles west of Saline.	7.30	.27	.04
Saline River tributary	SE¼ sec.34, T.3 S., R.5 E., at Saline Waterworks Rd., 2.2 miles northwest of Saline a/.	13.2	.17	.01
Saline River	SE¼ sec.1, T.4 S., R.5 E., at Monroe St., at Saline a/.	77.6	6.86	.09
Koch-Warner Drain	SW¼ sec.6, T.4 S., R.6 E., at Saline-Milan Rd., at Saline.	12.1	3.52	.29
Saline River	Gaging station near Saline (04176400).	94.6	8.40	.09
Saline River tributary	SW¼ sec.17, T.4 S., R.6 E., at Saline-Milan Rd., 3.0 miles southeast of Saline.	5.44	.38	.07
Saline River	SW¼ sec.1, T.5 S., R.6 E., at U.S. Highway 23, at Milen a/.	113	9.12	.08

a At low-flow partial-record station.

Huron River basin low-flow investigation

On August 9, 10, 1971, a series of discharge measurements were made at many selected locations in the Huron River basin as part of a water-resources investigation carried on in cooperation with U.S. Army Engineers District, Detroit, Corps of Engineers, Detroit, Michigan, for the determination of the occurrence, distribution, magnitude, and quality of streamflow. The measurements were unaffected by surface runoff from antecedent precipitation and are representative of base-flow conditions. This investigation is used in conjunction with streamflow records, levels of ground-water aquifers, and geologic studies for the determination of ground-water yields at selected points in the basin. Records of chemical analysis and water temperature obtained at the time of this investigation are published in Part 2 of this report.

The drainage areas shown were determined from U.S. Geological Survey topographic maps having scales of 1:24,000 or 1:62,500 and contour intervals of 5, 10, or 20 feet.

Discharge measurements of Huron River and tributaries near Ann Arbor, Mich., Aug. 9, 10, 1971

Stream	Location	Drainage area (sq.mi.)	Discharge (cfs)	Cfs per square mile
Huron River	SW1/4 sec.3, T.3 N., R.8 E., at White Lake Rd., 5.0 miles southwest of Clarkston.	13.9	0.10	0.007
do	SE1/4 sec.13, T.3 N., R.8 E., at Pontiac Lake Rd., 4.4 miles southwest of Drayton Plains.	20.7	.64	.03
do	SE1/4 sec.27, T.3 N., R.8 E., at Oxbow Lake Rd., 2.9 miles north of Commerce.	27.6	1.65	.06
Hayes Creek	SE1/4 sec.10, T.2 N., R.8 E., at Tanworth Dr., 0.6 mile east of Commerce.	9.49	2.28	.24
Huron River	Gaging station at Commerce (04169500).	58.0	5.29	.09
do	W1/2 sec.18, T.2 N., R.8 E., in park upstream from Wixom Rd., 2.2 miles southeast of Milford.	83.6	8.20	.10
Norton Creek	NE1/4 sec.25, T.2 N., R.7 E., at Buno Rd., 3.2 miles southeast of Milford.	18.3	2.89	.16
Pettibone Creek	NE1/4 sec.10, T.2 N., R.7 E., at Commerce Rd., at Milford.	12.0	.76	.06
Huron River	Gaging station at Milford (04170000).	135	23.5	.17
do	Gaging station near New Hudson (04170500).	152	23.7	.16
Mann Creek	NW1/4 sec.27, T.2 N., R.6 E., at Spencer Rd., 3.0 miles east of Brighton.	17.8	2.96	.17
Woodruff Creek	NW1/4 sec.2, T.1 N., R.6 E., at Grand River Rd., 4.0 miles east of Brighton.	36.3	5.11	.14
Huron River	NW1/4 sec.16, T.1 N., R.6 E., at McCabe Rd., 2.5 miles southwest of Greenoak.	200	36.3	.18
Davis Creek	NE1/4 sec.18, T.1 N., R.7 E., at Pontiac Trail Rd., 2.0 miles north of South Lyon.	24.4	.44	.02
Inchwagh Lake Outlet	NE1/4 sec.26, T.1 N., R.6 E., at Rushton Rd., 2.6 miles west of South Lyon.	18.9	.07	.004
Davis Creek	NW1/4 sec.21, T.1 N., R.6 E., at Silver Lake Rd., 3.3 miles north of Whitmore Lake.	66.6	3.73	.06
South Ore Creek	NW1/4 sec.12, T.1 N., R.5 E., at Hamburg Rd., 2.5 miles southwest of Brighton. (old gaging station, 04171500.)	33.7	1.52	.05
Huron River	Gaging station near Hamburg (04172000).	313	41.3	.13
Horseshoe Lake Outlet	NW1/4 sec.8, T.1 S., R.6 E., at Whitmore Lake Rd., at Whitmore Lake.	21.4	.02	.001
do	NW1/4 sec.26, T.1 N., R.5 E., at Merrill Rd., 1.0 mile west of Hamburg.	30.7	1.75	.06
Chilson Creek	NW1/4 sec.21, T.1 N., R.5 E., at State Highway 36, 1.0 mile west of Lakeland.	15.5	.69	.04
Arms Creek	NE1/4 sec.5, T.1 S., R.5 E., at Mast Rd., 4.4 miles southwest of Hamburg a/.	20.9	1.71	.08
Portage Creek	NE1/4 sec.6, T.1 S., R.3 E., at Bowdish Rd., 1.5 miles southwest of Williamsville.	16.4	1.08	.07
do	NW1/4 sec.33, T.1 N., R.3 E., at Williamsville Rd., at Williamsville.	33.2	1.66	.05
South Lake Outlet	NE1/4 sec.9, T.1 S., R.3 E., at Boyce Rd., 2.0 miles southwest of Unadilla.	13.6	.18	.01
Livermore Creek	NW1/4 sec.24, T.1 N., R.3 E., at State Highway 36, 2.2 miles northeast of Unadilla.	8.42	.10	.01
Portage River	Gaging station near Pinckney (04172500).	79.1	1.30	.02

Huron River basin low-flow investigation

Discharge measurements of Huron River and tributaries near Ann Arbor, Mich., Aug. 9, 10, 1971--Continued

Stream	Location	Drainage area (sq.mi.)	Discharge (cfs)	Cfs per square mile
Huron River	Gaging station near Dexter (04173000).	527	46.8	0.09
Mill Creek	SW1/4 sec.36, T.2 S., R.3 E., at Manchester Rd., 3.3 miles southeast of Sylvan a/.	11.1	2.13	.19
Mill Creek tributary	NW1/4 sec.1, T.3 S., R.3 E., at Waldo Rd., 3.7 miles southeast of Sylvan a/.	23.8	2.42	.10
Mill Creek tributary	NE1/4 sec.35, T.2 S., R.4 E., at Liberty Rd., 2.7 miles southeast of Lima Center.	9.70	.47	.05
Mill Creek	NE1/4 sec.26, T.2 S., R.4 E., at Jerusalem Rd., 2.0 miles southeast of Lima Center.	59.8	8.08	.14
North Fork Mill Creek	SE1/4 sec.1, T.2 S., R.3 E., at McKinley Rd., 0.5 mile north of Chelsea.	14.6	.45	.03
Letts Creek	NE1/4 sec.12, T.2 S., R.3 E., at State Highway 52, at Chelsea a/.	18.8	1.66	.09
Fourmile Lake Outlet	NW1/4 sec.9, T.2 S., R.4 E., at Dexter-Chelsea Rd., 2.5 miles east of Chelsea.	9.89	.01	.001
North Fork Mill Creek	SW1/4 sec.23, T.2 S., R.4 E., at Dancer Rd., 1.2 miles southeast of Lima Center a/.	59.0	3.51	.06
Mill Creek tributary	NE1/4 sec.25, T.2 S., R.4 E., at Jerusalem Rd., 2.8 miles southeast of Lima Center a/.	8.46	.47	.06
Mill Creek	Gaging station near Dexter (04173500).	130	14.4	.11
do	NW1/4 sec.6, T.2 S., R.5 E., at Island Lake Rd., at Dexter.	143	13.1	.09
Huron River	SW1/4 sec.32, T.1 S., R.5 E., at Mast Rd., at Dexter.	686	61.8	.09
Huron River tributary	SW1/4 sec.2, T.2 S., R.5 E., at Huron River Drive, at Delhi Mills.	8.02	.95	.12
Honey Creek	SE1/4 sec.21, T.2 S., R.5 E., at Zeeb Rd., 2.2 miles south of Scio.	8.99	.21	.02
do	NE1/4 sec.14, T.2 S., R.5 E., at Miller Rd., 1.4 miles west of Foster a/.	22.4	1.64	.07
Huron River	Gaging station at Ann Arbor (04174500).	736	66.5	.09
Allen Creek	SW1/4 sec.21, T.2 S., R.6 E., at Plymouth Rd., at Ann Arbor.	6.99	.22	.03
Pittsfield Drain	SE1/4 sec.35, T.2 S., R.6 E., at Huron River Drive, 3.0 miles east of Ann Arbor.	11.0	2.33	.21
Fleming Creek	NW1/4 sec.17, T.2 S., R.7 E., at Ford Rd., 1.0 mile east of Dixboro a/.	15.0	.11	.007
Fleming Creek tributary	NE1/4 sec.18, T.2 S., R.7 E., at Ford Rd., 0.6 mile northeast of Dixboro a/.	8.08	.46	.06
Fleming Creek	SE1/4 sec.25, T.2 S., R.6 E., at Geddes Rd., 0.5 mile north of Geddes.	30.6	3.31	.11
Huron River	NE1/4 sec.9, T.3 S., R.7 E., at Michigan Ave., at Ypsilanti.	808	105	.13
Griggs Drain	NW1/4 sec.36, T.3 S., R.8 E., at Haggerty Hwy., 3.0 miles southeast of Belleville.	9.95	.12	.01
Huron River	SW1/4 sec.31, T.4 S., R.10 E., at Telegraph Rd., at Flat Rock.	866	44.9	.05
Silver Creek	NW1/4 sec.14, T.5 S., R.10 E., on Streicher Rd., 1.5 miles southeast of Rockwood.	22.9	.53	.02

a/ At low-flow partial record station.

Low-flow investigations in Monroe County, Mich.

On Aug. 5, 1971 a series of discharge measurements were made at many selected locations in Monroe County as part of a water resources investigation. The purpose of the measurements is to determine the occurrence, distribution, and magnitude of dry-weather streamflow. The results, together with continuous streamflow records, ground-water records, and geologic studies are intended as a ground-water reconnaissance aid and an indication of the water-supply potential of the area with particular reference to sustained flow. The measurements are believed to be unaffected by surface runoff due to antecedent precipitation, and thus represent base flow. Records of chemical analyses and water temperatures obtained at the time of this investigation are published in Part 2 of this report.

The drainage areas shown were determined from U. S. Geological Survey topographic maps having scales of 1:24000 or 1:62,500 and a contour interval of 5, 10 or 20 feet.

Discharge measurements made in Monroe County, Mich., Aug. 5, 1971

Stream	Location	Drainage area (sq mi)	Discharge (cfs)	Cfs per square mile
Swan Creek	SE¼ sec.4, T.5 S., R.8 E., at Sumpter Rd., 4.6 miles west of Carleton	14.1	0	0
do	NW¼ sec.7, T.5 S., R.9 E., at Burns Rd., 1.3 miles northwest of Carleton	a28.5	0	0
North Branch Swan Creek	NE¼ sec.5, T.5 S., R.9 E., at Will Carleton Drive, at Waltz.	20.3	0	0
Polzin Drain	SE¼ sec.35, T.4 S., R.7 E., at Torrey Rd., 6.0 miles east of Milan	7.14	0	0
Stony Creek	SE¼ sec.12, T.5 S., R.7 E., at Rawsonville Rd., 4.2 miles north of Maybee.	a79	2.87	.04
Stony Creek	NE¼ sec.25, T.5 S., R.8 E., at Exeter Rd., Rd., 2.8 miles southwest of Carleton	105	3.09	.03
Sandy Creek	NW¼ sec.21, T.6 S., R.9 E., at Monroe St., 3.0 miles north of Monroe	a12.3	0	0
Little Sandy Creek	NE¼ sec.29, T.6 S., R.9 E., at Monroe St., 2.3 miles north of Monroe	a10	.001	0
River Raisin	NE¼ sec.34, T.7 S., R.4 E., at Crockett Ave. 3.2 miles west of Blissfield	470	53.0	.11
Plum Creek	SW¼ sec.34, T.6 S., R.8 E., at Raisinville Rd., 3.0 miles west of Monroe		.003	0
Pitts Creek	NE¼ sec.4, T.7 S., R.8 E., at Raisinville Rd., 3.0 miles west of Monroe		0	0
Otter Creek	SW¼ sec.16, T.7 S., R.8 E., at Goutz Rd., 5.3 miles southwest of Monroe.		0	0
South Branch Otter Creek	SE¼ sec.17, T.7 S., R.8 E., at Suder Rd., 5.5 miles southwest of Monroe.		0	0
Otter Creek	NW¼ sec.25, T.7 S., R.8 E., at LaPlaisance Rd., Rd., 4.5 miles south of Monroe.		0	0

a Approximately

Low-flow investigations in southeastern Michigan

On Aug. 31, Sept. 1, 1971 a series of discharge measurements were made on many incidental streams in southeastern Michigan that flow directly into either the St. Clair River, Lake St. Clair, Detroit River or Lake Erie. The measurements are part of a water resources investigation carried on in cooperation with U.S. Army Engineers District, Detroit, Corps of Engineers, Detroit, Mich. The purpose of the measurements is to determine the occurrence, distribution, and magnitude of dry-weather streamflow. The results, together with continuous streamflow records, ground-water records, and geologic studies are intended as a ground-water reconnaissance aid and an indication of the water-supply potential of the area with particular reference to sustained flow. The measurements are believed to be unaffected by surface runoff due to antecedent precipitation, and thus represent base flow. Records of chemical analyses and water temperatures obtained at the time of this investigation are published in Part 2 of this report.

The drainage areas shown were determined from U. S. Geological Survey topographic maps having scales of 1:24000 or 1:62,500 and a contour interval of 5, 10 or 20 feet.

Discharge measurements made in southeastern Michigan Aug. 31, Sept. 1, 1971

Stream	Location	Drainage area (sq mi)	Discharge	Cfs per square mile
Marsh Drain	Private claim 186, T.3 N., R.16 E., St. Clair County, at Broadbridge Rd., 3.2 miles southeast of Marine City.	4.94	0	0
Beaubien Creek	NW¼ sec.20, T.3 N., R.16 E., St Clair County, at Starville Rd., 1.0 mile south of Starville.	11.8	0	0
Swan Creek	SW¼ sec.24, T.4 N., R.15 E., St Clair County, at Meisner Rd., 0.7 mile northeast of Peters.	5.30	0	0
do	SE¼ sec.11, T.3 N., R.15 E., St Clair County, at Shortcut Rd., 1.1 miles northeast of Fairhaven.	15.8	0	0
Swan Creek tributary	SW¼ sec.10, T.3 N., R.15 E., St Clair County, at Shortcut Rd., 1.1 miles east of Anchorville.	11.2	.08	.007
Marsac Creek	SW¼ sec.8, T.3 N., R.15 E., St Clair County, at Bethuy Rd., at New Baltimore.	5.68	.08	.01
Salt River	SE¼ sec.22, T.4 N., R.14 E., Macomb County, at 28-Mile Rd., 1.7 miles northeast of New Haven.	8.98	1.80	.20
Fish Creek	SE¼ sec.15, T.3 N., R.14 E., Macomb County, at 23-Mile Rd., 2.9 miles west of New Baltimore.	7.10	.09	.01
Ecorse River	SE¼ sec.36, T.2 S., R.9 E., Wayne County, at Inkster Rd., 1.3 miles south of Inkster.	7.32	.002	0
do	Private Claim 51, T.3 S., R.11 E., Wayne County, at Dix Rd., at Lincoln Park.	16.5	.33	.02
South Branch Ecorse River	NE¼ sec.24, T.3 S., R.10 E., Wayne County, at Hazel Rd., at Lincoln Park.	11.7	1.10	.09
Frank and Poet Drain	NE¼ sec.34, T.3 S., R.10 E., Wayne County, at Allen Rd., at Southgate.	9.65	.06	.006
do	SW¼ sec.24, T.4 S., R.10 E., Wayne County, at Van Horn Rd., at Trenton.	17.4	.51	.03
Brownstown Creek	NE¼ sec.34, T.4 S., R.10 E., Wayne County, at Allen Rd., 1.5 miles east of Gibraltar.	7.39	.08	.01
Blakely Drain	NE¼ sec.2, T.4 S., R.9 E., Wayne County, at Middle Belt Rd., 3.5 miles southeast of Romulus.	11.6	.07	.006
Marsh Creek	SW¼ sec.26, T.4 S., R.10 E., Wayne County, at Vreeland Rd., 1.5 miles northwest of Gibraltar.	26.4	.73	.03
Bradshaw Drain	SW¼ sec.32, T.4 S., R.8 E., Wayne County, at Oakville-Waltz Rd., 3.5 miles east of Oakville.	10.5	1.02	.10

Low-flow investigations in southeastern Michigan—Continued

Discharge measurements made in southeastern Michigan Aug. 31, Sept. 1, 1971

Stream	Location	Drainage area (sq mi)	Discharge	Cfs per square mile
Swan Creek	SE¼ SW¼ sec.1, T.5 S., R.8 E., Monroe County, at Carleton-West Rd., 2.3 miles northwest of Carleton.	17.4	0	0
Disbrow Drain	NE¼ SW¼ sec.1, T.5 S., R.8 E., Monroe County, at Carleton-West Rd., 2.5 miles northwest of Carleton.	9.64	.08	.008
Swan Creek	NE¼ sec.8, T.5 S., R.9 E., Monroe County, at Grafton Rd., 1.0 miles northeast of Carleton.	35.0	.08	.002
North Branch Swan Creek	SW¼ sec.24, T.4 S., R.8 E., Wayne County, at Carleton-west Rd., 2.6 miles northwest of Waltz.	13.5	0	0
do	SE¼ sec.4, T.5 S., R.9 E., Monroe County, at Newburg Rd., 1.7 miles northeast of Carleton.	21.1	0	0
Little Swan Creek	SE¼ sec.22, T.5 S., R.9 E., Monroe County, at Sweitzer Rd., 2.6 miles southeast of Carleton.	11.8	0	0
Swan Creek	NE¼ sec.1, T.6 S., R.9 E., Monroe County, at Brandon Rd., at Newport.	88.4	0	0
Stony Creek	SE¼ sec.21, T.4 S., R.7 E., Washtenaw County, at Willow Rd., 2.7 miles northwest of Oakville.	6.32	.87	.14
Sugar Creek	NE¼ sec.33, T.4 S., R.7 E., Washtenaw County, at Fuller Rd., 1.8 miles northwest of Oakville.	13.5	0	0
Paint Creek	NE¼ sec.33, T.3 S., R.7 E., Washtenaw County, at Merritt Rd., 3.3 miles northwest of Willis.	17.5	2.74	.16
do	NE¼ sec.34, T.4 S., R.7 E., Washtenaw County, at Liss Rd., 1.0 miles north of Oakville.	34.9	1.92	.06
Stony Creek	Gaging station at Oakville (04175550).	68.0	2.93	.04
Polzin Drain	SE¼ sec.35, T.4 S., R.7 E., Washtenaw County, at Torrey Rd., 1.2 miles northeast of Oakville.	7.14	0	0
Stony Creek	SW¼ sec.17, T.5 S., R.8 E., Monroe County, at Timbers Rd., 2.8 miles north of Maybe.	90.0	2.65	.03
do	NE¼ sec.25, T.5 S., R.8 E., Monroe County, at Exeter Rd., 2.9 miles southwest of Carleton.	105	2.96	.03
Robert Drain	NW¼ sec.5, T.6 S., R.9 E., Monroe County, at South Stony Creek Rd., 4.0 miles south of Carleton.	8.71	0	0
Stony Creek	NE¼ sec.22, T.6 S., R.9 E., Monroe County, at Mentel Rd., 3.2 miles southwest of Newport.	121	2.00	.02
Sandy Creek	Private claim 646, T.6 S., R.9 E., Monroe County, at Telegraph Rd., 3.4 miles north of Monroe.	12.9	0	0
Little Sandy Creek	Private claim 353, T.6 S., R.9 E., Monroe County, at North Monroe St., 3.0 miles north of Monroe.	10.8	.01	.001
Sandy Creek	Private Claim 476, T.6 S., R.9 E., Monroe County, at North Dixie Hwy., 3.2 miles northeast of Monroe.	29.6	0	0
Plum Brook	Private claim 521, T.6 S., R.7 E., Monroe County, at Geiger Rd., 2.3 miles northeast of Ida.	10.9	0	0

Low-flow investigations in southeastern Michigan--Continued

Discharge measurements made in southeastern Michigan Aug. 31, Sept. 1, 1971

Stream	Location	Drainage area (sq mi)	Discharge	Cfs per squar. mile
Pitts Creek	Private claim 517, T.7 S., R.8 E., Monroe County, at Raisinville Rd., 1.5 miles east of Strasburg.	11.4	0	0
Plum Creek	Private claim 500, T.7 S., R.9 E., Monroe County, at Kentucky Ave., at Monroe.	32.1	1.20	.04
North Branch Otter Creek	NE¼ sec.11, T.7 S., R.7 E., Monroe County, at Geiger Rd., 1.5 miles southeast of Ida.		0	0
Summerfield and Ida Drain	SE¼ sec.12, T.7 S., R.7 E., Monroe County, at Minx Rd., 2.7 miles southwest of Strasburg.		0	0
South Branch Otter	NE¼ sec.19, T.7 S., R.8 E., Monroe County, at Strasburg Rd., 3.2 miles west of LaSalle.		0	0
Otter Creek	Private claim 47, T.7 S., R.8 E., Monroe County, at State Hwy.25, at LaSalle.		0	0
Muddy Creek	Private claim 384, T.7 S., R.8 E., Monroe County, at Belleterre Rd., 2.1 miles west of Columbus Grove.		0	0
Bay Creek	NE¼ sec.16, T.8 S., R.8 E., Monroe County, at Detroit-Toledo R.R., 1.2 miles east of Erie.		.03	-
Little Lake Creek	NE¼ sec.20, T.8 S., R.8 E., Monroe County, at Suder Rd., 1.4 miles south of Erie.		0	0
Flat Creek	SW¼ sec.20, T.8 S., R.8 E., Monroe County, at Dean Rd., 2.0 miles south of Erie.		0	0
Hoegle Drain	NE¼ sec.2, T.8 S., R.6 E., Monroe County, at School Rd., 4.1 miles west of Samaria.		0	0
Halfway Creek	SW¼ sec.1, T.8 S., R.6 E., Monroe County, at Cummins (Samaria) Rd., 4.0 miles west of Samaria.		0	0
do	SW¼ sec.33, T.8 S., R.7 E., Monroe County, at Smith Rd., 2.3 miles southeast of Lambertville.		1.28	-
Indian Creek	SW¼ sec.36, T.8 S., R.7 E., Monroe County, at LaVoy Rd., 3.2 miles southeast of Temperance.		.08	-
Big Ravine Drain	SE¼ sec.19, T.8 S., R.6 E., Monroe County, at Lansing Rd., at Ottawa Lake.		0	0
Ottawa Lake Outlet	SE¼ sec.27, T.8 S., R.6 E., Monroe County, at Sterns Rd., 3.1 miles southwest of Lambertville.		0	0
North Branch Tenmile Creek	SE¼ sec.34, T.8 S., R.6 E., Monroe County, at Hicker Rd., 3.6 miles southwest of Lambertville.		0	0

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WATER RESOURCES DATA FOR MICHIGAN—PART 1. SURFACE WATER RECORDS 1971