Surface Water Supply of the United States 1949

Part 4. St. Lawrence River Basin

Prepared under the direction of C. G. PAULSEN, *Chief Hydraulic Engineer*

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PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Vermont, and Wisconsin and other agencies, by personnel of the Water Resources Division under the direction of:

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SCOPE OF WORK

This volume is one of a series of 14 reports presenting results of measurements of stage and flow made on streams, lakes, and reservoirs in the United States during the water year ending September 30, 1949. The work was begun in 1888 in connection with special studies relating to irrigation. Measurements of the flow of streams and of the stage and contents of lakes and reservoirs have been made at about 11,680 gaging stations in the 48 States and also at many in the Territories of Alaska and Hawaii. On September 30, 1949, 6,240 gaging stations, including those in Hawaii and Alaska were being maintained by the Geological Survey and cooperating organizations. Miscellaneous discharge measurements were made during the water year at many other points.

In the execution of the work many State and private organizations have cooperated, either by furnishing data or by assisting in collecting data. Cooperation of the first kind is acknowedged in connection with the description of each station affected; cooperation of the second kind is acknowledged, under the heading "Cooperation," in the introductory matter that precedes the gaging-station records in each volume. In the present volume, the section on cooperation of the second kind appears on page 12.

DEFINITION OF TERMS

The units in which stream-flow data are presented in this report and other terms used herein are defined as follows:

"Second-feet" is an abbreviation for "cubic feet per second " A second-foot is the rate of discharge of a stream whose channel is 1 square foot in cross-sectional area and whose average velocity is 1 foot per second.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the runoff is distributed uniformly both as regards time and area.

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

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

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

"Stage-discharge relation" is an abbreviation for the term "relation between gage height and discharge."

"Control" is a term used to designate a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural section, a reach of the channel, or an artificial structure.

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

EXPLANATION OF DATA

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supplement the records of stage and discharge measurements in determining the daily flow. The records of stage are obtained either from direct readings on a nonrecording gage or from a water-stage recorder that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter by the general methods outlined in standard textbooks on the measurement of river discharge. Typical structures in use at gaging stations are shown in figure 1.

Rating tables giving the discharge for any stage are prepared from the discharge measurements. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the monthly and the yearly mean discharge are computed. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the "shifting-control method " in which correction factors based on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. At times the stage-discharge relation for a station may be temporarily changed by the presence of aquatic growth or debris on the control. For such times the daily mean discharge is computed by what is essentially the "shifting-control" method, described above.

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

At most gaging stations in the northern part of the United States and at some in the mountainous regions of other parts the stage-discharge relation is affected by ice during the winter, which makes it impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed on the basis of the gage-height record and occasional winter discharge measurements, consideration being given to the available information on temperature and precipitation, notes by gage observers and engineers, and comparable records of discharge for stations in the same or nearby basins. For those stations at which the stage-discharge relation is affected by ice, the days included in the periods of ice effect either are indicated in the table by symbols referring to a footnote that states this fact or are given in a general note following the table. The days on which discharge measurements were made during or between periods of ice effect, shortly before the first period, or shortly after the last period are similarly indicated by a footnote.

For most of the gaging stations on streams in the area covered by this report the data presented comprise a description of the station a table showing the daily discharge of

A. LITTLE WOLF RIVER AT ROYALTON, WIS.

B. BLACK RIVER NEAR BOONVILLE, N. Y.

FIGURE 1.—GAGING-STATION STRUCTURES

the stream, and a table of monthly and yearly discharge and runoff. Skeleton rating tables are published for all stations except those at which the daily discharge for the greater part of the year was determined by the shifting-control method, the slope method, or other special methods.

The description of the station gives the type of gage, location, drainage area, records available, average discharge, extremes of discharge, general remarks, and notations of revisions of previously published record. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Under "Average discharge" is given the average discharge for the number of years indicated. It is not given for stations having less than 10 complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "Extremes" are given the maximum discharge and gage height; the minimum discharge if there is little or no regulation; the minimum daily discharge if there is extensive regulation (also the minimum discharge if useful); and the minimum gage height (unless it is of no importance). Unless otherwise qualified, the maximum discharge corresponds to the crest stage, obtained by use of a water-stage recorder or a nonrecording gage read at the time of the crest. Information pertaining to the accuracy of the records and conditions which affect the natural flow at the gaging station is given under "Remarks."

For some stations previously published records have been found to be in error on the basis of data or information obtained subsequently. Revisions of such records are usually published along with the current records in one of the annual reports. In order to make it easier to find such revised records, a paragraph headed "Revisions (water years)" has been added to the station description of all stations for which revised records have been published. Listed therein are all the reports in which revisions appear, each followed by the water years for which figures are revised in that report. In listing the report number, W. means Water-Supply Paper. In listing the years, water years are indicated by only 1 year, for instance, 1933 stands for the water year October 1, 1932, to September 30, 1933. If there were no daily, monthly, or annual figures of discharge involved in the revision, that fact is brought out by notations after the year dates as follows: (M) means that only the instantaneous maximum discharge was revised; (m) that only the instantaneous minimum was revised; and (P) that only peak discharges were revised. If the drainage area has been revised, the report in which the revised figure was first published is given. It should be noted that for all stations for which second-feet 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 second-feet 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.

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

corresponding to either once-daily readings of the gage, the mean of twice-daily readings, or the mean gage height determined from gage-height graphs based on gage readings. For periods of rapidly changing stage, the daily mean discharge is determined from gage-height graphs based on gage readings, the frequency of which is stated in the station description.

In the table of monthly discharge the column headed "Second-foot-days" gives the sum for each month of the figures given in the table of daily discharge. The column headed "Maximum" gives the maximum daily discharge, not the momentary discharge when the water surface was at crest stage. Likewise, in the column headed "Minimum" the quantity given is the minimum daily discharge. The column headed "Mean" gives the average flow in cubic feet per second during the month.

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

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

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of stream-flow data depends primarily on (1) the permanency 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 flow, and interpretation of records.

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

Yield at some stations as indicated by monthly means may vary widely from natural yield, owing to diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or other factors. For such stations figures of "second-feet per square mile" and "runoff in inches" are not published unless storage or diversion records are included indicating the extent of the regulation or diversion or unless satisfactory adjustments can be made for changes in contents or reservoirs or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless its inclusion is indicated. Even at those stations where adjustments are made, in some instances large errors in computed yields may occur when relatively large negative adjustments are applied or when evaporation is large in comparison with the observed discharge. Figures of second-feet per square mile and runoff in inches are also omitted if the drainage area includes large noncontributing areas or if the average annual rainfall over the drainage area is less than 20 inches.

Many gaging stations on streams in the irrigated areas of the United States are situated above most of the diversions from those streams, and therefore the discharge recorded does not show the water supply available for further development, as prior appropriations below the station must first be satisfied.

The table of monthly discharge presents in summary the distribution of the flow past the station. The table of daily discharge affords opportunity for more detailed studies of the variation in flow. As further observations in each succeeding year may be expected to throw new light on data previously published, it should be borne in mind that such data are subject to revision in succeeding water-supply papers.

PUBLICATIONS

The results of stream-flow measurements are now published annually in 14 parts, each part covering an area whose boundaries coincide with natural drainage features as indicated below:

Part 1. North Atlantic slope basins (St. John River to York River).
2. South Atlantic slope and eastern Gulf of Mexico basins (James River to Mississippi River).
3. Ohio River Basin.
4. St. Lawrence River Basin.
5. Hudson Bay and upper Mississippi River Basins.
6. Missouri River Basin.
7. Lower Mississippi River Basin.
8. Western Gulf of Mexico basins.
9. Colorado River Basin.
10. The Great Basin.
11. Pacific slope basins in California.
12. Pacific slope basins in Washington and upper Columbia River Basin.
13. Snake River Basin.
14. Pacific slope basins in Oregon and lower Columbia River Basin.

Water-supply papers and other publications of the Geological Survey containing data on the water resources of the United States may be obtained or consulted as explained below.

1. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will, on application, furnish lists giving prices.

2. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

3. Sets are available for consultation in the offices of the water resources division of the Geological Survey as follows:

East of the Mississippi River:
Albany, N. Y., 526 Federal Building.
Asheville, N. C., 220 Post Office Building.
Atlanta, Ga., 411 Grand Theater Building.
Augusta, Maine, 420 Statehouse.
Baton Rouge, La., 538 Florida Street.
Boston, Mass., 939 Post Office Building.
Champaign, Ill., 605 South Neil Street.
Charleston, W. Va., 408 Union Building.
Charlottesville, Va., Cabell Hall, University of Virginia.
Chattanooga, Tenn., 442 Post Office Building.
College Park, Md., 106 Engineering Building, University of Maryland.
Columbia, S. C., 207 Creason Building.
Columbus, Ohio, 2590 West Hardin St., Ohio State University.
Harrisburg, Pa., 490 Education Building.
Hartford, Conn., 203 Federal Building.
Indianapolis, Ind., 311 West Washington Street.
Jackson, Miss., 208 Millsaps Building.
Knoxville, Tenn., 337 Post Office Building.
Louisville, Ky., 531 Federal Building.
Madison, Wis., 666 State Office Building.
Montgomery, Ala., 507 Post Office Building.
New Philadelphia, Ohio, Muskingum Watershed Conservancy District Building.
Ocala, Fla., Building 211, Camp Roosevelt.
Pittsburgh, Pa., 515 Plaza Building.
Raleigh, N. C., 908 Capitol Club Building.
St. Paul, Minn., 1427 New Post Office Building.
Trenton, N. J., 228 Federal Building.
Washington, D. C., General Services Administration Building.

West of the Mississippi River:
Austin, Tex., 302 West Fifteenth Street.
Bismarck, N. Dak., 7 Eltinge Building.
Boise, Idaho, 429 Federal Building.
Denver, Colo., 476 New Customhouse.
Fort Smith, Ark., 6 Post Office Building.
Helena, Mont., 408 Federal Building.
Honolulu, Hawaii, 225 Federal Building.
Idaho Falls, Idaho, 204 Federal Building.
Iowa City, Iowa, 508 Hydraulic Laboratory, University of Iowa.
Lincoln, Nebr., 510 Rudge-Guenzel Building.
Los Angeles, Calif., 429-F United States Post Office and Courthouse.
Oklahoma City, Okla., 203 Council Building.
Pierre, S. Dak., 207 Federal Building.
Portland, Oreg., 606 Post Office Building.
Rolla, Mo., 211 Ramsey Building.
St. Louis, Mo., 1004 New Federal Building.
Salt Lake City, Utah, 303 Federal Building.
San Francisco, Calif., 702 Appraisers Building.
Santa Fe, N. Mex., 204 United States Courthouse.
Tacoma, Wash., 207 Federal Building.
Topeka, Kans., 305 Federal Building.
Tucson, Ariz., 210 Post Office Building.

A list of Geological Survey publications may be obtained by applying to the Director, Geological Survey, Washington, D. C.

Prior to publication, records of discharge in provisional form for individual stations may usually be obtained from the district offices listed above.

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

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

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

Report	Character of data	Year
10th A, pt. 2	Descriptive information only.	
11th A, pt. 2	Monthly discharge and descriptive information	1884 to September 1890.
12th A, pt. 2	....do	1884 to June 30, 1891.
13th A, pt. 3	....do	1884-92.
14th A, pt. 2	Monthly discharge	1888-93.
B 131	Descriptions, measurements, gage heights, and ratings	1893-94.
16th A, pt. 2	Descriptive information only.	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge.	1895.
W 11	Gage heights	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge	1895-96.
W 15	Descriptions, measurements, and gage heights of streams east of the Mississippi River, and Missouri River and tributaries above Kansas River.	1897.
W 16	Descriptions, measurements, and gage heights of stream west of the Mississippi River, except Missouri River and tributaries above Kansas River.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge.	1897.
W 27	Measurements, ratings, and gage heights of streams east of the Mississippi River, and Missouri River and tributaries.	1898.
W 28	Measurements, ratings, and gage heights of streams west of the Mississippi River, except Missouri River and tributaries.	1898.
20th A, pt. 4	Monthly discharge	1898.
W 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
W 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4.	Monthly discharge	1900.
W 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
W 75	Monthly discharge	1901.

Papers on surface water supply containing records from 1899 to date, grouped by years and drainage basins, are listed by number on page 8. The data for any particular gaging station will, in general, be found in the reports covering the years during which the station was maintained. For example, the data for 1910 to 1920 for any station in the area covered by part 3 are published in Water-Supply Papers 283, 303, 323, 353, 403, 433, 453, 473, and 503, which contain records for the Ohio River Basin for those years.

Numbers of water-supply papers containing results of stream measurements, 1899-1949 (for basins included see p. 6).

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1899 a	35	b35, 36	36	36	36	c36, 37	37	37	d37, 38	38, e39	38, f39	38	38	38
1900 g	47, h48	48	48, 149	49	49	49, j50	50	50	50	51	51	51	51	51
1901	65, 75	65, 75	65, 75	65, 75	k65, 66, 75	66, 75	k65, 66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75
1902	82	b82, 83	83	m82, 83	k83, 85	84	k83, 84	84	85	85	85	85	85	85
1903	97	b97, 98	98	97	k98, 99, n100	99	k98, 99	99	100	100	100	100	100	100
1904	o124, p125, q126	q126, 127	128	129	k128, 130	130, r131	k128, 131	132	133	133, s134	134	135	135	135
1905	o165, p166, q167	q167, 168	169	170	171	172	k169, 173	174	175, t177	176, s177	177	178	178	u177, 178
1906	o201, p202, q203	q203, 204	205	206	207	208	k205, 209	210	211, t213	212, s213	213	214	214	214
1907-8	241	242	243	244	245	246	247	248	249	250, s251	251	252	252	252
1909	261	262	263	264	265	266	267	268	269	270, s271	271	272	272	272
1910	281	282	283	284	285	286	287	288	289	290	291	292	292	292
1911	301	302	303	304	305	306	307	308	309	310	311	312	312	312
1912	321	322	323	324	325	326	327	328	329	330	331	332-A	332-B	332-C
1913	351	352	353	354	355	356	357	358	359	360	361	362-A	362-B	362-C
1914	381	382	383	384	385	386	387	388	389	390	391	392	393	394
1915	401	402	403	404	405	406	407	408	409	410	411	412	413	414
1916	431	432	433	434	435	436	437	438	439	440	441	442	443	444
1917	451	452	453	454	455	456	457	458	459	460	461	462	463	464
1918	471	472	473	474	475	476	477	478	479	480	481	482	483	484
1919-20	501	502	503	504	505	506	507	508	509	510	511	512	513	514
1921	521	522	523	524	525	526	527	528	529	530	531	532	533	534
1922	541	542	543	544	545	546	547	548	549	550	551	552	553	554
1923	561	562	563	564	565	566	567	568	569	570	571	572	573	574
1924	581	582	583	584	585	586	587	588	589	590	591	592	593	594
1925	601	602	603	604	605	606	607	608	609	610	611	612	613	614
1926	621	622	623	624	625	626	627	628	629	630	631	632	633	634
1927	641	642	643	644	645	646	647	648	649	650	651	652	653	654
1928	661	662	663	664	665	666	667	668	669	670	671	672	673	674
1929	681	682	683	684	685	686	687	688	689	690	691	692	693	694
1930	696	697	698	699	700	701	702	703	704	705	706	707	708	709
1931	711	712	713	714	715	716	717	718	719	720	721	722	723	724
1932	726	727	728	729	730	731	732	733	734	735	736	737	738	739
1933	741	742	743	744	745	746	747	748	749	750	751	752	753	754
1934	756	757	758	759	760	761	762	763	764	765	766	767	768	769
1935	781	782	783	784	785	786	787	788	789	790	791	792	793	794
1936	801	802	803	804	805	806	807	808	809	810	811	812	813	814
1937	821	822	823	824	825	826	827	828	829	830	831	832	833	834
1938	851	852	853	854	855	856	857	858	859	860	861	862	863	864
1939	871	872	873	874	875	876	877	878	879	880	881	882	883	884
1940	891	892	893	894	895	896	897	898	899	900	901	902	903	904
1941	921	922	923	924	925	926	927	928	929	930	931	932	933	934
1942	951	952	953	954	955	956	957	958	959	960	961	962	963	964
1943	971	972	973	974	975	976	977	978	979	980	981	982	983	984
1944	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014
1945	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044
1946	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064
1947	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094
1948	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124
1949	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154

a Rating tables and index to WSP 35-39 contained in WSP 39. Monthly discharge for 1899 in 21st Annual Report, part 4.
b James River only.
c Gallatin River.
d Green and Gunnison Rivers and Colorado River above Gunnison River.
e Mojave River only.
f Kings and Kern Rivers and south Pacific slope.
g Rating tables and index to WSP 47-52 contained in WSP 52. Monthly discharge for 1900 in 22d Annual Report, part 4.
h Schuylkill River to James River.
i Scioto River.
j Loup, Platte, and Elkhorn Rivers and tributaries below Platte River.
k Tributaries of Mississippi River from east.
m Lake Ontario and tributaries to St. Lawrence River proper.
n Hudson Bay only.
o New England rivers only.
p Hudson River to Delaware River.
q Susquehanna River to Yadkin River.
r Platte and Kansas Rivers.
s The Great Basin in California, except Truckee and Carson River Basins.
t Below mouth of Gila River.
u Rogue, Umpqua, and Siletz Rivers only.

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

Each of the reports on surface water supply for the year 1939, issued as Water-Supply Papers 871 to 884 (see table on p. 8), contains, for the area covered by that report, a summary of yearly discharge at gaging stations at which 10 or more complete years of record have been collected. These summaries are available also as separate reprints.

Reports have been published that are compilations of records for various areas, usually a single State or drainage basin. These reports contain records previously published (some of which have been revised), as well as some records not contained in the annual series of water-supply papers. The following table gives the numbers and titles of these reports, arranged alphabetically, some by States and some by drainage basins.

Reports containing compilations of records of discharge by States and drainage basins

Report	Period	Water-Supply Paper
STATE		
Alabama, Water powers of, with an appendix on stream measurements in Mississippi.	1895-1903	107
California, Water resources of, part 1, Stream measurements in Sacramento River Basin.	1887-1912	298
California, Water resources of, part 2, Stream measurements in San Joaquin River Basin.	1878-1912	299
California, Water resources of, part 3, Stream measurements in the Great Basin and Pacific Coast river basins.	1891-1912	300
California, southern, Surface water supply of Pacific slope of	1890-1918	447
California, Surface water supply of Sacramento River Basin	1895-1927	597-E
California, Surface water supply of San Joaquin River Basin	1895-1927	636-D
California, southern, Surface water supply of Pacific slope basins in	1894-1927	636-E
California, Surface water supply of minor San Francisco Bay, northern Pacific, and Great basins in.	1895-1927	637-A
Colorado, Water resources of	1884-1900	74
Georgia, Water resources of	1895-1905	197
Massachusetts, Surface waters of	1848-1915	415
Massachusetts, Hydrology of, Part 1, Summary of stream-flow and precipitation records.	1863-1945	1105
Nebraska, Surface water supply of	1894-1906	230
Oregon, Surface water supply of	1878-1910	370
Texas, Summary of records of surface waters of	1898-1937	850
Vermont, Surface waters of	1875-1916	424
Washington, Summary of hydrometric data in	1878-1919	492
Washington, Summary of records of surface waters of	1919-35	870
Wisconsin, northern, Water power of	1895-1905	156
Wyoming, Surface waters of, and their utilization	1894-1921	469
DRAINAGE BASIN		
Colorado River (Ariz., Colo., N. Mex., Utah, Wyo.) and its utilization	1888-1914	395
Colorado River, upper (Colo., Utah), and its utilization	1897-1927	617
Colorado River Basin (Ariz., Calif., Colo., Utah, Wyo.), Surface waters at base stations in.	1891-1938	918
Colorado River Basin (Ariz., Calif., Nev., N. Mex., Utah), Surface waters at stations on tributaries in lower.	1888-1938	1049
Columbia River Basin, upper (Mont., Idaho), Surface waters of	1898-1938	916
Great Salt Lake Basin, Water powers of	1889-1920	517
Green River (Colo., Utah, Wyo.) and its utilization	1894-1928	618
Kennebec River Basin (Maine), Water resources of	1890-1908	198
Milk River. See St. Mary and Milk Rivers		
Missouri and St. Mary River Basins (Mont.), Surface waters of	1881-1938	917
New-Kanawha River Basin (N. C., Va., W. Va.), Surface water supply of	1895-1920	536
Penobscot River Basin (Maine), Water resources of	1904-9	279
Potomac River Basin (D. C., Md., W. Va.)	1895-1906	192
Rio Grande Basin (Colo., N. Mex., Tex.), Water resources of	1888-1913	358
St. Mary and Milk Rivers (Mont., Canada), Water supply of	1898-1917	491
St. Mary River. See St. Mary and Milk Rivers; Missouri and St. Mary River Basin.		
Sevier Lake Basin (Utah), Utilization of surface water resources of	1889-1937	920
Susquehanna River Basin (Pa., Md.) Hydrography of	1890-1904	109

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

State reports containing compilations of records of discharge

State	Period	Report	Issued by
Alabama.....	1895-1915	Bull. 17, Water powers of Alabama.....	Geological Survey of Alabama.
Do.....	1904-47	Special Report 20, Water Resources and Hydrology of southeastern Alabama.	Do
Arkansas.....	1857-1928	Stream-gaging Rept. 1.....	Arkansas Geological Survey.
Do.....	1903-48	Surface Water Resources of Arkansas.....	Arkansas Resources and Development Commission; University of Arkansas, Institute of Science and Technology.
Colorado.....	1881-1935	Water resources of Colorado, Appendix 2, Data on stream-gaging stations of Colorado.[1]	State Planning Commission, Water Conservation Board, State engineer.
Do.....	1881-1938	Water resources of Colorado, Appendix 3, vols. 1 and 2, Stream-flow data of Colorado.	Do.
Connecticut...	1900-1927	Bull. 44, Water resources of Connecticut...	State Geological and Natural History Survey.
Do.....	1912-33	5th biennial report.....	State Water Commission.
Florida.....	1898-1946	Bull. 31, Springs of Florida.....	Florida Geological Survey.
Georgia.....	1895-1906	Bull. 16, Water powers of Georgia.....	Geological Survey of Georgia.
Do.....	1907-19	Bull. 38, Water powers of Georgia.....	Do.
Illinois.....	1908-11	Water resources of Illinois.....	Rivers and Lakes Commission.
Do.....	1900-1934	Stream-flow data of Illinois.....	Division of Waterways.
Indiana.....	1923-27	Pub. 72, Surface water supply of Indiana...	Department of Conservation.
Do.....	1927-30	Pub. 112, Surface water supply of Indiana..	Do.
Iowa.....	1873-1932	Stream-flow records of Iowa.....	State Planning Board.
Do.....	1873-1940	Water-Supply Bull. 1, Summaries of yearly and flood flow relating to Iowa streams..	Iowa Geological Survey.
Do.....	1941-42	Water-Supply Bull. 2, Surface water resources of Iowa.	Do.
Kansas.....	1895-1919	Surface waters of Kansas.....	Kansas Water Commission.
Do.....	1919-24	...do.....	Do.
Do.....	1924-28	Report of Division of Water Resources.....	State Board of Agriculture.
Do.....	1928-35	Stream-flow data of Kansas.....	Do.
Do.....	1935-39	...do.....	Do.
Kentucky.....	1910-20	Surface waters of Kentucky.....	Kentucky Geological Survey.
Louisiana.....	1903-38	Geol. Bull. 16, Surface water supply of Louisiana.	Department of Conservation.
Maine.....	1887-1920	1st annual report.....	Maine Water Power Commission.
Maryland.....	1929-37	Flow data and draft storage curves for major streams in Maryland.	State Planning Commission and Water Resources Commission.
Do.....	1892-1943	Bull. 1, Summary of records of surface waters of Maryland and the Potomac River Basin.	Department of Geology, Mines, and Water Resources.
Do.....	1931-48	Bull. 5, Anne Arundel County Water Resources	Do.
Minnesota.....	1909-12	Water-resources investigation of Minnesota.	State Drainage Commission.
Mississippi...	1900-1948	Bull. 68, Surface Waters of Mississippi....	Mississippi Geological Survey.
Missouri.....	1857-1926	Vol. 20, 2d series, Water resources of Missouri.	Missouri Bureau of Geology and Mines.
Do.....	1927-39	Vol. 26, 2d series, Surface waters of Missouri.	Missouri Geological Survey and Water Resources.
Montana.....	1889-1911	5th biennial report.....	Office of the State Engineer.
Do.....	1881-1938	Special Rept. 10, vols. 1-4, Water resources of Montana.	Montana Agricultural Experiment Station.
Nebraska.....	1894-1914	1st hydrographic report.....	Bureau of Water Power, Irrigation, and Drainage.
Do.....	1914-28	2d hydrographic report.....	Do.
New Hampshire.	1889-1922	Annual and statistical report, vol. 12.....	Public Service Commission.
New Jersey....	1892-1928	Bull. 33, Surface water supply of New Jersey.	Department of Conservation and Development.
Do.....	1928-34	Special Rept. 5, Surface water supply of New Jersey.	State Water Policy Commission.
Do.....	1934-40	Special Rept. 9, Surface water supply of New Jersey.	Do.
New Mexico....	1888-1925	Surface water supply of New Mexico.....	Office of the State Engineer.
North Carolina	1889-1923	Bull. 34, Discharge records of North Carolina streams.	Department of Conservation and Development.
Do.....	1889-1936	Bull. 39, Discharge records of North Carolina streams.[2]	Do.
Do.....	1866-1945	Hydrologic Data on the Neuse River Basin.	Do.
Do.....	1820-1945	Hydrologic Data on the Cape Fear River Basin.	Do.
Do.....	1866-1945	Hydrologic Data on the Yadkin-Pee Dee River Basin.	Do.
Do.....	1872-1945	Hydrologic Data on the Catawba and Broad River Basins.	Do.
Do.....	1857-1945	Hydraulic Data on The French Broad River Basin.	Do.
North Dakota..	1919-21	Report to Governor of North Dakota on flood control.	State chief engineer.
Do.....	1882-1938	Surface water in North Dakota.....	State Planning Board.
Do.....	1882-1944	Supplamsnt B, 4th biennial report.....	State Water Conservation Commission.
Ohio.....	1898-1921	Bull. 73, Ohio stream flow, Part 1.....	Engineering Experiment Station, Ohio State University.
Do.....	1898-1944	Bull. 127, Ohio stream flow, Part 2.....	Do.
Do.....	1902-39	Bull. 200, Compilation of stream-flow records of Ohio.	Department of Agriculture, Division of Conservation and Natural Resources.
Do.....	1898-1939	Bull. 111, Ohio stream-drainage areas and flow-duration tables.	Engineering Experiment Station, Ohio State University.
Oregon.....	1878-1914	Bull. 4, Water resources of the State of Oregon.	Office of the State Engineer.
Do.....	1914-24	Bull. 7, Water resources of the State of Oregon.	Do.
Do.....	1924-30	Bull. 8, Water resources of the State of Oregon.	Do.

1 Contains records of yearly discharge only.
2 Contains records of maximum and minimum daily, weekly, and monthly discharge and yearly mean discharge.

State reports containing compilations or records of discharge--Continued

State	Period	Report	Issued by
Oregon.....	1930-36	Bull. 9, Water resources of the State of Oregon.	Office of the State Engineer.
Do.....	1936-41	Bull. 10, Water resources of the State of Oregon.	Do.
Pennsylvania..	1890-1911	Report of the Water Supply Commission of Pennsylvania.	Water Supply Commission of Pennsylvania.
Do.....	1928-32	Stream-flow records of Pennsylvania.....	Department of Forests and Waters.
Rhode Island..	1929-41	7th annual report.....	Department of Public Works.
South Carolina	1884-1946	Bull. 17, Summary of records of surface water supply of South Carolina.	South Carolina Research, Planning and Development Board.
Tennessee.....	1874-1924	Bull. 34, Water resources of Tennessee[3]....	Department of Education.
Do.....	1920-30	Bull. 40, Surface waters of Tennessee.....	Do.
Utah.....	1889-1905	5th biennial report.....	Office of the State Engineer.
Do.....	1906-10	7th biennial report.....	Do.
Do.....	1911-16	10th biennial report.....	Do.
Virginia.....	1895-1927	Bull. 31, Water resources of Virginia.....	Virginia Geological Survey.
Do.....	1927-42	Bull. 4, Surface water supply of Virginia (Potomac, Rappahannock, and York River Basins).	Virginia Conservation Commission.
Do.....	1927-42	Bull. 5, Surface water supply of Virginia (James River Basin).	Do.
Do.....	1927-42	Bull. 6, Surface water supply of Virginia (Roanoke and Chowan River Basins).	Do.
Do.....	1927-42	Bull. 7, Surface water supply of Virginia (New, Tennessee, and Big Sandy River Basins).	Do.
Washington....	1878-1933	Bull. 5, Monthly and yearly summaries of hydrometric data.	Department of Conservation and Development.
Wisconsin.....	1888-1914	1st report of Railroad Commission of Wisconsin to Legislature on water powers.	Railroad Commission of Wisconsin.
Do.....	1914-23	2d report of Railroad Commission of Wisconsin to Legislature on water powers.	Do.

3 Includes records of discharge for all stations in North Carolina in the Tennessee River Basin.

Note.- In addition to the records contained in the reports listed above, the following States have issued annual or biennial reports in which are contained records of discharge: California, Colorado, Connecticut, Idaho, Indiana, Kansas, Maine, Missouri, Montana, Nebraska, Nevada, New Mexico, New York (also New York City Board of Water Supply and city of Rochester), North Dakota, Oregon, Pennsylvania, Rhode Island, Washington, and Wyoming.

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

Water-Supply Paper	Title
88	The Passaic flood of 1902.
92	The Passaic flood of 1903.
96	Destructive floods in the United States in 1903.
147	Destructive floods in the United States in 1904.
162	Destructive floods in the United States in 1905.
334	The Ohio Valley flood of March-April 1913.
426	Southern California floods of January 1916.
487	The Arkansas River flood of June 3-5, 1921.
488	The floods in central Texas in September 1921.
520-G	Some floods in the Rocky Mountain region.
636-C	The New England flood of November 1927.
771	Floods in the United States, magnitude and frequency.
773-E	The New York State flood of July 1935.
796-B	Flood on Republican and Kansas Rivers, May and June 1935.
796-C	Flood in La Canada Valley, Calif., January 1, 1934.
796-G	Major Texas floods of 1935.
798	The floods of March 1936, part 1, New England rivers.
799	The floods of March 1936, part 2, Hudson River to Susquehanna River region.
800	The floods of March 1936, part 3, Potomac, James, and upper Ohio Rivers.
816	Major Texas floods of 1936.
836-A	Stages and flood discharges of the Connecticut River at Hartford, Conn.
838	Floods of Ohio and Mississippi Rivers, January-February, 1937.
842	Floods in Canadian and Pecos River Basins of New Mexico, May and June 1937.
843	Floods of December 1937 in northern California.
844	Floods of March 1938 in southern California.
847	Maximum discharges at stream-measurement stations through September 1938.
867	Hurricane floods of September 1938.
869	Flood of August 1935 in Muskingum River Basin, Ohio.
914	Texas floods of 1938 and 1939.
966	Minor floods of 1938 in North Atlantic States.
967-A	Floods of September 1939 in Colorado River Basin below Boulder (Hoover) Dam.
967-B	Flood of July 5, 1939, in eastern Kentucky.
967-C	Flood of August 21, 1939, in town of Baldwin, Maine.
994	Cloudburst floods in Utah, 1850 to 1938.
997	Floods in Colorado.
1046	Texas floods of 1940.
1066	Floods of August 1940 in the southeastern States.
1080	Floods of May-June 1948 in Columbia River Basin.

RECORDS OF DISCHARGE COLLECTED BY AGENCIES OTHER THAN THE GEOLOGICAL SURVEY

The following table contains a list of gaging stations for the area covered by this report at which records of discharge were collected during the water year October 1948 to September 1949 by agencies other than the Geological Survey. The records for these stations are not contained in publications of the Geological Survey.

Records of discharge collected by agencies other than the Geological Survey

Stream	Location	Period	Collected by
Cayuga Lake Outlet...	Lock 1 (Mud lock), N. Y.....	1926-49	State Department of Public Works, Albany, N. Y.
Clyde River.....	Clyde, N. Y.....	1924-49	Do.
Indian River.....	Theresa, N. Y.....	1934-49	Central New York Power Corporation, Syracuse, N. Y.
New York Barge Canal†	Brewerton, N. Y.....	1925-49	State Department of Public Works, Albany, N. Y.
Do.....	By-pass and Lock 30, Macedon, N. Y.	1938-49	Do.
Oneida River.....	Caughdenoy, N. Y.....	1929-49	Oswego River Watershed Corporation, Fulton, N. Y.
Oswegatchie River, East Branch.	Browns Falls, N. Y.....	1934-49	Central New York Power Corporation, Syracuse, N. Y.
Oswego River.....	Dam O-5, Minetto, N. Y.....	1928-49	State Department of Public Works, Albany, N. Y.
Do.....	Lower Dam, Fulton, N. Y.....	1928-49	Oswego River Watershed Corporation, Fulton, N. Y.
Do.....	High Dam, Oswego, N. Y.....	1940-49	Central New York Power Corporation, Syracuse, N. Y.
Raquette River.....	Colton, N. Y.....	1934-49	Do.
St. Regis River, West Branch.	Parishville, N. Y.....	1934-49	Do.
Salmon River.....	Bennetts Bridge, near Altmar, N. Y.	1934-49	Do.
Saranac River.....	Kents Falls, N. Y.....	1934-49	System Properties, Inc., Cadyville, N. Y.
Seneca River.....	Baldwinsville, N. Y.....	1928-49	Oswego River Watershed Corporation, Fulton, N. Y.
Do.....	Jacks Reef, near Baldwinsville, N. Y.	1933-49	State Department of Public Works, Albany, N. Y.
Do.....	Seneca Falls, N. Y.....	1931-49	New York State Electric & Gas Corporation, Geneva, N. Y.
Do.....	Waterloo, N. Y.....	1931-49	Do.
Skaneateles Lake Outlet.	Skaneateles, N. Y.....	1922-49	City of Syracuse, N. Y.

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

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

COOPERATION

The work in the several States was done under cooperative agreements with the organizations listed below.

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

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

Michigan: State Department of Conservation, P. J. Hoffmaster, director, through Geological Survey Division, G. E. Eddy, State geologist, Fish and Fisheries Division,

F. A. Westerman, head, Game Division, H. D. Ruhl, head, and Parks Division, A. C. Elmer, head; State Water Resources Commission, M. P. Adams, executive secretary-engineer; and State Highway Department, C. M. Ziegler, commissioner.

Minnesota: State Department of Conservation, Division of Waters, C. T. Ekman, director succeeded by S. A. Frellsen; and Minnesota State Iron Range Resources and Rehabilitation Commission, R. E. Wilson, commissioner, succeeded by B. P. Constantine.

New York: State Law Department, N. L. Goldstein, attorney-general; State Department of Public Works, B. D. Tallamy, superintendent; Board of Black River Regulating District, E. S. Cullings, chief engineer; Commission for the Improvement of Oswegatchie River and the Hydraulic Power Thereon C. H. Lord, chairman; Water Department, city of Auburn, G. F. Train, city manager; and Department of Public Works, village of Lancaster, H. J. Huber, superintendent.

Ohio: State Department of Highways, E. R. Reeb, director, succeeded by T. J. Kauer; Ohio Water Resources Board, C. E. MacQuinn, chairman; State Department of Natural Resources, A. W. Marion, director; Scioto-Sandusky Conservancy District, C. C. Chambers, chief engineer; and City of Van Wert, Department of Public Service, L. J. Mitchell, director.

Vermont: Water Conservation Board, Philip Shutler, commissioner.

Wisconsin: Public Service Commission of Wisconsin, G. P. Steinmetz, chief engineer.

Financial assistance was furnished by the Corps of Engineers in the operation of 71 gaging stations, of which 26 were in Michigan, 5 in Indiana, 13 in New York, 16 in Ohio, 5 in Vermont, and 6 in Wisconsin.

Financial assistance was furnished also by the Fish and Wildlife Service, United States Department of the Interior, and by the United States Department of State.

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

Assistance in collecting records was rendered by the following organizations:

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

New York: City of Batavia, N. F. Hall, acting city engineer; City of Syracuse, N. F. Pitts, Jr., city engineer; Cornell University; Central New York Power Corporation; International Paper Co.; New York State Electric & Gas Corporation;

Rochester Gas & Electric Corporation; Imperial Paper & Color Corporation; Deer River Power Co.; and Niagara-Mohawk Power Corporation.

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

DIVISION OF WORK

The stream-gaging work was conducted by the water resources division of the Geological Survey, Carl G. Paulsen, chief hydraulic engineer, and Joseph V. B. Wells, chief of the surface water branch. The data for the stations in the several States were collected and prepared for publication under the supervision of district engineers as follows: In Illinois, J. H. Morgan; in Indiana and Michigan, D. M. Corbett; in Minnesota, P. R. Speer; in New York, A. W. Harrington; in Ohio, O. H. Jeffers (acting), succeeded on September 6, 1949, by L. C. Crawford; in Vermont, H. B. Kinnison; in Wisconsin, F. C. Christopherson.

The records were reviewed and the manuscript prepared for publication under the direction of B. J. Peterson, chief, annual reports section.

ST. LAWRENCE RIVER MAIN STEM

Niagara River at Buffalo, N. Y.

Location.- Lat. 42°52'40", long. 78°53'25", at head of Niagara River at Buffalo. Flow computed by means of several U. S. Lake Survey gages on river.

Drainage area.- 263,500 square miles.

Records available.- January 1905 to September 1949 (prior to October 1935, monthly discharge only).

Average discharge.- 45 years (October 1904 to September 1949), 193,000 second-feet (not including diversions from Lakes Michigan and Erie).

Extremes.- Maximum daily discharge during year, 242,000 second-feet January 6; minimum daily, 168,000 second-feet March 31.
1905-49: Maximum monthly mean discharge, 242,000 second-feet May 1929; minimum monthly, 117,000 second-feet in February 1936.

Remarks.- Records do not include 3,100 second-feet diverted from Lake Michigan by Chicago Sanitary & Ship Canal and approximately 5,000 second-feet from Lake Erie by Welland Canal in Ontario, and Black Rock Canal at Buffalo. They include about 5,000 second-feet diverted into Lake Superior from Hudson Bay drainage. The first diversion from Hudson Bay Basin into Lake Superior began in 1937 from Long Lake for the purpose of floating pulpwood and was probably small. Since 1941 the diversion from Long Lake has been used for power and has averaged about 1,500 second-feet. A second diversion was started in 1943 from Ogoki River into Lake Nipigon where it is used for power at the outlet of that lake.

Cooperation.- Records of daily discharge furnished by Corps of Engineers.

Discharge, in thousand of second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	208	194	197	201	228	203	192	199	197	204	195	219
2	198	190	191	198	198	203	198	203	198	206	198	194
3	187	189	191	191	188	198	197	201	202	205	196	192
4	188	194	190	180	196	199	200	202	202	209	195	192
5	193	191	190	192	191	199	196	202	204	200	198	202
6	194	206	238	242	188	198	203	202	205	196	196	192
7	199	220	194	205	218	195	203	200	201	188	197	190
8	196	192	201	189	194	202	202	199	198	194	197	196
9	231	194	193	196	198	199	202	198	194	203	201	190
10	215	212	192	184	194	185	199	189	198	202	202	186
11	209	210	191	182	187	209	198	194	200	198	200	186
12	213	197	194	203	194	219	197	198	199	201	194	186
13	209	216	190	209	195	206	197	199	200	202	190	189
14	198	198	180	191	190	205	196	201	199	190	185	188
15	191	199	170	187	210	200	210	196	202	198	183	189
16	200	192	192	192	198	212	210	199	198	196	190	191
17	199	230	207	190	208	201	197	198	197	195	194	192
18	199	187	187	186	200	191	200	200	201	198	191	195
19	206	183	181	224	194	193	205	201	200	203	186	205
20	198	215	190	183	195	191	204	192	202	199	187	197
21	190	206	206	190	193	195	200	196	205	200	188	195
22	194	197	207	195	200	193	202	206	206	215	190	195
23	195	197	196	185	205	210	207	208	202	199	192	196
24	191	192	189	193	197	198	202	208	202	200	187	187
25	193	193	188	180	213	193	200	209	206	203	188	181
26	195	195	193	184	196	191	206	209	210	201	190	181
27	194	205	211	183	200	200	202	206	209	204	192	186
28	192	183	188	224	215	200	199	205	206	205	190	188
29	190	188	187	211	-	194	199	205	203	203	191	185
30	190	204	180	200	-	186	199	203	205	200	195	194
31	191	-	198	199	-	168	-	202	-	199	196	-

Month	Thousands of second-foot-days	Thousands of second-feet			Per square mile†	Runoff in inches
		Maximum	Mimimum	Mean		
October	6,146	231	188	198	0.751	0.87
November	5,969	230	183	199	.755	.84
December	6,002	238	170	194	.736	.85
Calendar year 1948	76,715	246	160	210	.797	10.83
January	6,069	242	180	196	.744	.86
February	5,583	228	187	199	.755	.79
March	6,136	219	168	198	.751	.87
April	6,022	210	192	201	.763	.85
May	6,230	209	189	201	.763	.88
June	6,051	210	194	202	.767	.86
July	6,216	215	188	201	.763	.88
August	5,976	202	183	193	.732	.84
September	5,759	219	181	192	.729	.81
Water year 1948-49	72,159	242	168	198	.751	10.20

† Expressed in second-feet.

St. Lawrence River at Ogdensburg, N. Y.

Location.- Lat. 44°42'25", long. 75°28'35", Flow computed by means of several U. S. Lake Survey gages on river. Discharge measurements made downstream from Galops Rapids and include flow of Oswegatchie River.

Drainage area.- 298,100 square miles, including that of Oswegatchie River.

Records available.- January 1919 to September 1949 (prior to October 1935, monthly discharge only).

Average discharge.- 31 years (October 1918 to September 1949), 226,000 second-feet (does not include diversion from Lake Michigan).

Extremes.- Maximum daily discharge during year, 262,000 second-feet May 25; minimum daily, 217,000 second-feet Dec. 30.
1919-49: Maximum monthly mean discharge, 300,000 second-feet July 1947; minimum monthly, 152,000 second-feet February 1936.

Remarks.- Records do not include 3,100 second-feet diverted from Lake Michigan by Chicago Sanitary & Ship Canal. They include about 5,000 second-feet diverted into Lake Superior from Hudson Bay drainage. The first diversion from Hudson Bay Basin into Lake Superior began in 1937 from Long Lake for the purpose of floating pulpwood and was probably small. Since 1941 the diversion from Long Lake has been used for power and has averaged about 1,500 second-feet. A second diversion was started in 1943 from Ogoki River into Lake Nipigon where it is used for power at the outlet of that lake. Water diverted from Lake Erie by Welland Canal and Niagara River by New York State Barge (old Erie) Canals, except that lost by seepage and evaporation, is discharged into Lake Ontario.

Cooperation.- Records of daily discharge furnished by Corps of Engineers.

Discharge, in thousand of second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	250	235	241	232	236	243	247	257	253	247	238	239
2	245	236	237	233	234	244	251	259	252	249	237	232
3	241	237	239	232	234	244	251	260	253	248	236	228
4	243	238	236	227	231	244	251	258	254	248	236	230
5	242	236	234	229	234	246	250	256	256	243	236	234
6	241	241	249	245	232	243	252	258	256	243	237	226
7	240	250	245	241	240	243	257	255	252	240	237	223
8	242	239	242	234	235	243	255	260	252	240	240	223
9	254	240	238	233	237	242	255	256	250	244	239	225
10	254	246	236	232	233	235	256	250	251	244	236	225
11	244	243	233	228	234	245	255	252	253	242	235	223
12	246	241	238	236	234	252	255	257	250	242	233	224
13	247	246	241	234	234	251	253	255	251	243	229	224
14	245	238	234	232	233	251	252	256	251	239	230	227
15	242	240	223	229	237	248	252	251	252	241	226	224
16	246	237	231	239	239	247	257	255	252	241	226	227
17	245	252	242	231	242	250	256	256	248	239	232	225
18	244	239	233	229	241	245	250	257	249	239	230	226
19	242	228	230	250	237	244	257	256	248	243	224	227
20	241	235	231	233	239	243	261	248	247	241	228	226
21	242	243	234	229	238	244	261	253	251	238	228	224
22	242	239	234	240	239	243	256	255	253	244	227	224
23	243	242	233	228	242	250	261	257	250	241	228	223
24	239	240	231	231	241	243	257	256	248	241	222	224
25	238	238	231	227	246	244	257	262	248	240	226	223
26	240	242	235	224	243	248	258	259	254	240	228	222
27	241	250	237	229	242	247	257	257	248	243	227	225
28	240	237	232	235	241	257	256	257	245	243	226	222
29	237	234	234	236	-	248	258	257	248	241	224	221
30	241	238	217	227	-	248	257	256	246	241	226	224
31	238	-	232	219	-	244	-	254	-	239	226	-

Month	Thousands of second-foot-days	Thousands of second-feet			Per square mile †	Runoff in inches
		Maximum	Minimum	Mean		
October	7,535	254	237	243	0.815	0.94
November	7,200	252	228	240	.805	.90
December	7,283	249	217	235	.788	.91
Calendar year 1948	92,750	289	174	253	.849	11.57
January	7,204	250	219	232	.778	.90
February	6,648	246	231	237	.795	.83
March	7,619	257	235	248	.825	.95
April	7,651	261	247	255	.855	.95
May	7,935	262	248	256	.859	.99
June	7,521	256	245	251	.842	.94
July	7,507	249	238	242	.812	.94
August	7,153	240	222	231	.775	.89
September	6,770	239	221	226	.758	.85
Water year 1948-49	88,026	262	217	241	.808	10.99

† Expressed in second-feet.

Pigeon River at Middle Falls, below International Bridge, Minn. (International gaging station)

Location.- Water-stage recorder, lat. 48°00'44", long. 89°36'58", in NE¼ sec. 24, T. 64 N., R. 6 E., 400 feet upstream from Middle Falls, 3½ miles upstream from mouth, and 5¾ miles downstream from International Bridge. Datum of gage is 789.58 feet above mean sea level, datum of 1929.

Drainage area.- 600 square miles at present site.

Records available.- October 1940 to September 1949. April 1924 to September 1940 at site at International Bridge 5¾ miles upstream, published as Pigeon River at International Bridge. October 1923 to September 1932 in House Document 92, 73d Congress, 1st session. June 1921 to September 1949 in reports of Water Resources Division, Department of Resources and Development, Canada.

Average discharge.- 26 years (1923-49), 488 second-feet.

Extremes.- Maximum discharge during year, 3,320 second-feet Apr. 14; maximum gage height, 7.05 feet Apr. 11, backwater from ice; minimum discharge, 63 second-feet Dec. 1 (gage height, 0.38 foot).

1923-49: Maximum discharge observed, 11,000 second-feet May 5, 1934 (gage height, 7.6 feet, site and datum then in use), from rating curve extended above 7,000 second-feet; minimum, 27 second-feet Nov. 4, 1945 (gage height, -0.08 foot).

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

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

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)

0.4	65	1.2	208	4.5	1,630
.5	75	1.7	351	5.5	2,440
.6	88	2.5	606	6.1	3,020
.7	104	3.3	951		
.9	140	3.9	1,260		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		69	70	80	90	*90	170	1,440	229	376	242	129
2		69	70	80	90	90	190	1,440	221	351	259	125
3	a95	70	75	85	85	95	200	1,350	221	460	259	119
4		*71	80	90	85	95	240	1,290	231	927	240	116
5		105	85	95	85	100	280	2,170	221	788	231	111
6		206	120	100	85	95	320	2,720	206	624	231	111
7		245	110	100	85	90	360	2,350	198	624	229	107
8	a90	221	95	95	80	90	420	1,850	191	880	218	104
9		191	90	95	80	85	550	1,500	184	744	208	101
10		163	80	90	80	85	700	1,290	191	589	201	99
11	a95	150	*80	90	80	80	1,200	1,130	330	475	194	102
12	a95	140	75	85	85	80	2,000	1,020	376	413	184	116
13	h93	130	80	85	85	80	3,000	927	475	370	177	121
14	a90	120	80	85	85	75	*2,920	833	444	336	175	130
15	a90	120	80	*90	85	75	2,170	765	391	318	170	136
16		111	80	90	90	75	1,740	702	345	306	168	129
17	a85	100	75	95	90	75	1,560	681	327	297	170	119
18		90	80	95	90	70	1,290	722	318	285	166	114
19		80	80	95	85	70	1,350	702	315	294	161	109
20	a80	75	80	90	85	70	1,700	642	321	291	157	106
21		70	85	90	85	75	2,440	589	321	274	153	106
22		70	80	90	85	75	2,920	572	294	256	150	102
23		70	80	95	90	*80	2,820	556	300	248	146	101
24	a75	70	80	95	95	80	2,170	523	327	259	150	99
25		70	80	90	95	85	1,660	507	318	268	155	94
26	70	75	75	90	95	90	1,530	460	554	259	159	98
27	70	75	75	90	95	100	1,470	294	662	242	155	101
28	70	75	75	90	95	100	1,350	234	475	242	148	98
29	70	75	75	85	-	120	1,320	216	376	245	142	98
30	69	70	75	85	-	130	1,350	208	339	248	136	94
31	69	-	75	85	-	150	-	218	-	237	132	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,601	-	69	83.9	0.140	0.16
November	3,246	245	69	108	.180	.20
December	2,520	120	70	81.3	.136	.16
Calendar year 1948	190,448	9,940	69	520	.867	11.80
January	2,795	100	80	90.2	.150	.17
February	2,440	95	80	87.1	.145	.15
March	2,750	150	70	88.7	.148	.17
April	41,390	3,000	170	1,380	2.30	2.57
May	29,901	2,720	208	965	1.61	1.85
June	9,701	662	184	323	.538	.60
July	12,526	927	237	404	673	.78
August	5,666	259	132	183	.305	.35
September	3,293	136	94	110	.183	.20
Water year 1948-49	118,829	3,000	69	326	.543	7.36

Peak discharge (base, 3,000 sec.-ft.).- Apr. 14 (12:10 a.m.) 3,320 sec.-ft.; Apr. 22 (9 p.m.) 3,120 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of 1 discharge measurement and weather records.

h Computed from staff-gage reading.

Note.- Stage-discharge relation affected by ice Nov. 11-15, Nov. 17 to Apr. 13.

Baptism River near Beaver Bay, Minn.

Location.- Water-stage recorder, lat. 47°20', long. 91°12', in sec. 15, T. 56 N., R. 7 W., 260 feet upstream from highway bridge and 6 miles northeast of village of Beaver Bay. Datum of gage is 609.97 feet above mean sea level.

Drainage area.- 140 square miles.

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

Average discharge.- 17 years (1930-47), 159 second-feet.

Extremes. Maximum discharge during period June to September 1949, 1,100 second-feet July 5 (gage height, 4.19 feet); minimum, 11 second-feet Sept. 3 (gage height. 2.04 feet). 1928-29, 1930-47, 1949: Maximum discharge, 9,350 second-feet Aug. 9, 1939 (gage height, 8.11 feet), from rating curve extended above 2,600 second-feet; minimum daily, 0.3 second-foot Jan. 5, 6, 1940.

Remarks.- Records good.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									-	211	144	13
2									-	167	157	12
3									-	123	113	15
4									-	658	83	27
5									-	1,000	64	21
6									317	988	63	19
7									222	828	48	17
8									181	593	40	15
9									154	532	31	13
10									131	371	25	12
11									111	244	23	19
12									103	186	19	59
13									222	181	18	59
14									211	171	17	55
15									181	151	22	42
16									157	123	14	33
17									154	94	32	28
18									151	101	97	25
19									125	96	74	23
20									123	78	51	23
21									106	67	42	23
22									83	56	43	22
23									249	47	47	20
24									428	80	48	18
25									323	94	39	18
26									244	82	31	20
27									200	64	24	22
28									216	87	20	21
29									195	101	19	20
30									167	80	17	18
31									-	64	14	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October						
November						
December						
Calendar year						
January	-	-	-	-	-	-
February	-	-	-	-	-	-
March	-	-	-	-	-	-
April	-	-	-	-	-	-
May	-	-	-	-	-	-
June 6-30	4,754	428	83	190	1.36	1.26
July	7,718	1,000	47	249	1.78	2.05
August	1,479	157	14	47.7	.341	.39
September	732	59	12	24.4	.174	.19
Water year	-	-	-	-	-	-

Peak discharge (base, 1,300 sec.-ft.).- No peak above base.

St. Louis River near Aurora, Minn.

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

Drainage area.- 312 square miles.

Records available.- August 1942 to September 1949.

Extremes.- Maximum discharge during year, 1,240 second-feet July 7-8 (gage height, 4.08 feet); minimum, 4.0 second-feet Oct. 2, 3 (gage height, 0.30 foot).
1942-49: Maximum discharge observed, 3,960 second-feet June 6, 1944 (gage height, 7.30 feet); minimum discharge, that of Oct. 2, 3, 1948.

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

Rating table, water year 1948-49 except period of ice effect
(gage height, in feet, and discharge, in second-feet)

0.3	4.0	1.3	76	3.0	617
.4	7.7	1.5	106	3.8	1,040
.6	18	1.7	147	4.1	1,240
.9	37	2.0	225		
1.1	54	2.5	399		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.1	8.7	15	24	19	15	32	309	424	219	174	82
2	4.4	*8.7	15	26	19	15	34	295	474	228	169	75
3	4.4	8.2	15	26	19	16	38	288	572	265	166	72
4	5.1	8.2	16	26	19	16	48	281	641	509	161	71
5	21	12	17	26	19	18	70	395	617	870	154	65
6	7.0	30	20	28	19	17	90	545	568	1,140	143	63
7	4.7	30	24	28	19	17	140	641	527	1,200	134	62
8	5.1	34	24	26	19	17	200	690	466	1,240	121	59
9	4.7	39	24	26	19	17	*260	690	407	1,170	110	56
10	4.7	38	*22	24	18	16	320	665	360	1,040	104	53
11	5.8	36	22	24	18	16	400	594	316	898	96	52
12	7.3	30	20	24	17	16	500	540	288	740	89	52
13	9.2	28	20	*24	16	16	641	462	292	617	86	52
14	8.2	26	20	24	16	16	690	407	295	523	90	49
15	8.2	22	22	24	16	16	665	356	292	453	89	47
16	12	22	22	24	16	15	641	316	295	395	95	44
17	14	20	22	24	15	15	594	292	295	349	157	43
18	14	20	20	24	15	15	540	278	285	312	205	41
19	16	19	20	22	15	14	501	262	275	275	292	42
20	13	18	22	22	14	14	470	246	255	246	334	41
21	11	17	22	22	14	14	457	234	240	222	334	39
22	11	16	22	20	14	14	466	225	225	200	309	37
23	9.7	16	22	20	14	15	479	214	203	189	312	36
24	8.7	15	22	20	14	*15	487	200	197	234	258	36
25	8.2	15	22	20	14	16	470	194	187	228	214	35
26	7.3	16	22	20	14	18	449	189	189	208	184	36
27	11	16	20	20	*15	19	415	179	187	194	159	41
28	10	16	20	20	15	20	387	166	197	189	136	40
29	6.6	16	22	20	-	24	349	159	200	184	117	33
30	7.7	15	22	19	-	26	327	211	208	176	103	31
31	8.2	-	24	19	-	30	-	338	-	174	92	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	273.3	21	4.4	8.82	0.028	0.03
November	615.8	39	8.2	20.5	.066	.07
December	642	24	15	20.7	.066	.08
Calendar year 1948	78,951.6	3,660	4.4	216	.692	9.41
January	716	28	19	23.1	.074	.09
February	461	19	14	16.5	.053	.05
March	528	30	14	17.0	.054	.06
April	11,160	690	32	372	1.19	1.33
May	10,861	690	159	350	1.12	1.29
June	9,977	641	187	333	1.07	1.19
July	14,887	1,240	174	480	1.54	1.77
August	5,187	334	86	167	.535	.62
September	1,485	82	31	49.5	.159	.18
Water year 1948-49	56,793.1	1,240	4.4	156	.500	6.76

Peak discharge (base, 600 sec.-ft.).- Apr. 14 (5:30 p.m.) 690 sec.-ft.; May 9 (10 a.m.) 690 sec.-ft.; June 4 (5 p.m.) 665 sec.-ft.; July 7-8, 1,240 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Nov. 12 to Apr. 12.

Partridge River near Aurora, Minn.

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

Drainage area.- 156 square miles.

Records available.- August 1942 to September 1949.

Extremes.- Maximum discharge during year, 950 second-feet July 8, 9 (gage height, 5.06 feet); minimum, 3.2 second-feet Oct. 1 (gage height, 0.79 foot).
1942-49: Maximum discharge observed, 2,930 second-feet June 6, 1944 (gage height, 7.51 feet); minimum, 3.1 second-feet Sept. 22, 23, 1948 (gage height, 0.77 foot).

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

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

Rating table, water year 1948-49, except periods of ice effect or shifting-control
(gage height, in feet, and discharge, in second-feet)

0.7	2.5	1.9	28	3.5	229
.8	3.6	2.1	38	3.8	329
1.0	5.3	2.3	51	4.2	495
1.1	6.8	2.6	81	4.8	800
1.4	13	3.0	129	5.1	980
1.7	21	3.3	178		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.3	4.1	7.5	7.0	5.5	6.0	14	137	157	121	69	47
2	3.3	*4.0	8.0	7.0	5.5	6.0	16	129	229	133	68	42
3	3.4	4.0	8.0	7.4	5.5	6.0	20	125	315	163	70	42
4	13	4.0	9.0	7.6	5.5	6.0	35	121	359	325	70	39
5	8.2	5.7	9.8	9.0	5.5	6.0	48	159	352	533	69	35
6	3.7	16	13	9.0	5.5	6.0	50	244	337	740	62	33
7	3.8	14	12	8.8	5.5	6.0	58	356	307	860	56	32
8	3.9	11	11	8.8	5.5	6.0	72	433	251	950	50	29
9	3.8	10	10	8.4	5.5	6.0	94	464	192	920	45	27
10	3.7	9.6	*8.5	8.0	5.5	6.0	129	446	156	800	44	26
11	5.0	9.6	10	8.0	5.5	6.0	178	387	129	665	40	24
12	6.2	9.6	10	8.0	5.9	6.0	297	322	117	495	37	24
13	6.5	9.8	9.5	*8.5	5.8	6.0	428	244	114	359	35	23
14	5.4	10	9.0	8.4	5.8	6.0	514	194	115	254	39	21
15	6.0	10	9.0	8.2	5.6	6.0	533	157	120	190	36	19
16	9.8	11	9.5	8.0	5.5	6.0	518	133	128	156	38	18
17	9.4	11	9.0	7.6	5.5	6.0	472	119	130	135	71	18
18	11	11	8.5	7.0	5.5	6.0	416	108	126	117	119	17
19	10	10	8.5	7.0	5.5	6.0	363	99	125	99	187	18
20	7.8	10	9.0	6.5	5.5	6.5	318	92	111	85	244	17
21	7.0	10	9.0	6.5	5.5	6.5	300	88	106	74	248	17
22	6.0	9.6	8.5	6.5	5.5	7.0	304	82	100	60	223	15
23	5.4	9.0	8.0	6.0	6.0	7.5	311	79	90	63	209	15
24	5.0	9.0	7.5	6.0	6.0	*8.5	318	73	86	81	163	15
25	4.3	8.5	7.0	6.0	6.0	9.8	297	77	83	78	133	14
26	4.1	8.5	7.0	6.0	6.0	10	267	76	84	71	114	15
27	4.0	8.5	7.0	6.0	*6.0	10	232	71	88	70	99	28
28	4.0	8.5	7.0	6.0	6.0	9.6	196	67	99	67	84	15
29	3.9	8.0	7.0	6.0	-	9.8	168	63	105	65	72	13
30	4.0	8.0	7.0	5.5	-	11	151	86	109	65	61	13
31	4.2	-	7.0	5.5	-	13	-	117	-	68	53	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	179.1	13	3.3	5.78	0.037	0.04
November	272.0	16	4.0	9.07	.058	.06
December	270.8	13	7.0	8.74	.056	.06
Calendar year 1948	40,904.4	2,580	3.2	112	.718	9.74
January	224.2	9.0	5.5	7.23	.046	.05
February	158.1	6.0	5.5	5.65	.036	.04
March	223.2	13	6.0	7.20	.046	.05
April	7,117	533	14	237	1.52	1.70
May	5,348	464	63	173	1.11	1.27
June	4,820	359	83	161	1.03	1.15
July	8,862	950	60	286	1.83	2.11
August	2,908	248	35	93.8	.601	.69
September	711	47	13	23.7	.152	.17
Water year 1948-49	31,093.4	950	3.3	85.2	.546	7.39

Peak discharge (base, 400 sec.-ft.).- Apr. 15 (10 a.m.) 533 sec.-ft.; May 9 (11 a.m.) 463 sec.-ft.; June 4 (1 p.m.) 428 sec.-ft.; July 8, 9, 950 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Nov. 23 to Dec. 3, Dec. 8 to Jan. 2, Jan. 10-13, Jan. 18 to Feb. 11, Mar. 14-19. Shifting-control method used Feb. 16 to Mar. 13, Mar. 21-24.

Embarrass River at Embarrass, Minn.

Location.- Water-stage recorder, lat. 47°39'30", long. 92°11'50", in NW¼ sec. 25, T. 60 N., R. 15 W., at Embarrass, 30 feet upstream from highway bridge and 100 feet upstream from railway bridge.

Drainage area.- 93.8 square miles.

Records available.- August 1942 to September 1949.

Extremes.- Maximum discharge during year, 297 second-feet Apr. 15 (gage height, 5.12 feet); minimum daily, 1.9 second-feet Mar. 15-22; minimum gage height, 0.67 foot Mar. 20, 21.

1942-49: Maximum discharge, 1,490 second-feet Apr. 21, 1948 (gage height, 10.44 feet); minimum daily, that of Mar. 15-22, 1949; minimum gage height observed, that of Mar. 20, 21, 1949.

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

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Sept. 11-30)

0.68	1.9	1.2	23
.7	2.4	1.7	60
.8	4.9	2.5	125
.9	8.6	3.5	191
1.0	12	5.1	297

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.6	6.8	5.0	3.4	3.0	2.6	5.5	80	110	167	40	29
2	2.6	9.4	5.0	3.4	3.0	2.6	12	77	97	173	50	24
3	2.6	7.1	5.0	3.4	3.0	2.6	26	74	118	185	46	23
4	2.9	4.9	5.0	3.6	3.0	3.0	48	70	128	221	37	24
5	2.9	6.0	5.5	3.6	3.0	3.0	70	136	122	255	31	21
6	2.9	12	5.5	3.8	3.0	2.6	90	191	102	283	27	19
7	2.9	15	5.5	3.6	2.8	2.6	110	197	81	285	23	19
8	2.9	17	*5.5	3.6	2.8	2.6	*130	191	64	269	20	17
9	2.6	9.4	5.0	3.6	2.8	2.6	160	179	52	234	17	16
10	2.6	9.8	4.6	3.6	2.6	2.4	200	160	43	203	23	15
11	2.9	9.0	4.6	3.6	2.6	2.4	240	139	36	173	31	13
12	3.2	8.2	4.6	3.6	2.6	2.4	248	114	31	136	29	14
13	2.9	8.2	4.6	*3.6	2.4	2.4	269	93	40	98	23	15
14	2.6	7.9	4.6	3.6	2.4	2.2	290	75	43	70	30	16
15	3.4	7.9	4.6	3.6	2.4	1.9	297	65	39	54	43	14
16	7.1	7.9	4.6	3.6	2.4	1.9	283	57	36	43	43	13
17	6.4	7.9	4.4	3.6	2.4	1.9	255	51	40	36	146	12
18	5.6	7.1	4.4	3.4	2.4	1.9	227	50	40	30	209	11
19	5.6	6.8	4.4	3.2	2.4	1.9	209	50	34	26	221	11
20	4.9	6.8	4.4	3.2	2.4	1.9	197	46	32	22	215	13
21	5.6	5.6	4.4	3.2	2.4	1.9	185	43	30	19	197	13
22	5.3	4.9	4.4	3.2	2.4	1.9	191	41	26	17	179	12
23	4.9	4.9	4.2	3.2	2.4	2.2	185	39	31	15	173	12
24	4.9	4.9	4.0	3.2	2.4	*2.9	179	36	37	23	128	11
25	4.9	5.3	4.0	3.2	a2.6	3.2	167	33	42	32	90	10
26	4.9	5.6	3.6	3.2	a2.6	3.4	150	29	132	34	70	9.8
27	4.9	5.5	3.6	3.2	*2.8	3.6	132	26	150	32	60	10
28	4.9	5.5	3.6	3.2	2.6	3.6	118	23	179	31	52	10
29	5.3	5.5	3.6	3.0	-	4.0	102	21	164	38	45	10
30	6.0	5.5	3.4	3.0	-	4.6	90	36	139	36	38	9.8
31	6.8	-	3.4	3.0	-	5.0	-	102	-	71	34	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	130.5	7.1	2.6	4.21	0.045	0.05
November	228.3	17	4.9	7.61	.081	.09
December	139.0	5.5	3.4	4.48	.048	.06
Calendar year 1948	24,633.3	1,490	2.6	67.3	.717	9.76
January	105.2	3.8	3.0	3.39	.036	.04
February	73.6	3.0	2.4	2.63	.028	.03
March	83.7	5.0	1.9	2.70	.029	.03
April	4,865.5	297	5.5	162	1.73	1.93
May	2,524	197	21	81.4	.868	1.00
June	2,218	179	26	73.9	.788	.88
July	3,269	283	15	105	1.12	1.30
August	2,370	221	17	76.5	.816	.94
September	446.6	29	9.8	14.9	.159	.18
Water year 1948-49	16,453.4	297	1.9	45.1	.481	6.53

Peak discharge (base, 280 sec.-ft.).- Apr. 15 (2 a.m. to 2 p.m.) 297 sec.-ft.; July 7 (1 to 7 a.m.) 283 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge interpolated.

Note.- Stage-discharge relation affected by ice Nov. 27 to Feb. 21, Feb. 27 to Mar. 19, Mar. 25 to Apr. 11. Backwater from logs Oct. 5-17.

Amnicon Lake near South Range, Wis.

Location.- Staff gage, lat. 46°29', long. 92°04', in sec. 12, T. 46 N., R. 14 W., in north west corner of lake, 15 miles southwest of South Range. Datum of gage is 1,188.00 feet above mean sea level (State Highway Commission levels). Gage readings have been reduced to elevation above mean sea level.

Drainage area.- 5 square miles.

Records available.- August 1936 to September 1949 (fragmentary).

Extremes.- Maximum elevation observed during year, 1,197.78 feet May 8; minimum, 1,195.82 feet Oct. 28.
1937-49: Maximum elevation observed, 1,199.23 feet June 5,1944; minimum, that of Oct. 28, 1948.

Remarks.- Lake has natural outlet.

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

Elevation, in feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	5.84	6.16	-		-	-	-	-	-	-	6.90
2	5.90	-	-	-		-	6.88	6.96	-	-	-	-
3	-	-	-	-		-	-	-	-	-	7.16	6.88
4	-	5.84	6.18	-		-	-	-	6.86	6.96	-	6.88
5	5.96	-	-	-		6.66	-	7.26	-	-	-	-
6	-	6.04	-	-		-	-	7.58	-	7.04	7.10	-
7	-	-	-	-		-	-	7.74	6.78	-	-	6.84
8	-	-	-	-		-	-	7.78	-	-	-	-
9	5.98	6.04	-	-		-	7.00	7.72	-	7.04	-	-
10	-	-	-	-	6.58	-	-	-	-	-	-	6.80
11	-	-	6.24	-		-	-	7.72	6.70	7.00	-	-
12	-	-	-	-		-	-	-	-	-	-	6.82
13	5.88	6.04	-	6.38		-	-	7.62	-	-	6.98	-
14	-	-	6.30	-		-	7.04	7.46	6.82	-	-	-
15	-	-	-	-		-	-	-	-	-	-	6.78
16	5.86	-	-	-		-	7.08	-	-	6.98	7.10	-
17	-	-	-	-		-	-	7.38	-	-	-	6.74
18	-	-	6.32	-		-	-	-	-	-	-	-
19	5.84	-	-	-		-	-	-	6.90	-	-	6.70
20	-	6.14	-	-		-	7.12	-	-	-	7.04	-
21	-	-	-	-		-	-	7.20	-	-	-	-
22	-	-	-	-		-	-	-	6.94	-	-	-
23	5.84	-	-	-		6.72	7.04	-	-	6.86	-	-
24	-	6.16	6.36	-		-	-	-	-	7.08	7.00	6.62
25	-	-	-	-		-	-	-	6.92	7.10	-	-
26	5.84	-	-	-		-	-	-	-	-	-	-
27	-	6.18	-	6.54		-	-	-	-	-	6.92	-
28	5.82	-	-	-		-	-	6.96	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	-	-
30	5.84	-	-	-	-	-	6.98	-	6.66	7.14	-	-
31	-	-	-	-	-	-	-	6.92	-	-	-	-

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

Bois Brule River at Brule, Wis.

Location.- Cantilevered chain gage, lat. 46°32'15", long. 91°35'45", in NW¼SW¼ sec. 23, T. 47 N., R. 10 W., 1¼ miles southwest of Brule Post Office, 1½ miles downstream from Nebagamon Creek, and 1½ miles upstream from Little Brule River.

Drainage area.- 130 square miles.

Records available.- January 1943 to September 1949.

Extremes.- Maximum discharge observed during year, 824 second-feet May 6; maximum gage height, 3.88 feet Jan. 20 (backwater from ice); minimum daily discharge, 88 second-feet Jan. 18.

1943-49: Maximum discharge observed, 1,130 second-feet June 5, 1944 (gage height, 5.14 feet), from rating curve extended above 350 second-feet; minimum observed, 67 second-feet Mar. 13, 1943.

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

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Feb. 22				Feb. 23 to Sept. 30					
1.2	88	1.5	122	1.4	107	2.0	219	2.9	470
1.3	99	1.6	135	1.6	135	2.3	295	3.3	612
1.4	110	1.7	149	1.8	173	2.6	376	3.8	824

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	104	110	116	120	114	162	152	144	173	195	144	a111
2	104	110	116	122	114	120	152	152	152	173	135	a110
3	104	110	116	126	114	152	162	144	162	135	135	a109
4	104	116	116	130	114	120	173	219	162	195	135	a108
5	104	116	a126	145	114	120	207	539	152	269	128	107
6	110	142	135	153	114	120	219	824	135	243	128	107
7	104	142	135	*153	114	120	219	539	135	243	120	107
8	104	128	135	149	114	120	243	470	135	219	120	107
9	104	116	128	135	114	128	231	421	128	195	120	107
10	104	116	128	133	114	120	231	362	126	184	120	107
11	116	116	127	130	114	135	243	334	128	173	120	107
12	122	116	127	130	116	135	243	308	128	162	120	120
13	122	116	126	130	116	114	243	282	144	152	120	114
14	116	116	126	128	116	128	256	256	135	152	120	114
15	110	116	125	122	116	144	231	243	135	144	114	107
16	116	116	125	a119	116	135	219	231	128	144	195	107
17	110	116	125	116	116	128	219	231	120	135	195	107
18	116	116	125	88	116	120	219	219	120	152	173	107
19	116	116	124	115	116	128	219	219	207	144	152	107
20	110	122	125	120	116	120	219	207	231	135	135	107
21	110	122	124	120	116	114	207	195	243	135	135	107
22	110	122	124	120	118	120	219	195	207	128	120	107
23	110	116	124	118	120	114	219	195	173	120	135	107
24	110	116	123	118	128	120	195	184	152	152	128	107
25	110	122	122	116	135	128	195	173	144	162	120	107
26	110	122	121	116	*120	128	184	173	135	162	120	107
27	110	116	121	116	128	a136	173	162	135	152	120	114
28	110	116	120	116	152	144	173	152	128	152	120	107
29	110	116	120	115	-	144	152	152	120	152	114	107
30	116	116	120	115	-	152	152	162	120	152	a113	107
31	116	-	120	115	-	162	-	173	-	135	a112	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,422	122	104	110	0.846	0.98
November	3,556	142	110	119	.915	1.02
December	3,846	135	116	124	.954	1.10
Calendar year 1948	48,489	487	94	132	1.02	13.88
January	3,849	153	88	124	.954	1.10
February	3,315	152	114	118	.908	.95
March	4,031	162	114	130	1.00	1.15
April	6,169	256	152	206	1.58	1.76
May	8,260	824	144	266	2.05	2.36
June	4,495	243	120	150	1.15	1.28
July	5,146	269	120	166	1.28	1.48
August	4,066	195	112	131	1.01	1.16
September	3,254	120	107	108	.831	.93
Water year 1948-49	53,409	824	88	146	1.12	15.27

* Winter discharge measurement made on this day.
a No gage-height record; discharge interpolated.
Note.- Stage-discharge relation affected by ice Dec. 1, Dec. 10 to Jan. 7, Jan. 10-13, Jan. 19 to Feb. 22.

Bad River at Mellen, Wis.

Location.- Chain gage, lat. 46°19'30", long. 90°39'35", in sec. 6, T. 44 N., R. 2 W., at bridge on U. S. Highway 13 in Mellen, a quarter of a mile upstream from Devils Creek and 2½ miles downstream from Rock River.

Drainage area.- 101 square miles.

Records available.- May 1948 to September 1949.

Extremes.- Maximum discharge observed during year, 4,340 second-feet July 4 (gage height, 14.0 feet); minimum observed, 6.4 second-feet Oct. 1-3 (gage height, 2.08 feet).
1948-49: Maximum discharge observed, that of July 4, 1949; minimum observed, 3.8 second-feet Aug. 25-27, 1948 (gage height, 1.98 feet).
Flood of June 24, 1946, reached a stage of 18.60 feet, from floodmark, from information by local resident.

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

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 5 to Nov. 20, May 27 to June 19)

2.1	7	3.3	107	6.0	765
2.2	10	3.6	154	7.0	1,180
2.3	15	4.0	226	8.0	1,610
2.5	25	4.5	326	10.0	2,500
2.7	40	5.0	457	12.0	3,400
3.0	68	5.5	606	13.6	4,150

Discharge, in second-feet, water year October 1948 to September 1949.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.4	8.5	16	13	14	14	122	58	28	602	62	18
2	6.4	8.2	18	12	14	14	154	56	29	606	62	19
3	6.4	8.5	16	12	14	15	189	54	31	1,010	55	18
4	6.7	8.8	17	12	14	16	216	198	26	4,150	45	25
5	6.7	12	19	12	14	16	264	545	23	3,730	38	93
6	7.3	22	44	15	14	17	226	637	20	2,600	33	86
7	7.6	21	51	16	14	18	226	485	18	1,380	29	62
8	7.9	17	33	*16	14	19	245	350	17	765	27	51
9	8.2	14	33	17	14	20	216	245	16	515	24	34
10	8.5	10	33	18	14	21	207	189	16	326	24	30
11	14	11	30	18	14	21	207	146	15	245	22	27
12	15	8.8	25	18	14	21	198	122	15	189	22	33
13	13	10	24	18	14	21	207	100	19	146	20	130
14	11	10	22	18	14	21	198	86	21	122	18	100
15	10	9.4	22	18	14	19	130	68	19	146	18	74
16	12	9.7	24	18	14	18	107	61	14	122	17	57
17	9.4	10	26	18	14	18	146	58	12	93	17	48
18	9.4	11	17	18	14	17	154	57	10	74	20	36
19	9.1	11	14	18	13	17	207	54	31	66	26	32
20	9.1	13	16	17	13	17	216	52	100	57	22	30
21	9.1	33	16	16	13	20	198	43	350	56	19	26
22	8.8	25	16	15	13	25	189	39	304	53	16	25
23	8.5	24	16	14	13	35	162	36	245	46	18	24
24	7.9	23	15	15	14	38	130	33	180	49	18	21
25	7.6	22	14	15	14	40	114	32	138	53	22	20
26	7.6	21	14	15	14	43	114	32	86	46	19	20
27	7.6	20	14	15	14	46	93	29	60	45	25	22
28	7.6	18	14	15	*14	54	80	26	48	86	18	23
29	8.2	17	14	15	-	90	68	24	41	100	16	23
30	8.2	17	14	14	-	122	62	25	31	74	16	22
31	8.5	-	14	14	-	130	-	26	-	57	18	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	273.7	15	6.4	8.83	0.087	0.10
November	453.9	33	8.2	15.1	.150	.17
December	661	51	14	21.3	.211	.24
Calendar year	-	-	-	-	-	-
January	485	18	12	15.6	.154	.18
February	387	14	13	13.8	.137	.14
March	1,003	130	14	32.4	.321	.37
April	5,045	264	62	168	1.66	1.85
May	3,966	637	24	128	1.27	1.46
June	1,963	350	10	65.4	.648	.72
July	17,609	4,150	45	568	5.62	6.48
August	806	62	16	26.0	.257	.30
September	1,229	130	18	41.0	.406	.45
Water year 1948-49	33,881.6	4,150	6.4	92.8	.919	12.46

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 18 to Mar. 29.

Bad River near Odanah, Wis.

Location.- Water-stage recorder, lat. 46°29'15", long. 90°41'45", in SE¼ sec. 2, T. 46 N., R. 3 W., at Elm Hoist Bridge, 2½ miles downstream from Potato River, 8½ miles south of Odanah, and 12 miles upstream from mouth.

Drainage area.- 616 square miles.

Records available.- May 1948 to September 1949. July 1914 to November 1922 at site 2 miles downstream.

Extremes.- Maximum discharge during year, 16,500 second-feet July 4 (gage height, 17.3 feet, from floodmark); minimum, 50 second-feet Nov. 29 (gage height, 2.02 feet).
1914-22, 1948-49: Maximum discharge, that of July 4, 1949; minimum, that of Nov. 29, 1948.
Flood of June 24, 1946, reached a stage of at least 22.2 feet (top of bridge which was submerged), from information by Indian Service.

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a52	77	66	82	90	87	850	331	174	780	304	104
2	a53	75	81	74	90	89	1,000	318	189	1,560	308	104
3	a55	77	102	68	89	92	1,200	308	189	1,820	286	100
4	a56	79	107	67	89	97	1,380	906	189	13,700	246	98
5	a57	88	117	70	88	102	1,780	3,020	170	15,900	208	144
6	a59	134	163	94	88	107	1,780	5,200	147	12,400	185	286
7	a61	131	150	100	88	113	1,620	4,140	123	7,700	163	295
8	a62	126	163	*103	88	118	1,520	2,640	109	4,290	147	242
9	62	109	163	107	88	124	1,420	1,780	104	2,480	134	189
10	62	98	140	108	88	130	1,290	1,260	102	1,560	147	154
11	72	91	120	109	88	133	1,200	1,020	100	1,110	237	137
12	77	84	131	110	88	134	1,140	840	102	930	216	131
13	77	82	163	110	88	135	1,080	698	147	780	174	221
14	75	82	134	110	87	133	1,020	595	131	670	144	376
15	72	84	126	110	87	130	870	502	115	580	120	313
16	70	82	134	110	87	120	725	439	104	545	131	246
17	68	82	131	110	86	113	780	412	86	475	181	204
18	68	84	115	110	85	110	930	398	82	412	147	170
19	70	91	108	110	85	110	1,050	376	112	380	163	147
20	70	75	104	107	84	111	990	331	390	322	170	134
21	70	95	100	102	84	123	930	290	840	286	144	120
22	70	134	97	97	84	150	930	259	960	272	120	115
23	70	95	94	96	84	200	752	250	840	250	112	107
24	68	115	92	95	85	240	670	233	810	246	109	102
25	68	117	90	95	85	265	605	216	670	254	102	100
26	70	115	90	94	86	285	555	208	493	246	102	100
27	72	107	89	93	*86	310	502	197	362	225	126	107
28	72	95	88	92	86	400	448	181	272	286	157	117
29	73	65	87	91	-	520	403	163	212	430	115	112
30	73	88	87	91	-	640	362	174	181	408	115	115
31	75	-	86	90	-	740	-	197	-	340	117	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,079	77	52	67.1	0.109	0.13
November	2,857	134	65	95.2	.155	.17
December	3,518	163	66	113	.183	.21
Calendar year	-	-	-	-	-	-
January	3,005	110	67	96.9	.157	.18
February	2,431	90	84	86.8	.141	.15
March	6,161	740	87	199	.323	.37
April	29,782	1,780	362	993	1.61	1.80
May	27,882	5,200	163	899	1.46	1.68
June	8,505	960	82	284	.461	.51
July	71,637	15,900	225	2,311	3.75	4.32
August	5,130	308	102	165	.268	.31
September	4,890	376	98	163	.265	.30
Water year 1948-49	167,877	15,900	52	460	.747	10.13

Peak discharge (base, 1,400 sec.-ft.).- Apr. 5 (3 p.m.) 1,860 sec.-ft.; May 6 (4 p.m.) 5,510 sec.-ft.; July 4 (time unknown) 16,500 sec.-ft.

* Winter discharge measurement made on this day.

a Ne gage-height record; discharge computed on basis of records for station at Mellen.

Note.- Stage-discharge relation affected by ice Dec. 19 to Apr. 3 (no recorder record Dec. 21 to Apr. 2; wire-weight gage read at about weekly intervals; discharge computed on basis of records for station at Mellen).

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White River near Ashland, Wis.

Location.- Chain gage, lat. 46°29'50", long. 90°54'15", in sec. 6, T. 46 N., R. 4 W., at downstream end of power plant of Lake Superior District Power Co., a quarter of a mile downstream from bridge on State Highway 112 over dam, and 4½ miles south of Ashland.

Drainage area.- 266 square miles.

Records available.- May 1948 to September 1949.

Extremes.- Maximum discharge during year, 3,720 second-feet May 5 (gage height, 5.53 feet); minimum, 3.1 second-feet Apr. 28-30 (gage height, 0.09 foot).
1948-49: Maximum discharge, that of May 5, 1949; minimum, that of Apr. 28-30, 1949.

Remarks.- Records good. Gage read twice daily or oftener when plant load is changed.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	143	156	106	151	177	176	731	172	206	241	239	150
2	143	156	146	164	207	163	700	228	198	344	218	158
3	139	163	206	164	194	169	700	201	193	544	218	163
4	142	156	197	171	187	169	700	294	191	1,630	190	158
5	143	176	199	165	178	183	672	2,330	152	1,240	181	163
6	143	218	182	165	186	196	618	1,500	225	1,330	179	158
7	143	222	186	173	188	217	567	988	178	1,320	175	161
8	143	172	119	173	173	184	496	762	177	1,110	176	151
9	143	170	171	174	167	197	452	672	174	1,030	176	151
10	150	169	120	176	183	197	408	519	171	519	167	153
11	150	176	141	127	177	190	365	386	161	474	386	161
12	150	176	154	181	177	157	365	333	138	408	218	168
13	167	176	166	180	169	210	323	252	218	286	179	199
14	150	156	179	173	178	163	328	234	198	277	180	161
15	150	169	165	180	176	135	255	186	195	229	186	161
18	157	169	165	172	160	169	302	220	195	235	463	161
17	163	169	176	180	181	176	259	202	147	197	365	161
18	163	169	114	188	176	169	408	202	138	202	263	161
19	152	169	160	133	162	139	386	202	256	182	228	161
20	157	176	182	235	192	186	365	206	474	177	195	161
21	176	88	187	163	176	164	338	191	496	190	199	161
22	157	203	174	199	171	176	286	156	474	177	169	153
23	157	211	165	198	167	177	283	200	465	185	158	153
24	164	187	128	181	165	210	230	198	357	186	161	153
25	157	167	166	181	165	248	238	180	252	217	171	153
26	157	187	165	174	175	446	204	180	182	211	177	154
27	157	173	173	174	179	479	216	180	221	210	171	154
28	142	173	172	183	172	359	208	187	168	269	169	155
29	156	152	173	206	-	798	201	167	163	330	169	161
30	156	159	173	206	-	798	186	208	163	302	153	161
31	156	-	171	179	-	731	-	194	-	274	150	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,726	176	139	152	0.571	0.66
November	5,163	222	88	172	.647	.72
December	5,080	206	106	164	.617	.71
Calendar year	-	-	-	-	-	-
January	5,404	235	127	174	.654	.75
February	4,958	207	160	177	.665	.69
March	8,131	798	135	262	.985	1.14
April	11,790	731	186	393	1.48	1.65
May	12,130	2,330	156	391	1.47	1.70
June	6,926	496	138	231	.868	.97
July	14,526	1,630	177	469	1.76	2.03
August	6,429	463	150	207	.778	.90
September	4,779	199	150	159	.598	.67
Water year 1948-49	90,042	2,330	88	247	.929	12.59

Montreal River near Saxon, Wis.

Location.- Water-stage recorder, lat. 46°32'45", long. 90°24'5", in NW¼ sec. 23, T. 48 N., R. 49 W., 2 miles upstream from mouth and 3½ miles north of Saxon.

Drainage area.- 281 square miles.

Records available.- September 1938 to September 1949.

Average discharge.- 11 years, 322 second-feet.

Extremes.- Maximum discharge during year, 3,460 second-feet July 6 (gage height, 5.41 feet); minimum, 5.8 second-feet Oct. 17 (gage height, 1.09 feet).
1938-49: Maximum discharge, 5,700 second-feet July 18, 1942 (gage height, 6.93 feet); minimum, 2 second-feet Sept. 21, Oct. 8, 1939.

Remarks.- Records good except those for periods of ice effect, which are fair. Diurnal fluctuation caused by Saxon Falls power plant, 1½ miles upstream. Flow regulated by Gile Reservoir on West Branch Montreal River (capacity, 1.29 billion cubic feet).

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

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Mar. 30				Mar. 31 to Sept. 30					
1.2	8.5	1.5	29	1.4	21	2.3	255	4.1	1,680
1.3	14	1.6	40	1.5	29	2.6	416	4.6	2,300
1.4	21	1.8	73	1.6	41	2.9	597	5.1	3,020
				1.8	78	3.3	890		
				2.0	132	3.7	1,260		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	7.5	14	11	25	19	500	20	180	296	184	184
2	50	7.5	15	10	18	23	520	95	184	450	184	184
3	28	7.5	27	12	30	15	580	97	175	450	180	184
4	69	7.5	33	60	23	25	723	338	237	1,520	180	188
5	61	36	34	24	15	33	874	1,210	196	2,580	175	184
6	82	37	70	20	21	17	850	2,040	175	3,020	184	184
7	66	83	60	15	21	47	766	1,620	171	1,920	68	184
8	76	40	52	25	25	27	737	1,120	153	1,210	139	184
9	76	42	40	20	13	31	679	730	146	788	214	184
10	22	47	49	30	18	32	617	509	150	546	214	180
11	54	28	41	35	25	38	552	399	85	405	227	175
12	54	35	32	15	28	32	546	333	78	317	196	180
13	45	34	30	27	18	24	527	275	171	265	171	184
14	30	25	32	28	30	21	491	227	175	227	167	184
15	30	36	35	45	20	20	439	196	188	275	132	184
16	33	40	25	23	16	30	360	175	171	214	180	184
17	12	26	19	30	11	28	338	171	171	180	175	188
18	66	42	15	45	15	25	366	171	139	167	180	114
19	80	39	18	54	32	40	338	180	153	175	184	156
20	58	49	40	39	13	30	311	171	255	180	184	188
21	24	24	25	36	20	50	286	136	467	184	180	184
22	34	49	17	52	18	70	265	78	539	180	136	184
23	8.0	38	21	31	27	90	255	146	462	180	175	184
24	7.2	50	18	26	21	110	237	180	388	175	171	184
25	15	24	17	22	10	160	214	167	317	156	175	184
26	12	46	22	30	45	250	175	164	232	180	180	184
27	11	49	45	35	10	350	175	160	188	184	188	184
28	8.7	38	102	22	19	500	164	180	175	184	136	184
29	8.0	23	98	35	-	600	171	171	175	184	156	184
30	8.2	17	102	10	-	700	142	167	180	184	184	184
31	7.5	-	40	25	-	580	-	167	-	180	184	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,185.6	82	7.2	38.2	0.136	0.16
November	1,027	83	7.5	34.2	.122	.14
December	1,182	102	14	38.1	.136	.16
Calendar year 1948	57,644.6	2,000	7.2	157	.559	7.64
January	862	54	10	27.8	.099	.11
February	587	45	10	21.0	.075	.08
March	4,017	700	15	130	.463	.53
April	13,198	874	142	440	1.57	1.75
May	11,793	2,040	20	380	1.35	1.56
June	6,476	539	78	216	.769	.86
July	17,156	3,020	156	553	1.97	2.27
August	5,383	227	68	174	.619	.71
September	5,417	188	114	181	.644	.72
Water year 1948-49	68,283.6	3,020	7.2	187	.665	9.05

Note.- Stage-discharge relation affected by ice Nov. 29 to Dec. 31, Jan. 2 to Apr. 3 (no gage-height record Dec. 19-29, Jan. 20-26, Mar. 1-9; discharge computed on basis of recorded range in stage, weather records, and Superior Falls power plant records).

Presque Isle River at Marenisco, Mich.

Location.- Water-stage recorder, lat. 46°22', long. 89°41', in NW¼ sec. 21, T. 46 N., R. 43 W., a quarter of a mile upstream from county highway bridge in Marenisco and about 2½ miles downstream from confluence of East and West Branches of Presque Isle River. Prior to May 27, 1949, wire-weight gage at site a quarter of a mile downstream at different datum.

Drainage area.- 175 square miles.

Records available.- February 1945 to September 1949.

Extremes.- Maximum discharge during year, 1,350 second-feet May 7 (gage height, 7.77 feet, from graph based on gage readings); minimum observed, 14 second-feet Oct. 3-6; minimum gage height observed, 2.27 feet Oct. 4, 6.
1945-49: Maximum discharge, 1,860 second-feet June 26, 1946 (gage height, 9.4 feet, from floodmark, site and datum then in use); minimum observed, 13 second-feet Sept. 30, 1948 (gage height, 2.25 feet, site and datum then in use).

Remarks.- Records good except those for periods of shifting control, which are fair, and those for period of ice effect, which are poor. Gage read twice daily Oct. 1 to May 26.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	25	56	37	48	47	180	126	77	164	86	38
2	16	24	*54	37	48	*47	220	134	74	208	82	59
3	14	24	50	*36	48	47	250	149	70	237	74	70
4	14	*29	50	36	48	47	270	334	64	392	64	80
5	14	47	56	36	48	47	280	915	58	547	54	138
6	14	72	62	36	48	46	290	1,250	54	699	61	140
7	15	82	64	36	48	46	*310	1,250	48	655	56	132
8	16	79	64	36	48	46	315	915	40	547	48	121
9	18	63	60	36	48	46	320	762	38	432	40	106
10	20	58	58	36	48	46	320	543	34	332	48	91
11	23	54	54	36	48	46	324	391	31	256	94	79
12	30	40	52	36	48	46	344	334	28	199	96	82
13	30	38	50	36	48	46	362	306	48	160	64	104
14	27	36	48	36	48	46	353	258	61	130	42	135
15	24	39	47	36	48	46	277	211	51	108	40	150
16	24	40	46	38	47	46	222	189	40	84	48	142
17	24	44	45	40	47	46	200	202	34	66	54	125
18	22	45	44	43	47	46	240	240	30	58	56	108
19	22	48	43	46	47	46	258	226	45	51	53	89
20	21	55	42	47	47	46	268	208	238	43	50	77
21	21	62	40	47	47	48	277	182	547	42	45	69
22	21	62	40	45	47	50	286	163	484	40	39	58
23	21	60	39	46	47	52	268	149	402	36	39	42
24	21	58	39	47	47	56	229	137	312	38	36	34
25	21	54	38	48	47	60	194	126	219	48	36	32
26	21	50	38	48	47	68	174	118	147	69	35	32
27	21	48	38	48	47	75	158	116	70	74	38	36
28	21	47	38	*48	47	85	146	103	19	101	39	38
29	20	47	38	48	-	95	132	92	28	120	35	36
30	24	52	38	48	-	115	126	89	42	106	36	32
31	27	-	38	48	-	130	-	84	-	87	35	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	643	30	14	20.7	0.118	0.14
November	1,482	82	24	49.4	.282	.31
December	1,469	64	38	47.4	.271	.31
Calendar year 1948	26,877	509	14	73.4	.419	5.70
January	1,277	48	36	41.2	.235	.27
February	1,331	48	47	47.5	.271	.28
March	1,759	130	46	56.7	.324	.37
April	7,593	362	126	253	1.45	1.61
May	10,302	1,250	84	332	1.90	2.19
June	3,433	547	19	114	.651	.73
July	6,129	699	36	198	1.13	1.30
August	1,623	96	35	52.4	.299	.34
September	2,475	150	32	82.5	.471	.53
Water year 1948-49	39,516	1,250	14	108	.617	8.38

Peak discharge (base, 600 sec.-ft.).- May 7 (5 to 8 a.m.) 1,350 sec.-ft.; July 6 (2 to 4 p.m.) 721 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Nov. 18 to Apr. 10. Shifting-control method used May 24-26, July 16 to Sept. 14.

Presque Isle River near Tula, Mich.

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

Drainage area.- 260 square miles.

Records available.- February 1945 to September 1949.

Extremes.- Maximum discharge during year, 2,600 second-feet May 7 (gage height, 11.82 feet, from graph based on gage readings); minimum, 22 second-feet Oct. 5, 6 (gage height, 4.22 feet).
1945-49: Maximum discharge, 3,170 second-feet June 25, 1946 (gage height, 12.45 feet, from graph based on gage readings); minimum, that of Oct. 5, 6, 1948.

Remarks.- Records good except those for period of ice effect, which are poor. Gage read once daily.

Rating tables, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Aug. 29 to Sept. 4)

Oct. 1 to Apr. 10						Apr. 11 to Sept. 30					
4.2	21	4.5	43	5.1	157	4.4	35	5.0	128	8.4	1,000
4.3	27	4.55	48	6.7	516	4.5	45	5.7	258	10.4	1,840
4.4	34	4.6	56	7.6	732	4.6	59	6.9	550	11.6	2,470

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	30	46	42	56	54	280	180	95	227	121	40
2	25	30	49	42	56	54	330	180	86	388	124	40
3	24	30	*54	42	56	*54	370	193	81	462	107	56
4	24	30	54	*41	56	54	450	390	78	575	91	103
5	23	41	60	40	54	52	540	1,280	71	795	79	142
6	22	109	70	40	54	52	*650	2,410	64	1,320	71	151
7	23	144	84	40	54	52	680	2,470	59	1,360	66	146
8	25	128	82	40	56	52	700	1,940	55	1,120	62	133
9	27	99	78	42	58	52	710	1,520	52	840	56	121
10	29	77	72	42	58	52	720	1,080	51	600	58	107
11	30	64	66	42	56	52	750	750	49	412	128	88
12	34	56	64	40	56	52	795	550	51	280	175	90
13	37	49	62	40	56	52	855	425	56	210	135	204
14	36	46	58	40	56	52	780	325	73	166	90	265
15	32	44	56	40	56	52	645	260	76	137	68	232
16	32	44	54	46	56	52	512	236	64	117	62	189
17	31	49	54	50	56	52	450	232	52	93	62	162
18	30	54	52	54	56	52	425	265	49	84	62	137
19	30	50	52	56	54	54	425	280	59	100	61	121
20	30	45	50	56	54	54	438	258	189	91	56	107
21	28	58	50	54	54	56	450	223	388	74	52	96
22	28	83	49	54	54	58	462	195	562	68	49	86
23	20	79	48	54	54	62	438	178	630	64	48	76
24	29	75	48	56	54	65	388	168	575	61	48	64
25	29	71	48	58	54	70	325	157	475	61	45	55
26	28	69	48	58	54	75	280	150	325	64	43	52
27	28	67	48	60	54	82	252	141	208	78	44	55
28	28	58	47	*60	54	95	223	126	124	98	46	59
29	28	49	46	58	-	120	200	114	79	128	41	61
30	28	48	45	58	-	155	180	103	86	133	40	56
31	29	-	44	58	-	225	-	98	-	121	39	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	881	37	22	28.4	0.109	0.13
November	1,876	144	30	62.5	.240	.27
December	1,738	84	44	56.1	.216	.25
Calendar year 1948	42,496	1,030	22	116	.446	6.08
January	1,503	60	40	48.5	.187	.21
February	1,546	58	54	55.2	.212	.22
March	2,115	225	52	68.2	.262	.30
April	14,703	855	180	490	1.88	2.10
May	16,877	2,470	98	544	2.09	2.41
June	4,862	630	49	162	.623	.70
July	10,327	1,360	61	333	1.28	1.48
August	2,229	175	39	71.9	.277	.32
September	3,294	265	40	110	.423	.47
Water year 1948-49	61,951	2,470	22	170	.654	8.86

Peak discharge (base, 1,000 sec.-ft.).- May 7 (12:30 a.m.) 2,600 sec.-ft.; July 7 (2 a.m.) 1,400 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 5 to Apr. 10.

Middle Branch Ontonagon River near Paulding, Mich.

Location.- Water-stage recorder, lat. 46°21'30", long. 89°04'40", in sec. 29, T. 46 N., R. 38 W., 25 feet downstream from highway bridge, 2¼ miles upstream from Bond Falls Reservoir, and 5¾ miles southeast of Paulding.

Drainage area.- About 175 square miles.

Records available.- June 1942 to September 1949.

Extremes.- Maximum discharge during year, 596 second-feet May 6 (gage height, 6.16 feet); minimum, 39 second-feet Nov. 20 (gage height, 3.01 feet).
1942-49: Maximum discharge, 1,320 second-feet June 6, 1944 (gage height, 9.15 feet); minimum, 27 second-feet Nov. 22, 1946; minimum gage height, 2.96 feet Nov. 26, 1942 (corrected).

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

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)

3.3	58	4.5	227
3.6	83	5.3	398
3.9	120	6.1	574

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	81	78	84	78	94	123	112	86	145	102	74
2	72	*78	100	84	78	92	126	116	85	156	96	73
3	72	78	94	84	78	90	138	116	84	125	91	72
4	72	81	90	84	78	92	158	168	81	216	86	75
5	72	102	88	84	78	94	185	321	78	332	84	92
6	72	154	100	86	78	90	192	530	77	376	88	99
7	72	140	90	88	76	88	*186	574	73	310	93	92
8	74	113	100	88	76	90	195	530	72	243	92	87
9	76	100	100	85	78	85	195	409	72	201	86	84
10	74	96	98	82	78	88	199	310	73	170	105	77
11	80	93	96	80	75	90	197	257	72	145	158	77
12	90	91	94	80	75	86	210	219	72	133	141	88
13	88	88	92	80	75	85	231	197	79	123	114	96
14	81	87	90	80	75	84	227	174	83	112	99	96
15	78	85	90	82	77	84	210	159	90	104	90	87
16	78	86	88	90	78	82	190	152	84	99	88	81
17	77	92	86	88	78	82	192	141	77	93	86	78
18	78	90	86	86	86	82	192	158	74	87	83	77
19	78	88	82	84	86	80	190	154	74	86	80	76
20	77	65	80	82	86	82	183	140	96	83	78	79
21	78	115	80	80	84	85	177	125	271	81	77	78
22	77	100	84	80	84	90	183	117	208	80	78	76
23	78	94	84	80	88	92	190	112	248	78	77	76
24	78	90	84	80	*92	94	170	109	300	87	73	75
25	78	85	84	80	90	96	156	106	332	88	73	75
26	75	85	84	80	92	98	145	105	244	85	72	76
27	75	80	84	*80	94	100	134	98	170	86	77	78
28	74	80	84	80	90	105	128	94	140	117	75	78
29	74	*75	*84	80	-	110	123	92	119	143	72	77
30	74	75	84	80	-	115	114	92	107	117	72	77
31	78	-	84	80	-	120	-	90	-	99	74	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,372	90	72	76.5	0.437	0.50
November	2,767	154	65	92.2	.527	.59
December	2,742	100	78	88.5	.506	.58
Calendar year 1948	37,771	332	65	103	.589	8.03
January	2,561	90	80	82.6	.472	.54
February	2,278	94	75	81.4	.465	.48
March	2,845	120	80	91.8	.525	.80
April	5,239	231	114	175	1.00	1.11
May	8,077	574	90	196	1.12	1.29
June	3,721	332	72	124	.709	.79
July	4,400	376	78	142	.811	.94
August	2,760	158	72	89.0	.509	.58
September	2,428	99	72	80.9	.462	.52
Water year 1948-49	40,189	574	65	110	.629	8.53

Peak discharge (base, 500 sec.-ft.).- May 6 (11 p.m.) 598 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Nov. 21 to Mar. 31.

Middle Branch Ontonagon River near Trout Creek, Mich.

Location.- Water-stage recorder, lat. 46°28'45", long. 89°05'25", in sec. 8, T. 47 N., R. 38 W., an eighth of a mile upstream from State Highway 28, 3⅔ miles west of town of of Trout Creek, and 6¼ miles downstream from Bond Falls Dam.

Drainage area.- About 225 square miles.

Records available.- June 1942 to September 1949.

Extremes.- Maximum discharge during year, 144 second-feet July 6 (gage height, 2.14 feet), during period of doubtful gage-height record; minimum, 21 second-feet Mar. 7 (gage height, 1.30 feet), caused by ice jam upstream.
1942-49: Maximum discharge, 1,170 second-feet June 7, 1944 (gage height, 4.53 feet); minimum, 14 second-feet sometime during period of no gage-height record Jan. 23 to Feb. 13, 1947 (gage height, 1.14 feet, from recorded range in stage), caused by ice jam upstream.

Remarks.- Records excellent except those for periods of ice effect or doubtful gage-height record, which are good. Flow regulated by Bond Falls Reservoir. Diversion to South Branch Ontonagon River by Bond Falls Canal (see p. 34).

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

1.4	27	1.7	58
1.5	34	1.9	92
1.6	44	2.1	134

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	32	30	32	31	31	38	32	39	95	58	54
2	46	32	33	31	31	*32	39	32	52	75	55	47
3	46	32	*32	*31	*31	32	41	32	54	70	55	48
4	47	32	32	31	31	32	44	41	54	105	55	52
5	47	38	34	32	31	32	47	82	54	120	55	52
6	46	38	34	32	31	30	43	94	54	130	55	49
7	46	34	31	32	31	30	42	55	54	85	55	48
8	46	33	33	32	31	31	40	43	54	74	54	47
9	47	32	32	32	31	31	38	39	54	70	54	47
10	47	32	30	31	31	31	37	36	54	65	80	47
11	48	32	32	30	31	31	37	35	54	62	84	48
12	48	32	32	32	31	31	37	34	54	58	65	49
13	47	32	30	32	31	31	37	33	58	56	58	49
14	47	32	32	32	31	31	36	33	57	55	57	48
15	47	32	32	32	31	31	35	32	57	55	55	47
16	46	32	32	33	31	31	35	32	55	54	55	47
17	44	33	32	31	31	32	35	33	54	54	55	47
18	44	32	32	32	31	31	36	38	54	57	55	47
19	44	33	32	32	31	31	35	41	65	57	55	47
20	44	34	32	32	31	32	34	37	68	55	55	47
21	46	35	32	32	31	32	34	35	72	55	54	47
22	46	34	32	32	31	32	35	34	62	55	54	47
23	46	34	32	32	31	32	34	34	82	54	54	48
24	46	34	32	32	32	32	33	34	70	55	54	47
25	46	34	32	32	31	32	33	34	60	54	54	47
26	46	33	32	32	30	33	33	34	57	54	54	47
27	41	33	32	32	32	36	32	33	54	58	55	47
28	32	33	32	31	31	36	32	33	54	60	55	47
29	32	31	32	31	-	38	32	33	54	57	57	47
30	32	33	32	31	-	39	32	32	62	55	57	47
31	32	-	32	31	-	38	-	32	-	54	57	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,368	48	32	44.1		
November	993	38	31	33.1		
December	991	34	30	32.0		
Calendar year 1948	17,299	63	30	47.3		
January	982	33	30	31.7		
February	869	32	30	31.0		
March	1,004	39	30	32.4		
April	1,096	47	32	36.5		
May	1,202	94	32	38.8		
June	1,726	82	39	57.5		
July	2,083	130	54	66.5		
August	1,755	84	54	56.6		
September	1,436	54	46	47.9		
Water year 1948-49	15,485	130	30	42.4		

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 23, 25-27, 29, 30, Jan. 2, 3, 21, Feb. 4-18, Mar. 1, 11, 12, 14, 19. Doubtful gage-height record Dec. 16-18, Jan. 20, Jan. 28 to Feb. 3, June 19 to July 14; discharge computed on basis of discharge measurements, weather records, and unpublished records for bypass weirs at Bond Falls.

Middle Branch Ontonagon River near Rockland, Mich.

Location.- Wire-weight gage, lat. 46°42'05", long. 89°09'40", in sec. 27, T. 50 N., R. 39 W., at bridge on U. S. Highway 45, 300 feet downstream from East Branch and 2½ miles southeast of Rockland.
Drainage area.- 670 square miles.
Records available.- July 1942 to September 1949.
Extremes.- Maximum discharge during year, 11,000 second-feet July 6 (gage height, 13.1 feet, from floodmark); minimum observed, 157 second-feet Dec. 1 (gage height, 4.45 feet).
1942-49: Maximum discharge, 27,000 second-feet Aug. 22, 1942 (gage height, 21.2 feet, from floodmarks), from rating curve extended above 4,500 second-feet, on basis of slope-area and contracted-opening determinations at gage height 21.2 feet; minimum observed, that of Dec. 1, 1948; minimum gage height observed, 4.39 feet Aug. 13, 1942.
Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Gage read once or twice daily. Flow regulated by Bond Falls Reservoir. Diversion to South Branch Ontonagon River by Bond Falls Canal (see p. 34).

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Apr. 22 to May 4, June 20 to July 3, Sept. 20, 21)

Oct. 1 to Sept. 19										Sept. 20-30	
4.5	166	4.9	257	5.5	530	6.6	1,440	10.0	5,870	4.8	195
4.7	204	5.2	373	5.8	730	7.5	2,450	11.6	8,380	4.9	230

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	168	188	168	200	190	185	1,200	226	202	904	352	240
2	168	190	*200	200	195	*185	1,060	226	211	778	334	228
3	168	190	225	200	*180	185	1,050	240	206	2,240	310	223
4	170	200	220	200	190	190	1,590	560	206	7,880	284	245
5	171	226	250	205	190	195	*1,860	4,590	202	3,610	267	299
6	173	314	290	210	185	200	1,590	6,620	196	8,340	274	322
7	173	314	260	220	190	195	1,300	2,950	194	3,280	274	295
8	177	245	240	220	195	190	1,340	1,340	194	1,490	257	271
9	186	221	230	220	195	190	1,040	827	196	920	242	251
10	200	200	223	215	190	200	929	560	198	590	326	240
11	218	192	216	205	185	190	886	420	202	446	616	234
12	240	192	230	200	180	185	963	360	226	387	636	242
13	235	192	240	200	180	185	904	318	237	356	406	281
14	215	190	230	200	180	185	648	284	234	330	310	281
15	200	190	225	200	180	180	502	257	234	310	274	267
16	190	188	220	220	180	180	420	242	237	291	264	248
17	192	200	215	250	180	180	406	251	211	274	257	237
18	194	209	210	250	190	180	415	284	202	274	264	228
19	196	209	210	220	195	180	378	406	242	310	254	223
20	194	218	210	200	190	185	347	436	425	334	240	216
21	194	234	210	200	190	200	360	334	1,120	291	234	209
22	192	242	210	195	190	220	378	277	920	274	228	206
23	194	214	200	195	190	250	360	254	1,440	264	226	202
24	192	209	200	195	190	260	310	240	1,090	254	226	202
25	190	211	200	195	185	290	295	234	802	251	228	209
26	190	211	200	195	180	330	281	228	616	254	228	209
27	190	211	200	190	185	400	254	223	392	257	237	220
28	184	206	205	190	185	500	242	211	307	339	245	220
29	180	209	210	190	-	700	237	211	277	382	245	212
30	186	204	205	195	-	900	231	209	267	356	248	206
31	188	-	205	180	-	1,050	-	209	-	352	251	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	5,908	240	168	191		
November	6,419	314	188	214		
December	6,757	290	168	218		
Calendar year 1948	118,133	2,610	160	323		
January	6,355	250	180	205		
February	5,235	195	180	187		
March	8,845	1,050	180	285		
April	21,776	1,860	231	726		
May	24,027	6,620	209	775		
June	11,686	1,440	194	390		
July	36,618	8,340	251	1,181		
August	9,037	636	226	292		
September	7,166	322	202	239		
Water year 1948-49	149,829	8,340	168	410		

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 3-7, 9, Dec. 12 to Apr. 1 (no gage-height record Dec. 23-28, Dec. 30 to Jan. 2, Jan 16, 17). No gage-height record Oct. 12-15 and on Sundays and holidays; discharge computed on basis of adjacent record and records for nearby stations.

Ontonagon River near Rockland, Mich.

Location.- Water-stage recorder, lat. 46°43'15", long. 89°12'25", in sec. 20 T. 50 N., R. 39 W., at bridge on county road between Rockland and Victoria, 1¾ miles southwest of Rockland and 2 miles downstream from confluence of Middle and South Branches.

Drainage area.- 1,290 square miles.

Records available.- June 1942 to September 1949.

Extremes.- Maximum discharge during year, 17,900 second-feet July 6 (gage height, 18.52 feet); minimum daily, 280 second-feet Oct. 2.
1942-49: Maximum discharge, 42,000 second-feet Aug. 22, 1942 (gage height, 28.6 feet, from floodmark), from rating curve extended above 9,500 second-feet on basis of slope-area determination; minimum daily, 260 second-feet Sept. 6, 1948.

Remarks.- Records excellent except those for period of ice effect, which are fair. Flow regulated by Victoria power plant, on South Branch, 5 miles above station, and by Bond Falls Reservoir and Gogebic and Cisco Lakes.

Rating tables, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Mar. 31				Apr. 1 to Sept. 30			
5.2	280	5.7	470	7.8	1,860	11.5	6,370
5.4	345	6.3	765	8.8	2,880	13.0	8,620
5.7	460	7.0	1,200	10.0	4,300	15.6	12,800
6.0	590						

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	303	338	a410	350	470	560	2,770	479	572	1,780	685	644
2	280	342	*369	320	500	*540	2,880	551	587	2,250	682	606
3	307	369	375	360	510	520	3,100	551	581	2,190	647	590
4	314	369	334	360	500	480	4,300	893	572	9,420	616	609
5	297	416	358	370	480	560	5,350	8,290	504	5,630	606	590
6	294	545	536	370	480	590	*4,300	12,400	577	12,700	592	663
7	308	489	496	380	500	590	3,700	8,770	571	8,470	528	642
8	307	511	454	380	500	590	3,580	6,070	566	4,090	626	638
9	315	456	472	350	500	570	3,100	4,090	571	2,780	633	614
10	332	378	454	390	480	560	2,600	2,260	582	1,950	696	574
11	380	354	450	390	470	540	2,290	1,780	635	1,590	946	534
12	394	353	440	360	470	520	2,500	1,640	562	1,310	1,310	613
13	382	324	430	360	490	560	2,440	1,430	618	868	953	623
14	362	340	420	390	510	580	1,900	1,000	631	693	749	637
15	416	377	410	390	500	550	1,470	880	620	655	699	604
16	380	387	410	370	510	550	1,130	1,030	632	625	654	622
17	334	368	400	440	500	550	1,160	710	595	598	664	594
18	356	396	400	480	490	550	1,350	965	556	637	628	616
19	360	390	400	420	480	540	1,100	1,040	590	680	628	591
20	348	345	400	370	510	530	1,160	1,030	903	707	587	548
21	353	354	400	390	520	560	1,060	789	3,270	655	568	566
22	357	486	400	390	540	610	1,030	673	2,580	628	610	594
23	304	464	400	360	540	680	1,000	628	3,460	586	618	608
24	311	464	400	430	540	740	792	590	3,460	537	640	588
25	350	376	400	450	540	800	765	612	2,250	633	655	572
26	355	399	380	450	510	900	716	551	1,540	648	650	610
27	328	413	420	*450	540	1,000	635	570	923	630	610	637
28	306	344	400	450	*560	1,200	620	556	800	725	600	642
29	303	417	*370	450	-	*1,750	585	502	679	748	636	621
30	287	451	360	410	-	2,250	542	492	658	685	668	607
31	286	-	350	450	-	2,500	-	564	-	620	652	-•

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	10,309	416	280	333		
November	12,015	545	324	400		
December	12,698	536	334	410		
Calendar year 1948	271,473	5,600	260	742		
January	12,280	480	320	396		
February	14,140	560	470	505		
March	24,020	2,500	480	775		
April	59,925	5,350	542	1,998		
May	62,386	12,400	479	2,012		
June	31,645	3,460	504	1,055		
July	66,718	12,700	537	2,152		
August	21,036	1,310	528	679		
September	18,197	663	534	607		
Water year 1948-49	345,369	12,700	280	946		

Peak discharge (base, 7,000 sec.-ft.).- May 6 (9 a.m.) 14,100 sec.-ft.; July 4 (10 a.m.) 11,000 sec.-ft.; July 6 (3 p.m.) 17,900 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge interpolated.
Note.- Stage-discharge relation affected by ice Dec. 11 to Mar. 31 (no gage-height record Dec. 11-16, Feb. 16-21, Mar. 10, 11, 16-18, 22-28).

Bond Falls Canal near Paulding, Mich.

Location.- Staff gage and concrete control, lat. 46°24'10", long. 89°09'00", in sec. 11, T. 46 N., R. 39 W., 40 feet upstream from intake to pipe line No. 2, 1.4 miles southeast of Paulding, and 1½ miles downstream from Bond Falls Reservoir.

Records available.- July 1942 to September 1949.

Extremes.- Maximum discharge during year, 255 second-feet Sept. 22-24 (gage height, 2.54 feet); minimum, 5.1 second-feet Apr. 17-20 (gage height, 0.23 foot).
1942-49: Maximum discharge, 362 second-feet Aug. 27, 1947 (gage height, 3.13 feet, from graph based on gage readings); minimum, 2.5 second-feet Nov. 3, 4, 11, 12, 1943; minimum gage height, -1.25 feet May 29, 1943 (two drain holes in weir open and canal gate closed).

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	23	5.5	7.0	128	160	5.5	5.5	9.2	12	16	97
2	23	23	5.5	6.7	102	*158	5.5	5.5	9.2	12	16	97
3	23	23	5.5	6.3	*86	158	5.5	5.5	9.2	12	16	97
4	23	23	5.9	6.3	86	158	5.5	5.5	9.2	14	16	133
5	23	23	5.9	6.3	86	138	5.5	5.9	9.2	14	16	171
6	23	23	5.9	24	86	122	5.5	6.3	9.2	14	16	119
7	23	23	5.9	44	106	140	5.5	6.3	51	14	15	98
8	23	23	6.3	48	142	156	5.5	6.7	66	14	15	98
9	23	23	6.3	49	152	156	5.5	7.0	62	14	37	98
10	23	23	6.3	49	152	156	5.5	7.0	54	14	29	119
11	31	23	6.3	49	150	115	5.5	7.0	51	14	15	144
12	51	17	6.3	49	150	80	5.5	7.0	74	15	15	145
13	54	11	6.3	49	150	80	5.5	7.0	98	15	15	145
14	68	5.9	6.3	49	148	80	5.5	7.0	98	15	15	56
15	68	5.9	6.3	49	148	120	5.5	7.0	128	15	15	15
16	68	5.9	6.3	49	148	140	5.5	7.0	148	15	15	15
17	68	5.5	30	49	148	140	5.1	7.0	148	15	15	185
18	68	5.5	45	49	146	150	5.1	7.4	148	15	15	210
19	68	5.5	45	49	146	160	5.1	8.7	148	15	15	210
20	68	5.5	45	49	146	172	5.1	9.2	148	15	15	210
21	68	5.5	45	49	146	185	5.5	9.2	59	15	15	210
22	68	5.5	36	49	144	185	5.5	9.2	12	15	42	228
23	68	5.5	16	49	144	185	5.5	9.2	12	15	62	255
24	68	5.5	8.3	49	144	185	5.5	9.2	12	15	79	255
25	68	5.5	7.8	81	144	152	5.5	9.2	12	15	99	251
26	68	5.5	7.0	120	150	93	5.5	9.2	12	15	98	251
27	74	5.5	7.0	130	165	52	5.5	9.2	12	15	98	250
28	81	5.5	7.0	130	165	17	5.5	9.2	12	15	98	250
29	85	5.5	7.0	130	-	5.5	5.5	9.2	12	15	98	248
30	84	5.5	7.0	130	-	5.5	5.5	9.2	12	15	98	246
31	53	-	7.0	130	-	5.5	-	9.2	-	16	98	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,627	85	23	52.5		
November	375.7	23	5.5	12.5		
December	416.9	45	5.5	13.4		
Calendar year 1948	30,191.7	304	4.8	82.5		
January	1,783.6	130	6.3	57.5		
February	3,808	165	86	136		
March	3,809.5	185	5.5	123		
April	163.4	5.5	5.1	5.45		
May	236.7	9.2	5.5	7.64		
June	1,644.2	148	9.2	54.8		
July	449	16	12	14.5		
August	1,227	99	15	39.6		
September	4,906	255	15	164		
Water year 1948-49	20,447.0	255	5.1	56.0		

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Feb. 2 to Mar. 5, Mar. 7-11, 15-24.

East Branch Ontonagon River near Mass, Mich.

Location.- Wire-weight gage, lat. 46°41'25", long. 89°04'20", in sec. 33, T. 50 N., R. 38 W., at county highway bridge, 300 feet downstream from Adventure Creek, 5 miles south of Mass, and 6½ miles upstream from mouth.

Drainage area.- 265 square miles.

Records available.- July 1942 to September 1949.

Extremes.- Maximum discharge during year, 4,160 second-feet July 4 (gage height, 11.52 feet, from floodmark); minimum, 75 second-feet Oct. 6 (gage height, 3.64 feet, from graph based on gage readings).
1942-49: Maximum discharge, that of July 4, 1949; minimum, 60 second-feet Aug. 25, 1948 (gage height, 3.55 feet, from graph based on gage readings).

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

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to July 7						July 8 to Sept. 30			
3.6	68	5.3	491	8.6	1,990	3.7	101	5.3	505
4.1	162	6.2	810	10.0	2,900	4.	197	6.4	910
4.4	228	7.4	1,340	10.6	3,380	4.5	265		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	78	100	115	110	110	100	600	127	115	285	181	117
2	82	*102	*125	110	110	*100	625	129	110	343	183	112
3	82	104	120	110	110	100	625	132	106	884	169	108
4	80	102	120	110	110	100	730	233	102	3,260	151	132
5	76	115	140	110	110	100	*830	1,340	89	1,750	136	163
6	75	186	160	110	110	100	770	2,230	80	3,340	136	189
7	76	200	150	115	110	105	730	1,390	78	1,640	134	173
8	80	164	145	115	105	105	712	850	83	890	128	151
9	87	140	140	115	105	105	608	557	85	575	119	134
10	91	129	135	115	105	105	524	397	83	365	149	123
11	112	119	130	115	105	105	557	274	82	260	233	117
12	129	119	130	110	105	100	678	226	82	218	347	121
13	119	115	125	110	105	100	608	197	98	195	250	144
14	112	102	120	110	105	105	476	162	115	179	175	159
15	100	106	120	110	105	105	367	152	119	163	148	146
16	94	112	120	120	105	105	299	154	117	151	132	127
17	94	125	115	135	105	105	276	162	110	138	132	114
18	98	138	115	130	105	105	257	193	98	130	144	110
19	100	142	110	125	100	105	231	358	104	169	127	110
20	98	148	110	120	100	110	223	319	209	193	114	115
21	96	150	105	115	100	115	223	223	557	161	108	110
22	91	140	105	115	100	140	233	176	524	146	105	110
23	93	125	105	115	100	145	238	158	508	130	103	110
24	96	131	105	115	100	150	193	148	508	123	103	110
25	94	131	105	115	100	165	180	136	415	127	103	110
26	94	125	105	115	100	190	172	131	310	128	105	112
27	93	127	105	*115	100	235	158	123	226	127	108	119
28	94	129	105	110	100	320	146	119	178	171	123	123
29	94	125	*105	110	-	*390	136	123	144	225	127	119
30	96	120	105	110	-	480	131	138	140	199	121	115
31	96	-	105	110	-	550	-	121	-	171	119	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,900	129	75	93.5	0.353	0.41
November	3,871	200	100	129	.487	.54
December	3,700	160	105	119	.449	.52
Calendar year 1948	60,696	1,260	60	166	.626	8.53
January	3,550	135	110	115	.434	.50
February	2,925	110	100	104	.392	.41
March	4,945	550	100	160	.604	.69
April	12,536	830	131	418	1.58	1.76
May	11,178	2,230	119	361	1.36	1.57
June	5,575	557	78	186	.702	.78
July	16,856	3,340	123	544	2.05	2.36
August	4,513	347	103	146	.551	.63
September	3,803	189	108	127	.479	.53
Water year 1948-49	76,352	3,340	75	209	.789	10.70

Peak discharge (base, 1,400 sec.-ft.).- May 6 (9 a.m.) 2,480 sec.-ft.; July 4 (1 p.m.) 4,160 sec.-ft.; July 8 (11:30 a.m.) 3,890 sec.-ft.

* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Nov. 21, 22, Nov. 30 to Apr. 1.

Cisco Branch Ontonagon River at Cisco Lake Outlet, Mich.

Location.- Staff gage, lat. 46°15', long. 89°27', in sec. 32, T. 45 N., R. 41 W., just downstream from Cisco Lake Dam, 2½ miles upstream from Langford Lake Outlet, 4¾ miles upstream from U. S. Highway 2, and 13 miles southwest of Watersmeet.

Drainage area.- 50 square miles.

Records available.- October 1944 to September 1949. July 1942 to September 1944 at site 4¾ miles downstream. Records not equivalent.

Extremes.- Maximum discharge during year, 198 second-feet July 6, 7 (gage height, 1.74 feet); minimum daily, 0.8 second-foot Oct. 6, 7.
1944-49: Maximum discharge, 229 second-feet June 25, 26, 1946 (gage height, 1.88 feet); minimum daily, 0.2 second-foot May 29 to June 17, 1948.

Remarks.- Records good except those below 10 second-feet and those for periods of doubtful gage-height record, which are fair. Gage read once daily. Flow regulated by dam at outlet of Cisco Lake.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Mar. 22 to June 22)

0.13	1.4	0.40	8.0	1.2	88
.15	1.6	.50	13	1.4	122
.20	2.4	.60	20	1.7	188
.25	3.2	.70	28	1.8	213
.30	4.2	.90	49		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	21	71	22	44	8.0	d32	d9.5	6.9	82	51	d2.9
2	21	21	70	22	44	8.5	26	9.5	5.7	81	50	3.8
3	20	21	69	23	42	9.0	26	9.5	5.3	82	49	d2.5
4	20	22	68	23	42	9.0	26	9.5	4.6	88	d18	1.6
5	d7.2	26	66	23	42	9.5	27	10	4.2	98	2.9	1.5
6	e.8	26	65	24	42	30	28	11	4.0	d166	2.9	1.5
7	e.8	26	65	23	42	42	29	12	4.0	198	2.9	1.5
8	d19	27	64	23	42	41	30	12	3.8	79	2.9	1.4
9	d41	26	62	22	41	40	31	12	3.4	9.5	2.9	1.5
10	d46	26	61	23	41	d19	32	10	d3.0	9.5	2.9	1.4
11	44	26	61	23	40	9.0	31	10	d3.0	9.5	2.9	1.5
12	44	26	60	23	38	9.0	32	10	3.0	9.5	d38	1.9
13	44	25	60	23	38	8.5	d19	10	3.0	9.5	55	2.1
14	41	26	59	22	38	8.5	13	10	3.0	9.5	21	2.1
15	41	26	25	23	38	9.0	12	10	2.9	9.5	4.0	2.1
16	37	27	6.1	23	37	28	12	9.5	2.9	9.5	3.8	d18
17	35	26	6.1	24	37	27	12	9.5	2.9	9.5	3.4	26
18	d32	26	6.1	24	16	21	12	9.5	2.7	9.0	3.2	25
19	28	26	6.1	25	4.2	21	d5.7	9.5	2.7	8.5	2.7	25
20	44	34	6.1	25	5.0	21	2.5	9.0	2.9	8.0	2.4	24
21	54	50	6.9	26	5.0	22	d5.6	9.0	3.0	7.6	2.4	22
22	51	47	8.0	26	5.0	39	7.2	9.5	d18	7.6	2.2	19
23	49	46	8.5	26	5.3	47	7.2	9.0	d60	d4.1	d2.0	d28
24	30	46	8.5	27	6.1	47	7.2	10	71	2.7	d2.0	33
25	21	56	18	37	6.1	46	7.2	10	70	2.7	d2.0	33
26	21	72	23	47	6.9	45	7.2	10	71	2.7	1.8	42
27	20	77	23	46	7.2	46	7.2	10	74	2.7	1.8	47
28	20	75	23	46	8.0	46	7.2	8.5	75	d34	1.8	46
29	20	74	22	47	-	46	7.2	8.0	75	d49	1.8	44
30	20	73	22	46	-	46	7.2	7.6	81	49	1.8	42
31	21	-	22	45	-	46	-	7.2	-	51	1.8	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	913.8	54	0.8	29.5		
November	1,126	77	21	37.5		
December	1,141.4	71	6.1	36.8		
Calendar year 1948	8,353.7	77	.2	22.8		
January	882	47	22	28.5		
February	762.8	44	4.2	27.2		
March	854.0	47	8.0	27.5		
April	508.6	32	2.5	17.0		
May	300.8	12	7.2	9.70		
June	671.9	81	2.7	22.4		
July	1,198.1	198	2.7	38.6		
August	343.2	55	1.8	11.1		
September	503.3	47	1.4	16.8		
Water year 1948-49	9,205.9	198	.8	25.2		

d Doubtful gage-height record; discharge computed on basis of discharge measurements, adjacent record, observer's notes, records for level of Cisco Lake, and weather records.
e Stage-discharge relation indefinite; discharge computed on basis of 1 discharge measurement.

South Branch Ontonagon River at Ewen, Mich.

Location.- Staff gage, lat. 46°32'05", long. 89°16'30", in sec. 26, T. 48 N., R. 40 W., on piers of old M28 highway bridge in Ewen.

Drainage area.- About 320 square miles.

Records available.- April 1942 to September 1949.

Extremes.- Maximum discharge during year, 3,860 second-feet May 7; maximum gage height observed, 15.97 feet May 7; minimum observed, 76 second-feet June 7, Aug. 9, 22 (gage height, 0.88 foot).

1942-49: Maximum discharge, 6,640 second-feet June 25, 1946; maximum gage height, 18.86 feet June 25, 1946; minimum discharge observed, 76 second-feet Sept. 23, 1948, June 7, Aug. 9, 22, 1949.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Gage read twice daily. Records not adjusted for diversion from Middle Branch Ontonagon River by Bond Falls Canal (see p. 34).

Rating table, water year 1948-49, except periods of ice effect or when rate of change of stage was used as a factor (gage height, in feet, and discharge, in second-feet)

0.8	69	3.1	357	10.3	1,890
1.2	109	5.1	686	14.3	3,160
2.0	201	8.0	1,270	15.4	3,560

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	94	122	201	105	245	230	700	195	110	855	159	153
2	94	108	227	105	240	*240	740	201	100	875	177	153
3	94	106	*240	105	210	240	815	201	95	450	165	148
4	91	110	234	105	210	240	995	350	89	a860	142	165
5	90	126	214	115	200	240	1,160	1,520	83	a1,540	138	247
6	90	183	200	115	210	230	1,100	3,340	80	2,060	121	275
7	91	195	200	130	200	220	*915	3,550	87	1,650	98	214
8	93	165	210	150	240	260	855	2,360	126	955	85	189
9	88	148	195	155	245	260	815	1,370	123	633	78	183
10	84	141	190	150	245	260	758	740	121	434	122	171
11	120	135	180	150	245	200	686	548	123	290	261	177
12	148	130	175	145	245	180	686	466	132	240	466	208
13	153	121	170	145	245	175	686	387	159	220	312	214
14	159	120	165	145	240	170	565	334	165	195	227	177
15	165	117	160	150	245	170	514	282	165	171	183	118
16	159	122	130	160	245	210	498	254	195	159	148	94
17	159	122	110	160	240	220	466	234	195	148	112	86
18	159	120	110	145	245	230	482	247	195	142	96	220
19	159	119	115	140	245	240	466	282	208	148	90	261
20	159	121	130	140	240	250	434	261	466	135	85	282
21	153	142	130	140	230	260	402	234	1,200	121	80	290
22	159	165	125	140	220	270	387	214	1,100	118	77	282
23	171	183	105	140	220	280	387	177	1,180	111	106	312
24	171	165	90	145	220	280	350	159	1,200	107	114	312
25	171	148	95	150	220	290	334	153	815	113	139	327
26	159	148	90	180	225	290	312	148	514	104	148	320
27	142	153	95	215	235	300	282	138	334	101	153	327
28	153	165	98	*230	230	330	254	130	261	134	159	334
29	153	165	*100	230	-	*360	234	122	227	159	159	357
30	159	195	105	230	-	480	214	117	201	165	159	350
31	159	-	105	240	-	600	-	114	-	159	153	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,199	171	84	135		
November	4,260	195	106	142		
December	4,694	240	90	151		
Calendar year 1948	89,466	1,300	77	244		
January	4,755	240	105	153		
February	6,480	245	200	231		
March	8,205	600	170	265		
April	17,492	1,160	214	583		
May	18,828	3,550	114	607		
June	10,049	1,200	80	335		
July	13,552	2,060	101	437		
August	4,712	466	77	152		
September	6,946	357	86	232		
Water year 1948-49	104,172	3,550	77	285		

Peak discharge (base, 2,000 sec.-ft.).- May 7 (3 a.m.) 3,860 sec.-ft.; July 6 (10 a.m.) 2,130 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for nearby stations.

Note.- Stage-discharge relation affected by ice Dec. 6 to Apr. 1. Discharge computed using rate of change of stage as a factor May 6-8, July 6.

West Branch Ontonagon River near Bergland, Mich.

Location.- Water-stage recorder, lat. 46°35'30", long. 89°32'20", in sec. 3, T. 48 N., R. 42 W., a quarter of a mile downstream from dam at outlet of Gogebic Lake and 1¼ miles east of Bergland. Datum of gage is 1,290.81 feet above mean sea level, datum of 1929.

Drainage area.- 160 square miles.

Records available.- July 1942 to September 1949.

Extremes.- Maximum discharge during year, 700 second-feet July 7 (gage height, 4.34 feet, during seiches on Gogebic Lake); minimum daily, 6 second-feet Apr. 27 to May 3; minimum gage height observed, 0.48 foot Apr. 29.

1942-49: Maximum discharge, 1,100 second-feet May 6, 1943 (gage height, 5.41 feet); minimum, that of Apr. 27 to May 3, 1949; minimum gage height observed, that of Apr. 29, 1949.

Remarks.- Records excellent except those for periods of ice effect, which are good, and those for periods of no gage-height record or shifting control, which are fair. Flow regulated by Gogebic Lake.

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Sept. 24-30)

0.48	6.3	1.6	54	2.7	186
.6	8.8	1.9	78	3.1	278
.8	14	2.2	106	3.5	392
.9	18	2.4	132	4.3	680

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	13	16	22	25	55	28	6	214	56	110	205
2	19	13	16	d22	25	*55	28	6	255	52	84	194
3	18	13	*16	d22	*25	54	29	6	268	61	84	178
4	17	13	16	*22	25	53	24	10	256	82	102	170
5	17	14	16	22	25	53	15	18	248	148	113	188
6	18	16	16	22	25	53	11	215	227	281	103	110
7	16	15	16	22	25	58	10	495	239	502	180	60
8	16	14	16	22	24	67	10	565	248	680	249	58
9	16	14	17	22	24	67	10	565	236	640	309	58
10	15	14	17	22	24	66	9	582	229	600	291	90
11	14	14	17	22	24	64	9	600	220	565	237	121
12	14	14	17	22	24	63	9	565	214	435	95	121
13	14	14	17	22	23	62	9	402	211	99	58	79
14	14	14	17	22	23	63	8	207	201	100	58	34
15	15	14	17	22	23	60	8	203	192	95	58	31
16	16	14	18	24	23	59	8	196	194	95	129	30
17	16	14	18	24	23	58	8	232	186	92	194	30
18	16	14	18	24	34	57	8	281	168	155	214	78
19	15	14	19	24	58	57	7	204	174	190	256	95
20	15	14	20	24	58	55	7	114	194	172	248	92
21	15	14	20	24	56	55	7	114	98	170	243	95
22	14	14	20	24	56	59	7	105	42	170	284	93
23	14	15	20	24	55	59	7	100	62	215	296	64
24	14	15	21	25	55	58	7	98	49	210	301	38
25	14	15	21	25	55	59	7	89	49	235	288	44
26	14	15	22	25	55	58	7	83	50	245	273	48
27	14	15	22	25	55	61	6	74	48	240	258	45
28	14	16	23	25	55	46	6	71	46	280	251	43
29	13	16	22	25	-	32	6	111	43	265	241	45
30	13	16	22	25	-	33	6	170	52	190	225	41
31	13	-	22	25	-	31	-	196	-	150	209	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	473	20	13	15.3		
November	430	16	13	14.3		
December	575	23	16	18.5		
Calendar year 1948	24,962	311	13	68.2		
January	722	25	22	23.3		
February	1,002	58	23	35.8		
March	1,730	67	31	55.8		
April	321	29	6	10.7		
May	6,683	600	6	216		
June	4,913	268	42	164		
July	7,470	680	52	241		
August	6,041	309	58	195		
September	2,578	205	30	85.9		
Water year 1948-49	32,938	680	6	90.2		

* Winter discharge measurement made on this day.

d Doubtful gage-height record; discharge computed on basis of 1 discharge measurement and adjacent record.

Note.- Stage-discharge relation affected by ice Dec. 17, Jan. 19, Jan. 26 to Feb. 18. No gage-height record Oct. 23-28, Apr. 6 to May 4, July 21 to Aug. 1; discharge computed on basis of 4 discharge measurements, observer's weekly gage inspections, and observer's daily readings of staff gage at dam a quarter of a mile upstream.

Sturgeon River near Sidnaw, Mich.

Location.- Water-stage recorder, lat. 46°35', long. 88°35', in sec. 5, T. 48 N., R. 34 W., 40 feet downstream from bridge on county road, 2 miles downstream from Rock River, 3½ miles northwest of Covington, 4 miles upstream from Perch River, and 9 miles northeast of Sidnaw.

Drainage area.- 155 square miles.

Records available.- October 1912 to September 1915, April 1943 to September 1949.

Extremes.- Maximum discharge during year, 2,430 second-feet May 7 (gage height, 9.28 feet); minimum, 4.6 second-feet Oct. 8 (gage height, 3.47 feet).
1912-15, 1943-49: Maximum discharge, 3,280 second-feet May 7, 1943; maximum gage height, 10.18 feet June 6, 1944; minimum, that of Oct. 8, 1948.

Remarks.- Records excellent except those below 20 second-feet, which are good, and those for periods of ice effect, no gage-height record, or shifting control, which are fair.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Sept. 24-30)

Oct. 1 to Mar. 24				Mar. 25 to Sept. 30					
3.48	4.8	3.9	27	3.8	18	4.8	127	7.5	1,240
3.5	5.4	4.1	44	3.9	24	5.0	164	8.9	2,130
3.6	8.3	4.4	75	4.0	32	5.3	238	9.1	2,270
3.7	13.5	4.7	115	4.2	51	5.7	365		
				4.5	85	6.1	525		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.3	12	44	33	41	25	222	204	86	116	376	54
2	6.0	12	43	32	41	25	255	194	78	114	294	55
3	5.7	12	43	33	41	25	294	191	69	121	241	51
4	5.7	15	44	32	*41	24	369	270	59	601	184	68
5	5.4	24	50	33	40	24	476	1,010	50	720	142	124
6	5.1	65	80	34	39	24	498	1,920	43	845	122	188
7	5.1	100	100	35	38	24	498	2,200	36	845	106	188
8	4.8	94	92	35	37	24	575	1,600	32	720	92	156
9	5.4	74	85	34	36	23	580	1,120	29	590	77	132
10	7.4	63	75	33	35	23	640	845	26	452	74	112
11	16	55	68	33	34	23	770	635	24	323	92	97
12	30	47	60	33	34	23	970	480	23	233	109	94
13	28	42	56	33	33	23	1,210	391	36	182	112	124
14	24	37	52	31	32	23	1,240	314	62	148	97	152
15	20	34	48	31	32	23	1,040	261	83	120	81	142
16	16	32	47	33	31	23	820	222	83	101	72	120
17	15	31	45	35	30	*23	670	201	72	84	78	104
18	14	40	43	38	*29	23	561	204	51	74	90	90
19	14	35	41	39	29	23	484	241	43	77	84	83
20	13	42	40	38	28	23	456	252	59	86	71	83
21	13	60	38	34	28	28	512	224	124	88	60	83
22	13	52	36	33	27	40	625	188	168	77	52	75
23	12	47	35	36	27	65	745	164	199	66	45	74
24	12	43	34	40	27	82	695	150	264	64	42	102
25	12	47	33	42	26	93	575	142	297	55	41	112
26	12	45	33	40	25	95	456	136	297	53	41	101
27	12	42	33	*39	25	102	372	122	250	60	44	95
28	12	40	33	39	*25	129	323	112	182	106	46	95
29	12	*39	*32	39	-	148	273	101	132	425	60	89
30	12	48	32	39	-	171	233	94	112	494	58	79
31	12	-	32	39	-	*201	-	93	-	460	52	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	380.9	30	4.8	12.3	0.079	0.09
November	1,329	100	12	44.3	.286	.32
December	1,527	100	32	49.3	.318	.37
Calendar year 1948	36,951.6	975	4.8	101	.652	8.86
January	1,098	42	31	35.4	.228	.26
February	911	41	25	32.5	.210	.22
March	1,825	201	23	52.4	.338	.39
April	17,437	1,240	222	581	3.75	4.18
May	14,281	2,200	93	461	2.97	3.43
June	3,069	297	23	102	.658	.74
July	8,500	845	53	274	1.77	2.04
August	3,135	376	41	101	.652	.75
September	3,122	188	51	104	.671	.75
Water year 1948-49	56,414.9	2,200	4.8	155	1.00	13.54

Peak discharge (base, 1,000 sec.-ft.).- Apr. 14 (6 to 9 a.m.) 1,270 sec.-ft.; May 7 (2 a.m.) 2,430 sec.-ft.

* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Dec. 1, Dec. 5 to Jan. 9, Jan. 16 to Mar. 24. No gage-height record Oct. 24-27, Oct. 29 to Nov. 5, Nov. 16-28; discharge computed on basis of 2 discharge measurements, recorded range in stage, weather records, and records for nearby stations.

Sturgeon River near Alston, Mich.

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

Drainage area.- 346 square miles.

Records available.- October 1947 to September 1949.

Extremes.- Maximum discharge during year, 3,470 second-feet May 6 (gage height, 49.44 feet); minimum, 7.9 second-feet Oct. 24 (gage height, 42.73 feet), power plant leakage. 1947-49: Maximum discharge, that of May 6, 1949; minimum, that of Oct. 24, 1948.

Remarks.- Records excellent except those below 100 second-feet, which are good. Flow regulated by power plant at station.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)

42.7	7	43.1	25	44.0	146	45.9	880
42.8	10	43.3	42	44.2	195	46.9	1,500
42.9	14	43.5	64	44.7	358	48.0	2,330
43.0	19	43.8	108	45.2	545	49.1	3,210

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	112	94	154	134	123	224	369	396	302	359	755	230
2	126	88	197	138	136	127	369	406	294	359	483	220
3	11	75	122	138	139	134	402	385	300	411	395	186
4	119	75	130	138	134	151	631	413	202	1,340	395	55
5	119	75	128	140	134	186	935	1,790	179	1,250	392	168
6	110	89	158	138	108	31	1,000	2,880	232	1,610	392	255
7	112	9.7	230	138	142	123	919	3,170	235	1,620	371	305
8	112	118	279	138	144	151	978	2,390	221	1,250	383	331
9	111	92	279	126	215	170	1,020	1,690	219	1,050	377	323
10	10	92	277	126	125	168	1,020	1,250	169	900	272	264
11	111	90	278	124	137	173	1,130	677	151	599	270	237
12	117	93	172	122	137	165	1,250	888	12	607	388	269
13	122	89	239	124	59	110	1,510	649	175	397	394	266
14	123	73	219	124	143	165	1,660	534	178	343	237	274
15	122	86	217	124	145	175	1,480	493	220	341	255	280
16	113	103	213	124	157	175	1,080	473	175	305	241	271
17	8.2	161	220	124	139	183	986	454	177	234	246	221
18	129	121	140	124	138	172	807	446	155	274	254	215
19	124	166	121	134	190	167	672	458	55	256	246	375
20	122	252	144	111	49	8.5	685	590	193	264	227	446
21	123	185	158	115	133	189	692	470	242	303	108	330
22	121	154	162	137	193	175	843	376	172	258	193	242
23	114	154	158	135	186	170	890	415	493	256	227	233
24	7.9	152	158	146	192	176	930	413	385	224	170	195
25	119	130	148	144	136	164	809	418	663	257	181	185
26	119	164	134	177	137	157	620	373	586	310	177	268
27	122	167	142	143	115	202	662	319	517	322	180	268
28	116	131	146	144	130	261	543	243	415	321	51	268
29	99	160	151	141	-	286	382	208	279	384	184	258
30	98	175	142	101	-	363	397	201	282	506	171	244
31	10	-	138	149	-	368	-	297	-	676	186	-

Month	Second-foot-days	Maximum	Minimum	Mean	Psr square mile	Runoff in inches
October	3,082.1	129	7.9	99.4		
November	3,613.7	252	9.7	120		
December	5,554	279	121	179		
Calendar year 1948	87,117.0	1,690	7.9	238		
January	4,121	177	101	133		
February	3,916	215	49	140		
March	5,469.5	368	8.5	176		
April	25,671	1,660	369	856		
May	24,155	3,170	201	779		
June	7,878	663	12	263		
July	17,586	1,620	224	567		
August	8,801	755	51	284		
September	7,682	446	55	256		
Water year 1948-49	117,529.3	3,170	7.9	322		

Sturgeon River near Arnheim, Mich.

Location.- Staff gage, lat. 46°56', long. 88°33', in sec. 6, T. 52 N., R. 33 W., a quarter of a mile downstream from Otter Lake, 3 miles northwest of Arnheim, and 8½ miles northeast of Pelkie. Datum of gage is 605.98 feet above mean tide at New York City (Corps of Engineers bench mark).

Drainage area.- 680 square miles.

Records available.- November 1942 to September 1949.

Extremes.- Maximum discharge during year, 4,000 second-feet May 8; maximum gage height, 11.30 feet May 9 (from graph based on gage readings); minimum discharge, 204 second-feet Oct. 5 (gage height, 1.17 feet).

1942-49: Maximum discharge, 6,600 second-feet Apr. 25, 1944; maximum gage height, 13.93 feet Apr. 26, 1943, from graph based on gage readings; minimum discharge, 200 second-feet Sept. 14, 1948 (gage height, 1.15 feet).

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	230	260	314	280	310	280	1,030	790	403	570	870	326
2	234	232	303	270	310	280	1,120	715	437	583	960	348
3	232	220	325	270	300	280	1,210	685	448	624	900	370
4	226	234	314	270	300	285	1,360	700	437	840	810	359
5	208	244	325	270	300	285	1,870	1,090	414	1,870	720	337
6	216	260	336	280	300	295	2,240	1,330	381	2,450	678	337
7	220	303	336	280	300	300	2,420	3,520	360	3,330	664	359
8	230	303	358	280	300	300	2,490	3,930	360	3,690	637	403
9	242	270	391	280	300	300	2,550	3,720	360	3,330	610	426
10	248	270	391	280	310	310	2,470	3,290	349	2,780	583	448
11	250	270	380	280	310	310	2,510	2,640	338	2,160	570	448
12	248	260	380	*275	300	310	2,740	2,190	328	1,630	531	437
13	250	260	370	270	300	310	3,150	1,800	326	1,410	519	448
14	260	250	360	270	290	310	3,260	1,450	316	1,170	531	448
15	260	*250	350	270	*270	308	3,090	1,270	326	960	507	483
16	260	240	340	280	280	308	2,760	1,060	359	810	472	483
17	244	248	340	290	280	*308	2,330	940	359	692	460	483
18	246	270	330	290	280	308	2,020	880	337	610	437	448
19	226	292	320	290	270	308	1,750	820	337	570	426	414
20	238	314	*310	290	280	308	1,510	790	337	557	414	437
21	245	336	300	280	280	298	1,470	790	370	544	414	507
22	250	369	300	270	260	289	1,510	790	448	531	370	507
23	250	369	300	270	260	308	1,550	700	495	507	337	483
24	250	347	300	280	260	328	1,510	670	596	483	370	448
25	248	336	290	280	280	338	1,430	641	706	460	370	437
26	234	336	290	290	280	360	1,330	613	780	448	348	403
27	236	336	280	300	280	403	1,090	600	810	448	348	403
28	244	336	280	310	280	460	1,060	559	780	483	348	414
29	250	336	280	310	-	559	1,000	508	720	650	326	426
30	250	325	290	310	-	700	730	460	637	750	305	426
31	260	-	280	305	-	880	-	426	637	780	316	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	7,486	260	208	241	0.354	0.41
November	8,676	369	220	289	.425	.47
December	10,063	391	280	325	.478	.55
Calendar year 1948	186,199	3,280	204	509	.749	10.18
January	8,770	310	270	283	.416	.48
February	8,070	310	260	288	.424	.44
March	10,926	880	280	352	.518	.60
April	56,560	3,260	730	1,885	2.77	3.09
May	40,367	3,930	426	1,302	1.91	2.21
June	13,654	810	316	455	.669	.75
July	36,720	3,690	448	1,185	1.74	2.01
August	16,151	960	305	521	.766	.88
September	12,696	507	326	423	.622	.69
Water year 1948-49	230,139	3,930	208	631	.928	12.58

Peak discharge (base, 3,300 sec.-ft.).- Apr. 14 (4 a.m.) 3,330 sec.-ft.; May 8 (6 p.m.) 4,000 sec.-ft.; July 8 (3 p.m.) 3,740 sec.-ft.

* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Dec. 13 to Mar. 14. Discharge computed using rate of change of stage as a factor Apr. 5-20, May 7-14, July 5-12.

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Otter River near Elo, Mich.

Location.- Wire-weight gage, lat. 46°52', long. 88°37', in sec. 34, T. 52 N., R. 34 W., at highway bridge 1¼ miles southwest of old Elo school and 3 miles upstream from Otter lake.

Drainage area.- 175 square miles.

Records available.- November 1942 to September 1949.

Extremes.- Maximum discharge during year, 1,870 second-feet May 6 (gage height, 10.35 feet); minimum, 74 second-feet Oct. 1-3, but may have been less at other times during period of ice effect; minimum gage height, 3.45 feet Oct. 1-3, Aug. 29.
1942-49: Maximum discharge, 4,300 second-feet Apr. 24, 1944 (gage height, 13.30 feet); minimum, 68 second-feet Nov. 18, 1947 (discharge measurement), but may have been less at other times during period of ice effect.

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

Rating tables, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used June 13 to July 3)

Oct. 1 to July 28				July 29 to Sept. 30	
3.4	71	5.8	450	3.4	78
3.6	87	7.3	840	3.6	97
3.9	123	9.2	1,440	4.0	152
4.9	282	9.8	1,650	4.7	271
				5.7	474

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74	91	90	78	92	90	400	160	96	115	214	98
2	74	85	109	78	92	88	363	176	91	113	221	91
3	74	84	108	78	90	90	475	181	87	113	169	85
4	76	85	102	78	90	*92	625	216	85	855	134	93
5	77	95	97	80	90	94	*870	462	82	600	119	129
6	77	156	119	80	90	92	870	1,620	82	1,050	138	124
7	76	153	126	80	90	88	725	1,140	80	990	148	104
8	76	123	114	82	90	94	900	588	77	840	123	99
9	81	102	115	82	90	90	780	381	77	498	107	95
10	88	96	100	80	90	90	750	282	78	327	105	93
11	111	91	115	78	90	90	870	240	78	224	117	89
12	108	90	125	*80	92	90	1,230	216	77	187	110	103
13	92	90	125	82	90	90	1,580	197	88	148	99	127
14	85	90	120	80	88	88	1,170	179	97	129	93	149
15	82	88	115	82	*90	80	700	165	103	122	91	155
16	82	*88	115	92	92	88	462	156	96	108	90	123
17	82	102	110	92	88	*90	400	154	87	100	97	105
18	83	108	105	85	90	90	354	170	83	100	92	98
19	82	106	105	92	90	88	354	154	89	170	90	94
20	84	109	*105	90	92	88	400	134	136	144	85	95
21	84	108	100	92	90	92	550	128	159	116	84	93
22	82	102	95	90	92	100	562	122	132	106	83	92
23	82	99	90	90	92	110	475	116	144	98	82	91
24	82	96	88	92	94	110	354	113	174	90	88	95
25	82	95	86	94	92	115	273	108	134	86	96	93
26	82	94	84	96	92	130	248	106	119	84	91	95
27	82	95	86	96	92	145	224	102	102	83	88	99
28	82	94	84	96	92	170	198	96	94	106	85	101
29	82	90	84	94	-	200	181	94	87	463	83	95
30	82	89	80	92	-	250	170	95	87	271	84	92
31	91	-	78	92	-	300	-	102	-	178	86	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,577	111	74	83.1	0.475	0.55
November	2,994	156	84	99.8	.570	.64
December	3,175	126	78	102	.583	.67
Calendar year 1948	56,744	1,720	71	155	.886	12.07
January	2,673	96	78	86.2	.493	.57
February	2,542	94	88	90.8	.519	.54
March	3,512	300	80	113	.646	.75
April	17,513	1,580	170	584	3.34	3.72
May	8,153	1,620	94	263	1.50	1.73
June	3,001	174	77	100	.571	.64
July	8,614	1,050	83	278	1.59	1.83
August	3,392	221	82	109	.623	.72
September	3,095	155	85	103	.589	.66
Water year 1948-49	61,241	1,620	74	168	.960	13.02

Peak discharge (base, 1,300 sec.-ft.).- Apr. 13 (9 a.m.) 1,720 sec.-ft.; May 6 (5:30 p.m.) 1,870 sec.-ft.; July 6 (6 p.m.) 1,400 sec.-ft.

* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Dec. 11 to Apr. 1.

Manistique River near Germfask, Mich.

Location.- Staff gage, lat. 46°15'25", long. 85°52'20", in sec. 36, T. 45 N., R. 13 W., at bridge on State Highway 98, half a mile upstream from Fox River, 2 miles downstream from Manistique Lake, and 2½ miles east of Germfask. Auxiliary water-stage recorder on Manistique Lake at outlet from South Manistique Lake.

Drainage area.- 120 square miles.

Records available.- April 1942 to September 1949.

Extremes.- Maximum discharge during year, 189 second-feet July 3, 4, but may have been greater during seiches on Manistique Lake; maximum gage height observed, 4.24 feet July 29, 30; maximum reverse flow, 16 second-feet Apr. 7; minimum gage height, 1.74 feet Mar. 16, 18-21.

1942-49: Maximum discharge, 446 second-feet June 29, 1943 (from graph based on gage readings); maximum gage height, 5.70 feet June 22, 25, 1943 (from graph based on gage readings); maximum reverse flow, 299 second-feet Mar. 28, 1945; minimum gage height, 0.16 foot Sept. 1, 1942 (from graph based on gage readings).

Remarks.- Records fair above 70 second-feet and poor below. Manistique Lake regulated by flashboards in timber dam half a mile below gage. Gage read once daily. Backwater from Fox River most of time; discharge computed using fall as determined by auxiliary water-stage recorder as a factor. Occasionally during high stages of Fox River the flow at this station is reversed.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	41	a90	110	95	89	45	4	4	166	154	5
2	0	41	a90	107	96	85	35	4	4	166	162	5
3	0	38	a90	108	97	84	20	4	4	166	166	5
4	0	41	a90	107	97	85	5	4	4	186	157	5
5	0	40	a90	108	97	85	0	4	4	175	154	5
6	0	52	a90	104	97	97	0	4	4	170	153	5
7	0	55	*b90	70	99	105	-16	4	4	162	150	5
8	0	47	b90	30	97	104	-10	4	4	164	50	5
9	0	49	b90	50	96	104	0	4	4	169	10	5
10	0	63	b92	75	96	103	5	4	4	163	14	5
11	0	66	b95	79	96	102	20	4	4	105	18	5
12	0	64	98	80	94	103	50	4	4	25	22	60
13	0	e60	103	80	93	101	81	4	4	22	22	170
14	0	58	104	79	93	101	83	4	4	18	18	172
15	0	67	106	81	94	101	102	4	4	14	18	166
16	0	66	108	85	94	100	110	4	4	18	10	159
17	0	e65	98	85	b94	98	107	4	4	18	8	161
18	0	60	107	85	93	98	121	4	4	14	8	163
19	0	e58	109	92	92	97	129	4	4	8	5	165
20	0	56	108	86	91	96	75	4	8	5	5	159
21	0	60	109	89	89	96	5	4	22	8	5	159
22	0	61	110	91	88	98	15	4	8	5	5	157
23	0	65	110	91	88	97	45	4	100	5	5	158
24	0	71	109	89	88	96	50	4	148	5	5	156
25	0	73	b105	89	92	94	50	4	137	5	5	156
26	0	77	100	89	91	96	50	4	165	10	5	152
27	0	82	105	89	89	93	50	4	146	8	5	158
28	0	78	104	95	91	92	35	4	134	14	5	156
29	15	78	110	96	-	88	4	4	157	28	5	157
30	41	91	93	97	-	83	4	4	156	28	5	157
31	41	-	91	94	-	59	-	4	-	60	5	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	97	41	0	3.1		
November	1,823	91	38	60.8		
December	3,084	110	90	99.5		
Calendar year 1948	22,586	206	-83	61.7		
January	2,710	110	30	87.4		
February	2,617	99	88	93.5		
March	2,930	105	59	94.5		
April	1,270	129	-16	42.3		
May	124	4	4	4.0		
June	1,257	165	4	41.9		
July	2,110	186	5	68.1		
August	1,359	166	5	43.8		
September	2,996	172	5	99.9		
Water year 1948-49	22,377	186	-16	61.3		

* Winter discharge measurement made on this day.

a No gage-height record at auxiliary gage; discharge computed on basis of 1 discharge measurement and base gage heights.

b Slope-stage-discharge relation affected by ice.

e Slope-stage-discharge relation affected by wind on Manistique Lake; discharge computed on basis of adjacent record.

Note.- Slope-stage-discharge relation indefinite Oct. 1-28, Nov. 5, Jan. 8, 9, Apr. 1-12, Apr. 21 to June 22, July 12-30, Aug. 9 to Sept. 11, when fall was less than 0.50 foot; discharge computed on basis of 5 discharge measurements made during these periods, gage heights, and engineer's notes. Negative sign indicates reverse flow.

Manistique River at Germfask, Mich.

Location.- Water-stage recorder, lat. 46°14'00", long. 85°55'40", in SE¼ sec. 4, T. 44 N., R. 13 W., 1 mile south of Germfask and 1½ miles upstream from Grays Creek.

Drainage area.- 341 square miles.

Records available.- March 1938 to September 1949.

Average discharge.- 11 years, 437 second-feet.

Extremes.- Maximum discharge during year, 916 second-feet Apr. 8, June 28; maximum gage height, 4.94 feet Jan. 3 (ice jam); minimum discharge, 144 second-feet Oct. 3 (gage height, 0.95 foot).
1938-49: Maximum discharge observed, 2,130 second-feet Apr. 1, 1938 (gage height, 8.50 feet, site and datum then in use); minimum, that of Oct. 3, 1948.

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

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

0.9	138	2.4	410
1.2	180	3.4	666
1.8	284	4.3	916

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	148	238	485	365	330	365	774	344	238	720	612	211
2	146	238	460	355	*320	350	830	344	238	612	626	213
3	145	238	435	350	340	340	858	344	230	548	599	213
4	146	238	422	345	340	334	858	344	222	586	573	206
5	148	274	435	*335	340	334	886	344	213	612	535	213
6	149	334	485	335	340	334	886	386	204	626	498	238
7	149	364	*460	315	340	335	886	422	199	626	485	256
8	150	364	450	265	340	334	886	435	194	599	408	247
9	157	386	450	340	340	334	886	410	191	573	314	247
10	188	448	440	320	340	335	830	375	190	535	304	238
11	230	485	430	315	340	334	802	344	188	472	304	230
12	238	498	430	310	340	344	774	324	183	334	294	241
13	230	498	420	300	340	334	720	314	183	314	274	410
14	222	498	420	300	340	334	720	304	185	294	265	522
15	208	485	420	300	350	334	680	284	222	274	256	535
16	199	472	410	295	350	*334	652	274	274	265	238	522
17	193	510	410	295	340	334	626	265	274	256	230	498
18	190	548	400	295	330	314	599	294	247	247	222	472
19	194	560	400	300	350	304	560	398	230	238	222	435
20	199	586	400	280	350	314	526	410	256	247	208	435
21	201	599	390	295	350	304	422	398	398	238	203	448
22	203	586	390	305	350	334	435	354	510	230	198	422
23	204	586	380	300	360	364	510	334	599	222	198	422
24	203	560	380	305	375	375	522	314	693	222	196	422
25	199	535	370	300	354	375	510	294	774	247	194	422
26	196	535	370	300	360	398	510	294	858	256	193	398
27	193	535	365	310	360	460	485	284	886	265	194	398
28	190	535	365	310	365	510	435	265	886	314	213	410
29	196	510	370	310	-	548	386	256	886	460	222	398
30	238	498	370	310	-	599	364	256	802	485	211	386
31	238	-	370	320	-	680	-	247	-	485	210	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	5,890	238	145	190	0.557	0.64
November	13,741	599	238	458	1.34	1.50
December	12,782	485	365	412	1.21	1.39
Calendar year 1948	119,254	916	145	326	.956	13.01
January	9,680	365	265	312	.915	1.06
February	9,674	375	320	346	1.01	1.06
March	11,622	680	304	375	1.10	1.27
April	19,818	886	364	661	1.94	2.16
May	10,255	435	247	331	.971	1.12
June	11,653	886	183	388	1.14	1.27
July	12,402	720	222	400	1.17	1.35
August	9,699	626	193	313	.918	1.06
September	10,708	535	206	357	1.05	1.17
Water year 1948-49	137 924	886	145	378	1.11	15.05

Peak discharge (base, 900 sec.-ft.).- Ap. 8 (3 to 6 a.m.) 916 sec.-ft.; June 28 (12 m. to 5 p.m.) 916 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 8 to Feb. 23, Feb. 26 to Mar. 3, Mar. 7, 10.

Manistique River near Blaney, Mich.

Location.- Water-stage recorder, lat. 46°05'05", long. 86°03'35", in NE¼ sec. 33, T. 43 N., R. 14 W., half a mile downstream from Duck Creek and 7 miles southwest of Blaney.

Drainage area.- 704 square miles.

Records available.- March 1938 to September 1949.

Average discharge.- 11 years, 815 second-feet.

Extremes.- Maximum discharge during year, 2,700 second-feet Apr. 6, 7; maximum gage height, 16.02 feet Mar. 31 (ice jam); minimum discharge, 218 second-feet Oct. 1-5; minimum gage height, 5.53 feet Oct. 3, 4.

1938-49: Maximum discharge observed, 9,300 second-feet Apr. 1, 1938 (gage height, 19.42 feet); minimum, 218 second-feet Sept. 28 to Oct. 5, 1948; minimum gage height, that of Oct. 3, 4, 1948.

Remarks.- Records excellent except those for period of ice effect, which are fair. Since July 2, 1948, slight regulation during low flow caused by dam on outlet of Manistique Lake.

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)

5.5	213	9.0	895
6.0	262	11.5	1,510
6.3	307	13.0	2,020
7.0	450	14.9	2,700

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	218	316	1,010	580	500	550	2,000	780	505	1,400	918	316
2	218	316	964	580	520	540	2,200	780	472	1,230	1,030	326
3	218	316	918	560	520	540	2,400	780	450	1,110	987	326
4	218	316	872	*540	520	540	2,560	780	429	1,080	918	316
5	218	356	895	550	530	540	2,630	803	408	1,130	849	326
6	222	461	987	560	550	540	*2,700	849	376	1,130	803	346
7	222	549	*987	540	550	540	2,700	895	346	1,110	758	376
8	226	549	918	540	550	540	2,620	895	336	1,060	736	387
9	231	560	930	490	560	540	2,540	872	326	1,010	604	376
10	246	692	950	530	560	520	2,400	872	316	941	560	376
11	275	780	930	520	540	520	2,220	849	307	895	582	356
12	307	780	900	520	560	520	2,050	780	298	780	560	356
13	316	758	880	500	560	500	1,880	692	298	648	527	461
14	307	758	850	500	560	*500	1,740	670	290	582	494	758
15	298	758	820	500	560	480	1,570	626	336	549	461	803
16	290	736	820	520	560	480	1,420	604	408	516	440	780
17	275	849	820	540	540	480	1,380	582	450	483	418	736
18	275	987	780	540	540	480	1,320	604	408	450	408	692
19	275	987	760	530	550	480	1,230	872	366	440	376	648
20	282	1,060	740	520	560	470	1,150	1,080	398	418	356	626
21	282	1,130	720	490	560	470	1,060	1,060	626	408	336	626
22	282	1,110	700	500	560	500	987	964	941	387	326	604
23	282	1,110	680	500	560	560	1,060	872	1,030	366	326	582
24	282	1,080	650	500	560	610	1,110	780	1,230	356	316	582
25	282	1,030	640	500	570	630	1,080	714	1,380	376	307	582
26	282	1,030	630	500	560	670	1,060	692	1,660	408	307	560
27	298	1,080	610	500	560	800	1,010	648	1,740	450	298	560
28	307	1,110	600	520	550	1,100	964	604	1,700	516	326	582
29	298	1,080	610	500	-	1,350	895	582	1,660	714	336	582
30	290	1,060	610	490	-	1,550	826	549	1,540	941	336	582
31	316	-	580	*490	-	1,700	-	527	-	918	326	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	8,338	316	218	269	0.382	0.44
November	23,704	1,130	316	790	1.12	1.25
December	24,761	1,010	580	799	1.13	1.31
Calendar year 1948	208,766	2,470	218	570	.810	11.02
January	16,150	580	490	521	.740	.85
February	15,370	570	500	549	.780	.81
March	20,240	1,700	470	653	.928	1.07
April	50,762	2,700	826	1,692	2.40	2.68
May	23,657	1,080	527	763	1.08	1.25
June	21,030	1,740	290	701	.996	1.11
July	22,802	1,400	356	736	1.05	1.20
August	16,325	1,030	298	527	.749	.86
September	15,529	803	316	518	.736	.82
Water year 1948-49	258,668	2,700	218	709	1.01	13.65

Peak discharge (base, 2,400 sec.-ft.).- Apr. 6, 7, 2,700 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 9 to Apr. 5.

Manistique River near Manistique, Mich.

Location.- Water-stage recorder, lat. 46°01'50", long. 86°09'40", in SE¼ sec. 15, T. 42 N., R. 15 W., 1 mile downstream from West Branch and 6 miles northeast of Manistique.

Drainage area.- 1,100 square miles.

Records available.- March 1938 to September 1949.

Average discharge.- 11 years, 1,314 second-feet.

Extremes.- Maximum discharge during year, 4,210 second-feet Apr. 6-8; maximum gage height, 9.59 feet Apr. 1 (ice jam); minimum discharge, 288 second-feet Oct. 4 (gage height, 1.02 feet).
1938-49: Maximum discharge 10,600 second-feet Apr. 27, 1939 (gage height, 12.59 feet, present site and datum); minimum, that of Oct. 4, 1948; minimum gage height, 1.01 feet Aug. 23, 1941.

Remarks.- Records excellent except those for period of ice effect, which are fair. Since July 2, 1948, slight regulation during low flow caused by dam on outlet of Manistique Lake.

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

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)

1.0	284	4.6	1,560
1.4	382	6.0	2,300
2.0	573	7.2	3,020
3.6	1,130	8.7	4,210

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	299	460	1,710	860	730	770	3,350	1,410	915	2,720	1,330	590
2	297	460	1,610	850	760	750	3,600	1,370	862	2,300	1,410	573
3	292	460	1,510	830	*760	760	3,800	1,370	828	1,960	1,460	573
4	290	476	1,410	*810	760	790	4,000	1,370	775	1,760	1,370	556
5	290	508	1,410	780	760	790	4,110	1,370	740	1,760	1,330	573
6	294	622	1,510	800	780	790	4,210	1,460	706	1,760	1,210	590
7	301	758	1,400	780	780	790	*4,210	1,610	656	1,760	1,130	639
8	307	828	*1,510	780	780	780	4,210	1,660	622	1,710	1,090	689
9	316	862	1,500	780	780	790	4,110	1,710	606	1,660	1,020	672
10	331	985	1,450	770	800	780	4,020	1,660	590	1,560	915	656
11	374	1,130	1,400	760	800	760	3,760	1,560	573	1,410	915	639
12	428	1,170	1,360	760	800	770	3,520	1,460	556	1,330	915	622
13	460	1,210	1,310	760	800	770	3,300	1,330	540	1,130	a870	689
14	460	1,250	1,300	760	800	740	3,090	1,210	540	1,020	a820	950
15	444	1,250	1,250	750	800	740	2,900	1,130	622	950	775	1,130
16	428	1,210	1,210	720	800	*720	2,720	1,090	723	880	740	1,130
17	413	1,330	1,190	700	800	700	2,600	1,060	828	845	706	1,090
18	407	1,510	1,150	700	780	700	2,480	1,060	845	792	689	1,060
19	407	1,610	1,100	700	780	700	2,300	1,330	792	758	672	985
20	407	1,760	1,090	720	780	700	2,120	1,760	792	723	639	950
21	413	1,860	1,050	730	800	700	1,960	1,860	985	706	606	915
22	413	1,910	1,020	740	800	750	1,860	1,810	1,370	689	590	915
23	428	1,910	990	750	800	820	1,860	1,710	1,610	656	573	880
24	428	1,910	950	760	810	900	1,910	1,560	1,860	639	573	845
25	428	1,860	930	760	830	950	1,910	1,370	2,120	656	556	862
26	413	1,810	920	780	830	1,050	1,910	1,290	2,540	656	540	845
27	428	1,810	920	780	800	1,220	1,860	1,210	2,900	706	540	845
28	444	1,810	900	780	790	1,480	1,760	1,130	3,020	810	540	845
29	444	1,810	900	760	-	1,820	1,660	1,060	3,160	985	573	862
30	428	1,760	920	740	-	2,200	1,510	1,020	3,020	1,210	606	845
31	444	-	900	730	-	3,000	-	950	-	1,330	590	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	11,956	460	290	386	0.351	0.40
November	38,299	1,910	460	1,277	1.16	1.29
December	37,780	1,710	900	1,219	1.11	1.28
Calendar year 1948	330,360	3,930	290	903	.821	11.16
January	23,680	860	700	764	.695	.80
February	22,090	830	730	789	.717	.75
March	29,980	3,000	700	967	.879	1.01
April	86,610	4,210	1,510	2,887	2.62	2.93
May	42,950	1,860	950	1,385	1.26	1.45
June	36,696	3,160	540	1,223	1.11	1.24
July	37,831	2,720	639	1,220	1.11	1.28
August	26,293	1,480	540	848	.771	.89
September	24,015	1,130	556	800	.727	.81
Water year 1948-49	418,180	4,210	290	1,146	1.04	14.13

Peak discharge (base, 4,100 sec.-ft.).- Apr. 6-8, 4,210 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records.
Note.- Stage-discharge relation affected by ice Dec. 9 to Apr. 4.

Duck Creek near Blaney, Mich.

Location.- Water-stage recorder, lat. 46°06'50", long. 86°04'50", in SE¼ sec. 17, T. 43 N., R. 14 W., 3 miles upstream from mouth and 7 miles west of Blaney.
Drainage area.- 92 square miles including area from which flow is diverted to Duck Creek from Walsh and Marsh Creeks (watershed indeterminate because of swamps).
Records available.- March 1938 to September 1949.
Average discharge.- 11 years, 94.5 second-feet.
Extremes.- Maximum discharge during year, 614 second-feet Apr. 6 (gage height, 7.91 feet); minimum, 5.8 second-feet Oct. 3 (gage height, 1.50 feet).
1938-49: Maximum discharge observed, 1,740 second-feet Apr. 26, 1939 (gage height, 11.70 feet, site and datum then in use); minimum, 4.0 second-feet Sept. 7, 1947 (gage height, 1.45 feet).
Remarks.- Records good except those for periods of ice effect, doubtful gage-height record, or shifting control, which are fair. Records include flow from Walsh and Marsh Creeks, which originate upstream from line between R. 14 W. and R. 15 W., and is diverted to Duck Creek through drainage canal about 3 miles above station.

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1-12, May 20 to June 21)

1.5	5	2.2	26	4.0	155
1.6	7	2.4	36	5.0	262
1.7	10	2.8	60	6.6	454
2.1	22	3.4	104	7.9	614

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.4	8.8	150	32	38	37	350	88	52	190	112	20
2	6.4	8.5	142	32	38	36	420	98	47	175	d98	19
3	6.0	8.5	137	32	37	36	500	98	43	155	d86	18
4	6.0	10	132	*32	37	37	560	98	38	150	d75	18
5	6.4	14	132	33	37	37	601	108	35	146	d66	19
6	6.6	24	125	35	37	38	*614	120	32	137	64	19
7	6.8	24	*115	36	37	38	588	128	29	132	63	18
8	8.5	21	110	35	36	38	562	128	27	124	62	20
9	11	22	105	36	36	38	526	120	25	116	59	18
10	14	*45	100	36	36	36	478	112	23	d104	59	17
11	15	43	95	34	36	36	442	103	22	d97	72	16
12	15	40	92	33	36	36	406	94	20	d88	74	17
13	14	41	88	32	36	35	370	89	20	d82	d66	26
14	12	40	84	32	36	*33	334	84	20	75	58	36
15	12	40	78	33	36	32	298	80	40	68	51	30
16	11	41	68	36	36	29	274	75	40	61	46	25
17	11	71	68	39	36	30	250	71	34	55	42	22
18	11	82	52	41	36	31	217	87	30	50	41	21
19	11	85	48	41	35	33	195	155	26	47	37	20
20	11	104	48	40	35	35	175	180	41	42	32	20
21	11	112	44	38	36	38	160	180	82	38	29	20
22	10	124	42	38	36	42	155	155	101	35	26	19
23	10	218	39	38	36	50	155	132	d104	32	25	20
24	9.7	128	34	40	36	58	150	112	d124	31	24	20
25	9.1	128	36	40	37	70	142	98	150	36	22	19
26	9.1	d142	35	41	38	80	d128	d90	185	34	21	19
27	9.1	150	34	41	38	96	d120	82	206	50	21	20
28	8.5	155	34	40	38	125	112	75	212	62	22	20
29	8.5	155	34	40	-	165	102	68	206	98	21	18
30	8.2	155	35	39	-	220	94	63	200	116	20	18
31	8.5	-	35	*39	-	280	-	59	-	120	20	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	302.8	15	6.0	9.77		
November	2,149.8	155	8.5	71.7		
December	2,371	150	34	76.5		
Calendar year 1948	18,876.0	454	6.0	51.6		
January	1,134	41	32	36.6		
February	1,022	38	35	36.5		
March	1,925	280	29	62.1		
April	9,478	614	94	316		
May	3,230	180	59	104		
June	2,214	212	20	73.8		
July	2,746	190	31	88.6		
August	1,514	112	20	48.8		
September	612	36	16	20.4		
Water year 1948-49	28,698.6	614	6.0	78.6		

Peak discharge (base, 500 sec.-ft.).- Apr. 6 (1 a.m. to 3 p.m.) 614 sec.-ft.
* Winter discharge measurement made on this day.
d Doubtful gage-height record; discharge computed on basis of records for nearby stations.
Note.- Stage-discharge relation affected by ice Dec. 6 to Apr. 4.

West Branch Manistique River near Manistique, Mich.

Location.- Water-stage recorder, lat. 46°05'20", long. 86°09'40", in SE¼ sec. 27, T. 43 N., R. 15 W., 300 feet downstream from Stutts Creek and 10 miles northeast of Manistique.

Drainage area.- 322 square miles.

Records available.- April 1938 to September 1949.

Average discharge.- 11 years 407 second-feet.

Extremes.- Maximum discharge during year, 1,400 second-feet Apr. 9 (gage height, 6.98 feet); minimum, 71 second-feet Oct. 3 (gage height, 1.90 feet, from recorded range in stage).
1938-49: Maximum discharge observed, 5,300 second-feet Apr. 29, 1939 (gage height, 12.9 feet); minimum, that of Oct. 3, 1948.

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

Rating tables, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 7-12)

Oct. 1 to Nov. 24		Nov. 25 to Sept. 30	
1.8	68	2.7	173
2.1	111	3.2	267
2.7	208	3.8	415
3.7	409	5.8	963
4.6	634	6.9	1,360

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a74	126	550	240	*210	220	720	550	338	1,030	402	192
2	a73	128	523	230	210	220	820	550	326	850	388	192
3	a72	131	496	*225	210	225	950	536	326	739	388	190
4	a73	136	482	215	215	225	1,060	536	302	672	402	183
5	a74	152	469	210	215	225	1,170	577	290	644	388	182
6	a74	182	*496	205	215	225	1,280	631	276	644	363	185
7	76	215	523	195	220	225	*1,360	685	263	644	350	216
8	82	243	500	195	220	210	1,360	739	250	631	338	225
9	89	265	490	195	225	225	1,360	766	240	604	313	219
10	95	295	480	190	225	215	1,320	739	233	550	302	212
11	102	325	470	190	225	205	1,200	685	227	510	302	204
12	112	345	450	190	225	210	1,140	631	219	469	302	201
13	123	376	430	185	225	210	1,060	577	212	428	290	219
14	123	387	420	180	225	195	995	550	206	402	281	244
15	122	387	400	180	225	*200	963	510	233	363	267	265
16	120	376	390	190	225	190	963	482	288	338	250	265
17	120	409	380	200	225	190	934	456	338	313	236	248
18	118	442	360	205	225	195	906	456	363	290	225	235
19	118	466	350	205	225	195	850	550	326	272	219	223
20	118	540	340	200	225	185	794	658	338	259	219	219
21	120	580	325	205	225	180	739	685	428	259	212	216
22	122	620	315	210	225	215	712	712	510	248	201	212
23	123	634	305	210	230	225	712	685	604	233	195	208
24	123	634	295	210	230	240	739	631	672	231	192	208
25	123	631	285	210	230	260	739	564	739	229	187	214
26	124	618	280	210	230	290	739	523	906	223	180	216
27	124	604	270	210	220	350	712	469	1,100	244	176	216
28	123	590	265	210	230	410	685	442	1,280	276	178	212
29	123	577	255	205	-	490	644	402	1,360	313	192	214
30	123	565	250	205	-	560	590	388	1,200	363	199	216
31	126	-	245	205	-	630	-	363	-	388	192	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,312	126	72	107	0.332	0.38
November	11,978	634	126	399	1.24	1.38
December	12,089	550	245	390	1.21	1.40
Calendar year 1948	100,343	1,290	72	274	.851	11.60
January	6,315	240	180	204	.634	.73
February	6,235	230	210	223	.693	.72
March	8,040	630	180	259	.804	.93
April	28,216	1,360	590	941	2.92	3.26
May	17,728	766	363	572	1.78	2.05
June	41,393	1,360	206	480	1.49	1.66
July	13,659	1,030	223	441	1.37	1.58
August	8,329	402	176	269	.835	.96
September	6,451	265	182	215	.668	.75
Water year 1948-49	136,745	1,360	72	375	1.16	15.80

Peak discharge (base, 1,600 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of 1 discharge measurement, recorded range in stage, and records for nearby stations.
Note.- Stage-discharge relation affected by ice Dec. 8 to Apr. 2. Doubtful gage-height record due to partially obstructed intake Apr. 3-7, 12-17, 20-23, 27, 29, 30, May 20, 22, May 25 to June 2, June 21-23, July 10-14, Aug. 6, 17, 18, 22; discharge computed on basis of records for nearby stations.

Indian River near Manistique, Mich.

Location.- Water-stage recorder, lat. 45°59'30", long. 86°17'15", in NE¼ sec. 34, T. 42 N., R. 16 W., above Indian Lake Outlet, 2 miles northwest of Manistique. Datum of gage is 608.66 feet above mean sea level (levels by Michigan Department of Conservation). Auxiliary staff gage above dam 1½ miles downstream.

Drainage area.- 302 square miles.

Records available.- March 1938 to September 1949.

Average discharge.- 11 years, 371 second-feet.

Extremes.- Maximum discharge during year, 595 second-feet July 3 (gage height, 4.87 feet, caused by seiches on Indian Lake); minimum daily, 114 second-feet June 14; minimum gage height, 3.09 feet Dec. 7 (ice jam at outlet of Indian Lake above gage).
1938-49: Maximum discharge, 1,550 second-feet June 24, 1943 (gage height, 7.79 feet), from rating curve extended above 660 second-feet, by computation of flow over dam; minimum daily, about 20 second-feet Nov. 23, 1946 (caused by ice jams on Indian Lake in outlet); minimum gage height, 2.83 feet Feb. 20, 1948 (ice jam in outlet of Indian Lake above gage).

Remarks.- Records excellent except those for periods of shifting control, which are good, and those for period of ice effect, which are fair. Indian Lake regulated by needles in gate section of rock-filled timber dam 1½ miles below gage. Discharge computed by using fall as determined by twice-daily readings at auxiliary gage as a factor.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	160	271	422	316	281	246	d336	374	323	324	356	231
2	152	271	412	316	281	246	d355	374	326	391	436	229
3	149	266	408	310	281	246	d364	374	323	434	440	216
4	146	268	397	313	281	244	d384	374	314	474	439	218
5	138	281	402	310	271	244	d397	374	314	486	443	218
6	138	322	b400	310	271	246	d404	374	304	490	452	226
7	131	320	b230	307	271	246	d414	374	285	476	437	222
8	146	290	*b140	307	271	246	d464	378	278	476	433	209
9	155	298	392	300	271	244	d468	364	207	467	428	215
10	162	322	429	300	271	244	d482	355	127	462	419	220
11	138	331	462	303	273	244	d482	362	125	456	419	228
12	156	317	438	293	266	246	d458	358	127	452	410	260
13	151	332	412	296	266	241	d457	358	120	471	400	260
14	145	330	412	293	269	246	d431	345	114	460	396	232
15	139	342	412	278	269	236	435	330	129	456	360	221
16	158	339	393	291	269	236	440	330	141	449	224	218
17	158	382	393	293	266	230	422	323	136	448	234	a220
18	139	355	380	293	254	234	422	339	131	448	239	a230
19	132	341	382	308	256	231	430	354	135	442	228	233
20	135	384	371	294	254	226	430	354	142	427	228	210
21	135	393	364	291	256	227	414	351	148	408	228	210
22	199	393	364	291	256	243	404	351	148	402	231	213
23	268	412	358	288	256	242	404	351	148	398	226	210
24	261	412	362	288	256	244	394	358	157	294	220	215
25	260	412	356	288	256	254	394	358	165	219	242	223
26	252	418	342	288	254	254	390	362	208	219	233	220
27	270	418	342	285	256	268	386	349	246	236	229	254
28	284	414	330	288	256	d290	380	349	229	245	223	327
29	286	422	333	288	-	295	383	339	270	242	226	349
30	271	422	324	288	-	314	374	342	281	238	220	351
31	284	-	324	278	-	d333	-	336	-	248	217	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	5,698	286	131	184	-	-
November	10,478	422	266	349	-	-
December	11,486	462	140	371	-	-
Calendar year 1948	96,686	487	131	264	0.874	11.91
January	9,192	316	278	297	-	-
February	7,438	281	254	266	-	-
March	7,786	333	226	251	-	-
April	12,398	482	336	413	-	-
May	11,014	378	323	355	-	-
June	6,103	326	114	203	-	-
July	12,138	490	219	392	-	-
August	9,916	452	217	320	-	-
September	7,088	351	209	236	-	-
Water year 1949	110,735	490	114	303	1.00	13.64

* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records.
b Slope-stage-discharge relation affected by ice.
d Doubtful gage-height record; discharge computed on basis of reconstructed gage-height graph.
Note.- Shifting-control method used June 9 to July 1, July 24 to Aug. 1, Aug. 15 to Sept. 27.

Brule River near Florence, Wis.

Location.- Water-stage recorder, lat. 45°57', long. 88°16', in sec. 11, T. 41 N., R. 32 W. Michigan meridian, at county highway bridge, 1 mile upstream from Paint River, 3½ miles north of Florence, and 6 miles upstream from confluence with Michigamme River.

Drainage area.- 380 square miles.

Records available.- January 1914 to February 1916, June 1944 to September 1949.

Extremes.- Maximum discharge during year, 811 second-feet May 7; maximum gage height, 5.88 feet Dec. 14 (ice jam); minimum discharge, 155 second-feet Aug. 16, 22; minimum gage height, 1.88 feet Oct. 1-5, Aug. 16, 22.
1914-16, 1944-49: Maximum discharge, 2,480 second-feet June 26, 1946; maximum gage height 7.25 feet Mar. 20, 1945 (ice jam); minimum discharge, that of Aug. 16, 22, 1949; minimum gage height, 1.86 feet Aug. 27, Sept. 13, 1948.

Remarks.- Records good except those for period of ice effect, which are fair. Flow not adjusted for ground water pumped from mines at Iron River.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	168	200	220	190	210	185	360	227	203	233	230	171
2	168	206	230	190	210	195	380	243	191	276	224	169
3	168	197	250	190	210	190	385	250	189	254	214	166
4	168	189	260	190	*205	*185	405	302	189	475	203	189
5	170	*276	270	190	205	185	442	370	181	654	194	453
6	172	399	280	*190	205	185	436	680	181	621	205	420
7	175	336	280	200	200	180	415	797	173	505	208	323
8	180	276	270	195	205	185	*410	660	173	395	203	273
9	180	261	260	190	200	180	395	517	169	332	189	230
10	178	254	240	185	200	180	375	426	169	280	189	208
11	186	236	230	180	200	175	361	380	164	247	211	208
12	203	222	220	180	200	175	361	346	164	237	214	276
13	197	213	210	180	200	175	365	310	161	230	197	314
14	192	206	*200	180	200	170	361	276	186	214	183	293
15	186	203	200	180	205	170	332	265	240	211	178	250
16	183	239	190	190	200	170	306	243	205	214	169	227
17	180	243	190	200	200	170	289	237	181	211	173	217
18	178	246	190	195	*205	170	280	258	169	208	183	203
19	178	239	190	185	215	170	273	342	166	205	178	197
20	178	257	190	180	210	175	269	328	203	203	169	191
21	178	226	190	*180	210	175	265	280	375	208	169	189
22	178	268	190	180	210	180	284	258	346	214	161	183
23	178	246	190	180	210	*185	289	240	258	205	159	183
24	178	243	190	185	210	190	273	240	328	221	161	181
25	178	243	190	185	200	205	258	243	284	214	164	181
26	178	239	190	185	190	220	258	233	265	230	189	186
27	178	232	190	190	195	250	258	221	243	233	189	191
28	178	222	190	195	190	275	243	211	211	254	186	191
29	178	219	190	200	-	300	233	205	191	269	181	186
30	178	219	190	215	-	320	230	214	181	240	173	183
31	183	-	190	215	-	340	-	208	-	237	171	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	5,551	203	168	179	0.471	0.54
November	7,255	399	189	242	.637	.71
December	6,660	280	190	215	.566	.65
Calendar year 1948	85,493	628	165	234	.616	8.36
January	5,870	215	180	189	.497	.57
February	5,700	215	190	204	.537	.56
March	6,210	340	170	200	.526	.61
April	9,791	442	230	326	.858	.96
May	10,010	797	205	323	.850	.98
June	6,339	375	161	211	.555	.62
July	8,730	654	203	282	.742	.85
August	5,817	230	159	188	.495	.57
September	6,832	453	166	228	.600	.67
Water year 1948-49	84,765	797	159	232	.611	8.29

Peak discharge (base, 800 sec.-ft.).- May 7 (5 to 7 a.m.) 811 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 1 to Apr. 2 (no gage-height record Feb. 1-4).

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

Location.- Lat. 45°52'20", long. 88°04'10", in sec. 12, T. 40 N., R. 31 W., at power plant of Wisconsin Michigan Power Co., 3 miles upstream from Pine River and 3½ miles north of city of Iron Mountain.

Drainage area.- 1,790 square miles.

Records available.- January 1914 to September 1949.

Average discharge.- 35 years, 1,762 second-feet.

Extremes.- Maximum daily discharge during year, 6,630 second-feet July 8; minimum daily, 498 second-feet Oct. 29.
1914-49: Maximum daily discharge, 16,700 second-feet Apr. 23, 24, 1916; minimum daily, 154 second-feet Aug. 9, 1925.

Remarks.- Records good. Discharge determined from powerhouse records. Flow regulated by power plant at which station is located and also by plants on Brule and Michigamme Rivers and by Way Reservoir on Michigamme River.

Cooperation.- Records of daily discharge computed by Wisconsin Michigan Power Co. on basis of load-discharge rating of hydroelectric unit as developed by Geological Survey in 1932-33 and taintor-gate ratings based on theoretical formulas.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,060	576	664	716	1,030	1,230	1,010	873	1,200	1,860	1,150	1,280
2	795	601	636	919	1,020	1,230	779	1,090	1,130	1,300	1,360	1,190
3	734	668	665	930	1,000	1,260	728	1,020	1,080	1,010	1,480	1,020
4	980	895	660	963	984	1,380	1,110	993	996	2,160	1,600	999
5	1,030	808	748	1,030	1,030	988	1,550	1,120	900	4,510	1,630	1,450
6	969	1,090	1,010	923	992	1,020	1,590	2,100	1,020	5,380	1,240	1,440
7	941	829	911	969	989	1,340	1,680	2,590	1,050	6,190	1,020	1,290
8	1,100	828	788	993	1,050	1,480	1,660	3,510	1,020	6,630	1,340	1,040
9	923	926	825	1,000	1,040	1,560	1,320	3,470	990	6,400	1,460	1,030
10	751	882	813	1,070	994	1,670	1,110	3,460	1,060	6,000	1,340	1,010
11	958	840	816	931	996	1,760	1,510	3,110	929	4,110	1,360	990
12	994	798	736	992	1,100	1,120	1,560	2,670	848	2,850	1,320	1,330
13	793	768	721	965	1,050	988	1,870	2,550	912	2,620	1,100	1,540
14	678	637	745	1,090	1,330	1,330	1,980	2,180	958	2,430	960	1,440
15	585	580	899	973	1,220	1,250	2,220	1,130	1,090	1,740	1,220	1,460
16	557	543	925	1,040	1,300	1,120	2,140	1,320	1,030	1,180	1,400	1,630
17	560	750	859	1,040	1,270	997	1,250	1,390	929	975	1,370	1,510
18	575	739	872	949	1,300	760	1,460	1,710	836	1,100	1,310	1,220
19	538	740	852	955	1,070	798	1,390	2,060	734	1,390	1,180	1,380
20	549	1,080	917	969	993	720	1,170	1,640	926	1,350	1,000	1,380
21	530	946	902	908	1,340	904	1,180	1,240	1,180	1,120	938	1,420
22	739	863	896	871	1,280	1,200	1,210	1,020	1,170	1,120	1,260	1,430
23	751	858	908	1,140	1,260	1,090	1,220	1,080	1,120	1,050	1,370	1,340
24	605	743	868	1,020	1,260	993	1,120	1,420	1,430	868	1,350	1,250
25	657	683	905	1,010	1,310	978	1,260	1,310	1,810	1,060	1,290	1,160
26	576	726	797	1,010	1,030	994	1,310	1,430	1,540	1,100	1,280	1,370
27	546	673	812	1,060	1,020	980	1,190	1,140	1,720	1,140	1,100	1,480
28	506	621	977	966	1,270	1,050	1,020	891	2,020	1,100	964	1,380
29	498	655	921	1,040	-	1,250	1,010	852	1,820	1,290	1,220	1,230
30	509	722	962	1,050	-	1,660	969	822	1,500	1,040	1,370	1,250
31	504	-	852	1,080	-	1,670	-	1,160	-	989	1,470	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	22,491	1,100	498	726	0.406	0.47
November	23,088	1,090	543	770	.430	.48
December	25,862	1,010	636	834	.466	.54
Calendar year 1948	413,136	4,590	498	1,129	.631	8.60
January	30,552	1,140	716	986	.551	.64
February	31,528	1,340	984	1,126	.629	.66
March	36,780	1,760	720	1,186	.663	.76
April	40,576	2,220	728	1,353	.756	.84
May	52,351	3,510	822	1,689	.944	1.09
June	34,948	2,020	734	1,165	.651	.73
July	73,062	6,630	868	2,357	1.32	1.52
August	39,452	1,630	938	1,273	.711	.82
September	38,939	1,630	990	1,298	.725	.81
Wster year 1948-49	449,629	6,630	498	1,232	.688	9.56

Menominee River below Koss, Mich.

Location.- Lat. 45°21'50", long. 87°39'20", in sec. 9, T. 34 N., R. 27 W., at power plant of Wisconsin Public Service Corp., half a mile upstream from Little Cedar River and 4 miles downstream from Koss.

Drainage area.- 3,790 square miles.

Records available.- July 1913 to September 1949.

Average discharge.- 36 years, 3,129 second-feet.

Extremes.- Maximum daily discharge, 8,420 second-feet July 10; minimum daily, 840 second-feet Oct. 26.
1913-49: Maximum daily discharge, 23,200 second-feet Apr. 23, 25, 1916; minimum daily, 162 second-feet 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 many power plants and reservoirs.

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,600	1,000	1,800	1,730	1,440	1,560	3,660	2,400	1,870	3,240	1,800	1,670
2	1,440	880	1,740	1,340	1,540	1,920	3,420	2,300	1,950	3,080	1,760	1,470
3	1,880	940	1,660	1,580	1,730	1,850	2,760	2,550	2,110	2,700	2,020	1,840
4	1,280	960	1,660	1,340	1,540	1,900	2,640	3,000	1,840	3,000	2,020	1,840
5	1,200	1,150	1,620	1,370	1,730	1,920	3,000	2,300	1,960	3,830	2,090	1,220
6	1,160	2,480	1,720	2,110	1,710	1,920	3,490	3,180	1,290	6,460	2,380	1,640
7	1,120	2,640	1,560	1,460	1,540	1,560	3,830	3,300	1,400	7,020	2,150	1,900
8	1,440	2,280	2,110	1,670	1,820	1,560	3,920	3,520	1,540	7,690	2,070	2,580
9	1,480	2,400	2,020	1,790	1,630	1,920	3,180	3,920	1,600	8,330	1,680	2,380
10	960	2,160	2,110	1,690	1,600	2,100	3,610	5,030	1,560	8,420	1,800	2,090
11	1,320	2,400	2,110	1,580	1,680	2,300	2,950	4,090	1,520	7,500	2,410	1,940
12	1,500	2,160	2,110	1,610	1,600	2,230	3,230	4,630	1,440	5,720	2,690	1,870
13	1,440	2,160	2,110	1,640	1,680	2,060	3,080	3,920	1,350	4,370	2,690	2,110
14	1,500	1,920	1,730	1,670	1,580	1,780	3,250	3,530	1,500	3,360	2,040	2,880
15	1,230	1,730	1,920	1,920	1,500	1,680	3,480	3,450	1,450	3,370	1,460	2,860
16	1,240	1,820	1,920	1,440	1,750	1,560	3,670	3,100	1,680	3,240	1,340	2,690
17	1,240	1,920	1,680	1,650	1,700	1,830	3,540	2,100	2,280	2,460	1,580	2,520
18	1,200	1,800	1,740	1,520	1,700	1,640	3,150	2,300	1,630	1,820	1,740	2,410
19	1,450	2,040	1,540	1,640	2,000	1,650	3,050	3,000	1,630	1,820	1,860	2,030
20	1,220	2,400	1,680	1,560	1,850	1,550	2,800	3,240	1,710	2,110	1,770	2,350
21	1,000	2,640	2,190	1,590	1,600	1,290	2,740	3,360	2,160	1,920	1,910	2,020
22	1,150	2,520	1,680	1,800	1,500	1,270	2,280	3,160	3,120	2,300	1,520	1,950
23	1,200	2,520	1,400	1,600	1,700	1,550	2,740	2,880	3,120	2,110	1,320	1,890
24	960	2,280	1,520	1,590	2,040	1,800	2,210	2,760	3,240	2,210	1,740	2,040
25	850	2,300	1,600	1,560	1,920	2,160	2,450	2,400	3,240	1,540	1,440	1,740
26	840	2,000	1,520	1,600	1,800	2,400	3,000	2,520	3,690	1,500	1,640	1,630
27	940	1,950	1,410	1,630	1,800	2,010	3,120	2,640	3,710	1,820	1,760	1,420
28	1,000	2,050	1,380	1,730	1,680	2,280	3,000	2,300	3,480	2,360	2,120	1,950
29	1,040	1,740	1,480	1,630	-	3,600	2,850	2,110	3,300	2,350	1,220	1,780
30	1,000	2,160	1,390	1,540	-	4,200	2,760	2,020	3,240	2,220	1,110	1,900
31	1,280	-	1,730	1,630	-	3,820	-	1,670	-	2,080	1,400	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	38,160	1,880	840	1,231	0.325	0.37
November	59,400	2,640	880	1,980	.522	.58
December	53,840	2,190	1,380	1,737	.458	.53
Calendar year 1948	709,080	6,720	832	1,937	.511	6.95
January	50,210	2,110	1,340	1,620	.427	.49
February	47,360	2,040	1,440	1,691	.446	.46
March	62,870	4,200	1,270	2,028	.535	.62
April	92,860	3,920	2,210	3,095	.817	.91
May	92,680	5,030	1,670	2,990	.789	.91
June	65,610	3,710	1,290	2,187	.577	.64
July	111,950	8,420	1,500	3,611	.953	1.10
August	56,530	2,690	1,110	1,824	.481	.55
September	60,610	2,880	1,220	2,020	.533	.59
Water year 1948-49	792,080	8,420	840	2,170	.573	7.75

Menominee River near McAllister, Wis.

Location.- Water-stage recorder, lat. 45°19'20", long. 87°39'40", in sec. 17, T. 33 N., R. 23 E., 2¼ miles downstream from Little Cedar River, 2¾ miles east of McAllister, and 22 miles upstream from mouth.

Drainage area.- 4,020 square miles.

Records available.- March 1945 to September 1949.

Extremes.- Maximum discharge during year, 10,800 second-feet July 8 (gage height, 13.42 feet); minimum discharge, 774 second-feet Nov. 3 (gage height, 7.56 feet); minimum daily, 810 second-feet Oct. 26.
1945-49: Maximum discharge, 12,800 second-feet June 28, 1946 (gage height, 14.33 feet); minimum observed, 538 second-feet Oct. 6, 1946 (gage height, 7.29 feet).

Remarks.- Records good. Flow is partially regulated by many power plants and Way Reservoir above station.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,500	990	1,850	1,700	1,500	1,600	4,290	2,560	1,800	3,450	1,800	1,580
2	1,340	954	1,730	1,400	1,550	1,850	4,290	2,490	1,850	3,370	1,740	1,520
3	1,850	981	1,730	1,550	1,700	1,900	3,210	2,700	2,030	2,770	1,970	1,800
4	1,290	1,080	1,730	1,350	1,550	1,900	2,910	3,510	1,740	3,210	1,970	1,850
5	1,150	1,240	1,730	1,350	1,750	1,900	3,140	2,630	1,970	4,490	2,090	1,170
6	1,080	2,630	1,910	2,000	1,700	1,850	4,130	3,580	1,170	7,990	2,220	1,580
7	1,160	2,770	1,610	1,500	1,600	1,600	4,290	3,740	1,370	9,460	2,030	1,850
8	1,440	2,420	2,360	1,650	1,850	1,600	4,290	4,130	1,470	9,900	1,970	2,420
9	1,500	2,560	2,300	1,800	1,650	1,900	3,580	4,790	1,580	9,680	1,680	2,280
10	1,160	2,230	2,300	1,650	1,600	2,100	4,130	5,940	1,520	9,460	1,680	1,970
11	1,290	2,490	2,100	1,600	1,700	2,300	3,210	4,770	1,520	8,800	2,160	1,800
12	1,440	2,160	1,970	1,600	1,600	2,200	3,580	5,060	1,370	6,820	2,490	1,740
13	1,440	2,160	2,230	1,650	1,650	2,000	3,440	4,220	1,270	4,680	2,770	1,910
14	1,290	1,910	1,850	1,750	1,600	1,800	3,510	3,960	1,370	3,870	1,970	2,910
15	1,240	1,560	1,910	1,900	1,550	1,700	3,820	3,780	1,370	3,960	1,470	2,840
16	1,170	1,910	2,040	1,500	1,750	1,600	4,130	3,290	1,580	3,780	1,420	2,770
17	1,240	2,040	2,100	1,600	1,700	1,800	3,970	2,090	2,160	2,630	1,520	2,420
18	972	1,790	2,040	1,500	1,700	1,700	3,440	2,490	1,470	1,740	1,800	2,350
19	1,190	2,040	1,440	1,650	2,000	1,600	3,360	3,140	1,420	1,800	1,800	1,970
20	1,110	2,490	1,670	1,600	1,850	1,500	2,980	3,620	1,580	2,030	1,800	2,280
21	954	2,770	2,300	1,600	1,650	1,300	3,060	3,870	2,030	1,850	1,910	1,910
22	1,150	2,630	1,910	1,800	1,500	1,300	2,490	3,780	3,370	2,220	1,520	1,970
23	1,190	2,770	1,400	1,600	1,700	1,550	3,060	3,060	3,530	2,090	1,320	1,850
24	954	2,490	1,500	1,600	2,000	1,800	2,420	2,910	3,530	2,030	1,370	2,090
25	882	2,490	1,600	1,550	1,900	2,100	2,630	2,490	3,620	1,520	1,520	1,800
26	810	2,040	1,550	1,600	1,800	2,350	3,360	2,490	4,680	1,420	1,680	1,680
27	936	2,040	1,450	1,650	1,750	2,100	3,660	2,630	5,060	1,680	1,800	1,470
28	1,010	2,100	1,400	1,700	1,650	2,300	3,510	2,350	4,310	2,420	2,090	1,970
29	1,030	1,730	1,450	1,650	-	4,390	3,060	2,160	3,780	2,420	1,270	1,850
30	1,040	2,100	1,450	1,600	-	5,530	2,980	1,970	3,700	2,220	1,120	1,910
31	1,240	-	1,750	1,600	-	4,970	-	1,580	-	2,030	1,370	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	37,048	1,850	810	1,195	0.297	0.34
November	61,565	2,770	954	2,052	.510	.54
December	56,360	2,360	1,400	1,818	.452	.52
Calendar year 1948	765,282	8,580	810	2,091	.520	7.07
January	50,250	2,000	1,350	1,621	.403	.46
February	47,500	2,000	1,500	1,696	.422	.44
March	66,090	5,530	1,300	2,132	.530	.61
April	103,930	4,290	2,420	3,464	.862	.96
May	101,780	5,940	1,580	3,283	.817	.94
June	69,220	5,060	1,170	2,307	.574	.64
July	125,790	9,900	1,420	4,058	1.01	1.16
August	55,320	2,770	1,120	1,785	.444	.51
September	59,510	2,910	1,170	1,984	.494	.55
Water year 1948-49	834,363	9,900	810	2,286	.569	7.70

Note.- Stage-discharge relation affected by ice Dec. 8 to Mar. 28.

Iron River at Caspian, Mich.

Location.- Wire-weight gage, lat. 46°03'80", long. 88°37'38", on line between SE¼ and SW¼ sec. I, T. 42 N., R. 35 W., at county highway bridge in Caspian, 5½ miles upstream from mouth.
Drainage area.- 84 square miles.
Records available.- March 1948 to September 1949.
Extremes.- Maximum discharge during year, 245 second-feet May 7 (gage height, 5.72 feet, from graph based on gage readings); minimum observed, 32 second-feet June 12 (gage height, 3.47 feet).
1948-49: Maximum discharge, that of May 7, 1949; minimum observed, that of June 12, 1949.
Remarks.- Records fair. Gage read twice daily. Flow regulated by ground water pumped from mines.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Aug. 11 to Sept. 30)

Oct. 1 to Nov. 20		Nov. 21 to Sept. 30			
3.6	44	3.5	34	4.8	129
3.8	57	3.9	57	5.5	216
		4.4	92		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47	49	50	50	50	46	77	53	54	56	50	46
2	47	49	*50	50	51	46	85	56	53	64	50	45
3	47	*50	50	50	52	*46	86	56	53	134	48	41
4	47	51	53	50	*52	50	98	66	53	136	47	43
5	47	52	55	50	54	52	109	86	53	122	48	84
6	47	52	57	*50	52	51	102	209	50	109	52	68
7	47	52	60	52	55	53	98	216	47	106	53	66
8	47	52	57	52	52	51	*94	109	46	104	53	63
9	47	52	56	52	53	50	95	98	46	89	52	51
10	47	50	53	52	53	48	91	84	46	70	72	50
11	48	50	50	50	52	48	85	84	44	65	72	52
12	50	50	50	52	53	48	86	79	38	68	58	103
13	50	49	48	52	52	46	86	68	43	68	53	106
14	49	49	46	53	53	47	84	66	46	66	54	61
15	49	47	46	54	53	48	74	66	48	66	52	57
16	49	47	48	52	53	48	72	65	47	65	51	55
17	45	47	48	50	55	48	68	63	46	64	53	55
18	45	47	48	50	54	48	68	65	45	60	55	53
19	45	47	48	46	54	48	68	79	46	58	53	52
20	45	49	50	48	53	49	68	76	50	56	51	52
21	45	52	50	50	50	52	66	66	60	55	50	52
22	45	52	51	50	50	59	64	59	72	55	47	52
23	45	54	52	52	52	58	63	61	70	51	44	52
24	45	54	52	53	52	52	57	66	83	50	46	52
25	45	54	50	53	49	49	57	63	77	49	46	49
26	45	54	50	53	46	55	57	61	65	45	44	47
27	45	52	50	53	49	70	57	58	58	51	49	50
28	45	52	50	52	52	81	56	56	53	68	49	51
29	45	50	50	50	-	85	54	56	52	65	47	50
30	46	50	50	50	-	85	52	56	50	54	47	50
31	49	-	50	50	-	86	-	55	-	51	46	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,445	50	45	46.6		
November	1,515	54	47	50.5		
December	1,578	60	46	50.9		
Calendar year	-	-	-	-		
January	1,581	54	46	51.0		
February	1,456	55	46	52.0		
March	1,703	86	46	54.9		
April	2,277	109	52	75.9		
May	2,401	216	53	77.5		
June	1,594	83	38	53.1		
July	2,220	136	45	71.6		
August	1,592	72	44	51.4		
September	1,710	108	41	57.0		
Water year 1948-49	21,072	216	38	57.7		

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Nov. 21 to Dec. 3, Dec. 11-19, Dec. 24-31, Jan. 2-5, 20-22, 28, 29, Feb. 11, Mar. 1, 2, 9-13, 15-19.

Paint River at Crystal Falls, Mich.

Location.- Water-stage recorder, lat. 46°07', long. 88°20', in sec. 20, T. 43 N., R. 32 W., 150 feet below municipal power plant at Crystal Falls and 13 miles upstream from mouth. Datum of gage is 1,306.1 feet above mean sea level (Wisconsin-Michigan Power Co. bench mark).

Drainage area.- 616 square miles.

Records available.- August 1944 to September 1949.

Extremes.- Maximum discharge during year, 4,400 second-feet July 7 (gage height, 5.63 feet); minimum, 26 second-feet June 16 (gage height, 1.23 feet), power-plant leakage while restoring head following emptying of reservoir for repairs; minimum daily, 93 second-feet June 18.

1944-49: Maximum discharge, that of July 7, 1949; minimum, 10 second-feet Nov. 1, 1947 (gage height, 0.99 foot), power-plant leakage while restoring head following emptying of reservoir for repairs; minimum daily, 81 second-feet Nov. 1, 1947.

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

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)

1.8	140	2.9	683
2.0	202	3.4	1,120
2.3	318	4.2	1,980
2.6	474	4.9	2,880

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	148	213	229	210	217	188	472	428	288	481	416	219
2	147	205	244	208	216	189	487	428	267	545	440	213
3	143	201	273	195	211	198	573	422	245	505	385	203
4	146	209	279	202	209	200	679	494	263	899	369	245
5	148	298	290	212	210	206	797	787	226	1,460	336	488
6	146	347	350	216	210	210	886	1,600	224	2,160	309	676
7	147	385	355	215	208	217	895	2,300	207	2,810	288	660
8	151	359	350	218	204	194	913	2,460	188	2,200	278	566
9	158	341	355	233	208	208	985	2,160	181	1,720	263	480
10	158	304	306	218	228	197	976	1,700	173	1,290	259	400
11	168	288	273	211	208	188	1,030	1,340	167	949	382	374
12	189	274	285	208	202	187	1,120	1,080	170	725	382	400
13	204	234	280	205	198	183	1,260	883	175	604	357	538
14	196	241	257	210	203	188	1,290	730	196	466	334	545
15	186	241	270	214	201	183	1,340	641	408	445	293	506
16	183	239	270	220	194	175	1,180	557	167	407	302	422
17	180	260	254	250	192	177	1,040	505	107	380	270	390
18	175	284	207	244	213	172	931	505	93	341	322	359
19	179	280	264	214	200	176	816	580	187	310	429	315
20	173	263	245	215	195	167	732	573	250	300	367	290
21	176	297	247	215	205	175	676	532	338	298	320	290
22	176	359	239	209	206	205	691	487	526	301	267	276
23	176	339	238	221	203	226	707	439	548	277	231	264
24	176	304	222	217	206	230	715	406	783	276	220	256
25	187	312	226	218	205	241	676	400	895	266	219	237
26	176	288	218	221	203	254	630	380	807	256	205	248
27	185	285	218	223	194	290	601	359	668	243	234	243
28	181	269	222	226	209	326	525	323	558	385	221	247
29	181	236	224	213	-	396	493	320	455	500	221	255
30	183	238	215	211	-	451	445	305	401	512	231	253
31	203	-	205	214	-	479	-	306	-	451	235	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	5,325	204	143	172	0.279	0.32
November	8,393	385	201	280	.455	.51
December	8,110	355	205	262	.425	.49
Calendar year 1948	122,739	2,180	141	335	.544	7.39
January	6,706	250	195	216	.351	.40
February	5,758	228	192	206	.334	.35
March	7,076	479	167	228	.370	.43
April	24,561	1,340	445	819	1.33	1.48
May	24,430	2,460	305	788	1.28	1.47
June	10,161	895	93	339	.550	.61
July	22,742	2,810	243	734	1.19	1.37
August	9,385	440	205	303	.492	.57
September	10,858	676	203	362	.588	.66
Water year 1948-49	143,505	2,810	93	393	.638	8.66

Michigamme River near Crystal Falls, Mich.

Location.- Water-stage recorder, lat. 46°07', long. 88°13', in sec. 20, T. 43 N., R. 31 W., 5 miles downstream from Way Dam, 6 miles east of Crystal Falls, and 16 miles upstream from confluence with Brule River.

Drainage area.- 670 square miles.

Records available.- August 1944 to September 1949.

Extremes.- Maximum discharge during year, 3,020 second-feet July 7 (gage height, 7.26 feet); minimum, 83 second-feet Nov. 9, Dec. 10 (gage height, 1.61 feet).
1944-49: Maximum discharge, that of July 7, 1949; maximum gage height, 7.54 feet Apr. 11, 1945; minimum, that of Nov. 9, Dec. 10, 1948.

Remarks.- Records excellent except those for period of no gage-height record, which are good, and those for the periods of ice effect, which are fair. Flow regulated by Way Reservoir.

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

1.6	83	3.3	371
1.8	91	3.7	509
2.1	118	4.3	800
2.5	179	5.8	1,740
2.9	265	7.2	2,930

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	188	126	*85	481	485	290	536	128	308	535	a645	554
2	176	112	86	477	480	300	540	132	390	434	645	545
3	165	93	85	477	477	*310	550	126	412	408	645	540
4	159	94	85	473	*477	285	558	156	418	1,350	645	558
5	154	92	86	473	477	278	576	202	412	1,670	645	399
6	152	90	88	*473	469	268	594	253	408	2,480	645	177
7	156	85	92	469	466	234	416	221	393	2,930	645	170
8	157	84	89	469	481	232	*255	190	380	2,570	645	154
9	149	84	87	466	497	265	258	170	449	2,840	645	167
10	144	85	84	466	493	268	260	264	509	2,840	622	351
11	152	85	86	462	490	272	268	362	575	2,750	622	514
12	264	85	88	462	485	265	275	388	622	2,060	622	710
13	600	85	84	462	481	226	285	365	622	1,430	622	890
14	701	85	85	458	600	192	246	396	622	1,270	622	860
15	950	85	86	458	670	226	206	415	486	950	622	860
16	1,040	85	85	455	645	278	206	415	365	720	622	860
17	1,010	85	110	478	640	282	208	418	334	720	599	860
18	1,010	85	215	522	630	272	206	428	310	645	498	860
19	1,010	85	280	518	595	282	190	424	312	590	402	830
20	980	85	345	518	563	243	174	448	377	452	408	634
21	980	86	342	514	535	192	174	535	434	371	405	481
22	1,030	86	342	463	501	234	181	599	424	344	399	481
23	1,100	86	429	270	477	254	185	599	312	302	399	477
24	1,070	85	497	391	441	94	183	599	183	351	399	477
25	1,040	85	497	505	405	88	177	599	170	354	399	477
26	1,010	86	493	501	356	85	179	599	144	443	399	477
27	635	86	493	501	270	235	198	419	132	518	467	546
28	152	86	489	497	275	501	198	251	272	a520	563	599
29	138	84	485	489	-	518	204	248	405	a575	563	599
30	126	84	485	490	-	540	166	248	441	a645	558	599
31	127	-	481	485	-	545	-	248	-	a645	558	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	16,725	1,100	126	540		
November	2,649	126	84	88.1		
December	7,364	497	84	238		
Calendar year 1948	156,456	1,580	84	427		
January	14,623	522	270	472		
February	15,861	670	270	495		
March	8,554	545	85	276		
April	8,652	594	166	288		
May	10,825	599	126	349		
June	11,621	622	132	387		
July	34,712	2,930	302	1,120		
August	17,175	645	399	554		
September	16,706	890	154	557		
Water year 1948-49	163,467	2,930	84	448		

* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of records of gate openings at Way Dam.
Note.- Stage-discharge relation affected by ice Dec. 13-15, 17-20, Jan. 30, 31, Feb. 2, 11, 17-19, 21, 27, Mar. 1-3, 23.

Pine River at Pine River power plant, near Florence, Wis.

Location.- Lat. 45°49'40", long. 88°14'55", in sec. 28, T. 39 N., R. 18 E., at power plant of Wisconsin Michigan Power Co., 4 miles downstream from Popple River and 6½ miles south of Florence.

Drainage area.- 543 square miles.

Records available.- October 1923 to September 1949; January 1914 to September 1923, at site 4 miles upstream (drainage area, 511 square miles).

Average discharge.- 26 years (1923-49), 420 second-feet.

Extremes.- Maximum daily discharge during year, 1,460 second-feet July 7, minimum daily, 45 second-feet Oct. 20.
1923-49: Maximum daily discharge, 4,380 second-feet Apr. 9, 1929; no flow at times in 1924, 1926, 1927, 1930, 1931, 1933, 1940.

Remarks.- Records good except those for high stages, which are fair. Discharge determined from power-plant records. Flow regulated by power plant at station, but pondage is small and monthly discharge is very nearly natural flow.

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

Revisions.- W 804: Drainage area.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	107	123	182	104	156	130	364	344	312	434	208	101
2	50	175	195	107	91	130	390	416	208	416	208	78
3	50	150	208	156	169	123	442	448	169	420	182	78
4	150	123	208	105	87	130	520	363	146	979	169	130
5	100	224	359	101	140	136	664	593	81	1,290	130	383
6	52	513	312	143	104	91	664	615	159	1,450	117	589
7	84	603	312	130	156	143	624	716	156	1,460	208	607
8	91	468	312	143	104	143	624	677	84	1,210	208	511
9	94	463	312	52	130	150	624	735	156	1,060	195	403
10	49	364	312	175	130	78	624	598	146	904	169	364
11	146	312	208	143	123	156	624	416	52	740	208	312
12	94	312	208	104	156	156	611	412	113	699	182	435
13	136	312	273	117	52	50	585	468	120	598	182	520
14	97	312	188	195	156	143	624	312	208	419	52	520
15	110	208	133	59	104	104	624	312	289	364	182	440
16	123	312	208	104	156	104	522	312	188	364	156	416
17	61	312	182	156	104	104	505	318	186	312	156	364
18	149	312	182	156	104	91	490	312	104	208	156	312
19	156	295	169	136	156	55	396	494	156	208	156	312
20	45	353	169	117	104	52	423	520	208	208	88	208
21	146	345	169	156	91	143	434	624	286	299	65	208
22	136	432	169	156	120	156	403	598	533	156	169	208
23	78	382	169	52	133	130	453	468	641	208	91	208
24	50	279	117	156	104	78	459	390	569	182	143	208
25	133	312	104	156	156	156	423	416	585	208	110	55
26	84	312	123	130	139	208	390	364	467	208	91	208
27	107	357	156	117	78	208	481	452	351	179	65	169
28	104	312	113	159	133	312	455	169	359	188	72	169
29	107	280	130	117	-	338	455	273	305	208	156	169
30	117	195	156	65	-	468	388	312	208	208	104	169
31	104	-	104	156	-	442	-	208	-	182	146	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,110	156	45	100	0.184	0.21
November	9,432	603	123	314	.578	.64
December	6,142	359	104	198	.365	.42
Calendar year 1948	82,107	866	13	224	.413	5.61
January	3,923	195	52	127	.234	.27
February	3,436	169	52	123	.227	.24
March	4,908	468	50	158	.291	.34
April	15,285	664	364	510	.939	1.05
May	13,655	735	169	440	.810	.93
June	7,545	641	52	252	.464	.52
July	15,969	1,460	156	515	.948	1.09
August	4,524	208	52	146	.269	.31
September	8,854	607	55	295	.543	.61
Water year 1948-49	96,783	1,460	45	265	.488	6.63

Pike River at Amberg, Wis.

Location.- Water-stage recorder, lat. 45°29'50", long. 87°59'40", in sec. 15, T. 35 N., R. 20 E., 500 feet upstream from Chicago, Milwaukee, St. Paul & Pacific Railroad bridge, a quarter of a mile south of Amberg and 1¼ miles downstream from North Branch.

Drainage area.- 250 square miles.

Records available.- February 1914 to September 1949.

Average discharge.- 35 years, 224 second-feet.

Extremes.- Maximum discharge during year, 800 second-feet July 5 (gage height, 4.10 feet); minimum, 73 second-feet Oct. 4, 5 (gage height, 1.56 feet).
1914-49: Maximum discharge observed, 2,730 second-feet Apr. 10, 1922 (gage height, 7.68 feet, site and datum then in use), from rating curve extended above 1,100 second-feet; minimum observed, 26 second-feet Dec. 27, 1925 (gage height, 1.30 feet, site and datum then in use).

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

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

Rating tables, water year 1948-49, except period of ice effect (gage height, in feet, and discharge, in second-feet)

Oct. 1 to July 3		July 4 to Sept. 30			
1.6	77	1.7	90	3.0	432
1.8	105	2.0	144	3.4	556
2.0	144	2.3	220	3.9	723
2.2	193	2.6	309		
2.5	279				

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	76	94	183	106	113	117	342	209	125	217	136	87
2	76	92	229	106	112	117	310	220	119	249	131	86
3	76	93	220	107	111	120	291	220	114	212	127	85
4	73	102	201	108	110	123	288	212	107	432	118	85
5	74	163	*178	113	110	133	291	223	102	723	110	100
6	74	288	190	117	110	140	291	215	93	636	129	107
7	75	301	225	120	110	140	288	201	89	478	161	109
8	81	249	250	120	110	140	285	186	85	361	151	112
9	81	217	250	120	110	130	270	173	82	297	129	102
10	80	229	240	*119	110	126	252	158	81	252	119	96
11	81	215	210	120	110	125	246	149	78	220	123	94
12	86	196	180	120	110	125	237	149	77	198	136	138
13	86	180	160	120	110	125	229	149	87	180	123	220
14	87	166	145	120	110	123	229	151	99	170	116	212
15	87	161	135	123	110	120	226	149	163	149	110	173
16	86	163	125	140	110	115	209	144	206	140	107	144
17	86	234	120	135	110	112	201	154	161	129	107	127
18	84	270	118	130	110	110	193	229	129	123	110	119
19	82	249	117	122	110	110	190	282	118	127	107	107
20	81	282	117	119	110	115	183	298	129	129	100	102
21	81	291	120	119	110	125	180	255	479	129	98	102
22	82	264	120	119	110	180	196	215	584	138	94	99
23	84	234	117	118	111	200	212	190	430	138	92	96
24	86	209	110	118	*111	200	206	173	320	127	92	94
25	93	198	107	118	112	195	198	163	336	127	92	96
26	89	193	106	117	113	190	249	154	420	121	90	98
27	92	193	105	117	115	230	304	144	332	125	87	99
28	93	188	105	116	116	349	282	140	248	168	89	99
29	85	176	105	115	-	498	245	140	201	180	89	94
30	85	170	105	114	-	566	217	144	180	149	89	94
31	98	-	105	114	-	479	-	134	-	138	89	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,580	98	73	83.2	0.333	0.38
November	6,058	301	92	202	.808	.90
December	4,798	250	105	155	.620	.71
Calendar year 1948	51,653	584	73	141	.564	7.68
January	3,670	140	106	118	.472	.54
February	3,104	116	110	111	.444	.46
March	5,676	566	110	183	.732	.84
April	7,338	342	180	245	.980	1.09
May	5,723	298	134	185	.740	.85
June	5,772	584	77	192	.768	.86
July	6,962	723	121	225	.900	1.04
August	3,451	161	87	111	.444	.51
September	3,376	220	85	113	.452	.50
Water year 1948-49	58,508	723	73	160	.640	8.68

Peak discharge (base, 700 sec.-ft.).- July 5 (9 p.m.) 800 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 6 to Mar. 27.

Oconto River near Gillett, Wis.

Location.- Water-stage recorder, lat. 44°52', long. 88°18', in sec. 34, T. 28 N., R. 18 E., at highway bridge 2 miles upstream from Christy Brook and 2½ miles south of Gillett.

Drainage area.- 678 square miles.

Records available.- June 1906 to March 1909, January 1914 to September 1949.

Average discharge.- 36 years (1908, 1914-49), 583 second-feet.

Extremes.- Maximum discharge during year, 1,150 second-feet Mar. 29; maximum gage height, 3.21 feet (backwater from ice); minimum discharge, 182 second-feet Oct. 1-4 (gage height, 0.54 foot).

1906-9, 1914-49: Maximum discharge observed, 6,470 second-feet Apr. 11, 1922, caused by failure of dam at Pulcifer, 4 miles upstream (gage height, 9.1 feet); minimum, 93 second-feet Nov. 26, 1941 (gage height, 0.13 foot); flow retarded by anchor ice above station.

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

Revisions.- W 384: Drainage area.

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)

0.5	172	1.6	610
.7	227	1.9	760
1.0	340	2.2	912
1.3	468	2.4	1,020

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	184	215	414	250	270	280	965	660	273	368	524	203
2	182	221	360	250	265	280	912	610	273	364	486	203
3	182	224	364	255	265	285	835	610	270	364	459	206
4	187	234	441	260	260	295	785	635	255	410	419	203
5	187	266	406	270	260	325	735	635	248	685	384	203
6	187	372	310	275	260	355	735	660	241	810	364	209
7	192	454	240	280	260	360	710	635	227	886	356	221
8	195	477	255	285	260	335	735	586	218	938	340	234
9	200	454	290	290	265	310	710	538	215	965	300	241
10	200	436	315	*288	265	305	660	486	212	860	285	241
11	200	410	340	285	265	300	635	464	209	552	281	230
12	203	376	365	280	265	300	610	459	206	500	277	238
13	209	376	375	280	265	300	610	454	195	477	273	273
14	209	368	340	280	265	295	586	436	209	414	262	300
15	206	356	320	295	270	295	586	414	270	389	248	308
16	206	356	300	480	270	295	562	393	423	364	244	300
17	203	402	285	390	270	275	557	368	446	364	241	296
18	203	446	280	310	270	275	562	389	368	352	296	273
19	203	477	280	290	270	270	562	402	344	348	332	241
20	203	528	280	280	270	270	562	446	397	336	304	215
21	203	586	285	280	270	310	548	459	441	300	296	218
22	203	586	285	280	275	560	538	432	505	292	262	221
23	203	552	270	280	275	650	538	402	468	285	238	212
24	203	509	260	280	*272	690	519	372	414	312	234	206
25	203	482	250	280	280	730	519	360	533	393	258	203
26	203	468	250	280	285	770	635	348	660	389	248	200
27	203	464	250	280	290	840	735	340	660	389	227	200
28	203	464	250	280	285	886	785	324	548	402	224	197
29	203	446	250	275	-	1,050	785	316	454	660	218	197
30	206	428	250	270	-	1,050	735	304	410	660	215	192
31	209	-	250	270	-	1,020	-	296	-	586	209	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	6,163	209	182	199	0.294	0.34
November	12,433	586	215	414	.611	.68
December	9,410	441	240	304	.448	.52
Calendar year 1948	131,145	2,340	170	358	.528	7.19
January	8,928	480	250	288	.425	.49
February	7,542	290	260	269	.397	.41
March	14,561	1,050	270	470	.693	.80
April	19,951	965	519	665	.981	1.09
May	14,233	660	296	459	.677	.78
June	10,592	660	195	353	.521	.58
July	15,414	965	285	497	.733	.85
August	9,304	524	209	300	.442	.51
September	6,884	308	192	229	.338	.38
Water year 1948-49	135,435	1,050	182	371	.547	7.43

Peak discharge (base, 1,500 sec.-ft.).- No peak above base.
Note.- Stage-discharge relation affected by ice Dec. 6 to Mar. 27.

Wheeler Lake near Lakewood, Wis.

Location.- Staff gage, lat. 45°19', long. 88°29', in sec. 27, T. 33 N., R. 16 E., on southwest shore of lake at Berglund's Resort, 3½ miles east of Lakewood.
Drainage area.- 2 square miles.
Records available.- August 1936 to September 1949 (fragmentary).
Extremes.- Maximum elevation observed during year, 94.40 feet Mar. 25, 28; minimum observed, 93.57 feet Nov. 5.
1936-49: Maximum elevation observed, 96.50 feet Oct. 5, Nov. 9, 1943; minimum observed, that of Nov. 5, 1948.
Remarks.- Gage heights have been reduced to datum assumed for this lake by Public Service Commission of Wisconsin.

Elevation, in feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	-	-	-	-	4.24	-	-	4.14	4.08	
2	-	3.58	-	-	-	-	-	4.20	-	-	-	
3	-	-	3.99	3.97	-	-	-	-	4.12	-	-	
4	-	-	-	-	4.21	4.21	4.24	-	-	4.12	-	
5	-	3.57	-	-	-	-	-	-	-	-	4.02	
6	-	-	4.03	-	-	-	-	4.22	4.10	-	-	
7	-	-	4.01	-	4.21	4.21	-	-	-	-	-	
8	-	-	-	4.03	-	-	4.28	-	-	4.22	4.02	
9	3.76	3.75	-	-	-	-	-	4.22	-	-	-	
10	-	-	4.01	4.03	-	-	-	-	4.00	-	-	
11	3.69	-	-	4.03	4.21	4.29	4.28	-	-	4.22	-	
12	-	3.82	-	-	-	-	-	-	-	-	3.96	
13	3.75	-	-	-	-	-	-	4.14	4.00	-	-	
14	-	-	4.01	-	4.21	4.29	-	-	-	-	3.92	
15	-	-	-	4.07	-	-	4.28	-	-	4.14	3.96	
16	3.75	3.85	-	-	-	-	-	4.14	-	-	-	
17	-	-	4.01	4.07	-	-	-	-	4.06	-	-	
18	-	-	-	-	4.21	4.27	4.28	-	-	4.14	-	
19	3.66	-	-	-	-	-	-	-	-	-	3.96	
20	-	3.95	-	-	-	-	-	4.26	4.06	-	-	
21	-	-	4.01	4.07	4.17	4.27	-	-	-	-	-	
22	-	-	-	-	-	-	4.18	-	-	4.02	-	
23	3.62	3.95	-	-	-	-	-	4.26	-	-	-	
24	-	-	4.01	4.07	-	-	-	-	4.08	-	-	
25	-	-	-	-	4.17	4.40	4.18	-	-	4.02	-	
26	3.60	3.97	-	-	-	-	4.22	-	-	-	-	
27	-	-	-	-	-	-	-	4.16	4.08	-	-	
28	-	-	4.01	4.21	4.17	4.40	-	-	-	-	-	
29	3.58	-	-	-	-	-	4.20	-	-	4.08	-	
30	-	3.99	-	-	-	-	-	4.16	-	-	-	
31	-	-	3.99	4.21	-	-	-	-	-	-	-	

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

Boot Lake near Townsend, Wis.

Location.- Staff gage, lat. 45°15', long. 88°39', in sec. 9, T. 32 N., R. 15 E., on pier of Pine Ridge Lodge at north end of lake, 5½ miles southwest of Townsend.
Drainage area.- 1.5 square miles.
Records available.- August 1936 to September 1949 (fragmentary).
Extremes.- Maximum elevation observed during year, 94.54 feet July 5; minimum observed, 93.92 feet Sept. 24.
1936-49: Maximum elevation observed, 98.25 feet June 28, 1943; minimum observed, that of Sept. 24, 1949.
Remarks.- Gage heights have been reduced to datum assumed for this lake by Public Service Commission of Wisconsin.

Elevation, in feet, water year October 1948 to September 1949

Day	Elevation	Day	Elevation	Day	Elevation	Day	Elevation
Oct. 1	4.21	Apr. 12	4.45	June 12	4.18	July 22	4.28
4	4.17	16	4.45	13	4.16	23	4.26
7	4.13	18	4.45	14	4.28	24	4.36
11	4.11	21	4.43	15	4.28	26	4.34
12	4.12	25	4.40	16	4.26	27	4.31
14	4.11	26	4.48	17	4.24	28	4.43
18	4.06	29	4.43	19	4.22	31	4.40
22	4.02	30	4.43	22	4.30	Aug. 2	4.40
27	4.00	May 3	4.53	23	4.30	4	4.36
30	4.00	5	4.48	24	4.32	6	4.34
31	3.99	7	4.47	25	4.36	7	4.34
Nov. 4	4.04	9	4.43	26	4.34	9	4.32
6	4.22	12	4.41	28	4.36	15	4.24
8	4.22	15	4.48	July 1	4.34	17	4.28
13	4.20	17	4.45	3	4.33	20	4.20
16	4.20	20	4.46	5	4.54	30	4.10
20	4.26	24	4.41	8	4.44	Sept. 3	4.02
24	4.30	28	4.38	9	4.42	5	4.10
27	4.32	June 1	4.39	11	4.40	8	4.07
28	4.30	2	4.36	12	4.38	10	4.04
Dec. 2	4.30	3	4.32	13	4.36	13	4.02
3	4.30	5	4.28	15	4.32	14	3.97
6	4.35	6	4.25	17	4.36	17	3.94
10	4.35	9	4.20	19	4.36	18	3.94
Apr. 11	4.45	10	4.20	20	4.31	24	3.92

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

Fox River at Berlin, Wis.

Location.- Staff gage, lat. 43°57'05", long. 88°57'30", in sec. 16, T. 17 N., R. 13 E., at Government lock and dam at Berlin, 2½ miles upstream from Barnes Creek.

Drainage area.- 1,430 square miles.

Records available.- January 1898 to September 1949.

Average discharge.- 51 years, 1,114 second-feet.

Extremes.- Maximum discharge observed during year, 2,600 second-feet Apr. 4 (gage height, 11.6 feet); minimum observed, 407 second-feet Sept. 26, 27, 29, 30 (gage height, 7.0 feet).

1898-1949: Maximum discharge observed, 6,900 second-feet Mar. 17, 18, 1946 (gage height, 15.5 feet); minimum observed, 248 second-feet Sept. 16, 1948 (gage height, 6.1 feet).

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

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	512	562	740	600	580	690	2,290	1,130	489	589	562	447
2	489	562	617	590	580	730	2,410	1,080	512	589	536	447
3	489	562	676	580	580	800	2,530	1,080	562	617	536	427
4	489	562	676	580	580	870	2,600	1,040	536	589	536	427
5	467	589	676	580	580	1,000	2,530	960	536	589	512	467
6	467	774	740	580	580	1,120	2,530	920	489	617	512	467
7	467	845	690	580	580	1,280	2,470	845	467	646	512	467
8	489	809	660	580	580	1,400	2,350	809	427	646	489	467
9	512	740	640	580	580	1,600	2,290	809	447	676	467	467
10	512	740	620	580	580	1,750	2,170	707	447	676	467	467
11	512	774	620	580	570	1,900	2,110	589	427	676	447	467
12	512	774	620	580	570	2,170	1,990	617	427	646	512	467
13	512	740	620	*583	570	2,230	1,930	617	447	617	489	467
14	512	740	620	580	570	2,230	1,810	617	447	617	489	467
15	512	707	620	580	570	2,230	1,630	589	489	617	489	467
16	512	676	620	580	570	2,170	1,480	589	562	589	489	467
17	512	740	620	600	570	2,110	1,480	617	589	589	512	467
18	489	845	620	620	570	2,050	1,480	617	562	589	512	467
19	489	774	620	640	570	2,050	1,480	617	562	562	512	447
20	489	676	620	640	575	1,930	1,480	536	512	562	467	447
21	489	740	620	640	*576	1,810	1,480	562	512	562	467	447
22	489	882	600	640	580	1,810	1,430	562	489	562	489	427
23	512	845	600	620	580	1,810	1,380	562	489	562	489	427
24	512	845	600	620	580	1,870	1,280	562	489	562	489	427
25	512	845	600	600	590	1,930	1,230	536	562	589	489	427
26	489	845	600	600	600	1,930	1,280	536	617	562	467	407
27	489	809	600	600	620	1,990	1,280	536	617	562	467	407
28	512	809	600	590	650	2,050	1,230	536	617	562	489	427
29	512	774	600	580	-	2,110	1,180	512	617	589	447	407
30	512	740	600	580	-	2,110	1,180	536	617	589	447	407
31	512	-	600	580	-	2,170	-	512	-	562	447	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	15,484	512	467	499	0.349	0.40
November	22,325	882	562	744	.520	.58
December	19,555	740	600	631	.441	.51
Calendar year 1948	335,737	4,540	248	917	.641	8.74
January	18,463	640	580	596	.417	.48
February	16,281	650	570	581	.406	.42
March	53,900	2,230	690	1,739	1.22	1.41
April	53,990	2,600	1,180	1,800	1.26	1.41
May	21,337	1,130	512	688	.481	.55
June	15,562	617	427	519	.363	.40
July	18,561	676	562	599	.419	.48
August	15,234	562	447	491	.343	.40
September	13,390	467	407	446	.312	.35
Watsr year 1948-49	284,082	2,600	407	778	.544	7.39

* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Dec. 7 to Mar. 11.

Lake Winnebago at Oshkosh, Wis.

Location.- Staff gage, lat. 44°00'40", long. 88°32'00", in sec. 24, T. 18 N., R. 17 E., in mouth of upper Fox River at Chicago & Northwestern Railroad bridge, 0.2 mile downstream from Main Street Bridge in Oshkosh and 18 miles up the lake from Menasha Dam and outlet. Datum of gage is 745.05 feet above mean tide at New York City (levels of Corps of Engineers.) Prior to 1882 lake levels were referred to Deuchman gage at lake outlet of Menasha Dam. Datum of Deuchman gage, which is still in existence, is 745.00 feet above mean tide at New York City.

Drainage area.- 6,030 square miles at lake outlet at Menasha Dam.

Records available.- October 1938 to September 1949. Records from 1857 to 1938 in files of Corps of Engineers. A report on Fox River by Corps of Engineers is published as House Document No. 146, 67th Congress, 2d session.

Extremes.- Maximum gage height observed during year, 3.25 feet May 9; minimum observed, 0.75 foot Mar. 4-6, 9-12.
1857-1949: Maximum gage height observed, 5.33 feet (Deuchman gage) Nov. 8, 1881; minimum observed, -2.00 feet (Deuchman gage) Nov. 28, 1891.

Remarks.- Lake elevations controlled by dams at Menasha and Neenah which are operated in the interest of navigation. Crests of both dams are at elevation 746.73 feet. Present limits of regulation are from 21½ inches above the crest of Menasha Dam down to the crest during navigation season, plus additional 18 to 24 inches below crest during winter. Oshkosh staff gage gives true level of lake while Deuchman gage readings are affected by loss of head in the Channel between lake and dam. Gage read once daily.

Cooperation.- Records furnished by Corps of Engineers.

Gage height, in feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.94	1.77	2.04	1.62	1.31	0.81	1.75	3.02	2.81	2.60	2.69	2.38
2	1.94	1.79	2.00	1.60	1.31	.79	1.83	2.98	2.85	2.79	2.75	2.31
3	1.92	1.81	1.98	1.60	1.29	.77	1.92	3.12	2.83	2.81	2.77	2.25
4	1.90	1.83	1.98	1.58	1.27	.75	2.00	2.98	2.81	2.83	2.73	2.23
5	1.88	1.96	1.96	1.58	1.27	.75	2.08	3.10	2.79	2.88	2.69	2.21
6	1.83	1.56	1.81	1.58	1.25	.75	2.12	3.15	2.77	2.73	2.65	2.29
7	1.88	1.96	1.94	1.52	1.23	.77	2.19	3.19	2.75	2.77	2.69	2.25
8	1.81	1.94	1.85	1.50	1.21	.77	2.27	3.23	2.73	2.79	2.67	2.29
9	1.67	1.92	1.90	1.50	1.21	.75	2.35	3.25	2.65	2.77	2.62	2.21
10	1.81	1.92	1.92	1.48	1.19	.75	2.40	3.17	2.67	2.81	2.60	2.23
11	1.83	1.88	1.90	1.48	1.17	.75	2.46	3.04	2.65	2.83	2.77	2.23
12	1.83	1.92	1.90	1.46	1.15	.75	2.50	3.12	2.60	2.83	2.69	2.23
13	1.81	1.94	1.88	1.46	1.12	.79	2.56	2.98	2.52	2.81	2.65	2.06
14	1.83	1.94	1.90	1.42	1.10	.85	2.62	3.10	2.69	2.85	2.60	2.15
15	1.81	1.92	1.88	1.38	1.10	.83	2.62	3.06	2.67	2.79	2.60	2.12
16	1.73	1.90	1.85	1.42	1.08	.88	2.69	3.02	2.67	2.85	2.60	2.10
17	1.81	1.98	1.83	1.44	1.08	.85	2.75	3.04	2.65	2.81	2.58	2.10
18	1.81	2.00	1.81	1.46	1.06	.85	2.81	2.96	2.67	2.77	2.65	2.08
19	1.79	2.10	1.83	1.42	1.00	.88	2.85	3.12	2.65	2.85	2.60	2.08
20	1.75	2.00	1.85	1.44	.96	.90	2.90	2.98	2.62	2.83	2.56	2.12
21	1.79	2.08	1.83	1.44	.92	.90	2.96	2.94	2.67	2.81	2.54	1.94
22	1.71	2.10	1.79	1.42	.92	.92	2.92	2.98	2.65	2.71	2.50	2.02
23	1.73	2.08	1.79	1.40	.90	.96	2.98	2.94	2.58	2.81	2.50	2.00
24	1.73	2.08	1.77	1.38	.90	1.02	2.94	2.92	2.73	2.83	2.48	2.00
25	1.73	2.08	1.77	1.38	.85	1.04	2.90	2.94	2.73	2.90	2.48	1.96
26	1.73	2.08	1.75	1.35	.85	1.15	3.02	2.92	2.75	2.79	2.44	1.92
27	1.75	2.06	1.73	1.33	.83	1.25	3.10	2.94	2.75	2.75	2.46	1.92
28	1.75	2.08	1.71	1.29	.81	1.38	3.04	2.90	2.85	2.90	2.48	1.94
29	1.75	2.08	1.69	1.29	-	1.46	3.00	2.88	2.77	2.65	2.46	1.90
30	1.73	2.00	1.67	1.29	-	1.48	3.06	2.84	2.71	2.81	2.44	1.85
31	1.79	-	1.65	1.27	-	1.56	-	2.83	-	2.77	2.40	-

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

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

Drainage area.- 6,150 square miles.

Records available.- March 1896 to September 1949.

Average discharge.- 53 years, 4,260 second-feet.

Extremes.- Maximum daily discharge during year, 6,360 second-feet Apr. 26; minimum daily, 830 second-feet Oct. 17.
1918-49: Maximum daily discharge, 21,300 second-feet June 6, 1943, Mar. 27, 1946; minimum daily, 138 second-feet Aug. 2, 1936.

Remarks.- Records good. Flow regulated by storage in Lake Winnebago (see preceding page).

Cooperation.- Figures of daily discharge (computed from power-plant records) furnished by Corps of Engineers. Records reviewed by Geological Survey.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,470	1,410	3,260	2,930	3,600	3,700	3,610	4,010	2,340	2,190	2,670	2,080
2	1,330	1,390	3,480	2,740	3,640	3,830	3,650	4,470	2,440	1,830	2,220	2,030
3	950	1,530	3,350	3,500	3,760	3,790	4,340	4,230	2,360	1,850	2,390	1,690
4	1,220	1,660	3,320	3,680	3,640	4,010	4,280	4,180	2,160	1,710	2,240	1,410
5	1,460	1,800	3,630	3,880	3,190	4,200	4,300	4,470	1,930	2,270	2,290	1,510
6	1,400	1,690	3,210	3,600	2,890	3,930	4,720	4,220	2,390	1,770	2,200	2,270
7	1,410	1,190	3,110	3,510	3,640	4,460	4,140	3,460	2,130	1,880	1,960	2,640
8	1,330	1,760	3,180	3,520	3,420	3,890	3,590	3,840	1,940	1,930	2,380	2,530
9	1,300	2,510	2,900	2,930	3,490	3,850	3,540	4,420	2,020	2,180	2,240	2,340
10	890	2,390	3,150	3,620	3,420	3,810	3,170	3,810	1,870	1,900	2,260	2,160
11	1,250	2,370	3,340	3,090	3,340	3,830	4,090	4,050	2,020	2,400	2,280	1,980
12	1,320	2,380	2,990	3,510	3,370	3,430	3,520	3,940	1,780	2,300	1,870	2,500
13	1,320	2,300	3,110	3,430	2,900	3,370	1,500	4,140	1,960	2,330	2,200	2,120
14	1,270	2,250	3,050	3,470	3,650	3,890	1,710	2,740	1,890	2,120	1,500	2,080
15	1,350	2,470	3,280	3,840	3,270	3,790	1,760	3,470	1,900	2,180	1,940	2,210
16	1,260	2,480	3,290	3,510	3,360	3,800	2,870	3,190	1,860	2,010	1,990	2,160
17	830	2,450	2,940	3,640	4,300	3,430	1,880	2,700	1,950	1,870	2,180	2,020
18	1,110	2,480	3,040	3,160	4,250	3,660	2,370	3,150	2,000	2,530	1,740	1,660
19	1,040	2,720	2,760	3,260	4,150	3,510	2,900	2,350	1,440	2,270	1,720	2,210
20	990	2,790	3,260	3,540	3,600	3,270	2,690	2,300	1,900	2,290	2,060	2,070
21	1,520	2,510	2,950	3,370	4,340	4,150	3,000	2,490	1,850	2,380	1,650	2,110
22	1,660	2,870	3,130	3,310	3,720	4,230	3,880	1,900	1,930	2,340	1,780	1,980
23	1,450	3,290	3,110	3,050	3,790	3,730	3,490	2,560	2,150	2,040	2,040	2,120
24	1,350	3,790	2,290	3,600	4,090	3,100	3,350	2,230	2,270	2,280	2,050	1,900
25	1,470	3,520	2,750	3,250	3,880	3,020	4,680	2,880	2,300	2,710	2,060	1,740
26	1,530	3,210	3,010	3,350	3,900	3,230	6,360	2,240	1,710	2,710	1,830	1,970
27	1,420	3,490	3,370	3,350	2,990	4,530	5,280	2,410	1,800	2,600	1,900	2,040
28	1,580	2,990	3,130	3,190	3,920	3,120	5,190	2,370	2,040	2,690	1,850	1,890
29	1,550	3,320	3,150	3,140	-	3,620	4,970	2,140	2,130	2,580	1,700	2,100
30	1,260	3,270	3,250	2,620	-	3,650	4,370	2,190	2,130	2,310	1,750	1,880
31	1,460	-	2,890	3,770	-	3,500	-	2,280	-	1,800	2,040	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	40,750	1,660	830	1,315	0.214	0.25
November	74,280	3,790	1,190	2,476	.403	.45
December	96,680	3,630	2,290	3,119	.507	.58
Calendar year 1948	1,130,270	10,300	830	3,088	.502	6.84
January	104,360	3,880	2,620	3,366	.547	.63
February	101,510	4,340	2,890	3,625	.589	.61
March	115,130	4,530	3,020	3,714	.604	.70
April	109,200	6,360	1,500	3,640	.592	.66
May	98,830	4,470	1,900	3,188	.518	.60
June	60,590	2,440	1,440	2,020	.328	.37
July	68,250	2,710	1,710	2,202	.358	.41
August	62,980	2,670	1,500	2,032	.330	.38
September	61,400	2,640	1,410	2,047	.333	.37
Water year 1948-49	993,960	6,360	830	2,723	.443	6.01

Silver Lake at Portage, Wis.

Location.- Staff gage, lat. 43°33', long. 89°29', in sec. 6, T. 12 N., R. 9 E., at ice hoist of C. Smith & Son, at southeast end of lake.
Drainage area.- 1 square mile.
Records available.- August 1936 to September 1949 (fragmentary).
Extremes.- Maximum elevation observed during year, 92.46 feet July 4; minimum, 91.71 feet Sept. 23.
1936-49: Maximum elevation observed, 93.15 feet June 15, 21, 1947; minimum, 90.85 feet Aug. 22, 24, 1937.
Remarks.- Gage heights have been reduced to elevations above datum assumed for this lake by Public Service Commission of Wisconsin.

Elevation, in feet, water year October 1948 to September 1949

Day	Elevation	Day	Elevation	Day	Elevation	Day	Elevation
Oct. 3	6.73	Apr. 16	7.30	June 18	7.18	Aug. 14	7.16
8	6.78	24	7.30	20	7.17	21	7.09
17	6.78	25	7.34	24	7.23	28	7.01
Nov. 11	6.84	May 1	7.34	July 4	7.46	Sept. 2	6.86
22	6.84	7	7.29	11	7.44	7	6.90
Dec. 4	7.21	14	7.21	16	7.41	11	6.85
12	7.21	22	7.19	23	7.36	17	6.79
Jan. 9	6.73	30	7.08	25	7.39	23	6.71
Apr. 2	7.20	June 5	7.11	31	7.31		
9	7.30	12	7.06	Aug. 6	7.23		

Note.- Add 85.00 feet to obtain elevation above datum assumed for this lake by Public Service Commission of Wisconsin.

Little Green Lake near Markesan, Wis.

Location.- Staff gage, lat. 43°44', long. 88°58', in sec. 32, T. 15 N., R. 13 E., half a mile north of lake outlet and 2 miles north of Markesan.
Drainage area.- 5 square miles.
Records available.- August 1936 to September 1949 (fragmentary).
Extremes.- Maximum elevation observed during year, 95.66 feet May 1; minimum observed, 94.54 feet Jan. 13, Sept. 29, 30.
1936-49: Maximum elevation observed, 96.74 feet June 23, 24, 1940; minimum observed 94.28 feet Sept. 10, 11, 1936.
Remarks.- Gage heights have been referred to datum assumed for this lake by Public Service Commission of Wisconsin.

Elevation, in feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								5.66	5.40	5.30	5.08	4.88
2								5.65	5.40	5.30	5.08	4.88
3								5.64	5.40	5.30	5.06	4.88
4								5.64	5.40	5.28	5.06	4.88
5								5.64	5.40	5.28	5.06	4.86
6								5.63	5.40	5.28	5.06	4.84
7			4.80					5.62	5.38	5.28	5.06	4.82
8								5.62	5.34	5.28	5.06	4.82
9								5.62	5.32	5.28	5.06	4.82
10								5.62	5.30	5.26	5.06	4.82
11								5.59	5.30	5.26	5.06	4.82
12								5.58	5.30	5.26	5.06	4.82
13				4.54				5.55	5.30	5.22	5.06	4.82
14								5.52	5.30	5.20	5.06	4.82
15	4.70							5.52	5.30	5.18	5.06	4.80
16								5.52	5.30	5.18	5.06	4.78
17								5.51	5.28	5.18	5.06	4.78
18								5.50	5.28	5.18	5.01	4.78
19								5.50	5.28	5.18	4.93	4.76
20								5.50	5.28	5.18	4.92	4.71
21					4.70			5.50	5.28	5.18	4.92	4.66
22								5.54	5.30	5.18	4.92	4.62
23								5.51	5.30	5.18	4.91	4.60
24								5.45	5.30	5.18	4.90	4.60
25								5.42	5.30	5.16	4.90	4.60
26								5.42	5.30	5.12	4.90	4.60
27								5.42	5.30	5.10	4.90	4.60
28								5.42	5.30	5.09	4.90	4.55
29					-		5.65	5.42	5.32	5.08	4.90	4.54
30					-			5.42	5.32	5.08	4.90	4.54
31					-		-	5.40	-	5.08	4.88	-

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

Wolf River above West Branch Wolf River, Wis.

Location.- Chain gage, lat. 44°55', long. 88°39', in E½ sec. 3, T. 28 N., R. 15 E., half a mile upstream from West Branch Wolf River and 4 miles north of Keshena. Datum of gage is 856.57 feet above mean sea level (levels by Wisconsin Power & Light Co.).

Drainage area.- 633 square miles.

Records available.- March 1928 to September 1949.

Average discharge.- 21 years, 570 second-feet.

Extremes.- Maximum discharge observed during year, 1,420 second-feet July 5-7; maximum gage height observed, 4.25 feet July 5; minimum discharge observed, 247 second-feet Oct. 4, 5, June 12.
1928-49: Maximum discharge observed, 2,580 second-feet Apr. 8, 1929 (gage height, 6.10 feet), from rating curve extended above 1,600 second-feet; minimum observed, 199 second-feet Feb. 20, 1936.

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

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)

1.4	237	2.5	578
1.6	281	3.0	794
1.8	333	3.5	1,040
2.0	396	4.2	1,420

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	258	306	348	335	290	340	938	748	333	380	578	281
2	270	306	320	330	290	340	938	704	333	396	538	281
3	258	320	464	330	290	340	889	704	333	464	464	270
4	247	333	538	330	290	340	661	748	320	1,200	430	258
5	247	413	464	325	290	340	704	748	306	1,420	430	281
6	258	538	464	320	290	340	704	794	306	1,420	430	306
7	270	578	413	320	290	335	661	748	294	1,420	413	464
8	281	538	410	320	290	330	619	748	281	1,200	363	500
9	281	538	400	320	290	330	619	704	270	1,090	348	500
10	281	538	400	315	290	330	619	661	258	938	333	464
11	281	500	395	*313	290	330	578	661	258	889	333	430
12	294	464	390	315	290	330	578	538	247	841	333	500
13	281	413	385	315	290	330	578	538	258	748	333	538
14	281	396	380	315	295	330	578	a538	396	748	320	619
15	270	396	380	320	300	330	578	a540	500	704	320	578
16	270	396	375	325	305	330	578	a545	464	661	281	578
17	281	464	370	330	310	330	538	a550	430	661	320	538
18	281	500	370	330	310	330	538	a560	363	619	430	500
19	294	500	365	330	310	330	538	a560	380	619	430	464
20	281	538	360	330	315	340	538	a560	413	578	430	413
21	270	538	360	330	320	360	500	a550	430	430	413	380
22	281	538	360	330	320	390	500	538	396	396	363	a350
23	281	538	360	330	*323	430	500	538	464	396	363	a340
24	281	500	355	325	325	470	500	500	500	661	333	a330
25	270	500	350	320	330	520	538	464	500	538	333	a325
26	281	464	350	320	335	600	704	413	500	500	281	a320
27	281	464	350	315	340	700	794	380	396	464	281	a320
28	281	430	345	310	340	820	748	363	413	661	281	a320
29	281	396	340	305	-	1,090	748	363	396	661	270	a320
30	a290	363	340	300	-	1,200	748	348	380	619	270	a320
31	a298	-	335	295	-	988	-	348	-	619	270	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	8,560	298	247	276	0.436	0.50
November	13,706	578	306	457	.722	.81
December	11,836	538	320	382	.603	.70
Calendar year 1948	154,200	1,420	237	421	.665	9.08
January	9,948	335	295	321	.507	.58
February	8,548	340	290	305	.482	.50
March	14,243	1,200	330	459	.725	.84
April	19,252	938	500	642	1.01	1.13
May	17,702	794	348	571	.902	1.04
June	11,118	500	247	371	.586	.65
July	22,941	1,420	380	740	1.17	1.35
August	11,315	578	270	365	.577	.67
September	12,088	619	258	403	.637	.71
Water year 1948-49	161,257	1,420	247	442	.698	9.48

* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of records for Wolf River at Keshena Falls and Oconto River at Gillett.
Note.- Stage-discharge relation affected by ice Dec. 8 to Mar. 28.

Wolf River at Keshena Falls, Wis.

Location.- Water-stage recorder, lat. 44°53', long. 88°39', in E½ sec. 22, T. 28 N., R. 15 E., 500 feet downstream from Keshena Falls, 1½ miles upstream from Keshena, and 2½ miles downstream from West Branch.

Drainage area.- 812 square miles.

Records available.- March 1928 to September 1949, May 1907 to March 1909, and February 1911 to March 1928 at site at Keshena, 1½ miles downstream.

Average discharge.- 39 years (1907-8, 1911-49), 782 second-feet.

Extremes.- Maximum discharge during year, 1,990 second-feet July 6 (gage height, 7.23 feet); minimum, 174 second-feet June 9 (gage height, 4.87 feet).
1907-9, 1911-49: Maximum discharge observed, 4,390 second-feet Apr. 10, 1922, from rating curve extended above 2,100 second-feet; minimum, 91 second-feet Dec. 22, 1939 (gage height, 4.67 feet), result of low temperature.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by one power plant upstream.

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

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)

5.2	325	6.3	1,110
5.4	431	6.7	1,470
5.6	549	7.2	1,940
5.9	760		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	305	420	477	420	355	475	1,230	851	448	494	817	370
2	325	388	471	420	350	470	1,210	859	460	500	737	365
3	356	372	549	415	345	465	1,220	868	454	525	707	h356
4	361	420	582	410	340	460	1,070	911	426	851	608	350
5	351	549	582	410	340	450	919	1,000	415	1,600	588	370
6	305	684	*566	405	335	440	919	1,010	437	1,940	582	440
7	325	760	540	405	335	430	911	956	377	1,650	575	600
8	372	707	525	405	335	425	911	919	377	1,470	549	640
9	399	663	515	405	335	420	885	894	351	1,290	465	640
10	399	635	505	405	340	420	885	826	341	1,190	431	610
11	415	635	495	*402	340	420	809	776	335	1,110	460	580
12	409	601	490	400	345	420	776	699	341	974	477	h614
13	393	568	485	400	350	420	760	656	382	928	477	720
14	415	531	480	405	360	420	752	682	415	876	442	780
15	399	518	475	415	365	420	752	656	649	859	442	770
16	361	506	475	420	370	420	730	699	601	826	388	750
17	367	594	470	435	375	420	699	684	575	793	377	710
18	399	628	470	445	380	420	699	692	531	776	506	650
19	382	628	465	445	390	425	707	699	460	670	543	610
20	351	760	465	440	400	435	684	714	568	562	537	550
21	341	768	460	440	410	460	684	677	628	506	562	500
22	341	722	455	435	410	510	692	670	628	512	525	480
23	367	670	455	430	*412	580	722	649	608	582	488	460
24	388	649	450	425	435	630	722	601	628	649	477	440
25	399	594	445	420	450	700	714	575	649	745	410	435
26	361	628	445	410	460	780	911	562	635	594	380	h431
27	399	588	440	400	470	900	1,100	506	588	635	370	430
28	420	582	440	390	470	1,170	1,080	488	525	1,010	370	430
29	420	525	435	380	-	1,380	974	494	512	1,060	370	430
30	420	500	430	375	-	1,520	902	512	488	974	370	430
31	420	-	425	365	-	1,380	-	482	-	*793	370	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	11,665	420	305	376	0.463	0.53
November	17,793	768	372	593	.730	.81
December	14,962	582	425	483	.595	.69
Calendar year 1948	197,336	1,840	285	539	.664	9.04
January	12,777	445	365	412	.507	.58
February	10,602	470	335	379	.467	.49
March	18,685	1,520	420	603	.743	.86
April	26,029	1,230	684	868	1.07	1.19
May	22,213	1,010	482	717	.883	1.02
June	14,832	649	335	494	.608	.68
July	27,944	1,940	494	901	1.11	1.28
August	15,400	817	370	497	.612	.71
September	12,941	780	350	531	.654	.73
Water year 1948-49	208,843	1,940	305	572	.704	9.57

Peak discharge (base, 1,700 sec.-ft.).- July 6 (9 to 11 a.m.) 1,990 sec.-ft.
* Winter discharge measurement made on this day.
h Computed from staff-gage reading.
Note.- Stage-discharge relation affected by ice Dec. 6 to Mar. 27 (no gage-height record Jan. 14-18, 20-24, Jan. 26 to Feb. 21). No gage-height record Aug. 25 to Sept. 2, Sept. 4-11, 13-25, 27-30; discharge computed on basis of records for station above West branch Wolf River.

Wolf River at New London, Wis.

Location.- Staff gage, lat. 44°23', long. 88°44', in sec. 12, T. 22 N., R. 14 E., 15 feet downstream from Pearl Street Bridge and three-quarters of a mile downstream from Embarrass River. Datum of gage is 749.37 feet above mean sea level (levels by Corps of Engineers).

Drainage area.- 2,240 square miles.

Records available.- October 1913 to September 1949.

Average discharge.- 36 years, 1,802 second-feet.

Extremes.- Maximum discharge observed during year, 4,020 second-feet Mar. 31, Apr. 1, 7-9 (gage height, 6.8 feet); minimum observed, 427 second-feet Oct. 4, 5, 20, June 12-14; minimum gage height, -0.10 foot Oct. 4, 5, 20.

1913-49: Maximum discharge observed, 15,500 second-feet Apr. 13, 1922 (gage height, 11.4 feet), from rating curve extended above 12,000 second-feet; minimum, 261 second-feet Sept. 6, 1933.

Maximum stage known, 11.6 feet Apr. 16, 1888, from information by Corps of Engineers.

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

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

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	493	594	1,030	720	720	830	4,020	2,840	699	882	1,430	664
2	493	594	845	740	710	840	3,840	2,770	771	808	1,310	594
3	493	560	882	760	700	840	3,930	2,510	771	808	1,230	560
4	427	629	919	780	700	850	3,840	2,280	771	735	1,230	560
5	427	664	995	800	700	880	3,840	2,080	699	699	1,150	560
6	460	845	1,030	810	700	1,000	3,930	2,030	594	882	1,070	526
7	560	882	1,110	820	700	1,080	4,020	1,980	493	919	995	526
8	560	882	845	820	700	1,120	4,020	1,930	560	1,690	957	594
9	560	995	771	815	700	1,160	4,020	1,830	629	1,830	845	664
10	493	1,070	870	790	700	1,190	3,930	1,780	594	1,930	845	735
11	526	1,030	920	780	700	1,200	3,750	1,690	526	1,930	845	735
12	560	995	940	*776	700	1,200	3,570	1,550	427	1,830	808	771
13	560	957	940	760	700	1,200	3,410	1,470	427	1,730	735	771
14	629	957	930	760	700	1,200	3,190	1,470	427	1,640	699	771
15	594	919	920	760	700	1,170	2,910	1,310	629	1,510	699	808
16	594	845	900	790	710	1,140	2,640	1,270	735	1,390	699	845
17	664	882	880	820	720	1,100	2,390	1,190	882	1,230	699	882
18	560	919	860	840	730	1,100	2,280	1,190	957	1,150	735	882
19	460	957	840	860	740	1,100	2,180	1,230	882	1,070	699	882
20	427	1,150	815	860	750	1,110	2,180	1,190	771	1,030	735	664
21	526	1,310	805	850	760	1,200	2,180	1,110	771	957	808	735
22	629	1,430	780	830	780	1,400	2,080	1,110	919	919	808	735
23	560	1,470	750	810	790	2,000	1,980	1,070	1,150	845	771	699
24	493	1,430	730	795	800	2,640	1,930	1,070	1,190	771	771	629
25	460	1,310	715	775	810	2,770	1,830	995	1,190	808	771	594
26	493	1,270	700	765	820	2,840	2,280	995	1,230	957	735	594
27	560	1,190	695	755	820	3,120	2,700	957	1,150	1,150	664	594
28	594	1,190	786	745	830	3,410	2,980	919	1,070	1,190	664	a594
29	526	1,150	680	740	-	3,570	2,980	882	1,030	1,110	699	594
30	560	1,070	680	735	-	3,750	2,910	845	957	1,110	594	526
31	594	-	700	725	-	4,020	-	771	-	1,310	526	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	16,535	664	427	533	0.238	0.27
November	30,146	1,470	560	1,005	.449	.50
December	26,162	1,110	680	844	.377	.43
Calendar year 1948	432,645	5,460	427	1,182	.528	7.18
January	24,386	860	720	787	.351	.40
February	20,590	830	700	735	.328	.34
March	52,030	4,020	830	1,678	.749	.86
April	91,740	4,020	1,830	3,058	1.37	1.53
May	46,314	2,840	771	1,494	.667	.77
June	23,901	1,230	427	797	.356	.40
July	36,820	1,930	699	1,188	.530	.61
August	26,226	1,430	526	846	.378	.44
September	20,288	882	526	676	.302	.34
Water year 1948-49	415,138	4,020	427	1,137	.508	6.89

* Winter discharge measurement made on this day.
a No gage-height record; discharge interpolated.
Note.- Stage-discharge relation affected by ice Dec. 10 to Mar. 23.

Embarrass River near Embarrass, Wis.

Location.- Water-stage recorder, lat. 44°43', long. 88°44', on line between sec. 13, T. 26 N., R. 14 E., and sec. 18, T. 26 N., R. 15 E., three-quarters of a mile downstream from Mill Creek and 4 miles northwest of Embarrass.

Drainage area.- 395 square miles.

Records available.- June 1919 to September 1949.

Average discharge.- 30 years, 297 second-feet.

Extremes.- Maximum discharge during year, 1,390 second-feet Mar. 24 (gage height, 5.36 feet); minimum, 31 second-feet Oct. 21 (gage height, 2.49 feet).
1919-49: Maximum discharge observed, 6,760 second-feet Apr. 10, 1922 (gage height, 11.5 feet), from rating curve extended above 2,800 second-feet; minimum observed, 23 second-feet Aug. 3, 6, 7, 1931.

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	110	149	64	90	110	546	367	132	154	232	102
2	76	114	135	64	80	110	514	342	132	149	259	90
3	66	120	138	67	76	110	584	293	112	114	311	90
4	64	122	146	75	77	110	685	302	95	122	280	73
5	78	163	124	92	80	140	758	367	85	568	199	60
6	83	210	196	110	81	145	808	413	97	1,030	196	85
7	83	232	220	118	83	160	735	357	95	974	146	85
8	85	210	179	122	85	175	651	302	95	679	140	95
9	95	170	150	125	87	180	601	276	95	455	120	95
10	83	166	140	98	90	180	530	210	97	263	117	100
11	100	160	139	120	100	170	498	179	95	157	140	83
12	104	170	140	*128	108	150	455	210	71	107	146	83
13	157	160	160	126	110	135	392	202	85	151	120	104
14	112	132	150	123	80	110	347	185	102	176	90	127
15	107	132	130	120	90	105	382	163	216	127	95	114
16	107	154	123	123	92	97	362	176	272	122	117	114
17	71	166	115	130	94	135	334	160	202	135	95	107
18	83	196	108	133	97	130	402	179	166	143	122	90
19	95	199	100	133	100	132	450	179	140	132	192	104
20	114	306	100	130	100	160	445	160	143	110	185	95
21	48	347	109	130	100	112	382	146	387	124	135	100
22	44	324	110	130	*100	706	377	138	397	122	132	97
23	71	293	109	130	110	974	429	160	280	110	127	95
24	69	255	96	130	118	1,060	342	166	192	135	110	92
25	88	173	74	128	120	769	280	151	176	293	90	83
26	92	210	76	126	90	579	450	146	135	329	92	76
27	85	216	90	122	100	763	651	143	206	228	107	90
28	90	196	120	118	110	974	674	135	185	216	88	97
29	92	185	90	108	-	1,180	568	114	166	329	83	97
30	90	160	70	100	-	1,000	455	117	151	429	92	97
31	80	-	64	95	-	842	-	107	-	289	88	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,692	157	44	86.8	0.220	0.25
November	5,751	347	110	192	.486	.54
December	3,850	220	64	124	.314	.36
Calendar year 1948	70,419	1,300	44	192	.486	6.63
January	3,518	133	64	113	.286	.33
February	2,648	120	76	94.6	.239	.25
March	11,703	1,180	97	378	.957	1.10
April	15,087	808	280	503	1.27	1.42
May	6,545	413	107	211	.534	.62
June	4,802	397	71	160	.405	.45
July	8,472	1,030	107	273	.691	.80
August	4,446	311	83	143	.362	.42
September	2,820	127	60	94.0	.238	.27
Water year 1948-49	72,334	1,180	44	198	.501	6.81

Peak discharge (base, 1,500 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 9 to Mar. 15.

Little Wolf River at Royalton, Wis.

Location.- Water-stage recorder, lat. 44°24', long. 88°51', in sec. 1, T. 22 N., R. 13 E., 4 miles upstream from mouth.

Drainage area.- 485 square miles.

Records available.- January 1914 to September 1949.

Average discharge.- 35 years, 429 second-feet.

Extremes.- Maximum discharge during year, 1,480 second-feet Mar. 22 (gage height, 3.21 feet); minimum, 89 second-feet Sept. 20, 22 (gage height, 0.93 foot).
1914-49: Maximum discharge, 6,950 second-feet Mar. 30, 1943 (gage height, 8.00 feet), from rating curve extended above 3,500 second-feet; maximum gage height, 10.33 feet Mar. 25, 1939 (backwater from ice); minimum discharge, 57 second-feet Feb. 10, 1934.

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	152	172	300	100	158	205	427	551	207	253	211	143
2	158	188	220	90	153	210	740	458	195	225	234	116
3	155	184	192	125	140	220	740	427	211	203	269	152
4	149	203	230	140	130	200	636	415	184	192	230	149
5	149	239	244	145	155	240	887	409	169	211	203	120
6	152	317	220	150	177	370	1,160	409	158	290	188	155
7	149	279	180	160	175	355	1,130	403	160	244	172	158
8	180	234	185	170	160	345	1,080	334	152	295	158	169
9	163	220	230	172	150	330	872	345	152	203	172	158
10	163	274	250	173	157	320	776	284	152	195	158	152
11	176	203	250	176	170	310	691	279	155	172	244	169
12	166	216	200	*176	170	300	564	269	143	199	138	160
13	169	220	195	173	160	290	603	290	146	176	130	155
14	166	220	195	180	165	280	577	284	216	169	152	176
15	169	199	180	225	172	260	551	274	488	244	130	160
16	172	203	160	357	180	230	501	258	409	230	143	184
17	163	230	150	357	175	239	458	211	290	188	169	158
18	149	263	140	300	170	211	538	345	279	184	284	152
19	152	322	132	200	190	220	538	253	166	172	195	146
20	155	398	130	190	190	211	558	220	184	158	203	103
21	158	398	160	192	180	368	564	199	374	176	163	158
22	160	386	160	196	*176	1,080	501	239	590	176	136	103
23	155	295	162	196	190	1,120	476	216	433	172	138	146
24	166	239	170	190	185	1,290	433	195	300	180	146	143
25	155	225	120	187	240	1,040	415	199	551	290	152	143
26	155	284	130	185	230	834	964	220	439	380	133	140
27	160	258	150	200	220	894	1,060	225	362	345	149	128
28	166	239	130	210	205	918	1,030	230	328	306	155	146
29	163	230	125	200	-	1,050	783	199	311	274	116	126
30	176	216	120	180	-	902	616	199	244	290	152	107
31	172	-	110	162	-	850	-	188	-	284	103	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,993	180	149	161	0.332	0.38
November	7,554	398	172	252	.520	.58
December	5,520	300	110	178	.367	.42
Calendar year 1948	105,005	3,500	108	287	.592	8.03
January	5,857	357	90	189	.390	.45
February	4,923	240	130	176	.363	.38
March	15,692	1,290	200	506	1.04	1.20
April	20,869	1,160	415	696	1.44	1.61
May	9,027	551	188	291	.600	.69
June	8,148	590	143	272	.561	.63
July	7,076	380	158	228	.470	.54
August	5,326	284	103	172	.355	.41
September	4,375	184	103	146	.301	.34
Water year 1948-49	99,360	1,290	90	272	.561	7.63

Peak discharge (base, 1,600 sec.-ft.).- No peaks above base.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 6 to Jan. 14, Jan. 19 to Mar. 15.

Waupaca River near Waupaca, Wis.

Location.- Water-stage recorder, lat. 44°21', long. 88°59', near north line of sec. 1, T. 21 N., R. 12 E., at highway bridge 1½ miles downstream from Crystal River and 4 miles downstream from Waupaca.

Drainage area.- 305 square miles.

Records available.- October 1917 to September 1949. June 1916 to October 1917 at site 1 mile downstream.

Average discharge.- 33 years, 251 second-feet.

Extremes.- Maximum discharge during year, 1,120 second-feet Mar. 15 (gage height, 3.90 feet); minimum, 79 second-feet Sept. 16 (gage height, 0.90 foot).
1916-49: Maximum discharge, 2,520 second-feet Mar. 20, 1948; maximum gage height, 6.95 feet Mar. 19, 1948 (backwater from ice); minimum daily discharge, 50 second-feet Jan. 22, 28, 1926.

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

Revisions (water years).- W 1054: 1926(m). W 1084: 1919, 1922-24, 1938, 1940, 1942(M), 1944(M), 1945(M), 1946.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	161	173	194	140	172	210	296	256	161	173	175	143
2	151	180	188	140	170	210	296	246	165	211	180	136
3	147	175	178	140	165	211	289	237	163	178	170	128
4	158	180	168	142	162	216	306	211	158	168	168	140
5	161	205	186	145	160	250	335	225	163	168	175	140
6	153	214	190	148	158	400	356	214	158	180	156	145
7	165	191	198	150	155	375	338	202	161	165	158	147
8	175	202	200	150	153	345	324	205	156	163	156	147
9	175	186	200	152	152	310	286	197	153	163	161	140
10	161	183	130	155	151	250	269	194	151	165	153	140
11	168	197	135	158	152	210	262	191	145	161	156	143
12	180	188	160	160	153	202	246	191	149	161	151	145
13	170	183	180	*163	157	200	225	188	168	158	151	163
14	168	180	187	170	161	216	225	186	202	180	151	156
15	168	188	190	180	165	460	237	188	265	191	153	151
16	156	191	185	200	170	338	225	180	216	163	151	132
17	161	194	140	218	172	302	246	197	180	165	168	145
18	173	208	130	215	175	211	253	197	168	161	173	128
19	173	205	155	185	175	191	269	183	170	153	163	140
20	170	259	180	168	175	186	250	183	173	151	151	151
21	168	243	190	169	176	216	237	180	175	156	147	138
22	170	222	182	172	*177	435	231	175	170	161	153	138
23	153	216	150	180	180	600	228	180	170	147	138	138
24	156	202	120	200	188	356	219	180	175	158	136	138
25	170	191	123	205	200	310	219	173	186	188	136	132
26	175	214	130	204	207	289	600	173	186	183	140	143
27	161	211	135	203	210	317	552	168	175	180	132	145
28	158	191	140	200	210	349	356	170	199	188	140	145
29	163	199	140	190	-	310	300	168	194	188	140	145
30	165	199	140	183	-	314	272	165	170	175	140	149
31	158	-	140	178	-	314	-	161	-	170	130	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	5,091	180	147	164	0.538	0.62
November	5,970	259	173	199	.652	.73
December	5,064	200	120	163	.534	.62
Calendar year 1948	78,137	2,150	120	213	.698	9.54
January	5,363	218	140	173	.567	.65
February	4,801	210	151	171	.561	.58
March	9,103	600	186	294	.964	1.11
April	8,747	600	219	292	.957	1.07
May	5,964	256	161	192	.630	.73
June	5,225	265	145	174	.570	.64
July	5,272	211	147	170	.557	.64
August	4,752	180	130	153	.502	.58
September	4,271	163	128	142	.466	.52
Water year 1948-49	69,623	600	120	191	.626	8.49

Peak discharge (base, 670 sec.-ft.).- Mar. 15 (11:30 a.m.) 1,120 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 6 to Mar. 13.

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

Location.- Water-stage recorder, lat. 43°45'45", long. 88°29'00", on line between secs. 17 and 20, T. 15 N., R. 17 E., at concrete bridge on Country Trunk Highway T., three-quarters of a mile west of Fond du Lac and 2½ miles upstream from confluence with East Branch. Datum of gage is 766.78 feet above mean sea level (Corps of Engineers bench mark).

Drainage area.- 88 square miles.

Records available.- March 1939 to September 1949.

Average discharge.- 10 years, 31.1 second-feet.

Extremes.- Maximum discharge during year, 501 second-feet Mar. 27; maximum gage height, 4.49 feet Mar. 14 (backwater from ice); no flow on many days.
1939-49: Maximum daily discharge, 1,390 second-feet Mar. 27, 1943; no flow on many days.

Remarks.- Records good except those below 1 second-foot and those for periods of ice effect, which are poor.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	0	0.1	0	0.3	6.6	276	13	0.2	0	0.1	0
2	.2	0	.1	0	.3	*6.1	268	11	.2	0	.1	0
3	.2	.1	.1	0	.3	4.5	245	9.4	.1	0	.1	0
4	a.2	.1	.1	0	.3	3.7	207	6.8	.1	0	.1	0
5	a.2	.1	.2	.2	.3	5.0	168	5.2	0	0	.1	.1
6	a.2	.2	.1	.2	.3	15	139	4.5	0	.1	.1	.1
7	a.2	.1	.1	.2	.3	13	112	4.1	0	.1	0	.2
8	a.2	a.1	.1	.2	.2	8.0	90	3.7	0	.1	0	.2
9	a.2	a.1	.1	.2	.2	15	67	3.3	0	0	0	.1
10	.2	a.1	0	.3	.2	30	52	2.5	0	0	.1	.1
11	a.2	a.1	0	.3	.2	34	40	2.1	0	0	11	.1
12	a.2	a.1	.1	.3	.2	35	32	1.8	0	0	2.7	.2
13	.2	a.1	.1	.3	.2	34	27	1.8	0	.1	.6	.2
14	a.2	.1	.1	.3	.2	32	23	2.1	.1	.1	.3	.2
15	a.2	a.1	.2	1.1	.3	25	23	1.8	.1	.1	.2	.1
16	a.2	a.1	.1	1.3	.3	5.0	21	1.8	0	0	.1	.1
17	.2	a.1	.1	1.1	.3	2.6	21	1.4	0	0	.2	.1
18	.1	a.1	.1	.8	.3	2.3	28	1.0	0	0	.2	.1
19	.1	a.1	.1	.7	.3	2.1	32	.8	0	0	.1	0
20	a.1	a.1	.1	.5	.3	2.0	35	.6	0	0	0	0
21	a.1	.1	.1	.4	.4	2.1	37	.4	0	0	0	.1
22	a0	a.1	.1	.4	.5	3.0	38	1.6	0	.1	0	.1
23	a0	a.1	0	.3	.6	10	35	1.8	0	.1	0	.1
24	0	.1	0	.3	2.0	116	32	.8	0	.1	0	.2
25	0	.1	0	*.3	4.0	*128	27	.8	0	.1	0	.2
26	0	.1	0	.3	7.0	136	27	1.2	0	.2	0	.1
27	a0	.1	0	.3	8.0	291	24	.7	0	.2	0	.1
28	a.1	.1	0	.4	7.3	268	21	.6	0	.3	.2	.1
29	.1	.1	0	.4	-	293	19	.5	0	.2	0	.1
30	.1	.1	0	.3	-	258	16	.4	0	.1	0	.1
31	.1	-	0	.3	-	301	-	.2	-	.1	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4.3	0.3	0	0.14	0.0016	0.002
November	2.9	.2	0	.10	.0011	.001
December	2.2	.2	0	.07	.00080	.0009
Calendar year 1948	5,991.3	444	0	16.4	.186	2.52
January	11.7	1.3	0	.38	.0043	.005
February	35.1	8	.2	1.25	.014	.01
March	2,087	301	2	67.3	.765	.88
April	2,182	276	16	72.7	.826	.92
May	87.7	13	.2	2.83	.032	.04
June	.8	.2	0	.03	.00034	.0004
July	2.1	.3	0	.07	.00080	.0009
August	16.3	11	0	.53	.0060	.007
September	3.1	.2	0	.10	.0011	.001
Water year 1948-49	4,435.2	301	0	12.2	.139	1.87

Peak discharge (base, 350 sec.-ft.).- Mar. 27 (1:30 a.m.) 501 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge interpolated.
Note.- Stage-discharge relation affected by ice Jan. 5 to Mar. 23 (no gage-height record Feb. 14-19, 21-25; discharge interpolated or computed on basis of records for East Branch Fond du Lac River at Fond du Lac).

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

Location.- Water-stage recorder, lat. 43°45'15", long. 88°27'10", in sec. 22, T. 15 N., R. 17 E., at steel bridge on town road, an eighth of a mile west of U. S. Highway 41, half a mile south of Fond du Lac, and 2½ miles upstream from confluence with West Branch. Datum of gage is 762.82 feet above mean sea level (Corps of Engineers bench mark).

Drainage area.- 75 square miles.

Records available.- March 1939 to September 1949.

Average discharge.- 10 years, 31.2 second-feet.

Extremes.- Maximum discharge during year, 403 second-feet Mar. 27; maximum gage height, 5.85 feet Mar. 6 (backwater from ice); no flow Jan. 3.
1939-49: Maximum discharge, 2,140 second-feet June 23, 1940; maximum gage height, 10.74 feet Mar. 16, 1943 (ice jam), from floodmarks; no flow Jan. 17-29, 1940.

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.7	1.7	2.3	0.4	4.9	36	263	10	2.3	1.5	3.1	1.7
2	3.4	1.5	1.7	.1	4.6	29	188	10	2.3	1.2	2.6	1.4
3	a3.1	2.1	2.6	0	4.3	*25	143	9.1	2.6	1.0	2.4	1.2
4	a2.8	2.6	1.9	.8	4.0	28	100	8.2	2.8	.9	2.3	1.5
5	a2.6	3.1	2.8	2.5	3.8	45	76	7.2	2.8	1.2	2.1	1.7
6	a2.4	3.7	4.3	3.5	3.6	100	61	6.7	2.4	10	1.9	1.7
7	a2.2	2.6	5.2	3.8	3.4	118	50	6.3	2.4	15	1.7	2.4
8	a2.0	2.1	5.8	3.2	3.2	123	42	5.8	2.4	9.1	a1.6	a2.4
9	a1.8	3.1	2.8	3.0	3.0	130	33	5.8	2.4	6.7	a1.5	a2.4
10	1.7	5.2	2.8	2.9	2.9	90	27	5.5	2.6	4.9	4.9	a2.4
11	1.5	4.6	2.1	2.9	2.8	50	23	5.5	2.6	4.6	6.3	2.4
12	1.5	3.4	1.7	2.9	2.7	40	21	5.5	2.4	4.0	4.6	2.8
13	1.5	3.1	1.5	3.0	2.6	50	18	5.5	2.4	4.3	4.0	3.4
14	1.7	2.8	2.3	3.3	2.5	98	15	5.2	3.7	5.2	4.6	2.8
15	1.5	2.8	3.1	3.8	2.5	45	14	4.6	4.6	5.5	3.7	3.1
16	1.4	3.7	7.7	6.0	2.5	20	10	4.9	3.1	5.2	3.7	2.6
17	1.2	12	7.2	15	2.5	15	24	4.6	1.9	2.6	5.8	2.4
18	1.2	10	3.4	12	2.5	13	30	4.3	1.4	2.3	8.6	2.3
19	.9	7.2	2.1	10	2.5	12	41	4.0	1.9	2.1	5.2	2.1
20	.9	9.1	1.5	8.6	2.6	25	30	3.7	1.4	1.9	4.3	1.9
21	1.0	7.2	1.5	7.4	2.7	70	22	3.4	1.5	1.9	4.0	1.7
22	1.5	4.3	1.7	6.6	2.8	90	20	8.2	1.5	2.3	5.2	1.5
23	1.7	3.1	1.7	7.0	3.2	84	20	10	1.4	2.3	4.9	1.4
24	1.9	2.6	1.4	7.1	5.0	74	18	5.2	1.9	2.1	4.6	1.4
25	1.9	2.4	.9	7.1	12	65	15	4.3	2.6	2.6	4.3	1.5
26	1.7	2.6	.8	*6.9	42	58	16	3.7	2.4	2.8	3.7	1.4
27	1.5	2.8	1.2	6.6	50	296	16	3.7	2.4	4.3	3.4	1.4
28	1.5	2.8	1.9	6.4	44	223	14	3.4	2.1	3.4	5.2	1.5
29	1.5	2.4	4.6	6.0	-	151	12	3.1	1.9	3.4	3.7	1.5
30	1.5	2.4	4.9	5.6	-	138	10	2.6	1.9	3.4	3.1	1.5
31	1.5	-	1.9	5.2	-	241	-	2.4	-	4.0	2.3	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	56.2	3.7	0.9	1.81	0.024	0.03
November	119	12	1.5	3.97	.053	.06
December	87.3	7.7	.8	2.82	.038	.04
Calendar year 1948	10,496.1	700	0.6	28.7	.383	5.20
January	159.6	15	0	5.15	.069	.08
February	225.1	50	2.5	8.04	.107	.11
March	2,582	296	12	83.3	1.11	1.28
April	1,372	263	10	45.7	.609	.68
May	172.4	10	2.4	5.56	.074	.09
June	70.0	4.6	1.4	2.33	.031	.03
July	121.7	15	.9	3.93	.052	.06
August	119.3	8.6	1.5	3.85	.051	.06
September	59.4	3.4	1.2	1.98	.026	.03
Water year 1948-49	5,144.0	296	0	14.1	.188	2.55

Peak discharge (base, 240 sec.-ft.).- Mar. 27 (4 to 6 p.m.) 403 sec.-ft.; Apr. 1 (12:01 to 2 a.m.) 344 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge interpolated or computed on basis of records for West Branch Fond du Lac River at Fond du Lac.

Note.- Stage-discharge relation affected by ice Jan. 5 to Mar. 24 (no gage-height record Jan. 22, 23, Mar. 2, 11-24; discharge computed on basis of records for West Branch Fond du Lac River at Fond du Lac.)

Lake de Neveu near Fond du Lac, Wis.

Location.- Staff gage, lat. 43°44', long. 88°24', in sec. 30, T. 15 N., R. 18 E., at boathouse at north end of lake on farm of Nick Giebel, 4 miles southeast of Fond du Lac.
Drainage area.- 2 square miles.
Records available.- August 1936 to September 1949 (fragmentary).
Extremes.- Maximum elevation observed during year, 97.75 feet Apr. 1; minimum, 97.18 feet Oct. 26.
1936-49: Maximum elevation observed, 98.20 feet Sept. 18, 1938; minimum, 96.90 feet Aug. 15, 1936.
Remarks.- Gage heights have been reduced to datum assumed for this lake by Public Service Commission of Wisconsin.

Elevation, in feet, water year October 1948 to November 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.24	-	-	-	7.64	7.68	7.75	-	-	7.36	-	-
2	-	7.26	-	-	-	-	-	-	-	-	7.36	7.40
3	-	-	7.50	-	-	-	-	7.49	7.42	-	-	-
4	-	-	-	7.56	7.62	7.66	-	-	-	-	-	-
5	7.22	7.30	-	-	-	-	7.63	-	-	7.40	7.32	-
6	-	-	-	-	-	-	-	7.51	-	-	-	7.40
7	-	-	7.56	7.58	-	-	-	-	7.38	-	-	-
8	7.24	-	-	-	7.62	7.74	7.57	-	-	7.44	-	-
9	-	7.44	-	-	-	-	-	-	-	-	7.32	7.36
10	-	-	7.54	-	-	-	-	7.46	7.32	-	-	-
11	-	-	-	7.56	7.60	7.70	-	-	-	-	-	-
12	7.24	7.44	-	-	-	-	7.51	-	-	7.40	7.42	-
13	-	-	-	-	-	-	-	7.46	-	-	-	7.36
14	-	-	7.50	7.54	-	-	-	-	7.34	-	-	-
15	7.24	-	-	-	7.66	7.68	7.53	-	-	7.40	-	-
16	-	7.44	-	-	-	-	-	-	-	-	7.38	7.36
17	-	-	7.56	-	-	-	-	7.46	7.32	-	-	-
18	-	-	-	7.68	7.64	7.66	-	-	-	-	-	-
19	7.22	7.58	-	-	-	-	7.51	-	-	7.36	7.38	-
20	-	-	-	-	-	-	-	7.42	-	-	-	7.32
21	-	-	7.54	7.66	-	-	-	-	7.32	-	-	-
22	7.20	-	-	-	7.62	7.70	7.51	-	-	7.36	-	-
23	-	7.60	-	-	-	-	-	-	-	-	7.36	7.30
24	-	-	7.54	-	-	-	-	7.54	7.36	-	-	-
25	-	-	-	7.62	7.72	7.68	-	-	-	-	-	-
26	7.18	7.58	-	-	-	-	7.53	-	-	7.34	7.34	-
27	-	-	-	-	-	-	-	7.52	-	-	-	7.26
28	-	-	7.52	7.68	-	-	-	-	7.42	-	-	-
29	7.20	-	-	-	-	7.72	7.51	-	-	7.42	-	-
30	-	7.50	-	-	-	-	-	-	-	-	7.42	7.25
31	-	-	7.58	-	-	-	-	7.44	-	-	-	-

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

Cedar Lake near Kiel, Wis.

Location.- Staff gage, lat. 43°55', long. 87°56', in sec. 24, T. 17 N., R. 21 E., at Cedar Lake Resort on narrows of lake and 5 miles east of Kiel.
Drainage area.- 3 square miles.
Records available.- August 1936 to September 1942; April 1945 to September 1949 (fragmentary).
Extremes.- Maximum elevation observed during year, 97.34 feet Apr. 30; minimum, 96.13 feet Sept. 28.
1936-42, 1945-49: Maximum elevation observed, 98.72 feet Mar. 9, 1946; minimum, 94.95 feet Aug. 14, 1936.
An elevation of 99.22 feet was observed Mar. 31, 1943.
Remarks.- Gage heights reduced to datum assumed for this lake by Public Service Commission of Wisconsin.

Elevation, in feet, water year October 1948 to September 1949

Date	Elevation	Date	Elevation	Date	Elevation	Date	Elevation
Oct. 2	6.96	Dec. 28	7.00	Mar. 31	7.22	June 25	7.08
9	6.92	Jan. 1	7.00	Apr. 2	7.32	30	7.16
16	6.84	8	7.10	8	7.30	July 2	6.98
23	6.76	14	7.14	15	7.28	9	6.96
29	6.70	21	7.14	22	7.32	16	6.80
30	6.70	29	7.14	30	7.34	23	6.78
Nov. 6	6.72	Feb. 4	7.14	May 7	7.32	30	6.92
13	6.74	11	7.14	10	7.25	Aug. 6	6.78
20	6.86	18	7.16	14	7.22	13	6.72
27	6.96	25	7.14	21	7.26	20	6.62
Dec. 4	6.94	Mar. 4	7.16	28	7.24	27	6.60
11	7.00	12	7.20	June 4	7.14	Sept. 2	6.54
18	7.00	19	7.22	11	7.12	9	6.49
25	6.98	25	7.22	18	7.16	28	6.13

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

Milwaukee River at Milwaukee, Wis.

Location.- Water-stage-recorder, lat. 43°06'00", long. 87°54'30", in NE¼ sec. 5, T. 7 N., R. 22 E., near north limits of Milwaukee, 2,000 feet downstream from Port Washington Road Bridge and 6 miles upstream from mouth. Datum of gage is 607.3 feet above mean sea level, adjustment of 1912.
Drainage area.- 661 square miles.
Records available.- April 1914 to September 1949.
Average discharge.- 35 years, 385 second-feet.
Extremes.- Maximum discharge during year, 1,620 second-feet July 28 (gage height, 4.10 feet); minimum, 0.8 second-foot Nov. 18 (gage height, 1.48 feet).
1914-49: Maximum discharge, 15,100 second-feet Mar. 20, 1918 (gage height, 9.00 feet, datum then in use, from floodmark); no flow Sept. 8, 1943.
Remarks.- Records good except those for periods of ice effect, which are fair. Occasional regulation caused by dams above station.
Revisions (water years).- W 564: 1918(M). W 924: 1940.

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Apr. 19 to June 12, July 29 to Sept. 12)

1.8	19	2.8	435
2.0	56	3.0	570
2.2	118	3.3	800
2.4	208	3.6	1,050
2.6	318	4.0	1,500

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	38	85	54	146	1,030	1,560	213	62	203	194	59
2	59	45	79	56	144	792	1,440	283	92	152	152	49
3	59	70	105	59	142	621	1,140	208	70	147	122	47
4	54	73	98	98	140	592	933	203	54	118	108	34
5	52	92	118	184	138	858	784	194	43	105	102	16
6	47	92	98	115	136	1,130	658	234	38	131	92	45
7	79	92	111	105	135	1,350	535	a180	34	92	88	65
8	43	98	92	108	134	1,400	514	a155	32	98	82	54
9	49	111	a92	126	133	1,160	514	a145	31	115	85	31
10	65	95	a88	152	132	942	406	a135	31	95	79	17
11	62	111	a82	147	132	908	382	118	31	82	98	49
12	59	111	a80	136	132	850	102	126	30	79	82	85
13	56	102	a76	108	132	760	250	118	229	88	79	62
14	52	98	a74	108	133	752	312	118	563	122	79	52
15	82	322	184	111	135	760	347	111	474	105	73	56
16	118	98	160	198	135	651	306	239	239	105	73	52
17	88	19	229	370	139	621	394	115	189	102	73	49
18	49	99	126	487	194	461	556	108	139	88	105	47
19	31	108	170	400	179	487	599	115	111	82	102	41
20	34	194	147	347	184	364	577	102	98	76	88	38
21	41	306	135	250	189	417	528	92	95	70	76	36
22	38	277	126	229	189	592	448	137	85	65	70	34
23	38	184	111	198	218	900	417	115	82	68	68	34
24	38	189	76	266	705	975	406	108	79	70	6f	34
25	43	174	70	218	1,300	900	330	108	218	68	59	34
26	45	126	68	218	1,350	858	318	118	556	131	59	34
27	41	108	56	*179	1,290	925	335	98	514	144	59	36
28	41	143	68	170	1,320	1,070	312	98	400	480	59	43
29	41	111	102	160	-	1,130	224	115	330	224	56	41
30	43	98	70	150	-	942	277	79	266	218	54	38
31	38	-	59	147	-	1,300	-	68	-	203	62	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,647	118	31	53.1	0.080	0.09
November	3,784	322	19	126	.191	.21
December	3,235	229	56	104	.157	.18
Calendar year 1948	113,728	6,800	19	311	.470	6.39
January	5,644	487	54	182	.275	.32
February	9,436	1,350	132	337	.510	.53
March	26,498	1,400	364	855	1.29	1.49
April	15,904	1,560	102	530	.802	.89
May	4,229	283	68	136	.206	.24
June	5,215	563	30	174	.263	.29
July	3,926	480	65	127	.192	.22
August	2,643	194	54	85.3	.129	.15
September	1,312	85	16	43.7	.066	.07
Water year 1948-49	83,473	1,560	16	229	.346	4.68

Peak discharge (base, 2,000 sec.-ft).- No peaks above base.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of records for Cedar Creek near Cedarburg.
Note.- Stage-discharge relation affected by ice Jan. 28-30, Feb. 1-15.

Cedar Creek near Cedarburg, Wis.

Location.- Chain gage, lat. 43°19'25", long. 87°58'50", on line between secs. 14 and 23, T. 10 N., R. 21 E., at bridge on State Trunk Highway, 2 miles north of Cedarburg and 6 miles upstream from mouth.

Drainage area.- 113 square miles.

Records available.- August 1930 to September 1949.

Average discharge.- 19 years, 55.5 second-feet.

Extremes.- Maximum discharge observed during year, 350 second-feet Apr. 1; maximum gage height observed, 8.10 feet Mar. 7 (backwater from ice); minimum discharge observed, 4.0 second-feet Dec. 27, June 9, 10.
1930-49: Maximum discharge, 3,180 second-feet by discharge measurement June 23, 1940; maximum gage height observed, 12.00 feet Feb. 7, 1938 (backwater from ice); minimum discharge observed, 0.2 second-foot Aug. 9-12, 1936.

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

Revisions.- W 804: Drainage area.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.4	6.4	11	5.8	16	130	350	54	10	36	91	6.1
2	5.8	6.4	12	5.8	16	120	332	50	9.0	28	54	6.1
3	5.8	7.0	14	6.4	16	105	246	40	7.0	20	40	5.5
4	5.2	7.0	14	8.0	16	*92	208	40	6.4	18	30	5.5
5	5.2	9.0	17	12	16	96	164	33	6.4	17	25	5.5
6	5.2	9.0	18	14	16	110	135	33	5.8	18	25	5.5
7	5.8	9.0	15	15	16	135	113	30	5.2	18	20	6.1
8	7.0	9.0	14	12	15	150	96	28	5.2	18	15	6.1
9	7.0	11	14	12	15	140	86	28	4.0	18	14	6.1
10	7.0	12	14	12	15	110	77	25	4.0	18	12	6.1
11	6.4	14	12	11	15	92	68	23	4.6	17	20	6.1
12	6.4	12	12	11	15	84	59	23	5.2	17	18	7.5
13	5.8	12	12	12	15	78	50	20	8.0	18	18	9.5
14	5.8	12	11	12	15	75	47	20	20	20	17	8.5
15	5.2	12	18	14	15	68	54	23	96	20	15	8.5
16	5.2	14	33	20	15	63	68	23	50	18	18	7.5
17	5.2	15	33	47	15	60	86	23	43	17	40	6.7
18	4.6	17	25	43	18	62	107	23	28	14	33	6.7
19	4.6	36	23	39	19	70	130	25	20	12	28	6.1
20	5.2	40	18	33	19	90	113	25	18	9.0	25	6.1
21	5.2	33	18	26	20	200	91	25	18	10	20	6.1
22	5.8	28	14	22	20	250	86	23	17	10	14	6.1
23	6.4	25	12	21	25	182	77	23	15	9.0	14	6.1
24	6.4	23	10	25	50	152	72	20	15	8.0	12	6.1
25	6.4	23	8.0	23	100	135	68	20	170	7.0	10	5.5
26	6.4	18	5.8	*21	130	130	59	18	146	7.0	8.0	5.5
27	6.4	15	4.0	18	138	152	63	18	118	9.0	8.0	4.9
28	6.4	14	5.2	17	140	176	63	17	96	59	7.0	4.9
29	6.4	14	6.4	17	-	170	63	17	72	102	7.0	4.9
30	6.4	12	6.4	16	-	164	59	14	59	124	6.4	5.5
31	6.4	-	5.8	16	-	227	-	11	-	113	6.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	183.4	7.0	4.6	5.92	0.052	0.06
November	472.8	40	6.4	15.8	.140	.16
December	435.6	33	4.0	14.1	.125	.14
Calendar year 1948	22,420.0	1,540	1.9	61.3	.542	7.39
January	567	47	5.8	18.3	.162	.19
February	941	140	15	33.6	.297	.31
March	3,868	250	60	125	1.11	1.28
April	3,290	350	47	110	.973	1.09
May	795	54	11	25.6	.227	.26
June	1,081.8	170	4.0	36.1	.319	.36
July	829	124	7.0	26.7	.236	.27
August	670.8	91	6.4	21.6	.191	.22
September	187.4	9.5	4.9	6.25	.055	.06
Water year 1948-49	13,321.8	350	4.0	36.5	.323	4.40

Peak discharge (base, 360 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Jan. 19 to Mar. 22.

Little Calumet River at South Holland, Ill.

Location.- Water-stage recorder, lat. 41°36'05", long. 87°34'38", in SW¼SW¼ sec. 13, T. 36 N., R. 14 E., at bridge on U. S. Highway 6, 0.6 mile downstream from Thorn Creek, 1.6 miles east of South Holland, and 4.1 miles upstream from former gaging station at Harvey. Datum of gage is 575.00 feet above mean sea level. Auxiliary recording gage, same datum, 6.1 miles downstream at Dixmoor.

Drainage area.- Indeterminate.

Records available.- October 1947 to September 1949.

Extremes.- Maximum discharge during year, 1,580 second-feet Feb. 14 (gage height, 13.04 feet); minimum daily, 13 second-feet Aug. 22, Sept. 12, 26; minimum gage height, 3.99 feet Sept. 26.

1947-49: Maximum discharge, 3,810 second-feet May 11, 1948 (gage height, 17.33 feet); minimum daily, that of Aug. 22, Sept. 12, 26, 1949; minimum gage height, that of Sept. 26, 1949.

Flood of Apr. 6, 1947, reached a stage of 19.24 feet, from floodmark (discharge, 4,760 second-feet).

Remarks.- Records fair.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	18	20	68	244	198	1,020	65	53	23	37	27
2	36	19	20	46	167	175	511	94	51	27	122	20
3	30	26	20	33	130	154	354	76	46	18	94	16
4	25	33	20	45	105	148	267	62	44	17	56	15
5	25	29	29	120	90	161	222	54	36	17	39	20
6	22	44	35	148	86	184	202	47	33	43	33	14
7	26	26	25	98	82	164	178	44	29	61	27	17
8	27	17	20	60	93	155	149	36	30	49	24	19
9	28	21	18	44	99	406	125	33	28	118	25	17
10	23	32	20	46	89	486	104	36	28	202	27	15
11	16	27	24	62	89	300	91	38	26	95	28	14
12	25	22	19	76	95	212	88	34	25	54	31	13
13	20	24	17	68	1,000	181	81	39	27	40	34	17
14	22	23	17	49	1,310	154	79	31	59	33	22	21
15	21	17	47	46	798	138	288	30	76	31	17	21
16	22	22	54	72	508	124	256	34	59	26	20	19
17	25	34	43	98	324	109	215	35	47	22	21	21
18	22	21	28	95	347	103	251	41	41	21	20	16
19	16	26	23	338	405	84	206	295	33	20	20	16
20	19	27	24	356	a360	79	170	938	31	20	19	20
21	17	21	30	264	a340	81	142	490	31	139	15	22
22	18	20	29	140	526	138	137	418	30	378	13	18
23	24	20	25	122	404	300	134	351	29	201	16	17
24	24	19	22	196	329	243	93	306	27	104	15	19
25	16	18	23	214	545	214	85	204	27	69	18	16
26	16	18	28	187	315	179	88	178	25	66	16	13
27	17	19	27	299	254	540	107	169	20	188	16	16
28	19	18	29	894	224	584	91	115	25	127	28	14
29	20	24	80	808	-	328	76	87	24	74	15	19
30	20	20	98	546	-	225	67	71	23	54	18	22
31	19	-	93	352	-	876	-	60	-	41	19	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	691	36	16	22.3		
November	705	44	17	23.5		
December	1,007	98	17	32.5		
Calendar year 1948	55,774	3,560	16	152		
January	5,990	894	33	193		
February	9,358	1,310	82	334		
March	7,423	876	79	239		
April	5,877	1,020	67	196		
May	4,511	938	30	146		
June	1,063	76	20	35.4		
July	2,378	378	17	76.7		
August	905	122	13	29.2		
September	534	27	13	17.8		
Water year 1948-49	40,442	1,310	13	111		

a No gage-height record for auxiliary gage; discharge computed on basis of records for Hart ditch at Munster, Ind.

Hart ditch at Munster, Ind.

Location.- Water-stage recorder and concrete control, lat. 41°33'35", long. 87°28'50", in N½ sec. 20, T. 36 N., R. 9 W., at city limit of Munster, a quarter of a mile downstream from U. S. Highway 6 and 0.4 miles upstream from mouth.

Drainage area.- 68 square miles (determined by Corps of Engineers).

Records available.- September 1942 to September 1949.

Extremes.- Maximum discharge during year, 850 second-feet Feb. 13 (gage height, 3.00 feet); minimum, 4.0 second-feet Oct. 4, 5; minimum gage height, 0.48 foot Dec. 27.
1942-49: Maximum discharge, 2,490 second-feet Apr. 6, 1947; maximum gage height, 7.23 feet Mar. 15, 1944; minimum discharge, 1.2 second-feet July 29, 1946; minimum gage height, 0.47 foot July 29, 1946, Sept. 2, 1948.

Remarks.- Records good. Flow from this ditch discharges into Little Calumet River near Munster, practically all of this flow discharging into the Calumet Sag Channel or Grand Calumet River.

Revisions.- W 1084: Drainage area.

Rating table, water year 1948-49 (gage hei ., in feet, and discharge, in second-feet, (Shifting-control method used Oct. 1-lo, ... 20 to Nov. 13, Nov. 28 to Dec. 26, May 1-14, Aug. 1-17, Aug. 25 to Sept. 24, Sept. 28-30)

0.48	4.5	0.9	47	1.6	212
.5	5.6	1.0	64	1.9	320
.6	13	1.1	83	2.3	500
.7	22	1.2	104	2.7	700
.8	32	1.3	128		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.6	7.0	5.6	16	32	46	374	22	13	7.0	13	6.3
2	5.0	8.4	5.6	13	35	42	150	28	13	6.3	20	5.6
3	4.5	9.1	5.6	11	38	40	102	22	13	6.3	14	5.6
4	4.5	9.1	5.6	13	29	41	74	18	11	5.6	12	7.0
5	4.5	9.1	6.3	49	20	52	61	17	11	7.0	9.1	8.4
6	4.5	8.4	5.6	32	16	59	56	16	11	9.8	8.4	7.7
7	6.3	7.0	5.6	22	14	46	47	13	11	27	8.4	7.0
8	6.3	6.3	5.6	18	15	46	40	12	9.8	22	7.7	6.3
9	6.3	6.3	5.6	16	15	262	32	11	9.1	23	7.0	6.3
10	6.3	6.3	5.6	18	16	163	30	11	9.1	59	7.0	5.6
11	5.6	6.3	5.0	24	16	79	27	11	9.1	25	7.7	5.0
12	6.3	6.3	5.0	20	17	61	27	11	8.4	18	17	4.5
13	6.3	6.3	5.0	16	572	49	27	11	11	14	15	6.3
14	5.6	5.6	6.3	15	520	44	31	9.8	12	12	11	6.3
15	5.0	5.0	9.8	16	296	35	116	11	20	11	9.1	5.6
16	5.6	5.6	17	31	139	31	79	11	21	9.8	9.1	5.0
17	5.0	6.3	9.8	32	91	29	83	11	18	8.4	9.1	4.5
18	5.0	6.3	7.0	31	147	30	89	11	14	7.0	8.4	4.5
19	6.3	6.3	7.0	179	144	24	66	72	11	7.0	8.4	8.4
20	5.6	6.3	6.3	70	96	25	50	109	9.1	7.7	8.4	7.0
21	5.0	5.6	7.0	50	77	26	42	56	9.1	51	8.4	4.5
22	6.3	5.6	6.3	27	228	76	40	66	8.4	104	8.4	4.5
23	6.3	5.6	6.3	31	106	116	35	70	9.1	52	9.1	5.6
24	6.3	5.6	5.6	87	136	77	28	81	7.7	30	8.4	5.6
25	6.3	5.6	5.0	64	200	61	25	44	7.0	20	7.7	5.6
26	7.0	5.6	4.5	75	87	54	28	49	7.7	32	7.0	5.6
27	6.3	5.6	4.5	144	79	424	41	35	7.0	89	7.0	6.3
28	7.0	5.0	6.3	530	59	221	31	27	7.0	38	7.7	6.3
29	6.3	5.0	18	163	-	102	27	21	8.4	24	7.0	7.0
30	6.3	5.6	32	83	-	89	25	18	7.0	20	7.7	6.3
31	7.0	-	20	52	-	700	-	16	-	15	7.7	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	180.2	7.0	4.5	5.81	0.085	0.10
November	192.1	9.1	5.0	6.40	.094	.11
December	250.4	32	4.5	8.08	.119	.14
Calendar year 1948	18,678.6	1,660	3.2	51.0	.750	10.22
January	1,948	530	11	62.8	.924	1.07
February	3,240	572	14	116	1.71	1.77
March	3,150	700	24	102	1.50	1.72
April	1,883	374	25	62.8	.924	1.03
May	920.8	109	9.8	29.7	.437	.50
June	323.0	21	7.0	10.8	.159	.18
July	767.9	104	5.6	24.8	.365	.42
August	295.9	20	7.0	9.54	.140	.16
September	180.2	8.4	4.5	6.01	.088	.10
Water year 1948-49	13,331.5	700	4.5	36.5	.537	7.30

Peak discharge (base, 800 sec.-ft.).- Feb. 13 (11:30 p.m.) 850 sec.-ft.

Thorn Creek at Glenwood, Ill.

Location.- Water-stage recorder, lat. 41°31'50", long. 87°36'20", in SW¼SE¼ sec. 9, T. 35 N., R. 14 E., at Baltimore & Ohio Chicago Terminal Railroad bridge, 0.7 mile north of Chicago Heights, 0.8 mile south of Glenwood, and 1 mile upstream from Deer Creek. Datum of gage is 610.97 feet above mean sea level, datum of 1929.

Drainage area.- 24.0 square miles.

Records available.- May to September 1949.

Extremes.- Maximum discharge during period, 469 second-feet May 19 (gage height, 7.21 feet); minimum daily, 6.0 second-feet July 4, Aug. 21, Sept. 5, 11, 25.

Remarks.- Records good. Undetermined amount of pumpage diverted by commercial livestock feeding pens above station.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								-	14	17	23	11
2								-	14	7.6	38	10
3								-	14	6.5	16	8.2
4								-	10	6.0	12	8.9
5								-	8.2	12	12	6.0
6								-	12	23	9.3	9.3
7								-	12	15	7.9	10
8								-	12	12	10	10
9								-	12	78	11	10
10								-	12	24	12	7.9
11								-	9.3	14	15	6.0
12								-	8.2	12	12	9.3
13								-	22	10	8.6	10
14								-	17	10	6.5	9.6
15								-	28	10	9.6	9.6
16								-	14	8.2	11	11
17								12	12	6.5	11	7.9
18								15	9.6	9.0	11	6.2
19								223	7.9	11	11	9.0
20								141	10	13	8.2	10
21								51	12	156	6.0	11
22								56	12	51	9.3	10
23								36	12	18	10	10
24								29	12	11	10	8.2
25								23	9.3	12	12	6.0
26								38	7.9	47	10	9.3
27								23	10	42	12	10
28								16	16	18	6.8	12
29								12	11	18	9.6	11
30								10	11	10	12	11
31								13	-	7.6	12	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October						
November						
December						
Calendar year						
January	-	-	-	-	-	-
February	-	-	-	-	-	-
March	-	-	-	-	-	-
April	-	-	-	-	-	-
May 17-31	698	223	10	46.5	1.94	1.08
June	371.4	28	7.9	12.4	.517	.58
July	695.4	156	6.0	22.4	.933	1.08
August	364.8	38	6.0	11.8	.492	.57
September	278.4	12	6.0	9.28	.387	.43
Water year	-	-	-	-	-	-

Peak discharge (base, 240 sec.-ft.).- May 19 (12:30 a.m.) 469 sec.-ft.; July 9 (5 p.m.) 311 sec.-ft.; July 21 (10:30 a.m.) 380 sec.-ft.

Thorn Creek at Thornton, Ill.

Location.- Water-stage recorder, lat. 41°34'05", long. 87°36'30", near center of N½ sec. 34, T. 36 N., R. 14 E., at Ridge Road bridge in Thornton, 1 mile downstream from North Creek and 1½ miles upstream from Grand Trunk Railway. Datum of gage is 586.43 feet above mean sea level, datum of 1929. Prior to Dec. 18, 1948, wire-weight gage at same site and datum.

Drainage area.- 105 square miles.

Records available.- May 1948 to September 1949.

Extremes.- Maximum discharge during year, 1,320 second-feet Feb. 13 (gage height, 9.81 feet); minimum, 3.4 second-feet Sept. 11 (gage height, 2.32 feet).
1948-49: Maximum discharge, 4,040 second-feet Mar. 20, 1948 (gage height, 14.08 feet, from floodmark); minimum, that of Sept. 11, 1949.
Flood of Apr. 5, 1947, eeached a stage of 14.34 feet, from floodmark (discharge, 4,200 second-feet).

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are poor. Gage read twice daily to Dec. 18.

Discharge, in aecond-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	10	a12	b40	a65	a90	588	29	43	21	31	18
2	14	10	a12	29	a45	a80	268	36	34	14	136	13
3	11	21	a12	31	a50	a74	162	27	40	6.1	100	11
4	12	20	a12	69	a35	*69	124	21	38	6.1	69	11
5	12	43	a25	146	a20	75	109	17	25	8.7	50	12
6	12	21	a23	124	a15	82	102	15	29	50	34	8.7
7	25	10	20	92	7.5	75	88	15	29	54	23	14
8	14	8.7	a13	67	9.3	73	75	12	27	40	21	15
9	11	12	15	36	14	239	62	12	25	109	21	17
10	10	15	a18	56	13	242	50	13	23	126	21	12
11	12	15	a14	79	11	139	45	12	23	84	31	4.4
12	12	14	11	77	12	102	38	10	18	60	25	8.1
13	13	20	a9	52	829	84	34	9.3	47	45	18	17
14	10	9.3	a15	40	a650	77	40	8.7	62	36	12	16
15	9.3	9.3	60	38	a450	65	140	7.5	90	31	14	15
16	12	14	50	86	a300	56	112	10	62	29	17	15
17	9.3	18	43	106	a180	43	106	8.7	50	20	18	12
18	9.3	a12	29	134	a250	40	123	12	43	21	18	7.5
19	16	15	18	248	a180	25	102	339	29	23	18	7.0
20	12	a13	27	168	a150	18	86	841	23	29	12	16
21	12	a12	38	142	a200	21	77	327	27	214	8.1	16
22	11	a12	b25	97	a400	65	79	303	29	221	9.3	15
23	16	a12	b20	104	a175	119	73	221	23	126	12	15
24	a16	a12	b13	168	a250	109	60	151	21	84	11	12
25	11	a12	b11	160	a450	100	50	112	17	65	12	6.1
26	16	a12	b10	164	a210	94	47	121	15	86	12	7.5
27	16	a12	b10	222	a140	327	54	102	15	134	11	13
28	14	a12	b25	700	a110	268	47	67	29	84	12	14
29	13	a12	b100	a500	-	146	36	43	18	71	8.7	14
30	13	a12	b80	a150	-	124	29	29	15	50	13	12
31	13	-	b60	a100	-	790	-	23	-	31	12	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	402.9	25	9.3	13.0	0.124	0.14
November	430.3	43	8.7	14.3	.136	.15
December	830	100	9	26.8	.255	.29
Calendar year	-	-	-	-	-	-
January	4,225	700	29	136	1.30	1.50
February	5,220.8	829	7.5	186	1.77	1.85
March	3,911	790	18	126	1.20	1.39
April	3,006	588	29	100	.952	1.06
May	2,954.2	841	7.5	95.3	.908	1.05
June	969	90	15	32.3	.308	.34
July	1,978.9	221	6.1	63.8	.608	.70
August	810.1	136	8.1	26.1	.249	.29
September	374.3	18	4.4	12.5	.119	.13
Water year 1948-49	25,112.5	829	4.4	68.8	.655	8.89

Peak discharge (base, 520 sec.-ft.).- Jan. 28 (3 p.m.) 778 sec.-ft.; Feb. 13 (10 p.m.) 1,320 sec.-ft.; Mar. 31 (6 p.m.)1,020 sec.-ft.; May 20 (5 a.m.) 1,100 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of records for Little Calumet River at South Holland and Hart ditch at Munster, Ind.

b Stage discharge relation affected by ice.

Deer Creek near Chicago Heights, Ill.

Location.- Water-stage recorder, lat. 41°31'15", long. 87°35'25", 0.1 mile west of center of sec. 14, T. 35 N., R. 14 E., at bridge on Joe Orr Road, 0.4 mile east of Cottage Grove Avenue, 1 mile north of U. S. Highway 30, 1.5 miles northeast of Chicago Heights, and 1.6 miles west of Torrence Avenue. Datum of gage is 615.95 feet above mean sea level, datum of 1929. Prior to Jan. 10, 1949, wire-weight gage at same site and datum.

Drainage area.- 24.4 square miles.

Records available.- May 1948 to September 1949.

Extremes.- Maximum discharge during year, 376 second-feet Feb. 13 (gage height, 10.00 feet); no flow Sept. 21-30.
1948-49: Maximum discharge, 663 second-feet May 10 or 11, 1948 (gage height, 11.52 feet, from floodmark); no flow Sept. 21-30, 1949.

Remarks.- Records fair except those for periods of no gage-height record, which are poor. Gage read twice daily to Jan. 10. Undetermined amount of flow diverted for irrigation.

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used June 4 to July 5, July 15 to Sept. 30)

Oct. 1 to Jan. 10

1.8	0.9	2.0	2.6	1.3	0.1	1.8	1.8	3.2	23	8.7	239
1.85	1.2	2.1	3.9	1.4	.2	1.9	2.5	4.0	44	9.4	301
1.9	1.6	2.3	6.9	1.5	.4	2.1	4.4	5.5	89		
Note.- Same as follow-				1.6	.7	2.3	6.9	7.0	145		
ing table above 2.3 feet.				1.7	1.2	2.8	15	8.0	195		

Jan. 11 to Sept. 30

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.0	3.4	1.0	5.7	a10	19	82	5.5	5.9	0.4	4.8	0.4
2	1.0	3.4	1.0	1.6	a8	15	44	6.2	5.7	.4	6.4	.3
3	.9	3.9	1.1	2.3	a7	14	29	5.1	5.4	.8	4.2	.2
4	1.1	3.0	1.0	4.5	a6	12	23	4.6	4.9	.5	4.1	.4
5	1.2	3.0	1.8	17	a6	12	21	4.2	4.4	.6	3.7	.7
6	1.2	3.4	2.1	17	a6	14	19	3.8	4.1	1.1	3.3	.8
7	1.5	3.0	1.5	14	a6	12	17	3.7	3.9	1.4	2.9	.8
8	1.9	2.9	1.0	8.7	a7	13	18	3.9	3.7	1.4	2.7	.7
9	1.9	2.9	.9	5.6	a8	477	13	3.8	3.2	2.6	2.4	.6
10	1.7	3.2	.9	5.4	a7	44	10	3.9	3.0	2.9	2.4	.6
11	1.6	2.6	1.0	8.1	a6	26	8.4	3.8	2.9	2.4	2.7	.6
12	1.6	2.2	1.2	6.8	a10	21	6.9	3.7	2.9	2.4	2.6	.6
13	1.6	2.2	1.3	4.8	a300	19	4.0	3.5	3.2	2.5	2.5	.6
14	1.9	2.1	1.6	3.9	a90	17	5.2	3.2	3.2	2.6	2.7	.3
15	2.1	2.0	2.6	4.0	a60	14	17	3.8	3.6	2.5	2.6	.3
16	2.2	2.0	3.8	10	a50	12	10	3.8	3.0	2.2	2.4	.3
17	2.2	1.8	1.8	13	a40	9.4	12	3.7	3.3	2.1	2.4	.3
18	2.4	2.2	1.0	12	a50	7.8	12	3.7	3.0	1.9	2.1	.2
19	2.4	1.9	1.2	38	a40	6.6	9.8	55	3.0	1.9	1.7	.1
20	2.6	1.6	1.5	27	a30	5.9	9.7	73	2.8	1.7	1.6	.1
21	2.9	1.6	1.2	25	40	5.9	9.4	37	2.7	5.0	1.3	0
22	2.9	1.6	.9	19	62	13	9.5	38	2.5	12	1.1	0
23	2.9	1.2	1.0	14	37	19	8.9	25	2.3	12	.8	0
24	3.0	1.2	1.2	22	45	18	7.0	11	2.2	6.5	.8	0
25	3.2	1.2	1.2	22	60	16	6.5	8.7	2.2	4.6	.5	0
26	3.0	1.2	1.2	27	30	16	6.5	14	1.9	5.5	.4	0
27	3.0	1.2	1.2	49	26	52	7.8	15	1.1	5.4	.4	0
28	3.0	1.0	1.5	163	23	46	6.5	9.7	1.1	5.0	.4	0
29	3.0	1.0	5.7	52	-	28	5.7	7.8	.8	5.1	.4	0
30	3.2	1.0	22	a30	-	28	5.2	7.0	.6	4.9	.4	0
31	3.2	-	13	a15	-	195	-	6.0	-	4.8	.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	67.3	3.2	0.9	2.17	0.089	0.10
November	64.9	3.9	1.0	2.16	.089	.10
December	79.4	22	.9	2.56	.105	.12
Calendar year	-	-	-	-	-	-
January	647.4	163	1.6	20.9	.857	.99
February	1,070	300	6	38.2	1.57	1.63
March	777.6	195	5.9	25.1	1.03	1.19
April	444.0	82	4.0	14.8	.607	.68
May	381.1	73	3.2	12.3	.504	.58
June	92.5	5.9	.6	3.08	.126	.14
July	105.1	12	.4	3.39	.139	.16
August	66.9	6.4	.4	2.16	.089	.10
September	8.9	.8	0	.297	.012	.01
Water year 1948-49	3,805.1	300	0	10.4	.426	5.80

Peak discharge (base, 250 sec.-ft.).- Feb. 13 (time unknown) 376 sec.-ft.
a Nc gage-height record; discharge computed on basis of records for Butterfield Creek at Flossmoor.

Butterfield Creek at Flossmoor, Ill.

Location.- Water-stage recorder, lat. 41°32'25", long. 87°38'55", in NE¼NW¼ sec. 8, T. 35 N., R. 14 E., at Riegle Road bridge and Homewood city limits, 0.1 mile north of Holbrook Road and three-quarters of a mile east of Flossmoor. Datum of gage is 616.80 feet above mean sea level, datum of 1929.

Drainage area.- 22.9 square miles.

Records available.- May 1948 to September 1949.

Extremes.- Maximum discharge during year, 465 second-feet Feb. 13 (gage height, 8.89 feet); minimum, 0.1 second-foot on many days.
1948-49: Maximum discharge, 683 second-feet Mar. 19, 1948, May 10 or 11, 1948 (gage heights, 10.29 and 10.28 feet, from floodmarks); no flow at times in 1948.

Remarks.- Records fair.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	1.5	0.3	3.7	16	25	84	6.8	10	1.4	6.1	0.4
2	.4	1.6	.3	2.2	9.7	17	52	7.4	9.0	1.2	57	.4
3	.5	2.1	.3	1.8	7.8	14	38	6.5	7.4	1.2	35	.3
4	.5	2.1	.4	6.6	7.1	14	30	6.0	6.5	1.1	18	.3
5	.6	2.6	.6	29	6.3	16	26	6.0	5.4	.9	11	.4
6	.6	3.5	1.2	14	6.3	17	23	5.7	4.6	1.2	7.4	.5
7	.6	1.4	1.2	7.1	6.0	14	18	5.4	4.1	2.4	5.4	.4
8	1.0	.9	1.2	3.7	8.1	15	16	4.9	3.3	4.1	3.7	.4
9	1.0	1.1	1.2	2.6	11	60	13	4.9	3.0	31	3.2	.4
10	1.4	2.0	1.1	3.7	7.4	39	11	4.1	3.2	34	2.6	.4
11	1.2	2.2	1.0	6.0	6.0	25	10	3.7	3.2	16	2.4	.5
12	1.1	1.5	.8	4.1	11	19	9.4	3.7	2.2	9.0	2.4	.6
13	1.1	1.7	.5	3.2	332	16	8.7	3.3	2.8	5.4	1.8	.3
14	1.0	1.8	.5	2.2	91	15	11	2.8	3.3	3.3	1.5	.3
15	.9	1.6	4.8	2.2	95	12	18	3.3	10	2.2	1.2	.3
16	.8	2.0	3.2	8.4	52	11	14	3.9	8.1	1.7	1.1	.3
17	.9	2.8	1.2	10	46	10	17	3.0	5.4	1.5	1.1	.3
18	.9	2.2	.9	16	53	8.4	19	3.5	4.4	1.3	1.2	.2
19	.9	2.2	.9	42	50	6.8	16	228	3.9	1.0	1.0	.5
20	.9	1.8	1.0	33	34	6.8	14	209	3.2	1.2	.9	.2
21	.9	1.5	1.4	14	36	7.4	13	89	3.0	94	.8	.1
22	1.2	1.6	1.7	10	78	17	14	97	3.0	94	.7	.1
23	1.5	1.5	1.5	11	39	25	12	65	2.2	41	.6	.1
24	1.2	1.3	1.4	37	57	21	9.0	47	2.1	24	.6	.1
25	1.2	1.4	1.4	24	57	19	7.4	35	2.0	15	.5	.2
26	1.2	1.3	1.3	25	32	20	8.4	55	1.8	21	.5	.2
27	1.3	1.2	1.2	52	29	95	9.0	34	1.5	39	.5	.2
28	1.2	.4	1.7	147	22	56	7.4	24	2.1	20	1.3	.1
29	1.2	.3	13	57	-	36	6.5	18	1.6	12	.6	.1
30	1.2	.3	8.1	50	-	36	6.3	15	1.3	9.0	.5	.1
31	1.4	-	7.8	29	-	166	-	13	-	6.0	.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	30.5	1.5	0.4	0.98	0.043	0.05
November	49.4	3.5	.3	1.65	.072	.08
December	63.1	13	.3	2.04	.089	.10
Calendar year	-	-	-	-	-	-
January	657.5	147	1.8	21.2	.926	1.07
February	1,205.7	332	6.0	43.1	1.88	1.96
March	859.4	166	6.8	27.7	1.21	1.40
April	541.1	84	6.3	18.0	.786	.88
May	1,013.9	228	2.8	32.7	1.43	1.65
June	123.6	10	1.3	4.12	.180	.20
July	496.1	94	.9	16.0	.699	.81
August	171.0	57	.4	5.52	.241	.28
September	8.7	.6	.1	.29	.013	.01
Water year 1948-49	5,220.0	332	.1	14.3	.624	8.49

Peak discharge (base, 240 sec.-ft.).- Feb. 13 (5 p.m.) 465 sec.-ft.; May 19 (8 p.m.) 450 sec.-ft.

North Creek near Lansing, Ill.

Location.- Water-stage recorder, lat. 41°32'45", long. 87°33'30", in SE¼SE¼ sec. 1, T. 35 N., R. 14 E., at Torrence Avenue Bridge, 1.1 miles south of Lansing and 2.7 miles north of U. S. Highway 30. Prior to Jan. 4, 1940, wire-weight gage at same site and datum. Datum of gage is 599.29 feet above mean sea level, datum of 1929.

Drainage area.- 18.2 square miles.

Records available.- May 1948 to September 1949.

Extremes.- Maximum discharge during year, 531 second-feet Feb. 13 (gage height, 8.08 feet); minimum, 0.1 second-foot on many days.

1948-49: Maximum discharge observed, 649 second-feet (revised) May 11, 1948 (gage height, 8.35 feet, corrected); no flow for many days in 1948.

Revisions.- The figures of maximum discharge and gage height for the period May to September 1948 have been revised to 649 second-feet May 11, 1948 (gage height, 8.35 feet), superseding figures published in Water-Supply Paper 1114.

Remarks.- Records fair except those for periods of no gage-height record or indefinite stage-discharge relation, which are poor. Wire-weight gage read twice daily prior to Jan. 4.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	e0.4	e0.4	e3.5	a6.0	a9.0	12	105	4.8	3.3	0.2	0.9	e3.0
2	e.4	e.4	e3.5	a6.0	a6.0	10	51	4.8	3.7	.1	4.8	e3.0
3	e.4	e4.5	e4.0	a6.0	a6.0	9.0	31	3.4	4.1	.1	2.3	e3.0
4	e.4	e2.5	e4.5	e12	a5.5	11	22	3.0	2.8	.1	1.1	e2.0
5	e.4	e.4	e6.0	e16	a4.5	18	17	2.6	2.8	.1	.8	e1.0
6	e.8	e.6	e8.0	e9.0	a5.0	25	14	2.3	2.1	.2	.7	e.9
7	e2.5	e.8	e8.0	e8.0	a5.0	16	11	2.0	1.1	.6	.7	e.9
8	e3.0	e.6	e7.0	e7.0	a6.0	17	8.1	1.9	0.3	.4	.7	e.8
9	e3.0	e1.5	e6.0	e7.0	a15	81	6.6	1.9	.1	7.1	.6	e.7
10	e2.5	e2.0	e6.0	e9.0	a10	47	5.9	1.4	.1	6.4	.7	e.6
11	e1.0	e2.0	e5.0	e10	a6.0	24	5.2	1.2	e.1	.5	.7	e.5
12	e.4	e2.0	e4.5	e8.0	a11	16	5.3	1.2	e.1	.2	.8	e.6
13	e.4	e2.5	e3.5	e8.0	331	12	4.6	1.0	e.1	.2	.4	e.6
14	e.4	e2.5	e3.5	e7.0	89	11	24	1.0	.1	.4	.3	e.5
15	e.4	e2.0	e8.0	e8.0	a70	7.6	51	1.0	.2	.4	.3	e.3
16	e.4	e3.5	e8.0	e16	a35	6.1	30	1.6	2.4	.3	.3	e.2
17	a.4	e5.0	a8.0	e11	a40	4.7	32	1.8	4.7	.2	.3	e.1
18	e.4	e4.0	a8.0	e18	a35	3.6	33	1.6	4.3	.3	e.6	e.2
19	e.4	e3.5	a8.0	e28	43	2.1	22	114	3.3	.5	e.5	.3
20	e.4	e3.5	a8.0	e22	26	1.9	16	131	3.1	1.1	e.5	.3
21	e.4	e3.5	a8.0	e12	25	2.1	13	54	1.9	32	e.5	.3
22	e.4	e3.5	a6.0	e9.0	70	14	12	79	1.2	25	e.5	.3
23	e.4	e3.5	a4.5	e11	31	28	9.9	52	1.0	8.1	e.5	.3
24	e.4	e3.5	a4.0	e26	55	20	7.4	49	.8	5.2	e.5	.3
25	e.4	e4.0	a3.0	e16	59	14	6.6	28	.6	3.7	e.7	.3
26	e.4	e4.0	a2.0	e26	28	12	7.4	18	.5	3.6	e2.0	.3
27	e.4	e4.5	a1.5	e60	29	79	9.7	11	.9	4.1	e1.0	.3
28	e.4	e4.0	a3.0	164	18	44	7.0	7.9	.3	2.8	e1.0	.3
29	e.4	e4.0	a12	a70	-	25	6.1	6.1	.2	1.5	e1.0	.3
30	e.4	e4.0	a13	a20	-	25	5.3	4.8	.2	1.1	e1.0	.3
31	e.4	-	a9.0	a13	-	259	-	3.8	-	.9	e2.0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	22.8	3.0	0.4	0.74	0.041	0.05
November	82.7	5.0	.4	2.76	.152	.17
December	187.0	13	1.5	6.03	.331	.38
Calendar year	-	-	-	-	-	-
January	649.0	164	6.0	20.9	1.15	1.33
February	1,073.0	331	4.5	38.3	2.10	2.19
March	857.1	259	1.9	27.6	1.52	1.75
April	579.1	105	4.6	19.3	1.06	1.18
May	597.1	131	1.0	19.3	1.06	1.22
June	46.4	4.7	.1	1.55	.085	.09
July	107.4	32	.1	3.46	.190	.22
August	28.7	4.8	.3	.93	.051	.06
September	22.5	3.0	.1	.75	.041	.05
Water year 1948-49	4,252.8	331	.1	11.7	.643	8.69

Peak discharge (base, 210 sec.-ft.).- Jan. 28 (5:30 a.m.) 241 sec.-ft.; Feb. 13 (11 a.m.) 531 sec.-ft.; Mar. 31 (7 a.m.) 331 sec.-ft.; May 19 (6:30 p.m.) 286 sec.-ft.

a No gage-height record; discharge computed on basis of records for stations in Thorn Creek Basin.

e Stage-discharge relation indefinite; discharge computed on basis of records for stations in Thorn Creek Basin.

Lansing ditch near Lansing, Ill.

Location.- Water-stage recorder, lat. 41°31'40", long. 87°31'45", at boundary line between secs. 8 and 17, 35 N., R. 15 E., at farm road bridge, 0.2 mile west of Indiana State line, half a mile east of Burnham Avenue, and 2 miles south of Lansing. Datum of gage is 607.16 feet above mean sea level, datum of 1929.

Drainage area.- 8.3 square miles.

Records available.- May 1948 to September 1949 .

Extremes.- Maximum discharge during year, 371 second-feet Feb. 13 (gage height, 8.68 feet); no flow on many days.
1948-49: Maximum discharge, 461 second-feet May 10 or 11, 1948 (gage height, 9.24 feet, from floodmark); no flow on many days in 1949.

Remarks.- Records poor.

Rating tables, water year 1948-49 except periods of indefinite stage-discharge relation (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used May 20, 21, May 26 to June 10, June 13 to Sept. 30)

Oct. 1 to Mar. 30						Mar. 31 to Sept. 30					
2.3	0.2	2.9	8.7	5.0	72	2.2	0	2.7	6.6	4.5	85
2.4	1.2	3.0	11	6.0	119	2.3	.2	2.8	9.5	5.0	113
2.5	2.4	3.4	19	6.5	145	2.4	1.2	3.0	16	5.5	143
2.6	3.7	4.0	35	7.1	183	2.5	2.4	3.5	36	5.8	164
2.8	6.9	4.4	48			2.6	4.3	4.0	59		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a0.2	e0.2	1.7	3.0	4.4	8.3	55	3.7	0.9	0	1.6	2.4
2	a.2	e.2	1.8	2.8	3.0	6.0	27	3.7	1.6	0	6.1	2.4
3	a.2	2.2	2.0	2.9	2.9	5.5	18	2.6	1.4	.2	2.3	2.3
4	.2	1.3	2.2	5.8	2.7	5.9	13	2.4	1.1	.6	1.0	2.3
5	.2	.2	3.0	8.2	2.3	6.9	11	2.3	1.1	.7	.6	1.1
6	.4	.3	3.8	4.3	2.5	8.0	8.0	2.2	.5	1.7	.3	.8
7	1.2	.4	4.0	3.7	2.5	6.2	6.4	2.0	.2	1.7	.2	.8
8	1.6	.3	3.3	3.6	2.8	6.9	5.4	2.2	2.1	1.2	.2	.7
9	1.4	.7	2.8	3.4	7.4	31	4.5	2.2	1.5	5.8	.2	.6
10	1.3	1.1	2.8	4.4	4.9	15	3.9	1.9	.2	8.3	.2	.5
11	e.5	1.1	2.4	4.7	2.7	10	3.7	1.8	e.2	2.6	.3	.3
12	e.2	1.1	2.2	4.0	5.5	7.6	3.7	1.9	e.2	1.4	.3	.5
13	e.2	1.2	1.8	3.8	183	6.4	3.5	1.7	1.4	.9	.2	.5
14	e.2	1.2	1.6	3.4	39	6.0	5.3	1.3	2.0	.7	.2	.3
15	e.2	1.1	3.6	4.0	34	4.7	27	1.4	2.8	.7	.2	.1
16	e.2	1.6	4.0	7.6	18	4.4	16	1.7	1.8	.8	.2	0
17	e.2	2.4	4.1	5.7	20	4.7	16	1.6	1.6	.6	.3	0
18	e.2	1.8	3.7	8.9	18	3.4	19	1.6	1.4	.5	.5	0
19	e.2	1.8	3.7	19	16	3.0	13	64	1.2	.1	.4	0
20	e.2	1.9	3.7	11	11	3.0	9.5	40	1.2	.2	.4	0
21	e.2	1.8	3.7	6.0	14	3.3	7.8	16	1.1	52	.4	0
22	e.2	1.8	2.9	4.4	24	9.0	7.5	a10	.9	22	.4	0
23	e.2	1.8	2.2	5.3	12	11	6.6	a8	.6	6.6	.4	0
24	e.2	1.8	1.9	13	25	8.3	6.9	a5	.6	3.5	.3	0
25	e.2	1.9	1.4	7.6	17	6.9	6.4	a3	.5	2.0	.6	0
26	e.2	2.0	1.1	13	12	7.3	5.2	2.4	.3	2.2	1.2	0
27	e.2	2.2	.5	31	11	34	5.7	2.0	.1	2.8	1.0	0
28	e.2	2.0	1.5	54	8.2	13	3.7	1.6	.1	1.3	.9	0
29	e.2	2.0	5.9	24	-	9.2	3.5	1.2	.1	.9	.6	0
30	e.2	2.0	6.4	10	-	12	3.4	1.0	0	.8	.6	0
31	e.2	-	4.4	6.6	-	162	-	.8	-	.5	1.1	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	11.4	1.6	0.2	0.37	0.045	0.05
November	41.4	2.4	.2	1.38	.166	.19
December	90.1	6.4	.5	2.91	.351	.40
Calendar year	-	-	-	-	-	-
January	289.1	54	2.8	9.33	1.12	1.30
February	505.8	183	2.3	18.1	2.18	2.27
March	428.9	162	3.0	13.8	1.66	1.92
April	325.6	55	3.4	10.9	1.31	1.46
May	193.2	64	.8	6.23	.751	.87
June	28.7	2.8	0	.96	.116	.13
July	123.3	52	0	3.98	.480	.55
August	23.2	6.1	.2	.75	.090	.10
September	15.6	2.4	0	.52	.063	.07
Water year 1948-49	2,076.3	183	0	5.69	.686	9.31

Peak discharge (base, 140 sec.-ft.).- Feb. 13 (7 a.m.) 371 sec.-ft.; Mar. 31 (6 a.m.) 243 sec.-ft.; May 19 (2 p.m.) 178 sec.-ft.
a No gage-height record; discharge computed on basis of records for stations in Thorn Creek Basin.
e Stage-discharge relation indefinite; discharge computed as explained in footnote a.

Wolf Lake at Chicago, Ill.

Location.- Water-stage recorder, lat. 41°40'00", long. 87°32'15", in SW¼ sec. 29, T. 37 N., R. 15 E., at outlet on west shore in Chicago. Datum of gage is 580.45 feet above mean sea level, datum of 1929 (Cook County Highway bench mark).

Records available.- December 1939 to September 1949.

Extremes.- Maximum mean hourly gage height during year, 1.86 feet Jan. 17; minimum mean hourly, 1.24 feet Aug. 1.
1939-49: Maximum mean hourly gage height, 2.14 feet Sept. 29, 1945; minimum gage height observed, 0.76 foot Aug. 3, 1940.

Remarks.- Mean hourly values used to determine extremes in order to dampen the effects of wind action.

Gage height, in feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.74	1.53	1.66	1.77	a1.85	1.74	1.66	1.50	1.55	1.40	1.26	1.34
2	1.77	1.55	1.66	1.75	a1.85	1.74	1.62	1.46	1.52	1.39	1.34	1.35
3	1.77	1.56	1.66	1.75	a1.85	1.73	1.59	1.50	1.53	1.37	1.34	1.35
4	1.76	1.61	1.66	1.77	a1.84	1.69	1.55	1.49	1.52	1.33	1.33	1.35
5	1.74	1.64	1.62	1.79	a1.84	1.66	1.54	1.50	1.48	1.35	1.31	1.35
6	1.77	1.61	1.58	1.77	a1.84	1.64	1.53	1.48	1.46	1.46	1.28	1.34
7	1.77	1.63	1.66	1.77	a1.84	1.58	1.52	1.48	1.47	1.52	1.26	1.35
8	1.78	1.64	1.66	1.77	a1.84	1.59	1.52	1.45	1.45	1.53	1.26	1.37
9	1.77	1.64	1.67	1.74	a1.84	1.67	1.50	1.44	1.44	1.60	1.26	1.39
10	1.76	1.66	1.67	1.75	a1.83	1.65	1.47	1.46	1.43	1.65	1.27	1.38
11	1.77	1.65	1.67	1.75	a1.83	1.64	1.45	1.44	1.41	1.62	1.28	1.36
12	1.78	1.66	1.66	1.72	a1.83	1.64	1.44	1.45	1.39	1.60	1.31	1.36
13	1.82	1.66	1.65	1.69	a1.83	1.63	1.44	1.43	1.38	1.59	1.31	1.36
14	1.81	1.64	1.67	1.71	a1.83	1.63	1.46	1.44	1.41	1.58	1.29	1.38
15	1.78	1.65	1.75	1.70	a1.83	1.62	1.49	1.44	1.48	1.55	1.29	1.39
16	1.75	1.63	1.73	1.68	a1.83	1.60	1.50	1.44	1.49	1.52	1.29	1.40
17	1.69	1.66	1.73	1.67	1.83	1.60	1.51	1.45	1.49	1.49	1.30	1.38
18	1.66	1.70	1.75	1.74	1.83	1.59	1.49	1.45	1.48	1.44	1.31	1.37
19	1.65	1.72	1.76	1.81	1.82	1.57	1.53	1.57	1.46	1.42	1.33	1.34
20	1.63	1.68	1.75	1.81	1.80	1.54	1.52	1.68	1.44	1.39	1.30	1.37
21	1.64	1.69	1.76	1.80	1.78	1.53	1.52	1.68	1.44	1.41	1.25	1.37
22	1.62	1.68	1.76	1.77	1.81	1.56	1.51	1.67	1.45	1.45	1.26	1.39
23	1.62	1.69	1.76	1.76	1.81	1.58	1.47	1.66	1.42	1.43	1.26	1.40
24	1.62	1.70	1.74	1.77	1.82	1.58	1.51	1.66	1.43	1.38	1.27	1.40
25	1.58	1.69	1.72	1.77	1.83	1.50	1.47	1.65	1.39	1.37	1.28	1.38
26	1.58	1.67	1.70	1.80	1.81	1.55	1.47	1.67	1.38	1.35	1.28	1.37
27	1.57	1.68	1.68	1.82	1.76	1.51	1.53	1.64	1.39	1.34	1.29	1.37
28	1.57	1.71	1.68	a1.85	1.74	1.56	1.53	1.62	1.40	1.31	1.32	1.40
29	1.57	1.67	1.77	a1.85	-	1.55	1.52	1.59	1.41	1.30	1.31	1.41
30	1.55	1.64	1.80	a1.85	-	1.58	1.51	1.56	1.41	1.30	1.31	1.41
31	1.54	-	1.79	a1.65	-	1.64		1.55	-	1.27	1.33	-

a No gage-height record; gage height interpolated.

Burns ditch at Gary, Ind.

Location.- Wire-weight gage, lat. 41°34'25", long. 87°17'15", in N½ sec. 13, T. 36 N., R. 8 W., at Central Avenue Bridge, half a mile east of Gary and 1¼ miles downstream from Deep River.
Drainage area.- 174 square miles.
Records available.- October 1943 to September 1949.
Extremes.- Maximum discharge during year, 732 second-feet Jan. 30 (gage height, 7.75 feet); minimum, 7.6 second-feet Aug. 25-27 (gage height, 3.33 feet).
1943-49: Maximum discharge, 2,660 second-feet May 11, 1948; maximum gage height, 16.44 feet Mar. 16, 1944 (from graph based on gage readings); minimum discharge, 1.8 second-feet Oct. 14, 1946; minimum gage height, 3.29 feet Sept. 1, 1948.
Remarks.- Records good. Gage read twice daily. Burns ditch is an artifical channel which reverses the direction of flow of part of little Calumet River and flows into Lake Michigan at Wickliffe.
Revisions (water years).- W 1034: 1944.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Nov. 18 to Dec. 14, Jan. 6-18, Apr. 5 to May 12)

Oct. 1 to Jan. 29						Jan. 30 to Sept. 30					
3.5	12	3.9	36	4.5	104	3.3	6.5	3.7	24	4.5	113
3.6	16	4.0	44	5.2	217	3.4	10	3.9	40	6.5	471
3.7	22	4.3	77	6.9	539	3.5	14	4.3	83	7.6	687

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	16	17	52	282	161	583	68	56	16	22	12
2	16	16	16	42	197	147	526	82	48	14	29	11
3	12	25	17	38	103	130	336	73	42	14	26	9.3
4	12	37	18	46	86	125	282	63	34	13	22	9.6
5	12	42	26	90	84	137	212	57	29	25	14	17
6	14	42	28	107	68	151	174	50	26	72	18	16
7	15	29	16	93	64	156	155	36	22	99	18	16
8	18	22	16	80	50	138	120	32	20	87	22	14
9	16	23	15	84	54	226	102	37	20	91	26	12
10	16	27	16	77	70	363	89	36	18	107	20	11
11	18	23	15	75	66	336	78	34	17	93	22	10
12	16	21	16	77	75	228	69	33	21	81	22	12
13	15	22	16	73	372	169	64	31	31	65	18	20
14	16	19	24	67	593	140	86	30	45	51	16	18
15	15	19	49	65	687	115	102	29	130	43	14	14
16	16	25	57	77	644	103	122	38	192	36	12	13
17	13	32	49	86	507	90	132	38	170	30	15	12
18	15	21	38	115	363	82	163	36	132	26	14	24
19	15	21	33	212	327	75	167	111	96	22	12	75
20	14	28	30	235	300	72	152	345	72	20	9.6	58
21	15	25	31	197	255	73	127	354	58	27	8.2	34
22	15	21	29	147	300	113	110	291	45	34	7.9	22
23	16	20	30	114	345	230	89	273	38	43	8.6	16
24	16	18	24	128	291	282	76	246	32	46	8.6	15
25	16	18	21	132	345	219	74	273	26	41	7.9	13
26	16	18	21	148	336	178	78	228	23	38	7.6	12
27	16	17	19	163	264	255	90	165	21	40	7.6	11
28	16	16	22	236	215	309	86	120	19	38	9.6	12
29	16	15	62	527	-	291	78	94	18	34	13	16
30	16	18	87	603	-	237	70	75	18	30	13	13
31	15	-	74	318	-	390	-	66	-	24	12	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	477	20	12	15.4	0.089	0.10
November	696	42	15	23.2	.133	.15
December	932	87	15	30.1	.173	.20
Calendar year 1948	45,868.2	2,480	6.0	125	.718	9.80
January	4,602	603	38	145	.833	.96
February	7,343	687	50	262	1.51	1.57
March	5,721	390	72	185	1.06	1.22
April	4,552	583	64	152	.874	.97
May	3,442	354	29	111	.638	.74
June	1,519	192	17	50.6	.291	.32
July	1,400	107	13	45.2	.260	.30
August	475.6	29	7.6	15.3	.088	.10
September	547.9	75	9.3	18.3	.105	.12
Water year 1948-49	31,607.5	687	7.6	86.6	.498	6.75

Peak discharge (base, 900 sec.-ft.).- No peak above base.

Deep River at Lake George Outlet, at Hobart, Ind.

Location.- Staff gage above concrete dam, lat. 41°32'03", long. 87°15'22", in NW¼NW¼ sec. 32, T. 36 N., R. 7 W., at northeast end of Lake George in Hobart, an eighth of a mile upstream from Duck Creek. Datum of gage is 600.00 feet above mean sea level, datum of 1929.

Drainage area.- 124 square miles.

Records available.- April 1947 to September 1949.

Extremes.- Maximum discharge during year, 620 second-feet Feb. 14 (gage height, 3.50 feet); minimum, 5.0 second-feet Oct. 5, 6, 13-16, 21; minimum gage height, 1.92 feet Oct. 5, 6, 13-16, 21-31, Dec. 1-4.

1947-49: Maximum discharge, 2,740 second-feet May 11, 1948 (gage height, 5.86 feet); minimum, 4.2 second-feet Sept. 14, 1948; minimum gage height, 1.91 feet Aug. 20-24, 26-28, 1947, Sept. 14, 1948.

Remarks.- Records good. Gage read twice daily.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1-30, Nov. 9 to Dec. 28, Apr. 9 to July 5)

1.9	5.0	2.3	84	2.9	290
2.0	19	2.4	112	3.1	385
2.1	36	2.7	213	3.5	620

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	17	11	53	119	122	494	50	36	11	17	15
2	9.2	17	8.2	33	84	109	390	50	33	11	17	12
3	8.2	19	9.2	29	72	95	239	48	29	9.2	17	11
4	7.0	22	9.2	34	58	90	178	38	26	8.2	13	12
5	5.0	22	21	70	48	98	142	36	22	8.2	12	13
6	5.0	28	21	90	41	112	112	31	15	29	11	12
7	9.2	21	15	67	36	115	95	29	9.2	48	13	12
8	12	17	12	46	36	101	82	29	8.2	50	21	12
9	9.2	19	12	43	50	167	72	28	9.2	70	21	11
10	8.2	22	12	48	60	286	67	22	9.2	62	19	11
11	9.2	21	12	55	53	270	65	21	11	72	21	9.2
12	8.2	17	12	60	50	188	55	19	11	62	21	9.2
13	7.0	17	12	50	181	132	50	19	13	48	17	11
14	5.0	21	15	38	530	104	46	19	33	33	12	19
15	6.0	13	33	38	584	84	62	17	104	26	13	19
16	6.0	12	41	48	548	77	82	21	152	21	11	12
17	8.2	21	38	60	360	70	95	26	145	19	12	11
18	8.2	21	29	70	282	60	109	26	101	13	12	11
19	8.2	21	22	140	270	58	119	68	74	12	11	11
20	8.2	26	21	192	232	58	109	239	55	12	11	12
21	6.0	21	26	171	192	50	112	232	38	13	9.2	17
22	6.0	15	22	112	235	79	109	199	31	24	9.2	19
23	6.0	17	19	90	274	201	77	182	28	31	9.2	13
24	6.0	13	19	98	228	246	65	199	22	34	9.2	12
25	6.0	13	17	104	270	175	65	224	17	34	9.2	11
26	6.0	13	12	109	250	132	53	160	15	29	9.2	12
27	6.0	12	12	148	196	202	65	106	15	28	9.2	11
28	6.0	11	15	314	158	262	65	79	13	28	11	11
29	6.0	11	36	375	-	213	55	65	11	24	12	11
30	6.0	11	67	262	-	171	50	48	11	26	15	13
31	9.2	-	58	182	-	180	-	41	-	21	15	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	229.4	13	5.0	7.40	0.060	0.07
November	531	28	11	17.7	.143	.16
December	668.6	67	8.2	21.6	.174	.20
Calendar year 1948	31,471.8	2,460	4.2	86.0	.694	9.43
January	3,229	375	29	104	.839	.97
February	5,497	584	36	196	1.58	1.65
March	4,407	286	50	142	1.15	1.32
April	3,379	494	46	113	.911	1.01
May	2,371	239	17	76.5	.617	.71
June	1,096.8	152	8.2	36.6	.295	.33
July	916.6	72	8.2	29.6	.239	.27
August	419.4	21	9.2	13.5	.109	.13
September	375.4	19	9.2	12.5	.101	.11
Water year 1948-49	23,120.2	584	5.0	63.3	.510	6.93

Peak discharge (base, 600 sec.-ft.).- Feb. 14 (1 p.m.) 620 sec.-ft.

Little Calumet River at Porter, Ind.

Location.- Wire-weight gage, lat. 41°37'18", long. 87°05'13", in NE¼ sec. 34, T. 37 N., R. 6 W., at highway bridge three-quarters of a mile northwest of Porter and 4½ miles upstream from Salt Creek.

Drainage area.- 62 square miles.

Records available.- May 1945 to September 1949.

Extremes.- Maximum discharge during year, 690 second-feet May 20 (gage height, 6.88 feet); minimum, 21 second-feet Aug. 22 (gage height, 2.14 feet).
1945-49: Maximum discharge, 2,440 second-feet June 28, 1945 (gage height, 9.88 feet, from graph based on gage readings); minimum, 18 second-feet Aug. 10, 11, Oct. 9, 1946; minimum gage height, that of Aug. 22, 1949.

Remarks.- Records good except those for periods of no gage-height record, which are fair. Gage read twice daily.

Revisions (water years).- W 1084: 1945.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a25	38	33	38	56	65	395	49	40	30	30	25
2	a24	36	32	37	45	62	190	156	37	30	35	25
3	a24	a35	33	36	43	58	110	148	35	30	31	24
4	24	52	34	47	43	60	83	73	34	30	28	25
5	24	46	35	92	36	74	72	57	33	32	27	37
6	24	52	39	58	38	77	66	48	32	74	26	28
7	25	a40	36	45	37	64	62	43	31	247	29	27
8	28	a35	34	44	42	62	58	42	31	191	30	27
9	28	a35	35	43	52	110	54	41	30	83	27	26
10	26	44	33	48	48	106	49	41	30	96	26	25
11	24	39	32	50	42	74	48	38	30	58	26	24
12	27	38	35	43	44	62	47	37	29	45	27	25
13	27	39	38	40	236	56	46	36	33	39	26	32
14	27	a37	39	38	456	56	50	35	77	34	25	31
15	26	a35	73	39	409	51	106	36	83	33	25	28
16	27	a35	80	60	361	48	86	41	64	31	24	27
17	28	41	52	50	143	47	89	38	48	30	24	26
18	29	37	43	51	102	45	124	39	44	28	25	58
19	30	36	41	153	113	45	110	103	40	28	24	72
20	31	43	38	164	113	45	83	526	36	28	22	36
21	32	40	41	69	99	50	69	296	35	30	22	29
22	32	38	45	48	139	90	65	191	36	31	23	28
23	32	36	38	47	124	143	60	316	34	29	23	28
24	33	34	37	67	113	99	53	196	33	28	22	27
25	33	33	34	60	160	73	50	106	32	26	23	25
26	33	34	30	77	113	66	52	83	32	27	24	25
27	32	33	32	89	92	106	70	67	32	28	24	24
28	31	33	34	214	80	86	56	57	31	26	28	25
29	32	33	72	235	-	69	50	50	31	50	28	30
30	32	34	59	120	-	62	47	44	31	47	25	27
31	35	-	44	74	-	331	-	43	-	32	25	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	885	35	24	28.5	0.460	0.53
November	1,141	52	33	38.0	.613	.68
December	1,281	80	30	41.3	.666	.77
Calendar year 1948	24,638	1,660	20	67.3	1.09	14.79
January	2,276	235	36	73.4	1.18	1.37
February	3,379	456	36	121	1.95	2.03
March	2,442	331	45	78.8	1.27	1.46
April	2,500	395	46	83.3	1.34	1.50
May	3,076	526	35	99.2	1.60	1.85
June	1,144	83	29	38.1	.615	.69
July	1,551	247	26	50.0	.806	.93
August	804	35	22	25.9	.418	.48
September	896	72	24	29.9	.482	.54
Water year 1948-49	21,375	526	22	58.6	.945	12.83

Peak discharge (base, 500 sec.-ft.).- Feb. 14 (7 a.m.) 605 sec.-ft.; Feb. 15 (7 p.m.) 585 sec.-ft.; Mar. 31 (9 p.m.) 508 sec.-ft.; May 20 (5 p.m.) 690 sec.-ft.;

a No gage-height record; discharge computed on basis of 1 discharge measurement, weather records, and records for Salt Creek near McCool.

Salt Creek near McCool, Ind.

Location.- Wire-weight gage, lat. 41°35'48", long. 87°08'40", in SE¼ sec. 6, T. 36 N., R. 6 W., at county highway bridge, just downstream from Michigan Central Railroad bridge, 1¼ miles north of McCool, and 1½ miles upstream from Calumet River.

Drainage area.- 73 square miles.

Records available.- May 1945 to September 1949.

Extremes.- Maximum discharge during year, 525 second-feet Feb. 14 (gage height, 9.28 feet); minimum daily, 20 second-feet Aug. 21-27, minimum gage height, 3.11 feet Aug. 27.
1945-49: Maximum discharge, 2,520 second-feet May 11, 1948; minimum daily, 20 second-feet Feb. 28, 1947, Aug. 21-27, 1949; minimum gage height, 3.10 feet Sept. 6, 1948.

Remarks.- Records good. Gage read twice daily.

Revisions.- W 1084: Drainage area.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1-12, Nov. 16 to Dec. 15, May 3-19, July 15 to Sept. 18)

3.0	20	4.7	83
3.5	32	5.6	142
3.8	41	7.2	290
4.3	62	8.6	430

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	30	30	49	59	58	250	44	34	25	22	23
2	26	31	30	42	46	56	172	72	32	25	34	22
3	25	35	30	39	46	55	83	59	32	a25	26	21
4	25	46	30	55	46	57	64	45	31	24	24	22
5	25	44	33	92	40	67	58	37	30	38	23	32
6	26	49	34	62	38	72	54	35	29	250	22	23
7	26	36	32	50	40	61	52	32	29	285	27	23
8	30	33	30	48	44	62	48	31	29	91	26	24
9	28	33	24	47	80	146	45	31	28	64	25	22
10	27	41	29	52	60	120	42	31	28	64	22	22
11	27	36	29	55	47	74	41	30	28	45	23	22
12	28	34	32	49	48	64	41	30	28	38	25	22
13	28	41	32	42	308	57	39	30	29	34	24	28
14	28	36	39	41	425	53	40	28	40	32	23	26
15	27	34	72	42	365	51	64	32	51	30	22	24
16	28	34	77	60	400	48	54	30	42	29	22	23
17	28	40	54	57	139	47	60	30	35	27	22	23
18	28	35	45	56	130	47	126	30	33	26	22	81
19	30	35	42	190	113	45	89	100	30	26	22	70
20	30	39	41	123	95	43	67	265	29	26	21	33
21	31	36	43	67	80	45	56	111	28	28	20	29
22	31	35	41	52	154	88	52	119	30	32	20	28
23	30	34	33	52	104	138	50	150	28	28	20	28
24	30	33	38	72	138	89	45	86	28	26	20	27
25	30	32	37	38	177	72	42	64	27	25	20	26
26	31	31	30	80	83	67	46	55	27	26	20	26
27	30	31	33	92	77	113	72	47	27	30	20	26
28	31	31	40	270	72	89	52	42	27	25	24	26
29	30	30	89	238	-	70	46	39	26	24	26	30
30	30	31	77	92	-	61	42	36	26	24	23	28
31	31	-	53	74	-	280	-	35	-	22	24	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	882	31	25	28.5	0.390	0.45
November	1,066	49	30	35.5	.486	.54
December	1,279	89	24	41.3	.566	.65
Calendar year 1948	24,581	1,850	22	67.2	.921	12.52
January	2,398	270	39	77.4	1.06	1.22
February	3,454	425	38	123	1.68	1.76
March	2,395	280	43	77.3	1.06	1.22
April	1,992	250	39	66.4	.910	1.01
May	1,806	265	28	58.3	.799	.92
June	921	51	26	30.7	.421	.47
July	1,494	285	22	48.2	.660	.76
August	714	34	20	23.0	.315	.36
September	860	81	21	28.7	.393	.44
Water year 1948-49	19,261	425	20	52.8	.723	9.80

Peak discharge (base, 700 sec.-ft.).- No peak above base.
a No gage-height record; discharge computed on basis of weather records and records for Little Calumet River at Porter.

.St. Joseph River at Mottville, Mich.

Location.- Float gage, lat. 41°48', long. 85°45', in NE¼ sec. 6, T. 8 S., R. 12 W., at hydroelectric plant of Michigan Gas & Electric Co. at Mottville, 5 miles downstream from Fawn River. Datum of gage is 759.5 feet above mean sea level (levels by Michigan Gas & Electric Co.).

Drainage area.- 1,860 square miles.

Records available.- December 1923 to September 1949.

Average discharge.- 25 years (1924-49), 1,473 second-feet.

Extremes.- Maximum daily discharge during year, 4,300 second-feet Feb. 16-18; minimum daily, 112 second-feet Oct. 10.
1924-49: Maximum discharge, 8,480 second-feet Apr. 8, 9, 1947 (gage height, 5.34 feet); minimum daily, 44 second-feet Oct. 17, 1937.

Remarks.- Records poor. Flow regulated by power plant. Gage read hourly.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	897	956	985	1,150	2,600	3,200	3,000	1,620	1,490	1,460	750	820
2	705	785	1,030	979	2,600	3,000	3,400	1,690	1,240	1,470	956	700
3	313	672	1,100	1,250	2,500	2,610	3,500	1,640	1,290	1,390	983	600
4	779	742	675	1,270	2,400	2,550	3,500	1,580	1,380	1,340	1,000	700
5	781	1,000	829	1,500	2,200	2,240	3,300	1,680	1,240	1,350	900	820
6	803	1,050	1,030	1,900	2,100	2,350	3,100	1,750	1,300	1,270	800	900
7	856	897	1,140	1,800	2,000	2,540	2,800	1,620	1,320	1,260	760	1,000
8	883	1,180	1,040	1,700	2,100	2,520	2,560	1,300	1,160	1,360	880	900
9	717	1,110	783	1,600	2,200	2,420	2,580	1,500	1,120	1,560	940	820
10	112	809	886	1,800	2,100	2,390	2,570	1,380	1,150	1,540	820	860
11	773	865	898	1,800	2,030	2,240	2,510	1,300	1,010	1,520	880	700
12	823	1,050	637	1,800	1,880	2,200	2,200	1,300	618	1,360	940	700
13	845	1,080	981	1,700	2,130	2,100	2,160	1,220	908	1,380	800	820
14	854	840	903	1,700	2,530	2,080	2,190	998	1,150	1,430	900	720
15	842	971	1,350	1,600	4,000	1,880	2,160	885	1,180	1,280	740	865
16	729	836	1,260	1,500	4,300	1,980	2,190	1,340	1,530	1,100	880	751
17	684	1,160	1,360	1,710	4,300	1,940	2,380	1,260	1,610	948	820	805
18	642	1,160	1,260	1,630	4,300	1,880	2,530	1,200	1,990	1,130	800	1,120
19	779	1,050	1,150	2,900	4,000	1,610	2,490	1,220	2,140	1,040	800	1,240
20	838	1,040	1,550	2,800	4,000	1,590	2,390	1,450	2,390	1,050	800	1,370
21	541	981	1,440	2,530	4,000	1,790	2,320	1,490	2,290	1,060	720	1,260
22	528	1,220	1,390	2,590	4,000	1,640	2,220	1,720	2,180	1,120	660	1,280
23	567	1,230	1,360	2,620	4,000	1,980	2,210	2,140	1,840	1,010	720	1,250
24	608	1,120	1,130	2,580	3,900	1,840	2,200	2,140	1,840	777	720	1,010
25	724	1,000	1,070	2,500	3,700	1,890	1,940	2,040	1,740	902	660	859
26	726	1,120	842	2,590	3,600	1,950	1,960	1,960	1,730	1,010	600	1,050
27	969	1,200	1,110	2,500	3,500	1,790	1,830	1,860	1,680	994	660	905
28	1,130	808	1,160	2,900	3,400	2,110	1,830	1,700	1,590	992	600	965
29	618	1,230	1,390	3,000	-	1,980	1,780	1,560	1,590	864	700	820
30	626	1,060	1,160	2,800	-	1,900	1,700	1,440	1,570	740	760	903
31	735	-	1,260	2,500	-	2,380	-	1,440	-	597	820	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	22,427	1,130	112	723	0.389	0.45
November	30,222	1,230	672	1,007	.541	.60
December	34,159	1,550	637	1,102	.592	.68
Calendar year 1948	615,745	7,870	112	1,682	.904	-
January	63,199	3,000	979	2,039	1.10	1.27
February	86,370	4,300	1,880	3,085	1.66	1.73
March	66,570	3,200	1,590	2,147	1.15	1.33
April	73,500	3,500	1,700	2,450	1.32	1.47
May	47,423	2,140	885	1,530	.823	.95
June	45,266	2,390	618	1,509	.811	.90
July	36,304	1,560	597	1,171	.630	.73
August	24,769	1,000	600	799	.430	.50
September	27,513	1,370	600	917	.493	.55
Water year 1948-49	557,722	4,300	112	1,528	.822	11.16

Note.- Discharges for Oct. 1 to Aug. 3 computed from power-plant record of kilowatt-hour output; discharges for periods when spillway gates may have been open, Jan. 5-16, 19, 20, Jan. 28 to Feb. 10, Feb. 15 to Mar. 2, Apr. 1-7, and for period of doubtful record, Aug. 4 to Sept. 14, computed on basis of records for stations at Elkhart, Ind., and Niles, Mich., and power-plant record at Buchanan, Mich.

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St. Joseph River at Elkhart, Ind.

Location.- Water-stage recorder, lat. 41°41'30", long. 85°58'25", in NE¼ sec. 5, T. 37 N., R. 5 E., on left bank of St. Joseph River, 100 feet downstream from mouth of Elkhart River, 200 feet upstream from Main Street Bridge, and 1,900 feet downstream from Christiana Creek. Datum of gage is 700.00 feet above mean sea level, datum of 1929.

Drainage area.- 3,350 square miles.

Records available.- August 1947 to September 1949.

Extremes.- Maximum discharge during year, 9,200 second-feet Feb. 17 (gage height, 23.12 feet); minimum, 335 second-feet Oct. 11; mininum daily, 870 second-feet Oct. 10.
1947-49: Maximum discharge, 12,800 second-feet Mar. 22, 1948 (gage height, 23.92 feet); minimum, that of Oct. 11, 1948; minimum daily, that of Oct. 10, 1948.

Remarks.- Records good. Flow regulated by Elkhart Hydro Plant, 2,400 feet upstream and by hydroelectric plant on Elkhart River at Goshen.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,350	1,180	1,440	2,150	4,340	5,600	5,080	2,860	2,460	2,770	1,340	1,350
2	1,270	1,360	1,530	2,080	4,430	5,060	5,780	2,860	2,120	2,710	1,710	1,220
3	946	1,230	1,580	2,220	4,250	5,060	5,960	2,700	2,020	2,510	1,710	1,020
4	1,040	1,210	1,170	2,080	4,160	4,880	5,960	2,540	2,300	2,320	1,690	1,290
5	1,190	1,600	1,220	2,700	3,820	4,340	5,600	2,700	2,200	2,250	1,580	1,240
6	1,270	1,590	1,620	3,260	3,500	4,520	5,240	2,670	2,200	2,380	1,370	1,360
7	1,300	1,490	1,670	3,100	3,420	4,430	4,880	2,360	2,110	2,510	1,230	1,650
8	1,400	1,740	1,520	2,860	3,660	4,250	4,430	2,110	1,840	2,580	1,440	1,530
9	1,170	1,670	1,400	2,780	3,740	4,160	4,250	2,330	1,760	2,640	1,550	1,330
10	870	1,570	1,260	3,020	3,500	4,070	4,070	2,150	1,710	2,710	1,340	1,400
11	1,040	1,470	1,400	3,100	3,180	3,820	3,820	2,020	1,590	2,840	1,490	1,120
12	1,260	1,590	1,100	2,940	3,100	3,820	3,420	1,930	1,260	2,510	1,600	1,150
13	1,400	1,490	1,280	2,860	3,660	3,580	3,260	2,000	1,480	2,120	1,280	1,350
14	1,320	1,490	1,520	2,780	4,430	3,500	3,260	1,590	1,890	2,320	1,460	1,180
15	1,290	1,540	1,940	2,620	7,220	3,260	3,340	1,580	2,210	2,060	1,240	1,410
16	1,150	1,380	2,150	2,540	8,480	3,340	3,340	1,760	2,800	1,840	1,400	1,350
17	1,160	1,670	2,080	2,860	7,400	3,260	3,580	1,820	3,340	1,660	1,360	1,090
18	1,110	1,580	2,080	2,940	7,400	3,020	3,740	1,870	3,630	1,550	1,300	1,660
19	1,150	1,740	1,940	5,150	7,040	2,700	3,820	2,060	3,850	1,780	1,360	1,810
20	1,260	1,440	2,080	5,590	7,040	2,700	3,820	2,480	3,710	1,610	1,260	2,070
21	1,160	1,740	2,150	5,210	6,860	2,620	3,500	2,850	3,850	1,590	1,110	1,960
22	1,040	1,800	2,080	4,810	6,860	2,860	3,420	3,180	3,710	1,820	1,090	1,780
23	937	1,670	2,150	4,730	6,860	3,020	3,500	3,790	3,410	2,010	1,180	1,910
24	964	1,740	1,800	4,650	6,680	2,940	3,420	3,820	3,200	1,700	1,180	1,670
25	1,130	1,600	1,640	4,700	6,500	3,020	3,100	3,580	3,070	1,590	1,120	1,570
26	1,080	1,470	1,060	4,700	6,320	3,100	3,020	3,330	3,030	1,680	976	1,640
27	1,310	1,630	1,480	4,880	6,140	3,100	3,020	3,260	2,840	1,620	1,070	1,400
28	1,500	1,430	1,740	5,780	5,960	3,260	2,940	2,940	2,840	1,680	1,020	1,570
29	1,210	1,540	2,540	5,960	-	3,340	2,860	2,660	2,770	1,790	1,220	1,570
30	973	1,490	2,460	5,420	-	3,100	2,780	2,560	2,960	1,490	1,150	1,400
31	1,140	-	2,150	4,070	-	3,900	-	2,280	-	1,260	1,320	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	36,390	1,500	870	1,174	0.350	0.40
November	46,140	1,800	1,180	1,538	.459	.51
December	53,230	2,540	1,060	1,717	.513	.59
Calendar year 1948	1,088,980	12,200	870	2,975	.888	12.08
January	114,540	5,960	2,080	3,695	1.10	1.27
February	149,950	8,480	3,100	5,355	1.60	1.66
March	113,630	5,600	2,620	3,665	1.09	1.26
April	118,190	5,960	2,780	3,940	1.18	1.31
May	78,640	3,820	1,580	2,537	.757	.87
June	78,160	3,850	1,260	2,605	.778	.87
July	63,900	2,840	1,260	2,061	.615	.71
August	41,146	1,710	976	1,327	.396	.46
September	44,050	2,070	1,020	1,468	.438	.49
Water year 1948-49	937,966	8,480	870	2,570	.767	10.40

St. Joseph River at Niles, Mich.

Location.- Water-stage recorder, lat. 41°49'45", long. 86°15'35", in sec. 26, T. 7 S., R. 17 W., at Niles, 1 mile upstream from Dowagiac Creek. Datum of gage is 635.02 feet above mean sea level, datum of 1929. Auxiliary float gage in powerhouse of Buchanan Dam, 8 miles downstream.

Drainage area.- 3,620 square miles.

Records available.- October 1930 to September 1949.

Average discharge.- 17 years (1930-37, 1938-39, 1940-49), 2,906 second-feet.

Extremes.- Maximum daily discharge during year, 9,980 second-feet Feb. 16; maximum gage height, 8.28 feet Feb. 16; minimum daily discharge, 1,130 second-feet Oct. 24.
1930-49: Maximum discharge, 17,300 second-feet May 26, 1943 (gage height, 11.78 feet); minimum daily, 407 second-feet Aug. 2, 1936.

Remarks.- Records fair. Flow regulated by power plants above station. Discharge computed by using fall as determined by hourly readings of auxiliary gage as a factor.

Cooperation.- Gage-height record at auxiliary gage furnished by Indiana & Michigan Electric Co.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,500	1,690	1,830	2,750	4,740	6,670	5,430	3,190	2,840	3,170	1,890	1,660
2	1,600	1,780	1,670	2,640	4,840	6,490	6,170	3,600	2,840	3,410	2,280	1,660
3	1,500	2,050	1,630	2,570	5,110	6,060	6,260	3,290	2,720	2,420	1,960	1,480
4	1,400	1,630	1,750	2,850	4,910	5,800	6,490	3,170	2,660	2,520	2,050	1,460
5	1,500	1,650	1,450	3,140	4,490	5,400	6,370	2,920	2,700	2,290	1,930	1,670
6	1,600	2,080	1,710	4,020	4,150	5,460	6,010	3,090	2,680	2,610	1,880	1,780
7	1,700	2,020	2,090	3,520	4,130	5,290	5,540	2,830	2,650	2,850	1,830	1,860
8	1,600	2,070	1,750	3,370	4,290	5,350	5,150	2,650	2,460	2,990	1,870	2,040
9	1,500	2,240	1,850	2,990	4,460	5,240	4,840	2,750	2,090	3,030	1,900	1,720
10	1,100	1,980	1,630	3,670	4,410	5,080	4,800	2,710	2,050	3,000	1,900	1,570
11	1,200	1,910	1,510	3,390	4,130	4,930	4,580	2,510	1,840	2,900	1,800	1,660
12	1,600	1,910	1,520	3,520	3,800	4,760	4,420	2,490	1,610	2,700	1,920	1,610
13	1,600	1,960	1,730	3,260	4,520	4,350	3,930	2,310	1,680	2,500	1,840	1,720
14	1,600	1,840	1,880	3,090	5,290	4,340	3,800	2,130	1,850	2,260	1,820	1,560
15	1,500	1,850	2,400	3,140	7,400	4,030	4,060	1,810	2,450	2,260	1,770	1,540
16	1,500	1,920	2,440	2,970	9,980	3,920	3,850	2,230	3,070	2,090	1,850	1,740
17	1,500	1,680	2,440	3,230	8,630	3,890	4,020	2,400	3,370	1,930	1,790	1,430
18	1,500	2,000	2,580	3,600	8,630	3,930	4,400	2,430	4,120	1,950	1,870	1,530
19	1,500	2,030	2,370	5,320	8,120	3,520	4,310	2,870	4,130	1,940	1,790	2,280
20	1,640	1,820	2,720	6,900	8,020	3,440	4,240	3,010	4,150	1,930	1,690	1,850
21	1,690	1,760	2,540	6,550	8,150	3,870	4,080	3,180	4,650	1,900	1,670	1,850
22	1,510	2,270	2,650	6,010	7,920	3,530	3,980	3,770	4,480	1,980	1,680	1,840
23	1,330	1,700	2,220	5,410	8,150	4,160	3,900	4,080	3,920	1,920	1,690	1,820
24	1,130	1,860	2,440	5,800	7,880	4,220	3,800	4,420	3,760	1,990	1,520	1,720
25	2,050	1,690	1,980	5,550	7,960	4,130	3,790	4,220	3,530	2,200	1,660	1,620
26	1,570	1,890	1,610	5,540	7,400	3,990	3,610	3,830	3,690	1,870	1,590	1,670
27	1,430	1,960	1,980	5,730	7,150	3,750	3,510	3,690	3,730	1,870	1,420	1,760
28	1,530	1,870	2,090	6,130	7,220	3,950	3,630	3,340	3,630	1,860	1,450	1,520
29	1,800	1,590	2,890	6,830	-	4,050	3,380	3,220	3,470	2,290	1,800	1,700
30	1,330	1,690	2,430	5,550	-	3,850	3,200	3,220	3,510	1,860	1,610	1,660
31	1,960	-	2,320	5,910	-	4,640	-	3,010	-	1,870	1,730	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	47,470	2,050	1,100	1,531	0.423	0.49
November	56,390	2,270	1,590	1,880	.519	.58
December	64,100	2,890	1,450	2,068	.571	.66
Calendar year 1948	1,210,790	12,300	900	3,308	.914	12.43
January	134,950	6,900	2,570	4,353	1.20	1.38
February	175,880	9,980	3,800	6,281	1.74	1.81
March	142,090	6,670	3,440	4,584	1.27	1.46
April	135,550	6,490	3,200	4,518	1.25	1.40
May	94,370	4,420	1,810	3,044	.841	.97
June	92,330	4,650	1,610	3,078	.850	.95
July	72,360	3,410	1,860	2,334	.645	.74
August	55,430	2,280	1,420	1,788	.494	.57
September	50,980	2,280	1,430	1,699	.469	.52
Water year 1948-49	1,121,900	9,980	1,100	3,074	.849	11.53

Note.- No gage-height record at upper gage Oct. 1-19, June 6, July 10-13; discharge computed on basis of weather records, recorded range in stage, records for station at Elkhart, Ind., and power-plant record at Buchanan, Mich.

East Branch Coldwater River at Coldwater, Mich.

Location.- Staff gage, lat. 41°56'25", long. 85°01'00", in NW¼ sec. 21, T. 6 S., R. 6 W., at Jay Street Bridge in Coldwater, 1 mile upstream from mouth. Datum of gage is 930.715 feet above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Drainage area.- 59 square miles.

Records available.- December 1937 to September 1949.

Average discharge.- 11 year (1938-49), 42.2 second-feet.

Extremes.- Maximum discharge observed during year, 269 second-feet Feb. 16 (gage height, 5.26 feet); minimum, 0.4 second-foot Nov. 8, 14, 15; minimum gage height, 3.57 feet Nov. 8.

1937-49: Maximum discharge, 680 second-feet Apr. 5, 1947 (gage height, 6.20 feet, floodmark), by slope-area method; minimum observed, 0.1 second-foot Dec. 13, 15-18, 1946.

Remarks.- Records fair. Gage read twice daily.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.9	0.8	2.1	14	64	128	146	64	21	a70	18	8.9
2	.8	.7	2.0	14	67	122	122	67	20	71	23	7.7
3	.9	.8	2.3	14	64	113	113	63	20	65	21	7.1
4	.9	.8	2.3	16	65	111	109	60	19	60	19	7.1
5	.9	.7	2.7	32	64	107	105	60	18	58	17	14
6	.9	1.1	3.2	27	63	105	101	58	16	58	16	12
7	1.1	.7	3.4	31	49	97	99	56	16	56	16	10
8	.9	.5	3.2	40	61	97	92	54	15	54	15	9.8
9	.8	.6	2.0	42	60	95	83	48	14	60	14	8.9
10	.8	.7	2.3	40	56	92	78	42	14	59	13	8.3
11	.9	.5	2.9	41	42	86	74	36	14	51	14	7.7
12	.9	.5	2.9	39	60	81	71	36	14	49	15	7.4
13	.9	.5	3.2	38	85	78	67	33	25	46	13	8.0
14	.9	.4	3.6	39	90	74	63	30	19	42	12	8.0
15	.9	.5	7.4	41	177	65	75	28	49	39	12	7.7
16	.9	1.4	6.2	41	194	63	77	25	80	36	11	7.1
17	.9	1.2	6.0	40	167	63	75	24	113	33	14	7.1
18	1.1	.9	4.2	54	155	58	75	23	78	30	12	15
19	.9	.8	6.0	80	152	55	72	32	68	29	12	12
20	.9	2.9	6.2	70	149	51	68	39	60	28	12	11
21	1.1	2.7	7.4	75	143	50	65	31	61	28	11	11
22	.9	2.5	7.7	67	143	58	64	43	67	34	11	11
23	.8	2.3	5.5	70	146	68	64	41	65	32	11	10
24	.8	2.3	8.0	68	143	65	72	36	60	30	9.8	9.8
25	.8	2.3	5.8	64	164	64	71	30	70	28	9.5	9.8
26	.8	2.3	6.0	68	143	65	64	28	65	25	8.6	9.8
27	.9	2.3	6.2	70	140	71	58	26	63	23	8.9	9.8
28	.8	2.3	7.4	92	132	74	54	25	67	22	9.8	13
29	.8	2.3	13	105	-	65	54	23	72	25	8.9	23
30	.8	2.1	12	58	-	65	54	23	68	22	8.3	24
31	.9	-	14	97	-	128	-	22	-	19	8.6	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	27.5	1.1	0.8	0.89	0.015	0.02
November	40.4	2.9	.4	1.35	.023	.03
December	167.1	14	2.0	5.39	.091	.10
Calendar year 1948	15,764.2	285	.8	43.1	.731	9.94
January	1,587	105	14	51.2	.868	1.00
February	3,038	194	42	108	1.83	1.91
March	2,514	128	50	81.1	1.37	1.58
April	2,385	146	54	79.5	1.35	1.51
May	1,206	67	22	38.9	.659	.76
June	1,351	113	14	45.0	.763	.85
July	1,281	71	19	41.3	.700	.81
August	404.4	23	8.3	13.0	.220	.25
September	516.0	24	7.1	10.5	.178	.20
Water year 1948-49	14,317.4	194	.4	39.2	.664	9.02

a No gage-height record; discharge interpolated.

Pigeon Creek at Hogback Lake Outlet, near Angola, Ind.

Location.- Staff gage, lat. 41°37'30", long. 85°05'46", in NE¼NW¼ sec. 36, T. 37 N., R. 12 E., at farm bridge 800 feet north of lake outlet, 2 miles southeast of Flint, and 5.1 miles west of Angola. Datum of gage 940.0 feet above mean sea level, datum of 1929.

Drainage area.- 106 square miles.

Records available.- October 1947 to September 1949. October 1945 to September 1947 at site 1½ miles downstream, published as Pigeon Creek near Flint.

Extremes.- 1947-48: Maximum discharge during water year, 355 second-feet (revised) Mar. 2 (gage height, 11.79 feet); minimum, 11 second-feet Sept. 16-20; minimum gage height, 7.36 feet Sept. 2-7.

1948-49: Maximum discharge during water year, 366 second-feet Feb. 19 (gage height, 11.93 feet); minimum, 12 second-feet Oct. 6, 7, Sept. 30; minimum gage height, 7.34 feet, Aug. 26-29, Sept. 3, 4.

1945-49: Maximum discharge, 458 second-feet Apr. 24, 1947 (gage height, 12.79 feet, present site and datum); minimum, 11 second-feet Oct. 14-16, 1946, Sept. 16-20, 1948; minimum gage height, that of Aug. 26-29, Sept. 3, 4, 1949.

Revisions.- The figure of maximum discharge, for the water year 1948 has been revised to 355 second-feet, superseding figure published in Water-Supply Paper 1114.

Remarks.- Records good. Gage read once daily.

Revisions.- Revised figures of discharge for the water year 1948, superseding those published in Water Supply Paper 1114, are given herewith.

Rating table, Oct. 1, 1947, to Sept. 30, 1949 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used July 13-18, 1948, July 20, 1943 to Jan. 6, 1949, Aug. 6 to Sept. 30, 1949)

7.1	11	10.2	189
7.9	35	10.9	256
8.2	48	11.9	366
8.6	73		

Discharge, in second-feet, 1947-49

1947-48

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	34	43	58	36	333	278	94	68	39	23	15
2	31	35	42	64	34	355	267	90	63	37	22	15
3	32	36	42	72	33	344	262	86	61	37	22	14
4	31	36	46	90	31	311	240	87	57	36	21	13
5	30	36	60	104	30	272	224	90	54	34	21	13
6	30	36	79	108	30	240	205	90	53	34	21	13
7	29	36	108	108	30	210	188	94	54	32	20	13
8	28	36	140	108	30	184	172	98	55	32	20	13
9	28	36	157	108	30	164	160	108	53	31	20	12
10	28	36	168	104	31	146	150	115	52	30	20	12
11	27	39	172	104	31	140	146	146	50	30	21	13
12	27	42	160	104	31	126	150	210	49	30	21	13
13	26	45	146	104	31	115	160	262	49	29	21	12
14	26	52	132	101	30	108	168	300	49	28	21	12
15	26	56	118	98	31	104	164	300	49	29	21	12
16	25	59	112	90	32	108	160	300	47	29	20	11
17	25	61	104	82	33	115	150	278	45	29	20	11
18	26	62	98	77	48	122	146	256	43	29	21	11
19	28	63	90	72	98	129	132	229	42	a28	21	11
20	29	62	83	65	160	150	118	205	40	27	20	11
21	30	59	79	62	229	180	112	184	39	26	19	14
22	30	58	74	56	278	219	104	164	40	26	19	16
23	31	55	69	53	278	272	101	146	41	25	19	15
24	30	55	65	50	267	300	98	136	42	25	18	15
25	30	54	62	47	240	311	87	126	44	25	18	15
26	29	53	59	44	214	300	84	112	43	25	18	15
27	29	51	56	42	205	289	84	104	42	25	17	14
28	30	49	54	41	240	289	87	94	42	25	17	14
29	31	48	52	39	289	300	90	87	41	24	16	15
30	32	46	49	39	-	300	94	79	39	24	16	16
31	33	-	48	38	-	289	-	74	-	23	15	-

Peak discharge (base, 200 sec.-ft.).- Feb. 23 (4:30 p.m.) 289 sec.-ft.; Mar. 2 (8 p.m.) 355 sec.-ft.; Mar. 25 (1 p.m.) 311 sec.-ft.; May 15 (1 a.m.) 311 sec.-ft.

a No gage-height record; discharge computed on basis of weather records.

Discharge, in second-feet, of Pigeon Creek at Hogback Lake Outlet, near Angola, Ind., 1947-49--Continued

1948-49

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	18	21	48	176	205	86	76	45	69	28	15
2	14	18	20	54	160	188	94	75	42	65	29	14
3	14	18	20	59	146	172	101	72	39	62	29	14
4	13	19	21	64	132	157	104	69	37	57	28	14
5	13	21	22	72	118	146	101	64	35	50	28	15
6	12	22	22	94	108	140	94	61	34	44	27	16
7	12	22	22	126	98	132	90	56	32	41	26	16
8	13	22	22	146	94	126	94	52	31	39	24	16
9	13	23	20	154	90	122	84	49	30	39	24	16
10	14	23	19	154	94	118	77	46	29	39	23	16
11	14	23	18	143	94	115	73	44	a28	37	23	16
12	15	23	18	132	98	108	67	42	28	35	23	16
13	16	23	19	122	101	104	62	40	28	34	22	15
14	16	23	20	112	108	101	60	38	30	33	22	15
15	16	23	22	104	146	90	60	37	34	31	21	14
16	16	22	22	98	229	87	61	35	38	30	20	13
17	16	22	24	90	311	84	65	35	49	29	20	14
18	17	22	25	90	355	79	70	34	68	29	19	14
19	18	22	28	104	366	73	74	34	94	29	18	15
20	17	23	29	132	355	68	78	36	108	29	18	15
21	18	24	30	172	333	64	79	40	118	29	17	15
22	18	25	29	200	311	64	79	42	115	30	17	15
23	18	25	29	205	278	67	77	51	108	30	16	15
24	17	26	28	196	262	72	74	59	98	30	16	14
25	18	25	27	184	245	76	69	65	94	29	16	14
26	18	25	27	172	240	79	67	67	84	28	15	14
27	18	24	26	164	234	80	69	65	74	27	15	13
28	18	24	24	160	224	80	72	62	70	26	15	13
29	18	23	25	168	-	80	77	57	69	26	15	13
30	18	22	30	184	-	81	78	53	70	27	15	12
31	18	-	40	184	-	82	-	48	-	27	15	-

Peak discharge (base, 200 sec.-ft.).- Jan. 23 (7 a.m.) 205 sec.-ft.; Feb. 19 (12 m.) 366 sec.-ft.
a No gage-height record; discharge computed on basis of weather records.

Monthly discharge, in second-feet, 1947-49

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October 1947	897	33	25	28.9	0.273	0.31
November	1,426	63	34	47.5	.448	.50
December	2,767	172	42	89.3	.842	.97
Calendar year	-	-	-	-	-	-
January 1948	2,332	108	38	75.2	.709	.82
February	3,080	289	30	106	1.00	1.08
March	6,825	355	104	220	2.08	2.39
April	4,581	278	84	153	1.44	1.61
May	4,744	300	74	153	1.44	1.66
June	1,446	68	39	48.2	.455	.51
July	903	39	23	29.1	.274	.32
August	609	23	15	19.6	.185	.21
September	399	16	11	13.3	.125	.14
Water year 1947-48	30,009	355	11	82.0	.774	10.52
October 1948	491	18	12	15.8	.149	.17
November	675	26	18	22.5	.212	.24
December	749	40	18	24.2	.228	.26
Calendar year 1948	26,834	355	11	73.3	.692	9.41
January 1949	4,087	205	48	132	1.25	1.43
February	5,506	366	90	197	1.86	1.93
March	3,240	205	64	105	.991	1.14
April	2,336	104	60	77.9	.735	.82
May	1,604	76	34	51.7	.488	.56
June	1,759	118	28	58.6	.553	.62
July	1,130	69	26	36.5	.344	.40
August	644	29	15	20.8	.196	.23
September	437	16	12	14.6	.138	.15
Water year 1948-49	22,658	366	12	62.1	.586	7.95

Christiana Creek at Elkhart, Ind.

Location.- Staff gage, lat. 41°41'45", long. 85°58'35", in NE¼ sec. 5, T. 37 N., R. 5 E., at Elkhart Water Works pumping plant three-eighths of a mile upstream from mouth. Datum of gage is 730.00 feet above mean sea level, datum of 1929. Prior to Oct. 1, 1948, wire-weight gage 700 feet downstream at same datum.

Drainage area.- 111 square miles.

Records available.- December 1946 to September 1949.

Extremes.- Maximum discharge during year, 240 second-feet Feb. 17 (gage height, 9.08 feet); minimum, 48 second-feet Aug. 26, minimum gage height, 8.10 feet Aug. 25, 26.
1946-49: Maximum discharge, 452 second-feet Apr. 8, 1947 (gage height, 2.19 feet, site then in use); minimum, 40 second-feet Jan. 22, 1947.

Remarks.- Records good except those for period of no gage-height record, which are fair. Gage read twice daily. Some water is diverted from an old mill race a quarter of a a mile upstream, entering into St. Joseph River about 1 mile downstream.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Apr. 5 to May 21, Aug. 10 to Sept. 30)

8.0	44	8.5	107
8.1	51	8.8	173
8.2	58	9.1	245
8.3	69		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	64	76	105	151	171	162	78	111	95	61	55
2	66	65	76	95	153	164	177	89	103	78	73	53
3	61	68	71	95	147	158	180	93	103	74	68	48
4	64	73	73	95	138	153	175	91	114	69	67	49
5	57	80	73	109	133	155	162	87	122	69	66	52
6	59	85	80	120	127	149	163	83	120	76	59	55
7	64	89	87	125	129	149	144	78	116	80	57	56
8	64	89	85	122	125	147	136	73	107	83	61	55
9	66	87	73	114	122	147	131	76	99	97	60	55
10	59	93	78	118	122	147	114	73	93	97	59	55
11	64	93	80	120	118	140	111	68	85	99	61	50
12	66	93	74	114	114	140	109	62	80	101	62	53
13	74	93	78	105	142	129	105	60	80	93	57	55
14	66	85	82	105	175	129	105	68	89	78	55	55
15	65	85	107	95	220	127	111	76	107	74	57	54
16	66	87	107	99	232	122	107	80	125	68	57	54
17	61	87	120	111	232	122	109	80	136	65	57	49
18	64	89	120	120	230	120	118	78	138	67	64	65
19	62	87	116	160	228	116	118	105	136	66	67	68
20	64	91	111	184	218	105	116	129	133	64	58	65
21	64	89	111	177	215	109	109	144	144	65	57	78
22	64	97	109	180	202	118	107	166	147	64	57	76
23	57	93	105	177	200	118	99	175	133	57	52	74
24	57	89	101	175	188	125	97	180	127	57	52	67
25	61	82	a98	166	193	127	97	180	122	60	53	62
26	62	83	95	166	184	109	95	166	122	60	52	66
27	62	80	95	162	182	107	95	158	120	59	49	69
28	61	78	97	175	184	111	91	149	107	58	51	68
29	61	78	101	177	-	111	87	129	111	69	54	66
30	62	74	109	184	-	111	76	122	103	60	54	66
31	59	-	107	177	-	144	-	118	-	57	54	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,947	74	57	62.8		
November	2,526	97	64	84.2		
December	2,895	120	71	93.4		
Calendar year 1948	34,064	320	45	93.1		
January	4,227	184	95	136		
February	4,804	232	114	172		
March	4,080	171	105	132		
April	3,596	180	76	120		
May	3,314	180	60	107		
June	2,433	147	80	114		
July	2,259	101	57	73.9		
August	1,811	73	49	58.4		
September	1,793	78	48	59.8		
Water year 1948-49	36,685	232	48	101		

a No gage-height record; discharge computed on basis of weather records and records for stations on nearby streams.

Elkhart River at Goshen, Ind.

Location.- Water-stage recorder, lat. 41°35', long. 85°50', near line between secs. 8 and 9, T. 36 N., R. 6 E., at River Avenue Bridge at Goshen, half a mile upstream from Rock Run.

Drainage area.- 573 square miles.

Records available.- April 1931 to September 1949 in reports of Geological Survey. September 1924 to September 1927 in reports of Indiana Department of Conservation.

Average discharge.- 21 years (1924-27, 1931-49), 455 second-feet.

Extremes.- Maximum discharge during year, 2,510 second-feet Feb. 15 (gage height, 6.64 feet); minimum, 53 second-feet Sept. 14; minimum daily, 61 second-feet Oct. 10, 31. 1931-49: Maximum discharge, 5,090 second-feet May 25, 1943 (gage height, 9.46 feet), from rating curve extended above 4,000 second-feet; minimum, 28 second-feet Sept. 5, 6, 1941; minimum daily, 35 second-feet Sept. 26, 1941; minimum gage height, 1.27 feet May 25, 30, 1932.

Remarks.- Records good except those for periods of ice effect, which are fair. Flow regulated by three power plants above station.

Revisions.- W 824: Drainage area.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	153	164	*181	568	b900	1,090	826	466	469	464	277	153
2	168	151	176	514	b850	1,060	778	474	436	444	288	109
3	63	154	181	528	b800	990	679	449	436	410	300	149
4	163	172	196	501	b780	966	611	404	549	388	311	220
5	151	236	138	755	b760	966	590	412	589	378	272	128
6	144	218	243	990	755	920	567	378	465	405	250	177
7	146	208	181	802	708	849	554	358	407	564	148	223
8	139	211	162	708	686	802	517	358	354	529	274	163
9	139	214	193	708	802	802	464	354	326	469	306	170
10	61	262	167	708	732	778	447	326	295	480	276	226
11	167	252	146	732	663	755	464	299	269	480	254	128
12	160	185	130	708	640	708	420	283	287	375	240	151
13	157	168	184	663	708	686	407	272	296	375	233	173
14	150	246	262	618	896	640	425	261	390	340	233	165
15	145	187	280	640	1,940	618	434	261	530	323	240	194
16	138	168	286	618	2,300	618	464	250	665	284	238	144
17	65	187	350	596	1,780	573	455	246	934	277	219	169
18	162	184	338	618	1,560	537	468	272	975	261	188	260
19	156	204	318	1,660	1,500	532	533	358	800	251	235	243
20	147	173	313	*1,880	1,500	492	502	528	690	251	229	212
21	140	248	306	1,440	1,500	483	477	610	669	257	219	168
22	148	198	302	1,090	1,560	519	502	632	662	406	176	144
23	139	187	272	990	*1,560	519	506	780	622	498	227	183
24	66	242	258	990	1,440	519	467	715	538	400	222	183
25	168	192	176	990	1,500	514	395	651	519	357	149	235
26	162	172	170	1,020	1,440	524	378	609	495	334	169	177
27	164	238	241	1,140	1,260	568	522	609	457	349	167	142
28	147	175	244	1,560	1,190	573	476	588	462	352	207	226
29	142	159	493	1,610	-	568	480	568	562	335	191	177
30	144	192	b650	1,190	-	555	471	522	555	324	156	140
31	61	-	b600	b950	-	640	-	498	-	290	172	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,255	168	61	137	0.239	0.28
November	5,947	262	151	198	.346	.39
December	8,137	650	130	262	.457	.53
Calendar year 1948	183,724	2,300	61	502	.876	11.95
January	28,485	1,880	501	919	1.60	1.85
February	32,710	2,300	640	1,168	2.04	2.12
March	21,364	1,090	483	689	1.20	1.39
April	15,279	826	378	509	.888	.99
May	13,791	780	246	445	.777	.90
June	15,703	975	269	523	.913	1.02
July	11,650	564	251	376	.656	.76
August	7,066	311	148	228	.398	.46
September	5,332	260	109	178	.311	.35
Water year 1948-49	169,719	2,300	61	465	.812	11.04

Peak discharge (base, 1,250 sec.-ft.).- Jan. 20 (3 a.m.) 2,240 sec.-ft.; Jan. 29 (5 a.m.) 1,880 sec.-ft.; Feb. 15 (11:30 p.m.) 2,510 sec.-ft.; Feb. 23 (5 to 8 a.m.) 1,610 sec.-ft.; Feb. 26 (12:30 a.m.) 1,560 sec.-ft.

* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Kalamazoo River at Marshall, Mich.

Location.- Water-stage recorder, lat. 42°15'55", long. 84°57'55", on line between secs. 25 and 26, T. 2 S., R. 6 W., at bridge on U. S. Highway 27 at Marshall. Datum of gage is 877.09 feet above mean sea level (levels by Michigan Department of Conservation).

Drainage area.- 449 square miles.

Records available.- November 1948 to September 1949.

Extremes.- Maximum discharge during period, 1,600 second-feet Feb. 16 (gage height, 7.41 feet); minimum, 40 second-feet July 19 (gage height, 3.38 feet); minimum daily, 119 second-feet Aug. 5.

High water of Mar. 22, 1948, reached a stage of 7.85 feet, from graph based on gage readings (discharge, 1,960 second-feet).

Remarks.- Records good. Flow regulated at all stages by power plant above station.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-	269	329	412	482	1,110	303	233	215	176	237
2		-	222	308	326	480	1,140	354	283	266	222	216
3		-	269	278	366	453	1,110	343	242	222	192	127
4		-	261	289	290	387	1,000	325	246	152	213	182
5		-	221	316	308	417	780	295	247	267	119	227
6		-	216	424	386	400	634	324	204	213	181	193
7		-	301	430	309	393	546	291	239	170	203	177
8		-	285	439	329	411	447	211	222	247	148	238
9		-	153	403	362	437	452	283	202	234	153	196
10		-	255	320	346	378	411	255	238	261	198	263
11		-	215	403	364	415	417	273	199	250	173	187
12		325	212	310	388	402	420	270	242	277	234	174
13		295	210	317	744	342	369	220	217	224	175	203
14	†237	305	277	324	812	415	345	274	272	212	178	176
15		232	266	332	1,420	329	405	227	387	228	238	212
16		340	392	336	1,290	207	432	257	486	164	183	205
17		307	409	360	1,290	310	411	251	587	229	176	177
18		291	331	390	1,290	302	460	237	623	243	238	331
19		314	363	669	1,030	294	466	339	618	132	214	344
20		361	277	630	838	291	461	403	559	209	132	308
21		303	310	730	714	287	426	399	511	146	157	255
22		326	295	636	648	354	422	420	458	266	236	293
23		347	316	545	562	442	404	463	415	234	134	220
24		334	271	506	522	471	384	465	374	260	160	264
25		315	209	474	558	431	312	455	354	133	183	147
26		220	228	452	591	427	374	397	378	161	188	253
27		379	262	426	549	423	368	381	294	177	146	211
28		278	260	499	514	451	345	350	265	197	149	233
29		224	319	517	-	400	321	276	340	176	183	210
30		283	284	434	-	410	335	292	214	187	235	190
31		-	299	342	-	768	-	214	-	132	191	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	-	-	-	-	-	-
November 12-30	5,779	379	220	304	0.677	0.48
December	8,457	409	153	273	.608	.70
Calendar year	-	-	-	-	-	-
January	13,168	730	278	425	.947	1.09
February	17,558	1,420	290	627	1.40	1.46
March	12,409	768	207	400	.891	1.03
April	15,507	1,140	312	517	1.15	1.28
May	9,847	465	211	318	.708	.82
June	10,149	623	199	338	.753	.84
July	6,484	277	132	209	.465	.54
August	5,708	238	119	184	.410	.47
September	6,649	344	127	222	.494	.55
Water year	-	-	-	-	-	-

† Result of discharge measurement.

Kalamazoo River near Battle Creek, Mich.

Location.- Water-stage recorder, lat. 42°20'45", long. 85°15'45", in NE¼ sec. 32, T. 1 S., R. 8 W., half a mile upstream from Wabascon Creek and 3 miles downstream from city of Battle Creek. Datum of gage is 797.00 feet above mean sea level, datum of 1929.

Drainage area.- 849 square miles.

Records available.- July 1937 to September 1949.

Average discharge.- 12 years (1937-49), 673 second-feet.

Extremes.- Maximum discharge during year, 3,510 second-feet Feb. 16 (gage height, 7.53 feet); minimum, 203 second-feet Oct. 10; minimum daily, 263 second-feet Aug. 28; minimum gage height, 1.94 feet Oct. 29.
1937-49: Maximum discharge, 7,290 second-feet Apr. 7, 1947 (gage height, 9.13 feet); minimum, 50 second-feet Sept. 22, 1939; minimum daily, 143 second-feet Aug. 21, 1941; minimum gage height, 1.51 feet Feb. 22, 1940.

Remarks.- Records good except those for periods of no gage-height record, which are fair. Flow below about 1,500 second-feet regulated by power plants above station.

Revisions (water years).- W 924: 1938, 1939.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	340	363	399	436	803	1,080	2,120	603	480	427	297	326
2	323	381	399	476	803	1,010	2,470	603	483	413	339	336
3	301	441	394	411	708	968	2,610	587	507	408	333	322
4	369	427	381	398	708	905	2,430	636	480	394	328	302
5	283	a420	368	476	636	885	2,130	a550	413	354	328	302
6	297	a450	435	a520	619	845	1,840	a600	435	422	272	328
7	311	a420	368	a600	636	845	1,420	a600	398	376	272	338
8	318	410	408	664	603	865	1,200	a500	392	416	297	338
9	337	452	389	604	636	885	1,040	a560	489	456	297	365
10	284	505	350	574	654	885	960	a540	395	424	282	333
11	333	501	376	516	636	805	841	a520	364	436	320	354
12	272	471	363	536	654	765	784	504	346	444	454	318
13	345	486	363	470	1,440	765	841	486	366	406	340	318
14	281	507	363	456	1,900	705	708	470	a450	425	314	371
15	356	492	551	389	2,850	745	920	486	a600	412	276	334
16	307	420	566	551	3,350	705	920	486	a800	395	314	345
17	301	471	619	523	3,070	495	898	537	983	356	305	350
18	317	486	589	604	3,070	652	960	521	1,020	401	286	415
19	292	494	544	1,460	2,750	565	983	689	1,020	346	314	574
20	321	550	436	1,370	2,240	600	920	879	1,050	335	286	559
21	332	536	476	1,370	1,840	582	940	841	983	390	267	529
22	325	536	476	1,460	1,690	652	920	879	878	337	296	476
23	330	522	450	1,460	1,440	865	879	973	706	360	305	476
24	322	499	424	1,280	1,300	865	784	996	644	367	267	450
25	351	433	398	1,110	1 300	845	765	900	612	373	286	431
26	331	446	384	983	1,260	885	689	891	550	327	286	379
27	349	404	326	940	1,260	865	708	869	550	356	292	457
28	379	454	371	1,010	1,170	845	708	787	482	317	263	406
29	308	441	450	1,070	-	885	670	670	441	356	282	418
30	342	406	489	784	-	885	570	528	509	340	307	392
31	350	-	424	860	-	1,590	-	567	-	312	356	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	10,007	379	272	323	0.380	0.44
November	13,824	550	363	461	.543	.61
December	13,329	619	326	430	.506	.58
Calendar year 1948	290,586	5,650	272	794	.935	12.74
January	24,361	1,460	389	786	.926	1.07
February	40,026	3,350	603	1,430	1.68	1.75
March	25,739	1,590	495	830	.978	1.13
April	34,628	2,610	570	1,154	1.36	1.52
May	20,258	996	470	653	.769	.89
June	17,826	1,050	346	594	.700	.78
July	11,881	456	312	383	.451	.52
August	9,461	454	263	305	.359	.41
September	11,642	574	302	388	.457	.51
Water year 1948-49	232,982	3,350	263	638	.751	10.21

Peak discharge (base, 1,500 sec.-ft.).- Jan. 19 (1 to 2 p.m.) 1,740 sec.-ft.; Feb. 16 (11 a.m.) 3,510 sec.-ft.; Apr. 3 (6 a.m. to 3 p.m.) 2,850 sec.-ft.

a No gage-height record; discharge computed on basis of weather records, recorded range in stage, and records for stations at Comstock and at Marshall.

Kalamazoo River at Comstock, Mich.

Location.- Water-stage recorder, lat. 42°17'05", long. 85°30'50", in NE¼ sec. 19, T. 2 S., R. 10 W., at highway bridge at Comstock, a quarter mile downstream from Comstock Creek. Datum of gage is 759.12 feet above mean sea level, datum of 1929.

Drainage area.- 1,010 square miles.

Records available.- April to August 1931, October 1932 to September 1949.

Average discharge.- 15 years (1934-49), 847 second-feet.

Extremes.- Maximum discharge during year, 3,640 second-feet Feb. 18 (gage height, 5.12 feet); minimum discharge, 274 second-feet Oct. 27 (gage height, 0.76 foot).
1931, 1932-49: Maximum discharge, 6,910 second-feet Apr. 8, 1947 (gage height, 7.94 feet); minimum observed, 199 second-feet Oct. 14, 1934; minimum gage height observed, 0.56 foot May 4, 1931.

Remarks.- Records good except those below 500 second-feet, which are fair. Flow regulated by power plants above station.

Revisions (water years). W 824: 1933-36.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used May 27 to Sept. 30)

0.9	340	3.0	1,900
1.2	500	4.0	2,700
1.6	780	4.9	3,450

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	567	524	645	750	1,140	1,340	2,060	812	574	554	506	446
2	548	530	645	720	1,140	1,260	2,380	780	602	542	476	446
3	530	574	630	742	1,100	1,180	2,700	796	567	518	482	430
4	548	720	623	720	1,020	1,180	3,020	804	630	488	488	482
5	530	652	581	750	948	1,060	2,860	812	542	482	476	548
6	446	588	630	940	844	1,060	2,460	735	512	482	446	494
7	470	780	720	972	852	1,060	1,860	660	482	488	435	482
8	567	652	588	972	844	1,060	1,620	758	470	476	410	452
9	574	567	623	1,060	796	1,060	1,340	682	470	500	410	464
10	560	750	616	1,060	860	1,060	1,220	630	430	524	435	a500
11	464	712	581	820	956	1,020	1,100	623	420	567	435	a500
12	630	750	623	820	884	940	1,100	652	430	560	567	a480
13	470	645	630	916	1,500	956	988	660	446	554	884	a450
14	588	742	602	735	2,220	956	1,060	638	560	542	536	a450
15	530	788	772	720	2,540	892	1,100	609	682	536	518	464
16	560	652	1,060	758	2,620	908	1,260	660	900	512	425	464
17	554	652	1,100	948	3,270	796	1,220	609	1,300	464	458	464
18	494	812	1,060	1,000	3,450	675	1,220	645	1,300	506	602	524
19	458	780	932	1,540	3,360	750	1,220	844	1,300	476	512	682
20	464	804	868	1,900	3,100	788	1,260	1,060	1,340	452	425	750
21	512	916	690	1,700	2,380	804	1,180	1,220	1,420	452	390	690
22	574	932	742	1,580	2,140	765	1,180	1,020	1,300	470	425	623
23	542	836	788	1,700	1,820	1,010	1,140	1,060	1,140	458	415	548
24	488	820	758	1,700	1,620	1,020	1,100	1,140	860	435	425	476
25	560	728	690	1,500	1,500	1,020	1,020	1,100	828	494	425	476
26	538	675	482	1,300	1,500	1,100	948	972	828	518	405	554
27	494	690	435	1,260	1,500	1,100	852	1,100	728	452	360	420
28	574	630	554	1,260	1,460	1,140	1,020	932	682	446	360	452
29	518	682	892	1,420	-	1,020	876	860	623	440	440	452
30	494	668	884	876	-	1,060	836	756	554	430	420	440
31	500	-	750	758	-	1,660	-	655	-	452	425	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	16,346	630	446	527	0.522	0.60
November	21,251	932	524	708	.701	.78
December	22,194	1,100	435	716	.709	.82
Calendar year 1948	366,771	5,740	380	1,002	.992	13.51
January	33,897	1,900	720	1,093	1.08	1.24
February	47,364	3,450	796	1,692	1.68	1.75
March	31,700	1,660	675	1,023	1.01	1.16
April	43,200	3,020	836	1,440	1.43	1.60
May	25,283	1,220	609	816	.808	.93
June	22,920	1,420	420	764	.756	.84
July	15,270	567	430	493	.488	.56
August	14,416	884	360	465	.460	.53
September	15,103	750	420	503	.498	.56
Water year 1948-49	308,944	3,450	360	846	.838	11.37

Peak discharge (base, 1,700 sec.-ft.).- Jan. 20 (7 p.m.) 2,020 sec.-ft.; Feb. 18 (5 a.m.) 3,640 sec.-ft.; Apr. 4 (7 to 9 a.m.) 3,020 sec.-ft.

a No gage-height record; discharge computed on basis of weather records, recorded range in stage, and records for stations near Battle Creek and near Allegan.

Kalamazoo River at Calkins Dam, near Allegan, Mich.

Location.- Water-stage recorder, lat. 42°34', long. 85°57', in sec. 15, T. 2 N., R. 14 W., at hydroelectric plant of city of Allegan, 1 mile upstream from Swan Creek and 8 miles northwest of Allegan. Datum of gage is at mean sea level (levels by city of Allegan).

Drainage area.- 1,540 square miles.

Records available.- April 1929 to September 1936, October 1937 to September 1949.

Average discharge.- 18 years (1930-36, 1937-49), 1,284 second-feet.

Extremes.- Maximum discharge during year, 5,080 second-feet Feb. 19 (gage height, 603.56 feet); minimum daily, 296 second-feet Sept. 3; minimum gage height, 593.16 feet Oct. 20.

1929-36, 1937-49: Maximum discharge, 17,500 second-feet Apr. 11, 1947 (gage height, 606.76 feet); minimum daily, 73 second-feet Aug. 31, 1941; minimum gage height, that of Oct. 20, 1948.

Remarks.- Records good above 900 second-feet, fair from 600 to 900 second-feet, and poor below 600 second-feet. Flow regulated by city of Allegan power plant.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	842	876	1,190	1,150	1,350	2,110	3,260	1,290	1,180	1,150	736	918
2	840	881	1,180	1,120	1,310	1,760	2,560	1,520	1,160	1,060	754	562
3	926	892	1,140	1,200	1,370	1,860	3,140	1,450	1,090	992	694	296
4	845	886	908	1,220	1,590	1,860	2,960	1,290	1,050	982	728	337
5	859	974	920	1,210	1,560	1,680	3,200	1,190	1,000	1,090	761	703
6	874	1,080	1,020	1,220	1,360	1,770	3,270	1,150	1,120	1,080	660	836
7	845	1,030	1,020	1,180	1,390	1,700	2,940	1,280	1,020	1,060	694	714
8	869	1,090	1,040	1,190	1,340	1,610	2,350	1,100	1,050	612	785	528
9	795	926	1,180	1,240	1,310	1,700	2,200	1,200	589	572	706	504
10	764	1,110	1,040	1,360	1,310	1,620	1,840	1,140	570	900	642	751
11	808	922	982	1,410	1,320	1,640	1,630	1,130	742	1,010	494	662
12	964	1,080	946	1,420	1,280	1,690	1,940	1,080	864	908	815	886
13	950	1,030	914	1,330	1,920	1,480	1,410	1,110	974	1,020	816	795
14	960	1,020	1,000	1,300	3,080	1,340	1,720	1,020	942	1,010	778	780
15	720	1,140	1,040	1,320	3,560	1,470	1,640	952	1,110	1,020	1,030	736
16	771	1,200	1,220	1,220	3,870	1,340	1,710	1,090	1,330	968	862	688
17	434	1,200	1,290	1,270	3,330	1,400	1,590	1,110	1,510	922	816	678
18	516	1,140	1,370	1,340	3,950	1,510	1,740	1,120	1,620	1,070	727	811
19	523	1,190	1,360	2,020	4,230	1,290	1,860	1,120	1,710	592	827	957
20	822	1,180	1,420	2,480	3,950	1,230	1,750	1,280	1,800	977	822	966
21	541	1,050	1,360	2,540	3,680	1,270	1,860	2,240	1,600	768	412	980
22	784	1,200	1,340	2,330	3,290	1,300	1,670	1,560	1,650	576	744	986
23	986	1,210	1,290	2,280	2,850	1,290	1,790	1,690	1,880	526	558	984
24	647	1,230	1,310	2,140	2,440	1,550	1,580	1,390	1,350	546	633	966
25	516	1,140	1,170	2,300	2,620	1,470	1,660	1,780	1,390	752	741	792
26	1,050	1,160	1,140	2,130	2,350	1,670	1,530	1,450	1,310	770	765	938
27	763	1,180	1,190	2,000	2,390	1,760	1,530	1,370	1,330	766	751	622
28	894	1,110	1,020	1,880	2,050	1,830	1,330	1,300	1,180	843	540	920
29	978	1,110	1,020	1,960	-	1,790	1,410	1,420	1,220	836	565	628
30	818	1,150	1,020	1,760	-	1,680	1,330	1,130	1,010	750	804	592
31	926	-	1,150	1,710	-	2,650	-	1,210	-	793	963	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	24,830	1,050	434	801	0.520	0.60
November	32,387	1,230	876	1,080	.701	.78
December	35,190	1,420	908	1,135	.737	.85
Calendar year 1948	568,284	7,980	354	1,553	1.01	13.73
January	50,230	2,540	1,120	1,620	1.05	1.21
February	66,050	4,230	1,280	2,359	1.53	1.59
March	50,320	2,650	1,230	1,623	1.05	1.21
April	60,400	3,270	1,330	2,013	1.31	1.46
May	40,162	2,240	952	1,296	.842	.97
June	36,351	1,880	570	1,212	.787	.88
July	26,921	1,150	526	868	.564	.65
August	22,623	1,030	412	730	.474	.55
September	22,518	986	296	751	.488	.54
Water year 1948-49	467,982	4,230	296	1,282	.832	11.29

Battle Creek at Charlotte, Mich.

Location.- Staff gage, lat. 42°32'20", long. 84°50'55", in SW¼ sec. 24, T. 2 N., R. 5 W., 30 feet upstream from county bridge and 1 mile southwest of Charlotte.

Drainage area.- 67 square miles.

Records available.- February 1948 to September 1949.

Extremes.- Maximum discharge during year, 376 second-feet Feb. 13 (gage height, 5.50 feet, from graph based on gage readings); minimum, 6.5 second-feet Aug. 26; minimum gage height, 1.18 feet Sept. 30.
1948-49: Maximum discharge, 722 second-feet Mar. 20, 1948 (gage height, 7.64 feet); minimum observed, that of Aug. 26, 1949; minimum gage height observed, that of Sept. 30, 1949.

Remarks.- Records good. Gage read twice daily. Slight infrequent regulation by city water works 1 mile upstream.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.2	9.6	12	14	34	47	316	27	13	16	16	9.8
2	8.4	9.6	12	11	33	45	236	41	12	16	18	8.9
3	8.0	9.6	12	11	28	42	164	37	12	15	17	9.2
4	8.0	11	12	12	28	47	123	30	11	15	16	9.5
5	8.0	12	12	76	26	51	100	27	9.8	13	15	9.5
6	8.0	12	12	47	26	49	83	26	8.9	14	15	9.8
7	8.4	11	12	30	26	44	70	24	8.6	14	15	10
8	8.8	11	12	28	24	41	59	22	8.0	14	14	9.5
9	8.4	10	12	26	34	40	52	20	7.4	19	13	8.6
10	8.0	12	12	24	32	39	46	19	7.4	18	11	8.6
11	9.2	12	12	22	27	37	41	18	7.1	16	11	7.4
12	9.6	11	12	19	41	35	38	15	7.1	15	13	7.1
13	9.6	12	12	18	316	33	37	14	7.4	15	10	7.7
14	9.6	11	11	17	316	32	34	13	18	20	8.9	8.0
15	9.2	11	17	16	346	30	40	12	72	18	8.6	8.0
18	8.4	11	24	25	326	28	41	13	123	16	7.7	7.7
17	d8.5	12	20	24	226	24	41	13	118	15	7.7	8.0
18	d9.0	12	17	27	159	27	48	13	79	15	7.7	17
19	9.2	12	16	177	132	26	49	38	58	15	7.7	10
20	8.8	14	16	109	110	25	42	30	45	15	7.4	9.2
21	8.8	13	16	74	88	25	38	47	43	16	7.4	9.8
22	8.8	12	16	51	82	32	39	37	53	16	7.1	10
23	8.8	12	15	41	76	41	38	168	37	16	6.8	9.8
24	8.8	12	15	43	74	36	34	86	30	17	7.1	9.8
25	8.8	12	15	41	90	34	34	51	30	16	7.1	9.2
26	9.2	11	15	36	70	35	32	39	29	16	6.8	9.5
27	9.2	11	15	36	61	43	31	32	24	17	6.8	9.5
28	8.8	12	15	60	56	41	29	26	20	18	7.4	9.5
29	8.8	12	26	58	-	36	28	21	16	19	9.5	9.5
30	8.8	12	20	36	-	35	27	18	18	17	8.6	9.5
31	9.6	-	17	34	-	186	-	16	-	16	9.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	272.2	9.6	8.0	8.80	0.131	0.15
November	344.8	14	9.6	11.5	.172	.19
December	462	26	11	14.9	.222	.26
Calendar year	-	-	-	-	-	-
January	1,243	177	11	40.1	.599	.69
February	2,887	346	24	103	1.54	1.60
March	1,286	186	24	41.5	619	.71
April	1,990	316	27	66.3	.990	1.10
May	993	168	12	32.0	.478	.55
June	932.7	123	7.1	31.1	.464	.52
July	498	20	13	16.1	.240	.28
August	323.5	18	6.8	10.4	.155	.18
September	279.6	17	7.1	9.32	.139	.16
Water year 1948-49	11,512.3	346	6.8	31.5	.470	6.39

Peak discharge (base, 190 sec.-ft.).- Jan. 19 (10 to 12 p.m.) 216 sec.-ft.; Feb. 13 (10 a.m.) 376 sec.-ft.; Apr. 1 (1 to 3 p.m.) 336 sec.-ft.; May 23 (10 a.m.) 221 sec.-ft.

d Doubtful gage-height record; discharge computed on basis of weather records and records for station at Battle Creek.

Battle Creek at Battle Creek, Mich.

Location.- Staff gage, lat. 42°19'55", long. 85°09'15", in sec. 5, T. 2 S., R. 7 W., 350 feet upstream from Verona Road bridge in city of Battle Creek and 3 miles upstream from mouth. Datum of gage is 823.24 feet above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Drainage area.- 241 square miles.

Records available.- October 1930 to July 1931, October 1932 to September 1949.

Average discharge.- 15 years (1934-49), 206 second-feet.

Extremes.- Maximum discharge during year, 1,270 second-feet Feb. 15 (gage height, 2.42 feet); minimum, 47 second-feet Aug. 22-29.
1930-31, 1932-49: Maximum discharge, 3,640 second-feet Apr. 7, 1947 (gage height, 4.48 feet, from floodmark); minimum, 22 second-feet Aug. 14, 1934; minimum gage height, about -0.5 foot in July 1936 and on Aug. 31, 1939, due to opening of gates at dam forming control.

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

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Nov. 30 to Dec. 29, Jan. 4-8, May 1 to Sept. 6)

0.6	50	1.4	430
.7	85	1.8	720
.8	125	2.3	1,170
1.1	265		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	71	64	89	110	240	359	530	179	125	101	64	74
2	68	60	82	100	220	326	1,080	174	105	89	64	68
3	68	57	82	110	206	280	1,120	161	105	85	60	68
4	68	57	82	134	192	255	980	156	105	89	57	68
5	68	71	82	170	184	255	848	143	101	85	57	64
6	64	105	82	197	174	260	680	138	97	82	57	57
7	64	105	82	215	166	265	495	130	89	82	54	57
8	64	101	78	240	170	265	406	125	82	82	50	57
9	64	101	78	260	156	265	354	117	74	93	50	64
10	60	93	78	235	170	260	315	113	71	109	50	64
11	60	93	78	210	179	240	290	113	64	101	71	64
12	57	89	78	202	202	230	250	109	64	93	105	64
13	57	85	78	192	290	215	240	105	71	82	93	57
14	57	85	85	188	495	197	230	101	105	82	74	57
15	54	85	113	179	1,120	192	255	97	152	78	71	57
16	50	85	125	174	1,170	188	265	101	206	71	64	57
17	50	101	117	166	1,120	184	285	97	280	71	64	57
18	50	105	117	206	1,080	174	315	101	348	68	60	93
19	50	125	113	315	980	174	320	161	382	64	57	101
20	50	156	105	348	848	170	315	202	495	64	57	93
21	54	166	101	364	680	166	305	250	565	64	50	93
22	57	152	97	430	530	170	295	285	462	60	50	89
23	57	138	93	530	462	202	280	290	359	57	47	85
24	60	125	89	495	424	240	265	300	270	57	47	85
25	64	113	85	418	412	260	260	300	230	60	47	85
26	64	105	78	359	400	250	240	290	188	64	47	78
27	64	97	74	305	394	245	230	270	174	60	47	78
28	64	93	74	280	376	250	220	245	166	57	47	78
29	64	93	93	245	-	265	206	188	166	68	57	71
30	64	89	100	240	-	255	197	156	156	74	60	71
31	64	-	110	245	-	376	-	138	-	68	64	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,870	71	50	60.3	0.250	0.29
November	2,994	166	57	99.8	.414	.46
December	2,818	125	74	90.9	.377	.43
Calendar year 1948	90,788	3,060	40	248	1.03	14.00
January	7,862	530	100	254	1.05	1.21
February	13,040	1,170	156	466	1.93	2.01
March	7,433	376	166	240	.996	1.15
April	12,071	1,120	197	402	1.67	1.86
May	5,335	300	97	172	.714	.82
June	5,857	565	64	195	.809	.90
July	2,360	109	57	76.1	.316	.36
August	1,842	105	47	59.4	.246	.28
September	2,154	101	57	71.8	.298	.33
Water year 1948-49	65,636	1,170	47	180	.747	10.10

Peak discharge (base, 700 sec.-ft.).- Feb. 15 (5:30 p.m.) 1,270 sec.-ft.; Apr. 2 (12 p.m.) 1,220 sec.-ft.

Note.- Stage-discharge relation affected by ice Dec. 30 to Jan. 3.

Portage Creek at Kalamazoo, Mich.

Location.- Wire-weight gage, lat. 42°16'30", long. 85°34'35", on line between secs. 22 and 27, T. 2 S., R. 11 W., on Reed Street Bridge, in Kalamazoo, and 1½ miles upstream from mouth. Datum of gage is 761.50 feet above mean sea level (levels by Michigan Department of Conservation).

Drainage area.- 48 square miles.

Records available.- December 1947 to September 1949.

Extremes.- Maximum discharge during year, 221 second-feet Mar. 31 (gage height, 3.82 feet); minimum observed, 24 second-feet Aug. 29 (gage height, 2.18 feet).
1947-49: Maximum discharge, 285 second-feet Mar. 19, 1948 (gage height, 4.20 feet, from graph based on gage readings); minimum observed, that of Aug. 29, 1949.

Remarks.- Records good except those for periods of doubtful or no gage-height record and those for Nov. 20 to Jan. 19, which are fair. Gage read twice daily. Flow regulated by St Regis Paper Co. dams above station.

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Dec. 14, 15)

Oct. 1 to Dec. 15		Dec. 16 to Sept. 30	
2.2	46	2.2	26
2.4	59	2.5	52
2.7	87	2.8	83
3.0	121	3.2	134
		3.7	206

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	49	55	58	53	a60	135	58	48	42	35	44
2	51	49	54	59	52	a60	112	56	46	a40	40	42
3	a48	53	56	60	52	60	81	58	48	a40	38	42
4	44	56	49	67	53	60	76	55	46	a40	38	45
5	44	61	59	93	48	60	69	55	42	a40	34	47
6	44	58	56	69	42	60	65	54	39	a40	34	44
7	44	61	51	67	48	61	63	48	43	a40	42	47
8	45	56	56	64	52	57	61	48	45	a40	38	42
9	46	53	55	64	52	60	57	50	46	a40	38	45
10	46	59	55	75	49	60	56	48	45	a40	35	46
11	44	57	44	58	50	a60	63	46	42	a40	36	47
12	49	58	52	54	49	a60	57	47	46	43	35	41
13	51	56	58	49	75	57	56	45	54	42	38	48
14	51	53	56	43	121	55	58	47	64	41	35	42
15	49	56	114	48	152	55	61	48	105	42	38	43
16	51	53	124	58	84	54	61	53	91	38	34	40
17	48	57	97	60	69	57	65	54	81	36	38	38
18	49	60	69	59	68	52	66	59	70	36	34	45
19	50	59	72	116	58	51	85	75	70	35	32	54
20	50	62	74	76	64	51	62	94	59	37	32	48
21	51	57	73	63	62	51	62	70	56	40	32	47
22	52	56	71	54	68	55	66	67	56	40	35	45
23	51	62	69	58	68	65	67	67	50	32	33	42
24	51	a62	66	65	67	65	65	59	48	38	32	42
25	51	a60	59	61	67	65	63	54	57	34	34	42
25	50	a60	41	55	63	67	62	57	48	35	31	40
27	50	a60	59	61	63	70	59	55	42	35	32	41
28	51	63	75	75	61	65	53	52	47	34	35	42
29	52	62	81	67	-	63	53	49	46	34	26	d40
30	47	56	64	53	-	69	54	48	45	37	35	38
31	47	-	66	58	-	206	-	47	-	37	43	-

Moath	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,507	52	44	48.6	1.01	1.16
November	1,724	83	49	57.5	1.20	1.34
December	2,030	124	41	65.5	1.36	1.57
Calendar year 1948	22,507	212	41	61.5	1.28	17.48
January	1,967	116	43	63.5	1.32	1.52
February	1,810	152	42	64.6	1.35	1.41
March	1,991	206	51	64.2	1.34	1.54
April	1,993	135	53	66.4	1.38	1.54
May	1,723	94	45	55.6	1.16	1.34
June	1,625	105	39	54.2	1.13	1.26
July	1,188	43	32	38.3	.798	.92
August	1,092	43	26	35.2	.733	.85
September	1,309	54	38	43.6	.908	1.01
Water year 1948-49	19,959	206	26	54.7	1.14	15.46

a No gage-height record; discharge computed on basis of weather records and records for Kalamazoo River at Comstock and near Battle Creek.
d Doubtful gage-height record; discharge computed on basis of weather records and records for Kalamazoo River at Comstock and near Battle Creek.

Grand River at Jackson, Mich.

Location.- Water-stage recorder, lat. 42°17'05", long. 84°24'30", in sec. 22, T. 2 S., R. 1 W., 1 mile north of Jackson and 2¼ miles upstream from Portage River. Datum of gage is 900.00 feet above mean sea level (Fargo Engineering Co. bench mark).

Drainage area.- 174 square miles.

Records available.- April 1935 to September 1949.

Average discharge.- 14 years, 117 second-feet.

Extremes.- Maximum discharge during year, 537 second-feet Feb. 15 (gage height, 11.20 feet); minimum, 28 second-feet Sept. 6; minimum daily, 33 second-feet Aug. 21, 28; minimum gage height, 8.57 feet Oct. 24.
1935-49: Maximum discharge, 1,070 second-feet June 25, 1937 (gage height, 13.50 feet); minimum, 9.2 second-feet Aug. 22, 1936; minimum daily, 12 second-feet Aug. 23, 1936.

Remarks.- Records good except those for period of no gage-height record, which are fair. Slight regulation above station.

Revisions (water year).- W 974: 1937(M).

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	46	128	89	175	218	430	108	79	66	42	37
2	44	46	118	80	160	205	442	113	72	57	59	37
3	38	53	71	82	105	188	454	109	67	51	a50	36
4	44	55	62	88	98	178	465	106	60	48	a45	49
5	44	92	63	148	86	177	465	105	53	52	a40	41
6	44	72	66	113	75	178	454	98	54	51	a40	36
7	50	71	61	130	71	177	430	88	51	61	a40	50
8	46	80	60	125	103	177	397	79	48	77	a40	41
9	42	94	60	132	97	177	356	82	47	109	a40	41
10	38	111	60	137	83	169	326	79	46	74	a40	37
11	43	100	55	135	80	160	296	75	44	74	a70	36
12	45	101	60	128	104	151	201	68	42	72	43	39
13	44	139	62	114	212	142	130	51	55	70	40	48
14	44	125	66	108	197	146	118	46	62	68	36	41
15	44	126	108	113	365	137	164	43	107	63	39	40
16	41	135	103	139	430	133	150	47	190	59	41	39
17	37	128	106	235	442	128	150	47	226	50	42	37
18	41	121	101	286	477	128	168	62	346	55	41	100
19	41	133	103	336	477	118	169	94	277	54	39	50
20	41	135	111	296	465	114	192	83	233	53	37	48
21	40	123	178	306	454	118	316	76	207	65	33	50
22	40	130	173	296	442	120	326	128	192	80	37	51
23	42	132	155	286	408	137	296	144	151	48	39	56
24	36	128	151	286	386	150	277	130	114	42	39	51
25	41	121	123	277	356	186	268	123	109	47	38	42
26	43	125	118	277	336	190	151	128	94	47	34	44
27	43	148	123	268	316	192	135	121	90	47	35	39
28	43	141	76	239	296	195	130	113	86	47	33	37
29	41	139	116	197	-	192	121	100	77	45	43	35
30	39	132	80	150	-	190	111	89	71	43	48	35
31	41	-	68	182	-	408	-	84	-	37	43	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,308	50	36	42.2	0.243	0.28
November	3,282	148	46	109	.626	.70
December	2,985	178	55	96.3	.553	.64
Calendar year 1948	49,268	652	22	135	.776	10.52
January	5,778	336	80	186	1.07	1.23
February	7,296	477	71	261	1.50	1.56
March	5,279	408	114	170	.977	1.13
April	8,088	465	111	270	1.55	1.73
May	2,819	144	43	90.9	.522	.60
June	3,350	346	42	112	.644	.72
July	1,812	109	37	58.5	.336	.39
August	1,286	70	33	41.5	.239	.28
September	1,323	100	35	44.1	.253	.28
Water year 1948-49	44,606	477	33	122	.701	9.54

Peak discharge (base, 420 sec.-ft.).- Feb. 15 (2:30 a.m.) 537 sec.-ft.; Mar. 31 (8 a.m.) 537 sec.-ft.

a No gage-height record; discharge computed on basis of recorded range in stage, weather records, and records for Grand River at Lansing and Orchard Creek at Munith.

Grand River at Lansing, Mich.

Location.- Water-stage recorder, lat. 42°45'20", long. 84°34'55", in SW¼ sec. 5, T. 4 N., R. 2 W., at northwest limits of Lansing, 3½ miles downstream from Cedar River. Datum of gage is 803.11 feet above mean sea level (levels by Michigan Department of Conservation).

Drainage area.- 1,230 square miles.

Records available.- November 1934 to September 1949. March 1901 to August 1906 at site at Seymour Street Bridge, 1⅝ miles upstream.

Average discharge.- 12 years (1935-37, 1938-39, 1940-49), 815 second-feet.

Extremes.- Maximum discharge during year, 5,890 second-feet Feb. 15 (gage height, 9.44 feet); minimum daily, 87 second-feet Oct. 30.

1934-49: Maximum discharge, 16,400 second-feet Apr. 7, 1947 (gage height, 15.59 feet, from floodmark); minimum, 6 second-feet Aug. 26, 1941; minimum daily, 20 second-feet Aug. 25, 1941.

Remarks.- Records good except those for periods of no gage-height record, which are poor. Flow regulated below about 2,500 second-feet and occasionally at high discharges by power plants above station.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	182	246	406	a550	783	1,430	3,780	685	498	613	188	205
2	110	152	358	a500	820	1,430	4,380	708	441	462	216	188
3	95	224	339	a450	792	1,340	4,180	634	382	389	201	112
4	217	203	320	a400	761	1,220	3,500	634	368	342	226	164
5	169	316	295	a700	706	1,160	2,960	566	356	304	191	168
6	167	304	305	a1,200	599	1,220	2,560	533	302	273	174	169
7	189	318	333	a1,100	576	1,220	2,260	491	299	321	223	181
8	170	358	302	a1,000	568	1,130	2,050	466	323	270	195	181
9	166	350	326	a900	685	1,070	1,770	450	281	393	204	180
10	145	377	292	847	830	1,040	1,580	368	274	458	199	118
11	199	343	146	752	780	955	1,330	416	278	482	280	142
12	190	489	281	691	780	905	1,290	406	264	406	199	180
13	166	339	283	618	2,480	930	1,160	363	309	345	237	218
14	195	247	276	595	4,180	830	1,100	333	543	457	241	197
15	a200	359	451	585	5,340	755	1,190	276	876	440	183	211
18	a200	366	360	595	5,780	730	1,280	309	1,290	404	186	194
17	a200	370	a550	693	5,010	618	1,340	292	1,660	333	a200	127
18	204	337	a500	911	4,480	640	1,490	373	1,760	284	a200	212
19	191	425	a450	1,800	4,180	595	1,640	545	1,590	237	a200	320
20	184	502	460	1,910	3,410	559	1,580	1,320	1,310	264	a200	395
21	172	478	513	1,840	2,720	586	1,430	1,320	1,150	227	a200	369
22	171	544	475	1,980	2,480	513	1,340	1,120	1,050	207	198	322
23	128	550	434	1,640	2,260	798	1,280	1,120	927	261	186	274
24	141	439	477	1,660	2,120	1,020	1,250	1,280	731	298	191	231
25	198	450	a350	1,470	2,120	1,090	1,280	1,080	859	253	183	222
28	197	466	a300	1,300	1,910	1,100	1,160	975	651	239	191	247
27	173	396	281	1,190	1,840	1,240	1,100	841	580	234	110	233
28	178	417	309	1,300	1,700	1,280	980	724	508	244	115	204
29	243	413	804	1,200	-	1,310	905	642	578	249	181	214
30	87	382	543	789	-	1,190	805	564	726	209	215	188
31	135	-	582	704	-	2,190	-	502	-	199	206	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	5,362	243	87	173	0.141	0.16
November	11,160	550	152	372	.302	.34
December	11,900	603	146	384	.312	.36
Calendar year 1948	379,370	11,400	70	1,037	.843	11.48
January	31,870	1,980	400	1,028	.836	.96
February	60,690	5,780	568	2,168	1.76	1.83
March	31,994	2,190	513	1,032	.839	.97
April	53,950	4,380	805	1,798	1.46	1.63
May	20,336	1,320	276	656	.533	.61
June	21,164	1,760	264	705	.573	.64
July	10,077	613	199	325	.264	.30
August	6,119	280	110	197	.160	.18
September	6,366	395	112	212	.172	.19
Water year 1948-49	270,988	5,780	87	742	.603	8.17

Peak discharge (base, 2,800 sec.-ft.).- Feb. 16 (1 to 3 a.m. and 8 p.m.) 5,890 sec.-ft.; Apr. 2, 4,380 sec.-ft.

a No gage-height record; discharge computed on basis of recorded range in stage, weather records, and records for Grand Rapids and Cedar River at East Lansing.

Grand River at Grand Rapids, Mich.

Location.- Water-stage recorder, lat. 42°57'10", long. 85°41'15", at minicipal sewage pumping plant near west limits of Grand Rapids, three-quarters of a mile upstream from Plaster Creek. Datum of gage is 589.01 feet above mean sea level (levels by city of Grand Rapids).
Drainage area.- 4,900 square miles.
Records available.- October 1930 to September 1949. March 1901 to December 1905 and January 1906 to September 1918 (gage heights only) at site at Fulton Street Bridge in Grand Rapids.
Average discharge.- 19 years (1930-49), 3,238 second-feet.
Extremes.- Maximum discharge during year, 18,000 second-feet Feb. 19 (gage height, 10.60 feet); minimum daily, 990 second-feet Aug. 22, 23, 28, 29.
1930-49: Maximum discharge, 42,200 second-feet Mar. 23, 1948 (gage height, 17.03 feet); minimum observed, 341 second-feet Aug. 17, 1936; minimum daily, 381 second-feet Aug. 17, 1936.
A stage of 19.3 feet occurred at Fulton Street gage Mar. 27, 1904 (discharge, 53,000 second-feet).
Remarks.- Records good except those for periods of ice effect or those below 1,500 second-feet, which are fair. Flow slightly regulated by power plants above station.
Cooperation.- Gage-height record furnished by city of Grand Rapids.
Revisions (water years).- W 924: 1938(M).

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1-10)

-4.1	990	-1.6	2,280	5.0	8,680
-3.4	1,270	.2	3,760	8.0	13,200
-2.6	1,670	2.5	5,980	10.5	17,800

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,110	1,370	1,720	2,020	b3,200	7,650	7,210	3,310	1,960	1,780	1,570	1,230
2	1,150	1,370	1,720	2,140	b3,100	6,780	7,980	3,140	1,780	1,840	1,570	1,320
3	1,150	1,230	1,720	2,080	b3,000	6,080	8,560	3,400	1,720	1,780	1,520	1,370
4	1,110	1,270	1,570	2,020	b2,900	5,680	9,200	2,980	1,820	1,670	1,320	1,320
5	1,150	1,470	1,620	1,900	b2,800	5,380	9,200	2,900	1,620	1,570	1,320	1,230
6	1,070	1,420	1,780	2,140	b2,700	4,980	8,560	2,660	1,570	1,470	1,150	1,190
7	1,110	1,470	*1,720	2,660	*b2,600	4,780	7,760	2,580	1,520	1,470	1,150	1,190
8	1,230	1,570	1,720	2,820	b2,500	4,480	6,880	2,280	1,470	1,520	1,190	1,270
9	1,270	1,520	1,620	3,060	b2,500	4,480	5,980	2,210	1,270	1,780	1,230	1,230
10	1,270	1,620	1,570	3,140	b2,500	4,480	5,480	2,080	1,320	2,210	1,110	1,270
11	1,270	1,720	1,570	*2,900	b2,500	4,210	4,880	2,020	1,230	3,060	1,110	1,190
12	1,370	1,670	1,570	2,740	b2,500	4,030	4,480	1,960	1,270	3,310	1,370	1,190
13	1,320	1,670	1,570	2,420	4,880	3,850	4,120	1,780	1,230	2,820	1,520	1,270
14	1,270	1,670	1,570	2,350	8,090	*3,580	3,850	1,780	1,470	2,210	1,520	1,320
15	1,230	1,720	1,780	2,350	9,770	3,310	3,670	1,720	2,020	2,140	1,570	1,320
16	1,230	1,670	1,960	2,420	11,500	3,220	4,030	1,780	2,900	2,140	1,420	1,270
17	1,270	1,670	2,420	2,580	13,100	3,060	4,120	1,780	3,490	2,280	1,370	1,320
18	1,230	1,720	1,960	2,820	14,900	2,900	4,580	1,780	3,850	2,140	1,320	1,270
19	1,270	1,780	1,780	4,210	17,800	2,660	4,980	1,840	4,030	1,960	1,230	1,270
20	1,230	1,960	2,020	6,080	17,000	2,660	5,380	1,980	3,850	1,780	1,150	1,230
21	1,190	2,210	2,080	5,880	15,600	2,580	5,480	2,350	3,760	1,720	1,110	1,190
22	1,230	2,280	2,140	6,080	13,900	2,660	5,280	2,740	3,310	1,780	g990	1,420
23	1,270	2,280	2,020	5,980	12,100	2,980	4,880	3,310	2,980	1,470	g990	1,110
24	1,230	2,210	1,720	6,080	10,500	3,310	4,880	3,140	2,420	1,470	g1,030	1,370
25	1,230	2,140	b1,500	5,880	10,700	3,400	4,580	2,900	2,420	1,370	g1,030	1,320
26	1,270	1,960	b1,400	5,580	10,100	3,760	4,300	2,900	2,280	1,470	g1,030	1,270
27	1,270	1,900	b1,300	4,780	9,480	4,390	4,210	2,620	2,020	1,420	g1,110	1,270
28	1,230	1,840	b1,400	4,300	8,680	4,880	4,030	2,350	2,210	1,670	g990	1,230
29	1,320	1,780	b1,600	3,850	-	5,080	3,760	2,280	2,020	1,670	g990	1,190
30	1,230	1,780	1,840	3,400	-	4,980	3,220	2,080	1,900	1,780	1,110	1,150
31	1,230	-	2,210	b3,300	-	5,780	-	2,020	-	1,670	1,230	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	38,010	1,370	1,070	1,226	0.250	0.29
November	51,940	2,280	1,230	1,731	.353	.39
December	54,170	2,420	1,300	1,747	.357	.41
Calendar year 1948	1,636,043	41,600	888	4,470	.912	12.40
January	109,960	6,080	1,900	3,547	.724	.83
February	220,900	17,800	2,500	7,880	1.61	1.68
March	132,050	7,650	2,580	4,260	.869	1.00
April	165,520	9,200	3,220	5,517	1.13	1.26
May	74,830	3,400	1,720	2,414	.493	.57
June	66,510	4,030	1,230	2,217	.452	.50
July	58,420	3,310	1,370	1,885	.385	.44
August	38,320	1,570	990	1,236	.252	.29
September	37,790	1,420	1,110	1,260	.257	.29
Water year 1948-49	1,048,420	17,800	990	2,872	.586	7.95

Peak discharge (base, 9,100 sec.-ft.).- Feb. 19 (6 a.m. to 12 m.) 18,000 sec.-ft.; Apr. 4 (7 p.m.) to Apr. 5 (9 a.m.) 9,340 sec.-ft.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.
g Gage heights obtained from graph based on gage readings.

Portage River below Little Portage Lake, near Munith, Mich.

Location.- Wire-weight gage, lat. 42°20'55", long. 84°13'45", in NW¼ sec. 32, T. 1 S., R. 2 E., at highway bridge on Portage Lake Road, 0.3 mile downstream from Little Portage Lake and 3½ miles southeast of Munith. Datum of gage is 900.00 feet above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).
Drainage area.- 55 square miles.
Records available.- April 1944 to September 1949.
Extremes.- Maximum discharge during year, 242 second-feet Apr. 3 (gage height, 11.34 feet); no flow Aug. 1 (gage height, 8.06 feet).
1944-49: Maximum discharge, 800 second-feet Apr. 6, 7, 1947 (gage height, 13.0 feet, from graph based on gage readings); no flow at times in 1946 and 1949; minimum gage height, that of Aug. 1, 1949.
Remarks.- Records fair except those for periods of doubtful gage-height record, which are poor. Gage read twice daily.

Rating table, water year 1948-49, except periods of doubtful gage-height record
(gage height, in feet, and discharge in second-feet)
(Shifting-control method used Oct. 1 to Nov. 5, May 1 to Sept. 3)

8.0	0	8.7	24	10.1	112
8.1	2.0	9.1	44	10.4	140
8.2	5.0	9.6	74	10.7	170
8.3	8.0	9.8	88	11.3	236

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.1	8.4	30	26	42	77	192	36	d20	9.6	0.2	1.1
2	4.4	8.0	26	23	36	70	238	35	17	7.7	1.1	1.4
3	4.4	9.2	25	20	32	61	242	34	15	6.2	1.7	1.7
4	3.8	11	24	18	29	56	225	31	13	5.0	2.0	2.0
5	3.8	16	24	26	26	57	198	28	10	4.1	2.6	2.6
6	3.5	26	24	33	24	61	176	25	7.7	4.7	2.6	3.2
7	3.8	32	24	36	25	60	155	22	5.9	4.4	2.6	3.8
8	4.4	34	25	44	21	63	135	19	4.4	4.7	2.6	4.4
9	4.7	34	23	48	22	64	112	16	2.9	5.0	2.3	4.7
10	5.0	34	21	51	26	58	96	15	3.2	5.9	2.3	4.4
11	5.0	33	18	49	26	55	82	12	2.6	6.2	3.5	4.7
12	5.3	32	17	46	26	51	69	12	2.3	5.9	4.7	4.1
13	5.3	31	17	40	48	48	63	9.2	2.0	5.6	5.0	3.8
14	5.0	32	17	36	101	48	60	10	2.9	5.3	5.0	4.4
15	5.3	28	23	32	165	44	d61	8.8	8.0	4.7	4.7	4.7
16	5.3	21	32	35	198	42	d70	8.4	26	4.7	4.4	4.7
17	5.3	28	24	50	214	38	d75	9.2	57	4.1	3.8	5.3
18	5.3	32	42	58	214	36	d90	9.6	61	3.5	4.1	8.8
19	5.6	32	43	90	d185	34	94	11	65	3.2	4.4	14
20	6.2	42	38	96	d165	32	91	16	66	2.9	3.5	16
21	5.9	50	36	108	135	34	85	d18	60	2.3	2.9	15
22	6.2	54	36	116	121	44	76	d28	56	3.2	2.6	14
23	5.0	53	34	112	104	67	72	d38	49	3.5	2.3	11
24	5.6	50	33	102	98	86	67	46	40	3.8	1.7	8.4
25	6.2	46	28	87	98	97	62	45	32	3.8	1.7	7.7
26	6.5	42	20	74	90	104	58	44	24	3.8	1.4	6.8
27	7.1	40	18	64	92	108	53	39	22	3.2	1.4	6.5
28	7.1	37	15	62	89	108	49	34	18	1.7	1.1	6.2
29	7.4	34	18	58	-	103	44	30	15	1.4	.8	5.9
30	7.4	32	26	58	-	103	40	26	18	.8	.5	5.3
31	8.0	-	26	48	-	126	-	d22	-	.2	1.1	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	167.9	8.0	3.5	5.42	0.099	0.11
November	961.6	54	8.0	32.1	.584	.65
December	807	43	15	26.0	.473	.55
Calendar year 1948	15,084.6	390	2.4	41.2	.749	10.20
January	1,746	116	18	56.3	1.02	1.18
February	2,452	214	21	87.6	1.59	1.66
March	2,035	126	32	65.5	1.19	1.37
April	3,128	242	40	104	1.89	2.11
May	737.2	46	8.4	23.8	.433	.50
June	725.9	66	2.0	24.2	.440	.49
July	131.1	9.6	.2	4.23	.077	.09
August	80.6	5.0	.2	2.60	.047	.05
September	186.6	16.0	1.1	6.22	.113	.13
Water year 1948-49	13,158.9	242	.2	36.1	.656	8.89

Peak discharge (base, 150 sec.-ft.).- Feb. 17 (8 to 12 p.m.) 220 sec.-ft.; Apr. 3 (2 to 8 a.m.) 242 sec.-ft.
d Doubtful gage-height record; discharge computed on basis of discharge measurement, weather records, and records for Orchard Creek at Munith and Grand River at Jackson.

Orchard Creek at Munith, Mich.

Location.- Staff gage, lat. 42°23'35", long. 84°15'50", on line between secs. 12 and 13, T. 1 S., R. 1 E., at highway bridge half a mile west of Munith and 3.0 miles upstream from mouth. Datum of gage is 900.00 feet above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Drainage area.- 49 square miles.

Records available.- March 1944 to September 1949.

Extremes.- Maximum discharge during year, 536 second-feet Feb. 15 (gage height, 12.20 feet); minimum, 3.5 second-feet for several days.
1944-49: Maximum discharge, 1,470 second-feet Apr. 5, 1947 (gage height, 14.88 feet, from graph based on gage readings); minimum observed, 1.6 second-feet Sept. 5-7, 22, 23, 1946.

Remarks.- Records fair except those for periods of ice effect or no gage-height record, which are poor. Gage read twice daily.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.8	4.0	7.4	15	23	50	345	27	12	12	5.0	5.9
2	3.5	4.0	7.4	13	22	45	220	24	12	11	5.9	5.3
3	3.5	4.8	7.4	11	20	40	155	21	12	10	5.6	5.3
4	3.5	5.6	7.4	20	19	40	112	20	12	10	5.6	5.3
5	3.5	6.5	8.0	50	18	42	83	19	11	9.6	5.0	5.3
6	3.5	7.1	8.0	40	17	40	74	18	11	9.6	5.0	5.0
7	3.5	7.4	8.4	30	17	37	67	18	10	8.4	5.0	5.0
8	4.2	7.4	8.4	27	18	39	59	17	10	8.0	4.5	5.6
9	4.0	7.4	8.4	20	23	39	50	16	9.6	9.6	4.5	5.0
10	3.5	8.4	8.4	19	28	39	44	15	9.6	11	4.5	4.8
11	3.8	8.0	8.4	19	25	35	41	14	9.6	9.2	6.5	4.0
12	4.0	8.0	8.4	18	25	29	38	14	9.6	8.0	7.7	3.8
13	4.0	7.4	8.4	18	250	25	36	13	9.6	7.7	6.5	4.0
14	4.0	7.4	*7.1	17	315	26	34	12	11	8.4	5.9	4.0
15	4.0	6.8	13	19	476	*26	64	12	16	8.0	5.6	3.8
16	4.0	6.8	17	22	*250	21	75	12	66	7.1	5.0	3.8
17	4.0	7.4	18	22	202	22	70	12	130	6.8	5.9	4.2
18	4.0	8.4	22	28	160	23	72	12	68	6.8	8.0	25
19	4.0	12	16	179	120	25	66	12	42	6.5	7.7	37
20	4.0	16	13	231	80	21	58	22	28	6.2	6.8	27
21	3.5	14	13	182	67	18	55	22	a30	6.2	6.2	15
22	3.5	12	13	132	82	25	50	32	*a25	8.0	6.2	13
23	3.5	12	12	86	66	46	46	44	a20	7.1	6.2	12
24	3.5	11	12	51	67	46	43	34	a17	6.8	6.2	10
25	3.5	9.6	10	*39	86	44	40	26	a15	6.2	6.2	12
26	3.5	8.8	9	38	75	48	37	21	a30	5.9	6.2	11
27	3.5	8.8	9	42	65	51	35	19	25	5.6	6.2	8.0
28	3.5	8.0	10	35	55	48	31	18	21	5.6	5.9	7.1
29	3.5	8.0	15	30	-	45	29	15	17	5.6	5.0	6.8
30	3.5	8.0	25	25	-	96	27	13	16	5.6	5.9	6.5
31	4.0	-	20	24	-	415	-	13	-	5.0	6.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	115.3	4.2	3.5	3.72	0.076	0.09
November	251.0	16	4.0	8.37	.171	.19
December	358.5	25	7.1	11.6	.237	.27
Calendar year 1948	15,359.0	612	3.2	42.0	.857	11.65
January	1,502	231	11	48.5	.990	1.14
February	2,671	476	17	95.4	1.95	2.03
March	1,546	415	18	49.9	1.02	1.18
April	2,156	345	27	71.9	1.47	1.64
May	587	44	12	18.9	.386	.44
June	715.0	130	9.6	23.8	.486	.54
July	241.5	12	5.0	7.79	.159	.18
August	182.6	8.0	4.5	5.89	.120	.14
September	270.5	37	3.8	9.02	.184	.21
Water year 1948-49	10,596.4	476	3.5	29.0	.592	8.05

Peak discharge (base, 140 sec.-ft.).- Jan. 20 (6 to 8 a.m.) 252 sec.-ft.; Feb. 15 (8 a.m.) 536 sec.-ft.; Mar. 31 (3 p.m.) 505 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for Cedar River at East Lansing.

Note.- Stage-discharge relation affected by ice Dec. 26 to Jan. 7, Jan. 28 to Feb. 13, Feb. 28 to Mar. 3.

Cedar River at East Lansing, Mich.

Location.- Water-stage recorder and concrete dam, lat. 42°43'40", long. 84°28'40", in SW¼ sec. 18, T. 4 N., R. 1 W., at East Lansing, 3 miles upstream from Sycamore Creek and 4 miles upstream from mouth. Datum of gage is 824.39 feet above mean sea level, datum of 1929.

Drainage area.- 355 square miles.

Records available.- March 1931 to September 1949. August 1902 to December 1903 at site three-quarters of a mile downstream.

Average discharge.- 18 years (1931-49), 188 second-feet.

Extremes.- Maximum discharge during year, 2,580 second-feet Feb. 16 (gage height, 7.68 feet); minimum, 10 second-feet Sept. 7.
1902-3, 1931-49: Maximum discharge, 5,920 second-feet Apr. 7, 1947 (gage height, 11.58 feet); minimum, 3 second-feet July 31, 1931.

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	50	57	117	191	264	1,450	148	a95	267	46	41
2	30	50	48	93	166	279	1,480	148	a90	175	46	39
3	36	59	50	78	142	264	1,170	a145	a80	157	46	38
4	36	80	50	71	133	235	878	a135	a75	103	43	24
5	39	98	50	195	128	271	692	a130	a70	83	43	14
6	39	a90	52	348	117	321	545	122	66	85	43	14
7	41	a80	52	301	119	301	450	a115	68	98	48	11
8	38	73	57	257	125	267	368	a105	61	90	50	19
9	34	66	52	211	179	253	309	98	57	90	48	28
10	34	63	48	179	242	235	a270	a90	61	133	43	32
11	32	66	43	148	198	211	232	a90	57	142	46	30
12	39	63	a50	131	192	198	208	a85	57	108	52	28
13	36	63	54	106	871	182	191	a80	59	85	48	32
14	32	63	54	111	1,840	179	182	a75	73	90	48	36
15	30	63	68	108	2,080	163	232	a75	111	148	46	52
16	36	57	78	133	2,320	148	364	71	253	119	41	30
17	39	54	106	a200	1,730	125	406	75	a450	93	41	18
18	32	52	90	a300	1,420	139	450	75	a550	78	41	38
19	32	68	95	a800	1,320	125	490	125	a400	73	41	57
20	34	a90	90	718	962	122	a430	467	279	66	39	68
21	38	a95	57	554	666	122	340	368	204	61	39	66
22	43	a90	57	463	559	154	279	271	157	61	38	59
23	41	90	63	377	554	260	301	279	122	57	38	52
24	46	78	73	368	490	301	294	290	103	57	38	46
25	34	66	50	305	545	279	267	215	98	57	38	43
26	38	63	52	242	517	271	235	175	108	54	36	41
27	38	57	52	208	432	328	215	148	95	50	36	39
28	39	66	50	232	373	381	191	131	75	50	38	39
29	34	59	73	242	-	336	169	119	85	50	41	39
30	41	57	122	157	-	279	157	106	332	50	41	39
31	48	-	131	182	-	646	-	101	-	50	39	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,139	46	30	36.7	0.103	0.12
November	2,069	98	50	69.0	.194	.22
December	2,024	131	43	65.3	.184	.21
Calendar year 1948	115,581	4,530	11	316	.890	12.10
January	7,935	800	71	256	.721	.83
February	18,611	2,320	117	665	1.87	1.95
March	7,639	846	122	246	.693	.80
April	13,245	1,480	157	442	1.25	1.40
May	4,657	467	71	150	.423	.49
June	4,391	550	57	146	.411	.46
July	2,880	267	50	92.9	.262	.30
August	1,321	52	36	42.6	.120	.14
September	1,112	68	11	37.1	.105	.12
Water year 1948-49	67,023	2,320	11	184	.518	7.04

Peak discharge (base, 1,100 sec.-ft.).- Feb. 16 (4 to 5 p.m.) 2,580 sec.-ft.; Apr. 1 (9 to 12 p.m.) 1,620 sec.-ft.

a No gage-height record; discharge computed on basis of weather records and records for Grand River at Lansing.

Lookingglass River near Eagle, Mich.

Location.- Wire-weight gage, lat. 42°49'45", long. 84°46'40", in sec. 10, T. N., R. 4 W., at highway bridge 1½ miles northeast of Eagle and 10 miles upstream from mouth.

Drainage area.- 281 square miles.

Records available.- August 1944 to September 1949.

Extremes.- Maximum discharge during year, 1,080 second-feet Feb. 15; maximum gage height observed, 6.55 feet Feb. 13 (backwater from ice); minimum discharge, 27 second-feet Sept. 30 (gage height, 1.25 feet).
1944-49: Maximum discharge, 2,860 second-feet Apr. 5, 1947 (gage height, 7.70 feet, from graph based on gage readings); minimum daily, 15 second-feet Jan. 2, 1947 (occurred during period of ice effect); minimum gage height observed, 1.12 feet Aug. 13, 1944.

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

Rating table, water year 1948-49, except period of ice effect or doubtful gage-height record
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Dec. 13, Sept. 24-30)

1.2	26	2.0	122	3.8	570
1.4	45	2.4	200	4.6	910
1.7	79	3.2	388	4.8	1,010

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	37	41	49	100	230	388	500	158	66	95	45	39
2	36	42	50	90	150	362	455	153	62	99	42	39
3	35	43	49	80	120	326	440	135	57	102	42	37
4	34	44	48	70	110	276	440	127	56	96	41	37
5	33	49	49	150	100	259	470	117	55	86	39	36
6	32	53	49	235	100	253	470	103	52	80	38	35
7	33	55	50	229	100	246	455	96	47	78	38	37
8	35	53	50	224	110	231	427	89	45	72	38	40
9	34	50	50	222	120	218	388	84	43	95	45	38
10	32	50	50	222	120	218	338	79	43	251	86	36
11	34	49	50	a200	150	198	295	77	42	178	109	36
12	38	49	50	a180	250	187	244	74	42	133	167	35
13	38	49	53	d160	400	174	209	72	43	116	95	35
14	38	48	53	d150	600	154	182	69	98	117	79	38
15	36	47	64	144	985	147	189	67	106	129	69	37
16	36	47	75	144	710	140	222	65	154	114	60	36
17	35	47	*80	109	630	130	240	64	172	103	54	36
18	35	48	90	131	*670	120	302	64	172	92	49	40
19	35	50	90	500	730	122	338	92	172	74	45	39
20	36	52	80	314	750	117	326	135	172	62	41	38
21	37	57	75	290	750	112	326	140	164	56	39	41
22	38	62	70	278	770	122	338	156	119	50	37	37
23	39	64	60	266	730	*153	338	166	95	45	35	39
24	40	58	55	266	690	182	326	153	88	43	35	38
25	39	57	50	250	650	209	314	140	79	40	35	36
26	39	54	50	220	535	220	309	133	73	39	35	33
27	39	52	50	200	485	253	266	106	68	39	34	31
28	39	52	50	180	427	253	233	91	68	44	35	30
29	39	52	70	200	-	251	207	84	75	52	36	28
30	40	50	100	250	-	259	176	77	116	52	36	28
31	40	-	100	250	-	455	-	71	-	48	41	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,131	40	32	36.5	0.130	0.15
November	1,524	64	41	50.8	.181	.20
December	1,909	100	48	61.6	.219	.25
Calendar year 1948	91,485	2,020	30	250	.890	12.11
January	6,304	500	70	203	.722	.83
February	12,172	985	100	435	1.55	1.61
March	6,735	455	112	217	.772	.89
April	9,763	500	176	325	1.16	1.29
May	3,237	166	64	104	.370	.43
June	2,644	172	42	88.1	.314	.35
July	2,680	251	39	86.5	.308	.36
August	1,629	176	34	52.5	.187	.22
September	1,085	41	28	36.2	.129	.14
Water year 1948-49	50,813	985	28	139	.495	6.72

Peak discharge (base, 700 sec.-ft.).- Feb. 15 (8 a.m.) 1,080 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records and records for Cedar River at East Lansing and Maple River at Maple Rapids.
d Doubtful gage-height record; discharge computed on basis of weather records and records for Cedar River at East Lansing and Maple River at Maple Rapids.
Note.- Stage-discharge relation affected by ice Dec. 8-12, Dec. 17 to Jan. 5, Jan. 25 to Feb. 14, Mar. 16-18.

Maple River at Maple Rapids, Mich.

Location.- Wire-weight gage, lat. 43°06'35", long. 84°41'35", in sec. 5, T. 8 N., R. 3 W., at highway bridge at Maple Rapids, just downstream from Pine Creek.

Drainage area.- 434 square miles.

Records available.- August 1944 to September 1949.

Extremes.- Maximum discharge during year, 1,430 second-feet Feb. 19 (gage height, 8.75 feet); minimum, 15 second-feet Oct. 7; minimum gage height observed, 2.04 feet Aug. 28. 1944-49: Maximum daily discharge, 6,500 second-feet Mar. 20, 1948; maximum gage height, 11.22 feet, from floodmark (backwater from ice) Mar. 20, 1948; minimum discharge observed, 8.2 second-feet Aug. 11, 1944 (gage height, 1.61 feet).

Remarks.- Records poor. Gage read twice daily.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	26	36	81	214	a600	390	285	44	48	56	24
2	18	26	35	75	189	a550	430	262	40	59	52	24
3	18	26	34	66	173	a500	485	241	38	58	46	24
4	17	27	34	57	158	a450	510	227	38	52	40	22
5	17	29	34	72	141	390	510	208	35	45	36	23
6	16	30	35	122	129	360	485	184	34	40	33	22
7	15	32	37	122	118	345	460	168	34	36	a35	22
8	16	35	36	111	108	338	420	154	32	34	a35	22
9	17	35	35	100	100	330	380	141	32	43	a35	21
10	17	34	33	100	94	322	352	129	30	94	35	21
11	17	37	32	100	91	300	330	118	30	122	36	20
12	17	38	32	97	88	278	300	104	30	137	35	20
13	17	37	33	94	262	278	285	91	30	158	35	20
14	17	36	34	91	522	248	262	82	38	195	32	21
15	16	36	36	88	815	234	255	72	64	220	30	22
16	16	35	42	91	1,140	214	270	72	114	227	27	22
17	16	35	48	97	1,260	195	278	60	133	227	26	21
18	16	39	a50	108	1,300	173	308	57	145	214	25	22
19	17	39	50	195	1,430	163	360	59	149	208	24	21
20	17	42	53	285	1,300	149	410	60	149	189	22	20
21	19	48	50	285	1,100	145	450	63	145	168	22	20
22	19	48	51	308	970	149	460	71	137	149	21	20
23	20	48	51	325	815	163	460	74	125	129	21	20
24	20	45	44	322	735	173	450	67	114	111	20	20
25	21	42	39	315	795	184	430	67	94	97	20	19
26	23	40	36	300	755	201	400	62	82	80	20	18
27	23	39	33	285	a700	227	380	59	69	66	20	19
28	24	38	32	270	a650	278	352	54	57	57	20	18
29	24	37	50	255	-	292	322	50	52	60	22	18
30	25	36	85	241	-	315	285	48	47	64	23	17
31	25	-	82	220	-	345	-	45	-	64	24	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	578	25	15	18.6	0.043	0.05
Movember	1,095	48	26	36.5	.084	.09
December	1,312	85	32	42.3	.097	.11
Calendar year 1948	110,650	6,500	15	302	.696	9.46
January	5,278	325	57	170	.392	.45
February	16,152	1,430	88	577	1.33	1.38
March	8,889	600	145	287	.661	.76
April	11,469	510	255	382	.880	.98
May	3,434	285	45	111	.256	.30
June	2,161	149	30	72.0	.166	.19
July	3,451	227	34	111	.256	.30
August	928	56	20	29.9	.069	.08
September	623	24	17	20.8	.048	.05
Water year 1948-49	55,370	1,430	15	152	.350	4.74

Peak discharge (base, 1,000 sec.-ft.).- Feb. 19 (8 a.m.) 1,430 sec.-ft.
a No gage-height record; discharge computed on basis of weather records and records for Lookingglass River near Eagle and Thornapple River near Hastings.

Thornapple River near Hastings, Mich.

Location.- Wire-weight gage, lat. 42°36'55", long. 85°14'15", in sec. 27, T. 3 N., R. 8 W., at highway bridge half a mile downstream from Cedar Creek, 2 miles downstream from Thornapple Lake, and 3½ miles southeast of Hastings.

Drainage area.- 385 square miles.

Records available.- October 1944 to September 1949.

Extremes.- Maximum discharge during year, 2,300 second-feet Feb. 15 (gage height, 6.68 feet); minimum, 82 second-feet Aug. 9, 10 (gage height, 2.90 feet).
1944-49: Maximum discharge, 6,810 second-feet Apr. 7, 1947 (gage height, 10.20 feet, from graph based on gage readings); minimum observed, 43 second-feet Aug. 26-28, 1946.

Remarks.- Records good. Gage read twice daily.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Dec. 4, June 28 to Sept. 30)

2.9	82	3.9	400
3.1	123	4.7	855
3.3	169	5.7	1,520
3.6	265	6.6	2,220

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	88	96	127	183	277	455	885	197	150	167	102	112
2	94	102	125	167	269	375	1,240	186	143	143	102	110
3	90	104	123	157	258	323	1,340	194	136	127	100	110
4	86	106	121	143	223	305	1,240	194	134	117	98	108
5	88	117	130	186	194	318	1,040	180	125	112	96	110
6	88	115	138	314	191	336	753	169	119	110	92	110
7	90	119	138	385	191	332	582	164	115	110	92	108
8	98	123	138	370	183	314	477	157	112	108	88	108
9	100	121	134	323	189	305	385	150	110	110	82	108
10	92	125	132	293	207	297	318	143	104	117	82	108
11	96	132	130	258	200	281	285	138	102	119	104	106
12	100	130	132	233	243	261	265	136	98	117	229	106
13	102	127	136	197	648	240	258	134	106	110	191	106
14	100	125	138	175	1,340	223	236	134	112	132	138	108
15	100	123	162	175	2,220	213	273	a130	169	152	123	108
16	98	123	203	226	2,220	200	336	130	301	152	110	106
17	96	132	233	285	2,050	186	360	130	390	134	106	106
18	96	141	213	318	1,770	183	375	132	428	119	104	110
19	92	143	191	560	1,620	183	416	177	416	112	102	117
20	92	164	177	717	1,340	175	416	355	328	108	102	117
21	94	186	169	885	915	175	375	400	258	106	100	115
22	98	177	167	975	735	203	350	422	226	106	98	112
23	98	164	157	885	620	269	336	385	194	104	96	112
24	98	145	150	664	582	293	332	365	167	100	96	112
25	96	136	138	582	631	289	314	328	172	100	96	112
26	96	130	121	494	675	293	281	285	229	100	96	112
27	98	127	121	416	648	318	265	247	251	96	96	112
28	98	127	121	380	538	390	247	213	216	102	100	112
29	98	123	138	395	-	428	226	183	177	104	106	112
30	96	125	a150	336	-	411	210	a170	189	106	106	110
31	96	-	167	289	-	526	-	157	-	104	112	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,952	102	86	95.2	0.247	0.28
November	3,908	186	96	130	.338	.38
December	4,620	233	121	149	.387	.45
Calendar year 1948	139,856	4,890	74	382	.992	13.51
January	11,966	975	143	386	1.00	1.15
February	21,177	2,220	183	756	1.96	2.04
March	9,100	526	175	294	.764	.88
April	14,416	1,340	210	481	1.25	1.40
May	6,485	422	130	209	.543	.63
June	5,777	428	98	193	.501	.56
July	3,604	167	96	116	.301	.35
August	3,345	229	82	108	.281	.32
September	3,303	117	106	110	.286	.32
Water year 1948-49	90,653	2,220	82	248	.644	8.76

Peak discharge (base, 750 sec.-ft.).- Jan. 22, 975 sec.-ft.; Feb. 15 (5 to 10 p.m.) 2,300 sec.-ft.; Apr. 3 (8 a.m. to 6 p.m.) 1,340 sec.-ft.
a No gage-height record; discharge interpolated.

Higgins Lake Outlet near Roscommon, Mich.

Location.- Wire-weight gage, lat. 44°25'50", long. 84°40'10", in sec. 34, T. 24 N., R. 3 W., on upstream side county highway bridge over Higgins Lake Outlet, 3 miles southwest of Roscommon and 8 miles upstream from Backus Creek. Datum of gage is 1,150.88 feet above mean sea level (levels by Michigan Department of Conservation).

Drainage area.- 58 square miles.

Records available.- June 1942 to September 1949.

Extremes.- Maximum discharge observed during year, 68 second-feet June 29 (gage height, 2.20 feet); minimum daily, 3 second-feet Dec. 10, 11, caused by ice jam upstream. 1942-49: Maximum discharge observed, 110 second-feet June 28, 1943 (gage height, 3.15 feet); minimum daily, that of Dec. 10, 11, 1948.

Remarks.- Records good except those for periods of ice effect or those below 10 second-feet, which are fair. Gage read once daily.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	16	21	23	36	42	44	44	34	67	44	7.6
2	23	16	21	23	36	40	45	45	34	66	43	6.6
3	23	16	21	*23	36	40	45	46	35	64	42	5.9
4	22	16	20	23	35	40	44	44	36	64	40	5.9
5	21	17	21	22	35	40	44	41	37	64	37	7.0
6	21	17	22	22	36	40	44	42	36	67	30	6.2
7	20	17	21	21	36	39	44	42	34	66	31	6.2
8	21	17	20	21	36	40	45	42	33	63	32	6.2
9	20	17	15	21	35	40	44	40	32	63	32	5.9
10	20	18	*3	21	35	40	44	39	32	66	32	5.6
11	19	17	3	21	35	39	44	38	32	61	32	5.9
12	20	17	12	21	36	39	44	38	32	60	33	5.6
13	20	18	11	21	36	38	44	38	33	59	32	5.9
14	19	17	11	21	37	38	42	38	39	58	31	5.9
15	19	18	18	21	38	38	43	38	53	57	31	5.6
16	19	17	16	23	40	38	46	38	52	55	29	5.6
17	19	20	15	25	46	38	43	38	52	54	29	5.6
18	18	18	15	26	38	38	42	38	52	53	28	5.6
19	18	18	18	30	38	38	42	41	52	52	24	5.6
20	18	21	15	30	38	38	42	38	52	50	11	5.2
21	17	22	15	30	38	36	42	39	52	48	10	4.8
22	17	22	16	30	37	39	40	40	52	47	9.8	4.5
23	17	21	28	30	36	40	40	40	50	45	9.4	4.5
24	17	21	25	30	40	39	42	42	52	44	9.0	4.2
25	16	21	23	30	42	40	40	40	54	46	8.7	3.8
26	16	22	21	30	42	40	45	40	56	46	8.4	4.2
27	16	22	22	31	42	42	46	39	56	46	8.0	7.0
28	16	22	23	34	42	42	45	38	58	46	8.0	7.0
29	16	21	23	36	-	43	44	36	67	46	8.0	6.6
30	16	22	25	38	-	44	44	36	67	46	8.0	6.2
31	16	-	24	36	-	45	-	36	-	45	8.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	584	24	16	18.8	0.324	0.37
November	564	22	16	18.8	.324	.36
December	564	28	3	18.2	.314	.36
Calendar year 1948	14,741	74	3	40.3	.695	9.46
January	814	38	21	26.3	.453	.52
February	1,057	46	35	37.8	.652	.68
March	1,233	45	36	39.8	.686	.79
April	1,303	46	40	43.4	.748	.83
May	1,234	46	36	39.8	.686	.79
June	1,356	67	32	45.2	.779	.87
July	1,714	67	44	55.3	.953	1.10
August	738.7	44	8.0	23.8	.410	.47
September	172.4	7.6	3.8	5.75	.099	.11
Water year 1948-49	11,334.1	67	3	31.1	.536	7.25

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 7 to Jan. 18.

Muskegon River near Merritt, Mich.

Location.- Water-stage recorder, lat. 44°20'10", long. 84°53'30", in sec. 2, T. 22 N., R. 5 W., 35 feet above bridge on State Highway 55, half a mile upstream from West Branch, 2½ miles east of Merritt, and 5 miles west of Houghton Lake. Datum of gage is 1,117.82 feet above mean sea level (levels by Michigan Department of Conservation). Prior to July 13, 1949, wire-weight gage on downstream side of bridge.

Drainage area.- 309 square miles.

Records available.- October 1946 to September 1949.

Extremes.- Maximum discharge during year, 584 second-feet Apr. 1, 2; maximum gage height, 6.82 feet Apr. 2; minimum discharge, 36 second-feet Sept. 26 (gage height, 2.37 feet). 1946-49: Maximum discharge observed, 904 second-feet Apr. 17, 1947 (gage height, 7.61 feet); minimum, that of Sept. 26, 1949.

Remarks.- Records fair except those for periods of ice effect or no gage-height record, which are poor. Occasional regulation by operation of gates at Reedsburg Dam.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Sept. 4-30)

Oct. 1 to June 18				June 19 to Sept. 30	
2.5	44	5.6	320	2.4	44
3.0	76	6.2	413	3.1	89
3.8	137	6.6	512	4.0	161
4.6	210	6.8	584	4.8	233

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	51	137	95	135	170	584	289	99	144	81	52
2	59	51	137	85	135	180	584	283	84	136	81	46
3	53	51	101	130	135	180	529	295	94	174	78	46
4	51	52	80	200	135	175	482	a300	99	a150	75	46
5	50	60	86	180	120	175	*456	301	90	124	72	49
6	48	a65	96	150	125	175	a450	266	89	161	69	49
7	45	68	121	135	130	175	433	250	85	144	69	51
8	48	67	a120	125	140	170	a410	220	78	a160	68	53
9	51	70	125	125	145	165	a390	200	76	179	60	50
10	a50	70	121	125	145	165	370	129	73	188	60	48
11	48	67	121	125	145	165	354	109	69	a180	62	46
12	52	74	117	125	145	160	333	117	64	161	64	45
13	54	89	121	125	135	160	320	117	63	148	61	48
14	54	91	a125	130	120	155	307	125	86	144	59	48
15	51	a90	125	165	140	150	a290	a125	150	136	58	48
16	54	a90	125	160	140	150	261	125	215	128	56	46
17	a52	99	121	160	140	150	261	105	a230	124	55	44
18	51	133	117	160	140	145	240	103	245	112	55	46
19	54	141	a120	150	140	145	215	121	238	108	53	43
20	53	145	121	135	140	140	215	125	a225	104	50	44
21	50	172	a120	150	145	140	225	117	202	96	48	44
22	a51	a170	a120	150	155	160	a240	125	184	92	47	42
23	52	163	*117	130	168	180	256	129	156	88	46	46
24	51	a160	a110	150	*181	210	266	a125	152	90	46	44
25	49	a160	100	a160	181	230	289	121	170	108	44	41
26	51	158	85	168	a175	250	a300	125	a170	100	44	40
27	51	158	90	*168	168	280	a300	125	161	94	44	42
28	51	a150	95	a155	155	310	314	117	156	90	46	45
29	52	145	95	168	-	350	301	113	166	89	46	52
30	52	141	90	160	-	430	295	a110	a160	90	46	61
31	51	-	80	135	-	*500	-	103	-	86	48	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,601	62	45	51.6	0.167	0.19
November	3,201	172	51	107	.346	.39
December	3,439	137	80	111	.359	.41
Calendar year 1948	63,544	644	45	174	.563	7.64
January	4,479	200	85	144	.466	.54
February	4,058	181	120	145	.469	.49
March	6,290	500	140	203	.657	.76
April	10,270	584	215	342	1.11	1.24
May	5,015	301	103	162	.524	.60
June	4,129	245	63	138	.447	.50
July	3,928	188	86	127	.411	.47
August	1,791	81	44	57.8	.187	.22
September	1,405	61	40	46.8	.151	.17
Water year 1948-49	49,606	584	40	136	.440	5.98

* Winter discharge measurement made on this day.
a No gage-height record; discharge interpolated or computed on basis of weather records and records for station at Evart.
Note.- Stage-discharge relation affected by ice Dec. 25 to Jan. 24, Jan. 30 to Feb. 22, Feb. 28 to Mar. 31.

Muskegon River at Evart, Mich.

Location.- Wire-weight gage, lat. 43°54', long. 85°15', in sec. 34, T. 18 N., R. 8 W., on highway bridge at east edge of Evart, half a mile upstream from Twin Creek.

Drainage area.- 1,450 square miles.

Records available.- November 1930 to June 1931, January 1934 to September 1949.

Average discharge.- 15 years (1934-49), 930 second-feet.

Extremes.- Maximum discharge during year, 3,100 second-feet Mar. 30 (gage height, 10.32 feet, from graph based on gage readings); minimum observed, 325 second-feet Aug. 27 (gage height, 6.80 feet).
1930-31, 1934-49: Maximum discharge, 7,000 second-feet June 3, 4, 1945 (gage height, 13.68 feet, from high-water mark); minimum observed, 164 second-feet Dec. 20, 1947 (gage height, 6.35 feet).

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

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Mar. 30				Mar. 31 to Sept. 30			
6.8	350	8.8	1,670	6.9	370	8.4	1,340
7.3	625	9.5	2,300	7.3	570	9.4	2,210
8.0	1,040	10.3	3,100	7.6	750	10.3	3,100

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	350	380	607	760	570	1,150	3,000	1,100	515	685	515	440
2	362	380	571	700	600	1,050	2,900	1,140	505	655	490	435
3	399	380	548	640	600	1,000	2,700	1,140	500	620	470	420
4	370	390	526	580	600	1,000	2,600	1,100	480	581	455	420
5	365	444	548	540	600	1,000	2,350	1,060	465	559	440	490
6	360	494	583	590	600	1,000	2,210	1,030	460	554	430	440
7	355	526	583	630	610	1,050	2,080	995	435	625	450	445
8	395	499	543	600	630	950	1,900	925	415	661	455	485
9	385	494	538	560	660	950	1,720	890	415	730	435	455
10	365	499	526	560	670	1,000	1,580	820	410	827	440	440
11	380	510	482	560	670	950	1,460	764	406	757	450	415
12	385	499	521	560	670	900	1,340	698	397	718	485	410
13	380	499	516	560	600	860	1,260	631	397	679	455	420
14	385	494	526	540	560	860	1,220	625	554	637	430	430
15	385	494	554	530	600	840	1,180	620	1,220	608	402	415
16	380	482	560	660	640	750	1,220	603	1,580	576	384	406
17	375	554	472	760	640	650	1,140	598	1,940	564	374	397
18	370	601	400	830	640	700	1,140	608	1,900	537	356	392
19	370	607	416	900	640	700	1,140	625	1,540	520	361	374
20	370	787	504	920	650	700	1,100	608	1,300	500	352	370
21	370	895	538	880	700	750	1,030	576	1,180	485	352	370
22	370	865	*589	840	709	1,460	1,030	581	1,100	475	348	366
23	370	835	521	810	*721	2,030	1,060	608	925	460	348	366
24	375	787	477	775	865	2,120	1,060	625	806	460	343	374
25	375	745	430	805	1,300	2,210	1,060	631	960	505	338	379
26	375	715	395	*781	1,500	2,450	1,140	631	1,060	704	343	370
27	375	679	380	739	1,380	2,700	1,220	608	925	834	334	374
28	370	651	500	709	1,250	2,900	1,220	586	834	834	374	388
29	375	631	740	601	-	3,000	1,180	576	750	750	392	366
30	375	643	900	600	-	*3,100	1,140	554	698	643	388	348
31	380	-	810	560	-	3,000	-	537	-	559	379	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	11,586	399	350	374	0.258	0.30
November	17,459	895	380	582	.401	.45
December	16,804	900	380	542	.374	.43
Calendar year 1948	303,291	5,800	309	829	.572	7.77
January	21,080	920	530	680	.469	.54
February	20,875	1,500	560	746	.514	.54
March	43,780	3,100	650	1,412	.974	1.12
April	46,380	3,000	1,030	1,546	1.07	1.19
May	23,093	1,140	537	745	.514	.59
June	25,072	1,940	397	836	.577	.64
July	19,302	834	460	623	.430	.50
August	12,568	515	334	405	.279	.32
September	12,200	490	348	407	.281	.31
Water year 1948-49	270,209	3,100	334	740	.510	6.93

Peak discharge (base, 2,500 sec.-ft.).- Mar. 30, 3,100 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 25 to Jan. 23, Jan. 30 to Feb. 21, Feb. 28 to Mar. 21.

Muskegon River at Newaygo, Mich.

Location.- Water-stage recorder, lat. 43°25', long. 85°48', in sec. 24, T. 12 N., R. 13 W., in tailrace of power plant operated by Consumers Power Co. at Newaygo, 600 feet downstream from Penoyer Creek.
Drainage area.- 2,350 square miles.
Records available.- October 1930 to September 1949. June 1901 to December 1906 at site above Newaygo.
Average discharge.- 19 years (1930-49), 1,745 second-feet.
Extremes.- Maximum discharge during year, 5,670 second-feet Apr. 5 (gage height, 50.14 feet); minimum, 446 second-feet Aug. 28 (gage height, 46.28 feet); minimum daily, 588 second-feet Aug. 21.
1901-6, 1930-49: Maximum discharge, 11,600 second-feet June 2, 1945 (gage height, 53.76 feet); minimum, about 150 second-feet June 4, 1941; minimum daily, 390 second-feet July 13, 1934.
Remarks.- Records good. Flow regulated by Hardy Dam (since 1931), Croton Dam, and several smaller dams, and by power plant at Newaygo at all stages.
Revisions (water years).- W 974: 1933, 1935, 1937, 1938.

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)

Oct. 1 to Feb. 28		Mar. 1 to Sept. 30	
46.5	590	46.4	540
46.9	920	46.7	800
47.2	1,230	47.4	1,530
47.7	1,860	48.0	2,400
48.9	3,750	49.0	3,910

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	614	630	1,720	646	1,760	3,380	3,750	1,770	1,280	1,490	1,480	1,030
2	606	814	1,460	854	1,730	2,920	3,680	2,020	1,290	1,080	1,830	1,020
3	590	1,250	1,060	1,050	1,750	2,920	3,680	2,180	1,280	1,070	1,800	1,020
4	830	1,080	1,040	1,190	1,720	3,000	3,910	2,180	1,140	1,080	1,410	1,030
5	1,140	893	1,020	1,730	1,210	2,920	3,680	2,020	1,100	890	1,040	1,020
6	1,020	638	1,350	1,720	1,200	2,780	3,220	1,770	1,170	1,090	656	1,030
7	893	622	1,730	1,460	1,420	2,700	3,220	1,760	1,290	1,090	629	1,230
8	622	806	1,730	1,010	1,660	2,920	2,850	1,790	1,300	1,080	970	1,800
9	614	1,140	1,470	1,000	1,640	2,920	2,100	1,760	1,300	1,100	1,090	1,060
10	614	1,780	1,050	1,360	1,630	2,780	1,950	1,760	1,170	1,390	1,080	1,050
11	1,410	1,760	1,020	1,720	1,660	2,480	1,920	1,650	950	1,800	1,100	920
12	1,820	1,750	1,020	1,720	1,660	2,180	2,180	1,300	612	1,770	1,080	950
13	1,780	1,050	1,280	1,720	1,680	2,180	2,250	1,200	980	1,790	1,080	1,080
14	1,490	1,000	1,730	1,630	2,000	2,700	2,400	1,050	1,120	1,800	1,070	1,120
15	622	1,110	1,220	1,030	2,080	2,920	2,400	1,040	2,030	1,510	1,080	1,100
16	614	1,730	893	1,340	2,080	2,700	1,790	1,220	3,300	1,090	1,360	1,080
17	598	1,330	1,030	1,930	2,080	2,180	1,770	1,300	3,220	1,080	1,530	800
18	814	1,030	1,000	2,150	2,080	2,180	2,020	1,300	3,220	1,090	1,080	860
19	1,080	1,040	1,020	2,150	1,710	1,740	2,400	1,320	2,480	1,430	1,060	1,090
20	1,200	1,240	1,360	2,150	1,750	1,730	2,400	1,290	2,620	1,830	665	1,140
21	990	1,730	1,730	2,080	2,080	2,020	2,250	1,080	2,850	1,430	588	1,150
22	875	2,000	1,640	1,690	2,080	2,780	1,950	1,090	2,780	960	870	1,120
23	598	2,150	1,040	1,750	2,080	3,300	1,770	1,240	2,100	620	1,080	1,080
24	614	2,080	1,020	2,080	2,230	3,300	1,760	1,600	1,790	638	1,080	860
25	606	1,760	1,000	2,150	3,590	3,300	1,950	1,760	1,390	970	910	604
26	782	1,800	662	2,080	3,750	2,250	2,180	1,760	1,340	1,430	612	980
27	1,000	1,120	782	2,150	3,750	2,320	2,100	1,740	2,020	1,600	612	1,120
28	1,020	1,000	1,130	2,080	3,750	3,450	2,180	1,030	2,180	1,170	596	1,120
29	662	1,560	1,050	2,080	-	3,750	1,950	1,040	2,180	1,150	1,180	1,120
30	622	1,730	1,060	1,550	-	3,750	1,760	1,050	1,950	1,100	1,030	1,130
31	614	-	970	1,490	-	3,750	-	1,160	-	1,080	1,030	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	27,354	1,820	590	882	0.375	0.43
November	39,623	2,150	622	1,321	.562	.63
December	37,287	1,730	662	1,203	.512	.59
Calendar year 1948	656,447	7,910	575	1,794	.763	10.38
January	50,540	2,150	646	1,630	.694	.80
February	57,810	3,750	1,200	2,065	879	.92
March	86,200	3,750	1,730	2,781	1.18	1.36
April	73,420	3,910	1,760	2,447	1.04	1.16
May	46,230	2,180	1,030	1,491	.634	.73
June	53,432	3,300	612	1,781	.758	.85
July	38,698	1,830	620	1,248	.531	.61
August	32,698	1,830	588	1,055	.449	.52
September	31,414	1,600	604	1,047	.446	.50
Water year 1948-49	574,706	3,910	588	1,575	.670	9.10

Pere Marquette River at Scottville, Mich.

Location.- Water-stage recorder, lat. 43°46'40", long. 86°16'45", in sec. 19, T. 18 N., R. 16 W., at Scottville, 5¾ miles downstream from South Branch. Datum of gage is 606.30 feet above mean sea level, datum of 1929.

Drainage area.- 709 square miles.

Records available.- June 1943 to September 1949. August 1939 to June 1943 at site 4¾ miles upstream, published as Pere Marquette River at Custer.

Average discharge.- 10 years (1939-49), 620 second-feet.

Extremes.- Maximum discharge during year, 1,150 second-feet Mar. 30 to Apr. 1; maximum gage height, 4.51 feet Dec. 30 (backwater from ice); minimum discharge, 380 second-feet Oct. 6, Aug. 27.
1939-49: Maximum discharge, 2,400 second-feet June 4, 5, 1945 (gage height, 5.84 feet); minimum observed, 310 second-feet Aug. 9, 10, 1941 (gage height, 2.12 feet, site and datum then in use).

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

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Mar. 25				Mar. 26 to Sept. 30			
2.0	390	3.8	974	1.8	380	3.2	750
2.5	500	4.1	1,120	2.2	445	3.7	955
3.0	645			2.6	545	4.1	1,150

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	420	420	500	550	600	860	1,150	658	465	490	465	445
2	430	410	488	530	600	820	1,120	658	455	465	455	445
3	410	410	488	500	600	780	1,100	658	455	455	435	435
4	390	420	488	475	600	760	1,050	675	445	445	425	410
5	390	420	488	475	600	740	978	675	445	435	418	410
6	380	440	500	475	600	730	910	640	435	455	418	410
7	390	450	500	475	600	710	850	605	435	490	418	418
8	400	450	500	475	600	700	810	575	425	502	418	435
9	410	440	488	475	600	700	770	560	425	478	410	445
10	400	462	475	475	600	700	750	545	425	478	402	435
11	400	475	488	475	600	700	710	530	425	515	455	418
12	430	475	475	475	600	700	675	530	418	478	445	418
13	440	475	488	475	610	662	658	530	425	455	455	445
14	440	488	488	475	630	645	640	515	465	455	435	465
15	420	488	500	475	640	628	658	502	605	465	418	465
16	420	475	512	580	650	610	692	502	710	478	410	445
17	410	512	512	645	650	580	730	502	870	455	402	425
18	410	550	512	740	620	565	750	502	1,050	435	395	418
19	410	595	488	700	600	565	750	502	1,050	425	395	418
20	410	628	488	660	595	538	730	515	850	418	388	410
21	410	645	500	660	595	550	710	515	710	418	388	410
22	410	700	*500	660	580	662	692	530	640	418	388	410
23	410	720	488	660	*580	800	730	545	590	410	388	410
24	410	662	475	660	645	930	790	545	575	410	388	418
25	410	610	475	*662	780	1,040	810	545	590	425	388	418
26	410	580	450	595	880	1,050	770	530	605	455	388	418
27	410	550	470	565	940	1,050	750	515	622	530	380	418
28	410	538	500	595	900	1,100	750	502	605	502	425	410
29	410	525	540	600	-	1,120	730	490	545	515	435	410
30	410	512	600	600	-	1,150	692	478	502	530	425	410
31	410	-	570	600	-	1,150	-	478	-	490	410	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	12,720	440	380	410	0.578	0.67
November	15,525	720	410	518	.731	.82
December	15,434	600	450	498	.702	.81
Calendar year 1948	216,748	2,260	355	592	.835	11.38
January	17,462	740	475	563	.794	.91
February	18,095	940	580	646	.911	.95
March	24,295	1,150	538	784	1.11	1.28
April	23,905	1,150	640	797	1.12	1.25
May	18,052	675	478	550	.776	.89
June	17,262	1,050	418	575	.811	.90
July	14,375	530	410	464	.654	.75
August	12,865	465	380	415	.585	.67
September	12,747	465	410	425	.599	.67
Water year 1948-49	201,737	1,150	380	553	.780	10.57

Peak discharge (base, 1,100 sec.-ft.).- Mar. 30 to Apr. 1, 1,150 sec.-ft.; June 19 (4 a.m.) 1,100 sec.-ft.

* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Dec. 27 to Jan. 13, Jan. 19-24, Jan. 29 to Feb. 19, Feb. 25 to Mar. 11.

Big Sable River near Free Soil, Mich.

Location.- Staff gage, lat. 44°07'15", long. 86°16'50", in sec. 24, T. 20 N., R. 17 W., 30 feet downstream from bridge on U. S. Highway 31, 2¼ miles northwest of Free Soil, and 6 miles upstream from Hamlin Lake. Datum of gage is 615.32 feet above mean sea level, datum of 1929 (levels by Michigan State Department of Conservation).

Drainage area.- 127 square miles.

Records available.- May 1942 to September 1949.

Extremes.- Maximum discharge during year, 323 second-feet Mar. 31; maximum gage height observed, 2.62 feet Jan. 30 (backwater from ice); minimum daily discharge, 94 second-feet Aug. 20-27.

1942-49: Maximum discharge observed, 487 second-feet Apr. 7, 1947; maximum gage height observed, 3.26 feet Jan. 20, 1943 (backwater from ice); minimum discharge observed, 81 second-feet Aug. 14, 1944.

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	108	107	125	125	140	135	235	152	115	107	112	102
2	107	106	123	125	140	130	235	152	112	106	112	103
3	105	106	122	125	140	130	228	151	112	105	106	98
4	105	106	122	125	140	130	220	151	110	104	105	99
5	105	107	122	125	140	130	199	151	107	104	103	99
6	106	115	122	127	140	130	192	147	106	115	105	99
7	106	113	123	128	140	130	186	141	106	114	104	101
8	105	107	123	129	135	130	179	135	106	107	103	105
9	106	106	123	129	130	125	172	134	106	106	101	105
10	106	114	123	127	125	125	166	133	106	106	100	102
11	106	118	122	125	130	125	160	130	105	104	107	100
12	116	118	124	124	136	125	153	128	104	103	108	101
13	116	117	125	122	136	125	153	127	105	103	105	110
14	113	118	127	121	137	125	149	125	114	104	103	115
15	109	115	130	123	137	125	160	124	141	104	101	112
16	108	121	135	135	133	120	165	122	147	102	100	106
17	106	136	134	150	128	120	166	122	142	102	98	105
18	106	133	134	140	136	120	161	129	133	99	96	101
19	106	129	133	130	129	120	161	133	124	96	95	100
20	106	147	128	130	128	120	156	129	122	96	94	100
21	107	162	127	130	128	125	152	124	115	96	94	100
22	106	156	129	135	*127	150	160	137	110	96	94	100
23	106	152	130	135	130	199	172	157	113	95	94	100
24	106	145	128	135	135	199	166	149	147	98	94	100
25	107	137	123	135	160	199	166	147	147	117	94	99
26	107	134	121	*136	150	199	179	139	149	156	94	97
27	107	134	121	135	145	220	179	135	141	153	94	95
28	106	133	122	133	140	228	172	129	125	147	97	96
29	106	129	119	134	-	*228	158	124	116	130	100	96
30	105	128	119	140	-	228	154	123	112	123	99	96
31	107	-	125	140	-	286	-	121	-	118	99	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,319	116	105	107	0.843	0.97
November	3,749	162	106	125	.984	1.10
December	3,884	135	119	125	.984	1.13
Calendar year 1948	49,619	371	90	136	1.07	14.53
January	4,053	150	121	131	1.03	1.19
February	3,815	160	125	136	1.07	1.11
March	4,781	286	120	154	1.21	1.40
April	5,254	235	149	175	1.38	1.54
May	4,201	157	121	136	1.07	1.23
June	3,598	149	104	120	.945	1.05
July	3,416	156	95	110	.866	1.00
August	3,111	112	94	100	.787	.91
September	3,042	115	95	101	.795	.89
Water year 1948-49	46,223	286	94	127	1.00	13.52

Peak discharge (base, 250 sec.-ft.).- Mar. 31 (8 p.m.) 323 sec.-ft.

* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Dec. 31 to Jan. 5, Jan. 16-25, Jan. 30 to Feb. 9, Feb. 11, Feb. 24 to Mar. 22.

Manistee River near Grayling, Mich.

Location.- Water-stage recorder, lat. 44°41'35", long. 84°50'50", in sec. 31, T. 27 N., R. 4 W., just upstream from bridge on State Highway 72, 2½ miles downstream from Goose Creek and 6½ miles northwest of Grayling.

Drainage area.- 159 square miles.

Records available.- November 1942 to September 1949.

Extremes.- Maximum discharge during year, 264 second-feet Mar. 28 (gage height, 1.26 feet); minimum, 147 second-feet Sept. 19.
1942-49: Maximum discharge, 354 second-feet Apr. 12, 1947; maximum gage height, 1.94 feet Feb. 6, 1947 (backwater from ice); minimum discharge, 122 second-feet Feb. 14, 1943.

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	167	164	169	155	180	176	223	186	164	168	163	162
2	162	162	168	155	178	182	213	196	163	167	165	163
3	161	162	168	*160	181	174	215	189	164	167	164	158
4	161	165	168	160	*182	173	210	186	164	180	163	156
5	161	172	168	160	186	172	210	183	163	175	163	157
6	162	180	169	160	181	170	213	180	163	173	164	154
7	162	175	168	160	177	170	210	176	162	169	183	157
8	165	168	167	160	178	170	212	174	163	166	171	160
9	164	167	166	165	174	169	205	174	163	169	166	156
10	163	171	166	165	173	169	204	173	162	171	165	155
11	165	171	165	165	173	168	204	171	162	169	170	154
12	171	169	168	165	174	168	202	173	162	167	171	153
13	175	172	167	170	174	167	202	171	165	166	166	156
14	171	171	165	170	172	168	199	173	198	165	163	161
15	168	172	168	170	173	168	199	171	242	164	163	155
16	167	170	169	184	172	168	201	171	228	164	162	155
17	166	183	166	192	170	169	199	173	195	163	162	151
18	168	186	167	187	173	167	198	175	182	162	162	151
19	169	178	166	196	172	165	195	171	175	163	162	149
20	167	199	167	191	171	165	191	170	174	163	160	151
21	169	207	168	189	170	169	192	168	172	162	161	151
22	167	192	168	186	171	181	198	170	171	163	162	150
23	166	182	167	186	169	195	192	172	169	162	161	152
24	165	177	160	183	177	188	192	168	174	165	161	153
25	165	174	150	182	195	192	191	166	181	173	159	152
26	165	174	155	181	188	208	220	170	191	168	160	151
27	164	173	155	180	182	237	220	168	180	174	161	151
28	164	171	160	180	174	259	198	166	172	170	170	151
29	164	171	160	177	-	257	192	167	170	168	166	151
30	163	170	160	180	-	248	187	165	168	164	162	150
31	164	-	155	180	-	235	-	166	-	163	162	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	5,131	175	161	166	1.04	1.20
November	5,248	207	162	175	1.10	1.23
December	5,103	169	150	165	1.04	1.20
Calendar year 1948	64,998	282	150	178	1.12	15.20
January	5,394	196	155	174	1.09	1.26
February	4,940	195	169	176	1.11	1.16
March	5,767	259	165	186	1.17	1.35
April	6,087	223	187	203	1.28	1.43
May	5,382	196	165	174	1.09	1.26
June	5,262	242	162	175	1.10	1.23
July	5,183	180	162	167	1.05	1.21
August	5,093	183	159	164	1.03	1.19
September	4,626	163	149	154	.969	1.08
Water year 1948-49	63,216	259	149	173	1.09	14.80

Peak discharge (base, 260 sec.-ft.).- Mar. 28 (7 p.m.) 264 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-dsicharge relation affected by ice Dec. 24 to Jan. 15, Jan. 30, 31.

Manistee River near Sherman, Mich.

Location.- Wire-weight gage, lat. 44°26', long. 85°42', on line between sec. 36, T. 24 N., R. 12 W., and sec. 31, T. 24 N., R. 11 W., 150 feet upstream from Wheeler Creek and three-quarters of a mile north of Sherman.

Drainage area.- 900 square miles.

Records available.- July 1903 to May 1916, November 1930 to June 1931, January 1934 to September 1949.

Average discharge.- 27 years (1903-15, 1934-49), 1,080 second-feet.

Extremes.- Maximum discharge observed during year, 2,070 second-feet Mar. 30 (gage height, 12.97 feet); minimum, 770 second-feet Oct. 4-6.
1903-16, 1930-31, 1934-49: Maximum discharge observed, 3,500 second-feet Mar. 25, 1913 (gage height, 7.0 feet, datum then in use); minimum observed, 540 second-feet Feb. 21-23, 1936 (backwater from ice).

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

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Nov. 20, Jan. 18 to Sept. 30				Nov. 21 to Jan. 17			
9.6	770	12.0	1,620	9.6	800	10.5	1,080
10.0	870	13.0	2,070	10.0	920	10.8	1,180
11.0	1,220						

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	782	795	935	880	930	995	1,890	1,340	900	995	930	858
2	782	808	935	900	930	945	1,760	1,180	885	960	915	845
3	795	795	920	920	930	960	1,580	1,220	885	930	885	845
4	770	808	920	920	930	960	1,460	1,180	870	930	885	820
5	770	820	920	920	930	945	1,380	1,180	858	930	885	832
6	770	845	935	920	900	960	1,340	1,180	858	1,100	870	808
7	782	870	935	920	900	945	1,300	1,100	845	1,710	870	820
8	808	845	920	920	900	930	1,260	1,060	832	1,580	900	820
9	a800	845	905	920	920	930	1,220	1,030	832	1,340	995	820
10	782	858	905	*920	950	915	1,180	995	832	1,340	945	832
11	782	858	890	910	945	900	1,140	978	832	1,300	915	820
12	820	845	890	905	930	900	1,140	960	832	1,140	915	820
13	832	858	905	905	930	885	1,100	960	845	1,060	885	832
14	832	858	920	890	960	885	1,100	960	945	995	885	858
15	832	858	920	905	930	885	1,100	960	1,380	978	870	858
16	820	858	920	1,010	915	870	1,100	960	1,710	945	858	845
17	808	930	905	1,080	885	870	1,100	960	1,620	930	845	832
18	795	945	905	978	885	858	1,100	978	1,620	915	845	820
19	795	930	905	930	900	870	1,100	960	1,460	900	832	820
20	808	1,060	905	945	900	858	1,060	960	1,260	885	820	808
21	808	1,180	*905	930	885	885	1,030	930	1,140	870	820	808
22	795	1,140	905	945	*885	1,030	1,060	945	1,060	870	808	808
23	795	1,110	905	945	885	1,380	1,100	1,030	995	858	808	820
24	795	1,080	890	*945	945	1,340	1,100	995	a1,030	915	808	845
25	795	1,040	845	945	1,180	1,340	1,100	995	1,220	1,030	808	858
26	795	1,010	890	915	1,140	1,460	1,300	995	1,340	1,140	808	832
27	795	995	900	900	1,100	1,660	1,540	960	1,220	1,180	808	832
28	795	980	920	915	1,060	1,840	1,500	945	1,100	1,180	820	820
29	782	965	920	900	-	1,940	1,460	930	1,060	1,100	820	820
30	795	950	920	915	-	2,020	1,380	900	1,030	995	832	820
31	795	-	890	920	-	2,020	-	900	-	960	845	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	24,710	832	770	797	0.886	1.02
November	27,739	1,180	795	925	1.03	1.15
December	28,185	935	845	909	1.01	1.16
Calendar year 1948	361,301	1,980	760	987	1.10	14.91
January	28,773	1,080	880	928	1.03	1.19
February	26,480	1,180	885	946	1.05	1.09
March	35,181	2,020	858	1,135	1.26	1.45
April	37,980	1,890	1,030	1,266	1.41	1.57
May	31,626	1,340	900	1,020	1.13	1.30
June	32,296	1,710	832	1,077	1.20	1.34
July	32,961	1,710	858	1,063	1.18	1.36
August	26,735	995	808	862	.958	1.10
September	24,876	858	808	829	.921	1.03
Water year 1948-49	357,542	2,020	770	980	1.09	14.76

Peak discharge (base, 1,800 sec.-ft.).- Mar. 30 (6 p.m.) 2,070 sec.-ft.; July 7 (5 p.m.) 1,840 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge interpolated.

Note.- Stage-discharge relation affected by ice Dec. 26 to Jan. 11, Jan. 30 to Feb. 10.

Sturgeon River near Wolverine, Mich.

Location.- Staff gage, lat. 45°17'25", long. 84°36'15", in sec. 31, T. 34 N., R. 2 W., 1½ miles north of Wolverine and 2 miles downstream from West Branch.

Drainage area.- 164 square miles.

Records available.- April 1942 to September 1949.

Extremes.- Maximum daily discharge during year, 550 second-feet Mar. 28; maximum gage height, 3.98 feet Mar. 28 (backwater from ice); minimum daily discharge, 125 second-feet Aug. 6.
1942-49: Maximum discharge, 919 second-feet Apr. 1, 1943 (gage height, 5.45 feet, from floodmark); minimum observed, 118 second-feet Aug. 22, 24, 1944 (gage height, 2.17 feet).

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

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

2.2	128
2.5	177
2.8	251
3.2	378
3.7	550

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	150	155	168	145	175	160	254	190	152	155	140	153
2	156	155	166	150	180	170	246	188	150	150	136	148
3	145	155	162	155	180	179	227	190	147	147	135	a140
4	142	166	162	155	180	169	224	197	144	156	a135	139
5	142	162	169	160	180	171	224	195	144	153	a130	142
6	142	173	173	160	170	175	224	188	144	152	a125	144
7	142	192	168	150	*177	160	224	177	145	150	144	152
8	147	177	162	168	192	173	216	169	144	150	144	158
9	150	184	160	168	169	168	209	166	145	164	142	158
10	168	190	160	162	177	160	195	164	148	166	142	155
11	162	181	160	158	184	158	195	162	144	153	147	152
12	168	186	158	158	158	160	199	162	141	148	212	148
13	175	177	162	156	168	168	199	164	150	148	173	166
14	166	179	153	158	168	164	197	177	337	145	150	168
15	158	168	160	168	166	168	a190	168	480	144	145	158
16	155	195	160	254	160	158	190	164	395	142	142	152
17	155	271	158	260	162	152	192	162	235	141	142	148
18	155	235	158	202	164	152	195	188	202	139	142	a140
19	155	243	158	219	179	152	a190	214	188	a135	142	a140
20	155	351	158	199	173	148	179	195	179	a135	142	a170
21	155	299	158	199	162	169	177	188	190	a135	141	a140
22	156	219	155	195	166	202	186	184	169	144	139	a150
23	155	209	155	195	164	254	222	175	164	144	139	a160
24	155	195	150	177	195	274	209	169	164	145	138	a160
25	155	169	140	164	266	263	206	166	344	145	134	155
26	155	175	140	169	212	375	245	164	a300	142	131	150
27	155	175	160	169	204	500	222	164	192	142	129	148
28	153	173	155	165	186	550	212	160	177	142	135	150
29	153	171	150	160	-	*425	198	158	162	142	136	147
30	153	168	150	150	-	330	192	156	156	142	135	147
31	155	-	130	170	-	283	-	155	-	141	a140	-

Month	Seoond-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,788	175	142	154	0.939	1.08
November	5,848	351	155	195	1.19	1.33
Deoember	4,878	173	130	157	.957	1.10
Calendar year 1948	68,162	725	130	186	1.13	15.43
January	5,418	260	145	175	1.07	1.23
February	5,017	266	158	179	1.09	1.14
March	6,890	550	148	222	1.35	1.56
April	6,238	254	177	208	1.27	1.42
May	5,419	214	155	175	1.07	1.23
June	5,932	480	141	198	1.21	1.35
July	4,537	166	135	146	.890	1.03
August	4,407	212	125	142	.866	1.00
September	4,538	170	139	151	.921	1.03
Water year 1948-49	63,910	550	125	175	1.07	14.50

Peak discharge (base, 450 sec.-ft.).- Mar. 28 (time unknown) about 550 sec.-ft.; June 15 (7:30 p.m.) 498 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for Middle Branch Au Sable River at Grayling and Manistee River near Sherman.

Note.- Stage-discharge relation affected by ice Dec. 22 to Jan. 7, Jan. 28 to Feb. 6, Mar. 1, 2, 26-30.

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Indian River at Indian River, Mich.

Location.- Water-stage recorder, lat. 45°24'35", long. 84°37'10", in sec. 24, T. 35 N., R. 3 W., at Indian River, an eighth of a mile downstream from Burt Lake and 3½ miles upstream from Mullett Lake. Datum of gage is 590.21 feet above mean sea level, datum of 1929 (levels by Michigan State Department of Conservation).

Drainage area.- 583 square miles.

Records available.- April 1942 to September 1949.

Extremes.- Maximum discharge during year, 682 second-feet Apr. 15 (gage height, 4.52 feet); minimum daily, 281 second-feet Aug. 30, Sept. 2, 3; minimum gage height, 3.45 feet Oct. 9.

1942-49: Maximum discharge, 1,080 second-feet Apr. 25, 1943 (gage height, 5.65 feet); minimum daily, that of Aug. 30, Sept. 2, 3, 1949; minimum gage height, that of Oct. 9, 1948.

Remarks.- Records fair.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	331	369	509	494	550	606	619	630	525	503	344	293
2	331	369	497	506	550	606	619	630	525	503	339	281
3	323	373	513	506	550	611	614	625	521	484	335	281
4	323	383	502	506	564	611	631	625	516	484	331	285
5	320	387	502	502	550	611	631	640	498	484	326	292
6	320	398	506	502	550	616	637	634	494	472	322	288
7	320	412	506	502	554	600	637	634	481	472	318	296
8	320	401	510	498	554	605	637	620	476	455	a310	300
9	320	401	510	498	554	605	642	615	458	455	a300	304
10	320	416	514	494	554	609	647	615	454	455	302	304
11	320	416	502	494	554	592	647	594	449	443	302	308
12	328	431	502	494	559	596	653	594	439	439	309	308
13	335	441	506	494	559	583	658	589	435	428	309	320
14	338	434	506	490	543	583	663	605	441	428	302	323
15	331	434	506	490	563	587	663	584	465	423	302	323
16	338	434	510	502	563	587	650	584	472	412	302	327
17	338	450	510	502	563	587	650	584	472	412	309	327
18	335	450	498	502	568	574	a640	579	472	408	309	331
19	342	454	498	525	568	574	a620	626	468	418	306	335
20	338	476	498	525	556	574	a620	621	468	403	306	335
21	338	476	502	525	556	574	624	603	475	403	299	339
22	345	492	515	540	556	574	624	598	475	398	299	339
23	348	492	502	540	561	574	640	598	475	383	296	343
24	348	496	502	545	561	574	635	593	470	370	288	338
25	352	496	515	545	582	574	619	579	494	370	288	338
26	352	496	502	545	582	587	635	574	508	365	292	332
27	352	500	498	545	602	618	650	569	503	369	292	345
28	366	500	498	559	602	641	650	554	503	365	296	345
29	366	505	510	559	-	639	645	535	503	360	289	339
30	366	505	510	545	-	610	630	535	503	356	281	343
31	369	-	510	545	-	619	-	530	-	348	293	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	10,473	369	320	338	0.580	0.67
November	13,287	505	369	443	.760	.85
December	15,669	515	497	505	.866	1.00
Calendar year 1948	189,072	913	320	517	.887	12.07
January	16,019	559	490	517	.887	1.02
February	15,728	602	543	562	.964	1.00
March	18,501	641	574	597	1.02	1.18
April	19,130	663	614	638	1.09	1.22
May	18,496	640	530	597	1.02	1.18
June	14,438	525	435	481	.825	.92
July	13,068	503	348	422	.724	.83
August	9,496	344	281	306	.525	.61
September	9,562	345	281	319	.547	.61
Water year 1948-49	173,867	663	281	476	.816	11.09

a No gage-height record; discharge interpolated.

Cheboygan River near Cheboygan, Mich.

Location.- Water-stage recorder, lat. 45°34'40", long. 84°29'15", in sec. 19, T. 37 N., R. 1 W., 300 feet downstream from Mullett Lake, 2½ miles upstream from Black River, and 5 miles south of Cheboygan. Datum of gage is 591.21 feet above mean sea level, datum of 1929. Auxiliary staff gage at Cheboygan 5 miles downstream. Datum of auxiliary gage is 590.00 feet above mean sea level, datum of 1929.

Drainage area.- 865 square miles.

Records available.- November 1942 to September 1949.

Extremes.- Maximum daily discharge during year, 1,200 second-feet Mar. 12-14; maximum daily gage height, 2.76 feet June 26; minimum daily discharge, 119 second-feet Oct. 10; minimum daily gage height, 1.45 feet Mar. 24.
1942-49: Maximum daily discharge, 1,590 second-feet Apr. 16, 1943; maximum daily gage height, 3.13 feet Apr. 17, 1945, Apr. 11, 1948; minimum daily discharge, that of Oct. 10, 1948; minimum daily gage height, 1.17 feet Oct. 23, 27, 1946.

Remarks.- Records fair except those for periods of ice effect or no gage-height record, which are poor. Discharge computed by using fall as determined from hourly readings of auxiliary staff gage as a factor. Flow affected by backwater from power plant at Cheboygan.

Cooperation.- Auxiliary gage readings furnished by Michigan Public Service Co.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	237	468	689	560	640	850	1,180	820	704	1,100	508	478
2	240	469	663	450	640	850	1,160	764	660	995	506	367
3	162	469	661	520	640	800	1,170	761	690	1,120	501	444
4	179	500	660	500	640	800	1,160	752	653	911	495	352
5	218	534	781	500	640	900	1,160	770	658	824	460	317
6	201	545	635	500	650	750	1,080	836	526	814	514	400
7	183	786	670	500	650	800	949	818	501	631	270	467
8	205	735	673	500	*660	895	976	766	598	770	405	420
9	208	695	671	750	662	1,060	908	754	685	768	400	383
10	119	736	639	720	660	1,020	811	798	624	615	381	413
11	176	651	661	683	650	1,120	844	741	552	582	445	182
12	215	712	805	695	650	1,200	856	782	343	611	429	452
13	307	693	743	680	650	1,200	911	728	318	556	383	499
14	274	788	*711	706	650	1,200	887	708	400	611	298	496
15	265	757	698	666	645	1,100	978	721	427	571	416	472
16	225	680	653	779	593	1,130	935	798	444	612	479	539
17	223	707	672	750	600	1,100	760	964	340	379	482	565
18	188	685	632	*642	600	800	888	1,000	377	428	465	604
19	320	811	640	630	600	900	755	902	444	265	460	604
20	228	799	640	660	600	1,100	820	868	479	e800	368	569
21	249	815	600	660	610	900	801	858	500	527	252	617
22	270	797	535	660	626	977	869	978	484	434	380	607
23	341	698	450	660	642	1,010	847	902	503	434	365	624
24	253	734	400	640	733	999	878	861	556	359	427	646
25	257	693	350	640	800	900	891	916	837	424	422	684
26	390	674	380	650	800	975	852	946	924	421	378	595
27	324	651	398	650	750	998	897	941	1,010	520	418	542
28	311	804	426	640	850	1,070	836	946	920	500	235	597
29	395	795	486	640	-	1,100	827	852	901	550	430	583
30	440	688	560	640	-	1,150	842	708	901	462	452	541
31	468	-	560	640	-	1,170	-	687	-	527	495	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	8,071	468	119	260	0.301	0.35
November	20,569	815	468	686	.793	.88
December	18,742	805	350	605	.699	.81
Calendar year 1948	256,190	1,500	119	700	.809	11.00
January	19,511	779	450	629	.727	.84
February	18,531	850	593	662	.765	.80
March	30,824	1,200	750	994	1.15	1.33
April	27,718	1,180	755	924	1.07	1.19
May	25,646	1,000	687	827	.956	1.10
June	17,959	1,010	318	599	.692	.77
July	19,121	1,120	265	617	.713	.82
August	12,919	514	235	417	.482	.56
September	15,059	684	182	502	.580	.65
Water year 1948-49	234,670	1,200	119	643	.743	10.10

* Winter discharge measurement made on this day.
e Gage reading at lower gage not representative of mean for day; discharge interpolated.
Note.- Stage-discharge relation affected by ice Dec. 19-26, Dec. 30 to Jan. 10, Jan. 23-28, Feb. 13, 14, Feb. 25 to Mar. 7, Mar. 25. No gage-height record Oct. 22, Jan. 20-22, Jan. 29 to Feb. 8, Feb. 10-12, 17-21, Mar. 12-15, 18-21, July 28, 29; discharge computed on basis of gage heights at auxiliary gage.

Pigeon River at Afton, Mich.

Location.- Staff gage, lat. 45°22'25", long. 84°30'50", in sec. 2, T. 34 N., R. 2 W., three-quarters of a mile west of Afton, 2 miles downstream from Wilkes Creek, and 5½ miles upstream from Mullett Lake.

Drainage area.- 159 square miles.

Records available.- April 1942 to September 1949.

Extremes.- Maximum discharge observed during year, 474 second-feet Mar. 29 (gage height, 5.48 feet); minimum discharge observed, 62 second-feet Aug. 27, 28 (gage height, 4.16 feet).

1942-49: Maximum daily discharge, 1,100 second-feet Mar. 31, 1943; maximum gage height, about 10.5 feet Mar. 31, 1943, from floodmarks (ice jam); minimum discharge observed, 60 second-feet Aug. 12, 1945 (gage height, 4.04 feet).

Remarks.- Records good except those for period of ice effect or no gage-height record, which are fair. Gage read twice daily.

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)

4.1	54	4.9	221
4.3	82	5.1	291
4.5	120	5.3	380
4.7	166	5.5	485

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	86	108	75	105	100	241	127	93	100	78	76
2	79	86	106	80	110	105	234	135	91	98	76	73
3	82	86	104	85	110	110	184	131	89	96	76	74
4	79	86	104	85	110	105	179	122	86	93	74	74
5	80	86	102	85	110	110	176	135	84	89	73	76
6	80	87	102	80	100	110	174	142	82	91	73	78
7	80	96	100	75	*110	110	171	133	82	87	73	a80
8	84	114	100	80	115	100	171	120	80	80	72	a80
9	86	91	95	90	100	110	169	110	79	79	73	a80
10	86	89	90	90	105	100	164	102	79	79	73	a80
11	89	91	90	90	110	100	154	100	79	79	73	a75
12	91	93	90	90	95	100	138	102	79	79	73	72
13	91	91	*90	90	100	110	140	102	79	78	70	a85
14	89	96	90	90	100	120	135	110	116	78	67	a85
15	91	104	90	90	100	120	138	118	215	78	70	76
16	89	106	90	130	100	110	138	112	244	79	70	79
17	91	104	90	*160	100	110	140	106	195	78	73	84
18	89	106	90	135	100	*110	142	114	149	74	70	80
19	89	106	90	115	110	110	149	174	131	78	68	76
20	87	110	90	110	100	110	138	215	149	89	67	78
21	87	114	90	110	95	125	133	221	156	100	66	79
22	87	114	90	110	95	140	135	171	138	95	67	79
23	86	116	90	110	95	160	156	122	127	87	67	79
24	86	118	85	105	120	200	161	118	116	86	67	79
25	89	120	80	100	170	220	149	116	166	89	67	79
26	86	120	80	100	140	200	176	114	a190	89	63	79
27	86	124	90	100	120	250	218	112	a170	84	63	78
28	86	116	90	100	110	350	247	112	a150	82	63	78
29	86	112	85	95	-	*469	187	108	a125	82	67	74
30	86	112	80	85	-	411	149	100	a105	80	73	74
31	86	-	70	100	-	312	-	98	-	79	78	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,663	91	79	85.9	0.540	0.62
November	3,080	124	86	103	.648	.72
December	2,841	108	70	91.6	.576	.66
Calendar year 1948	42,757	727	67	117	.736	9.99
January	3,040	160	75	98.1	.617	.71
February	3,035	170	95	108	.679	.71
March	4,997	469	100	161	1.01	1.16
April	4,986	247	133	166	1.04	1.16
May	3,902	221	98	126	.792	.91
June	3,724	244	79	124	.780	.87
July	2,635	100	74	85.0	.535	.62
August	2,183	78	63	70.4	.443	.51
September	2,339	85	72	78.0	.491	.55
Water year 1948-49	39,425	469	63	108	.679	9.20

Peak discharge (base, 400 sec.-ft.).- Mar. 29 (2 p.m.) 474 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for Sturgeon River near Wolverine and Black River near Tower.

Note.- Stage-discharge relation affected by ice Dec. 7 to Mar. 28.

Black River near Tower, Mich.

Location.- Water-stage recorder, lat. 45°24', long. 84°20', in NW¼ sec. 29, T. 35 N., R. 1 E., 400 feet downstream from Kleber Dam, 800 feet upstream from Milligan Creek, 3 miles northwest of Tower, and 8 miles upstream from Black Lake. Prior to Aug. 1, 1949, water-stage recorder at site 1 mile upstream at different datum.

Drainage area.- 313 square miles (310 square miles prior to Aug. 1, 1949).

Records available.- August to September 1949. November 1942 to July 1949 at site 1 mile upstream.

Extremes.- Maximum discharge during year, 675 second-feet Mar. 29; maximum gage height, 4.42 feet Feb. 13 (backwater from ice); minimum discharge, about 1 second-foot Sept. 30 (gage height, 1.36 feet); minimum daily, 40 second-feet Aug. 13-17, 30, 31, Sept. 1. 1942-49: Maximum discharge, 1,660 second-feet Apr. 1, 1943 (gage height, 5.30 feet); minimum, that of Sept. 30, 1949; minimum daily, that of Aug. 13-17, 30, 31, Sept. 1, 1949.

Remarks.- Records good except those for period of ice effect or no gage-height record, which are fair. Low and medium flow regulated by power plant at Tower and Kleber Dam.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	120	133	164	160	170	210	544	306	188	198		40
2	114	158	188	170	180	200	484	301	172	147	50	70
3	133	196	179	170	180	200	430	247	175	152		
4	132	83	183	180	190	170	378	264	158	167		
5	134	154	190	150	160	240	347	289	157	144	130	
6	113	176	185	160	160	220	331	248	133	151	180	
7	131	208	200	170	*200	200	343	256	149	164	170	110
8	116	180	178	190	170	180	329	217	127	138	200	
9	123	194	215	190	190	180	321	223	135	141	160	
10	152	171	149	175	180	200	301	192	136	156	90	
11	148	162	185	160	150	180	271	199	133	156	110	
12	153	192	170	160	150	150	273	190	135	141	90	119
13	149	172	240	140	170	165	268	188	132	139		115
14	179	166	181	180	170	*150	269	198	171	126		114
15	152	167	180	170	170	140	269	243	245	137		114
16	155	195	162	170	170	135	252	198	306	123	40	175
17	156	190	192	200	175	120	276	208	348	126		173
18	208	215	162	220	175	130	285	203	329	113	60	171
19	170	209	201	*210	170	150	270	285	269	145		118
20	114	255	173	180	230	130	245	344	193	134		81
21	86	333	180	160	200	120	271	366	242	126		82
22	129	316	195	160	180	200	253	361	197	114	90	84
23	160	350	202	200	190	270	282	277	186	107		101
24	132	360	130	180	200	300	282	236	178	114		114
25	143	274	140	210	210	350	357	247	329	129		114
26	124	254	80	200	250	400	304	201	354	140		133
27	160	236	130	190	270	452	366	213	359	143	100	161
28	159	235	170	180	250	588	403	219	327			165
29	117	216	180	170	-	641	415	190	242	50	70	189
30	140	231	210	130	-	*666	360	200	220		40	92
31	148	-	120	160	-	616	-	168	-		40	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,350	208	86	140	0.452	0.52
November	6,381	360	83	213	.687	.77
December	5,414	240	80	175	.565	.65
Calendar year 1948	79,173	1,010	80	216	.697	9.50
January	5,445	220	130	176	.568	.65
February	5,260	270	150	188	.606	.63
March	8,053	666	120	260	.839	.97
April	9,779	544	245	326	1.05	1.17
May	7,477	366	168	241	.777	.90
June	6,725	359	127	214	.690	.77
July	3,971	198	50	128	.413	.48
August	2,670	200	40	86.1	.275	.32
September	3,495	175	40	116	.371	.41
Water year 1948-49	68,720	666	40	188	.605	8.24

* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Dec. 24 to Mar. 26. No gage height record July 28 to Sept. 11; discharge computed on basis of weather records, 3 discharge measurements, and gage operation.

Black River near Cheboygan, Mich.

Location.- Water-stage recorder, lat. 45°30'00", long. 84°19'24", in sec. 21, T. 36 N., R. 1 E., half a mile downstream from Black Lake, 5½ miles upstream from Alverno Dam, and 12 miles southeast of Cheboygan. Datum of gage is 609.26 feet above mean sea level (levels by Michigan State Department of Conservation). Auxiliary water-stage recorder 3 miles downstream at same datum.

Drainage area.- 597 square miles.

Records available.- November 1942 to September 1949.

Extremes.- Maximum daily discharge during year, 886 second-feet July 2; minimum daily, 11 second-feet Aug. 14, 1949.
1942-49: Maximum daily discharge, 2,070 second-feet Apr. 12, 1943; minimum daily, that of Aug. 14, 1949.

Remarks.- Records good above 200 second-feet and fair below except those for periods of ice effect or no gage-height record, which are poor. Discharge computed by using fall as determined by auxiliary water-stage recorder as a factor. Flow affected during most of time by backwater from power plant at Alverno Dam.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	186	173	298	250	400	485	751	217	339	884	149	265
2	128	137	245	100	440	451	778	304	355	886	84	216
3	86	141	240	300	390	422	758	279	304	443	92	168
4	141	120	276	320	380	385	768	345	326	613	113	120
5	108	166	117	320	380	400	768	285	185	573	98	172
6	81	251	354	300	150	42	671	305	275	467	218	148
7	74	76	329	320	460	408	644	275	251	428	43	180
8	103	221	311	300	440	477	634	276	233	372	121	170
9	197	228	288	90	456	497	643	317	234	363	141	122
10	132	288	328	250	442	475	610	305	226	157	201	117
11	101	267	300	320	477	494	614	328	170	218	132	72
12	161	247	90	300	435	465	630	296	50	224	82	125
13	180	331	326	300	180	446	627	388	200	212	56	189
14	173	106	337	300	429	457	615	295	211	243	11	146
15	175	320	350	300	443	454	632	225	230	274	72	193
16	130	225	350	100	452	430	635	302	138	231	91	256
17	85	497	350	250	459	441	414	296	230	68	153	257
18	177	274	300	310	459	440	491	331	182	229	220	135
19	252	344	150	360	463	400	436	362	27	219	193	326
20	173	296	350	343	100	350	326	300	207	172	301	254
21	150	79	350	418	436	350	298	350	326	109	158	202
22	145	353	350	348	418	351	276	352	286	250	187	262
23	148	340	300	101	397	393	311	600	258	100	206	219
24	101	328	300	361	379	317	277	562	366	60	150	213
25	200	325	300	397	422	362	273	542	582	150	102	113
26	181	400	100	395	450	381	266	551	306	200	150	193
27	180	401	300	b380	131	403	275	528	451	190	206	209
28	208	122	320	b400	459	534	266	544	625	140	125	239
29	178	309	300	b370	-	556	285	375	668	176	185	215
30	193	300	300	220	-	745	241	422	873	130	199	217
31	64	-	300	380	-	740	-	391	-	65	220	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,591	252	64	148	0.248	0.29
November	7,665	497	76	256	.429	.48
December	8,909	354	90	287	.481	.55
Calendar year 1948	129,911	1,470	22	355	.595	8.08
January	9,203	418	90	297	.497	.57
February	10,927	477	100	390	.653	.68
March	13,551	745	42	437	.732	.84
April	15,213	778	241	507	.849	.95
May	11,248	600	217	363	.608	.70
June	9,114	873	27	304	.509	.57
July	8,846	886	60	285	.477	.55
August	4,459	301	11	144	.241	.28
September	5,713	326	72	190	.318	.35
Water year 1948-49	109,439	886	11	300	.503	6.81

b Stage-discharge relation affected by ice.
Note.- No gage-height record Oct. 16, 17, Dec. 15 to Jan. 17, Jan. 30 to Feb. 6, Mar. 19-20, June 11-13, July 22-28; discharge computed on basis of weather records and power-plant records at Alverno.

Rainy River near Onaway, Mich.

Location.- Staff gage, lat. 45°21'25", long. 84°10'00", in sec. 2, T. 34 N., R. 2 E., 1½ miles downstream from Little Rainy River and 3 miles east of Onaway. Datum of gage is 747.77 feet above mean sea level (levels by Michigan State Department of Conservation).

Drainage area.- 79 square miles.

Records available.- January 1942 to September 1949.

Extremes.- Maximum discharge during year, 121 second-feet Mar. 29 (gage height, 3.62 feet, from graph based on gage readings); no flow Aug. 24-28; minimum gage height observed, 1.74 feet Aug. 24-27.
1942-49: Maximum discharge observed, 668 second-feet Apr. 1, 1943 (gage height, 5.55 feet); no flow Aug. 24-28, 1949.

Remarks.- Records good except those below 1 second-foot and those for periods of ice effect or no gage-height record which are fair. Gage read once daily.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	1.1	1.5	2	3	9	71	40	7.7	6.8	0.4	0.2
2	.1	1.1	1.5	2	3	8	63	37	6.3	7.7	.4	.3
3	a.1	1.2	1.2	2	3	7	53	36	5.3	8.2	.3	.3
4	a.1	1.2	1.2	2	3	7	49	36	4.3	7.1	.4	.4
5	a.1	1.3	1.4	2	3	7	45	34	3.6	5.3	.4	.3
6	a.2	1.5	1.7	2	3	7	41	31	3.1	4.1	.4	.4
7	a.2	1.5	1.8	2	3	7	40	28	2.7	3.1	.3	.4
8	a.3	1.4	1.8	2	a3	7	39	23	2.3	2.5	.3	.4
9	a.3	1.8	1.7	2	*3	7	36	20	2.3	2.1	.4	.4
10	.4	2.2	1.7	2	3	7	33	18	2.3	2.1	.4	.4
11	1.2	2.2	2.1	3	3	7	30	16	2.5	2.0	.4	.4
12	1.5	2.4	2.1	3	3	7	27	14	2.5	1.6	.4	.4
13	1.9	2.5	*2.2	3	3	6	26	14	2.3	1.4	.3	.4
14	1.7	a2.5	2.7	3	3	6	24	17	2.9	.8	.2	.4
15	1.5	a2	2.7	3	3	6	26	18	6.5	.5	.1	.4
16	1.4	a2.5	2.7	4	3	*6	27	17	6.3	.3	.1	.4
17	1.2	a2.5	2.5	5	3	6	30	15	a6	.2	.1	.4
18	1.0	a4	2.5	6	3	7	30	14	6.0	.2	.1	.4
19	1.1	6.8	2	*8	3	8	26	39	5.8	.4	.1	.4
20	1.0	6.5	2	7	4	9	24	49	5.3	.4	.1	.4
21	.8	5.5	2	6	4	14	26	40	5.1	.4	.1	.5
22	1.0	4.6	2	6	4	20	32	32	5.5	.4	.1	.4
23	.7	3.6	2	5	4	25	36	25	5.5	.4	.1	.4
24	.9	3.1	2	5	4	30	36	18	5.3	.4	0	.4
25	.7	2.7	2	5	5	45	34	15	5.1	.4	0	.4
26	.8	2.2	2	4	7	80	39	15	5.1	.4	0	.4
27	1.1	1.9	2	4	10	95	57	14	5.1	.4	0	.4
28	.9	1.7	2	4	9	118	a55	13	5.5	.4	0	.4
29	.7	1.5	2	3	-	*121	48	12	5.8	.4	.1	.3
30	1.0	1.7	2	3	-	103	43	10	6.0	.4	.1	.4
31	1.1	-	2	3	-	78	-	8.2	-	.4	.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	25.1	1.9	0.1	0.81	0.010	0.01
November	76.7	6.8	1.1	2.56	.032	.04
December	61.0	2.7	1.2	1.97	.025	.03
Calendar year 1948	7,443.9	375	.1	20.3	.257	3.50
January	113	8	2	3.65	.046	.05
February	108	10	3	3.86	.049	.05
March	870	121	6	28.1	.356	.41
April	1,146	71	24	38.2	.484	.54
May	718.2	49	8.2	23.2	.294	.34
June	140.0	7.7	2.3	4.67	.059	.07
July	61.2	8.2	.2	1.97	.025	.03
August	6.3	.4	0	.20	.0025	.003
September	11.5	.5	.2	.38	.0048	.005
Water year 1948-49	3,337.0	121	0	9.14	.116	1.58

Peak discharge (base, 100 sec.-ft.).- Mar. 29 (9 a.m.) 121 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records and records for North Branch Thunder Bay River near Bolton.
Note.- Stage-discharge relation affected by ice Dec. 19 to Mar. 27.

Thunder Bay River near Hillman, Mich.

Location.- Water-stage recorder, lat. 45°00'30", long. 83°58'15", on line between secs. 8 and 9, T. 30 N., R. 4 E., just upstream from bridge on State Highway 32, a quarter of a mile downstream from Miller Creek, and 5 miles southwest of Hillman.

Drainage area.- 232 square miles.

Records available.- June 1945 to September 1949.

Extremes.- Maximum discharge during year, 653 second-feet Mar. 28 (gage height, 7.51 feet); minimum daily, 98 second-feet Aug. 7.
1945-49: Maximum discharge, 1,380 second-feet Apr. 12, 1947 (gage height, 8.86 feet); minimum daily, that of Aug. 7, 1949.

Remarks.- Records good except those for periods of ice effect, which are fair. Diurnal fluctuation from power plant at Atlanta.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Mar. 31 to Apr. 27)

Oct. 1 to Mar. 28				Mar. 29 to Sept. 30			
4.4	126	6.0	320	4.1	98	5.8	285
4.9	174	6.6	422	4.4	119	6.4	383
5.5	249	7.3	590	5.0	182	7.0	504

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	148	138	*174	180	*180	220	338	226	133	138	108	133
2	143	158	168	180	170	*220	285	245	148	143	119	119
3	138	148	163	*170	160	210	252	271	148	148	115	115
4	134	138	163	170	170	220	252	212	148	124	115	119
5	140	164	163	190	170	210	238	219	124	188	128	124
6	137	186	174	190	170	180	219	212	128	115	101	133
7	126	174	158	200	170	190	212	182	128	133	98	128
8	134	180	158	210	180	186	219	170	128	128	118	133
9	148	174	163	230	190	180	212	164	124	119	117	143
10	148	152	168	210	180	180	188	181	138	138	114	133
11	163	152	186	180	160	180	188	143	124	128	119	124
12	148	168	167	180	190	174	194	170	128	128	159	124
13	163	168	148	200	200	174	164	164	119	124	148	143
14	163	174	162	230	190	163	188	164	128	124	128	128
15	152	173	158	250	200	150	176	194	421	124	122	124
16	152	152	163	240	200	160	194	148	441	119	133	119
17	148	180	164	180	220	160	200	176	383	119	128	119
18	148	208	178	160	200	160	212	149	330	124	101	124
19	153	180	186	200	220	150	212	212	226	133	128	119
20	156	274	180	230	210	160	200	232	200	119	101	127
21	149	328	180	250	220	180	194	200	206	119	118	127
22	134	263	168	240	230	204	188	200	154	115	101	128
23	148	249	158	210	250	305	238	194	154	115	118	124
24	154	223	150	230	270	277	232	182	164	115	111	122
25	134	198	170	230	250	335	206	182	182	124	111	119
26	143	180	160	200	210	422	285	170	219	124	108	119
27	152	186	180	200	220	524	347	164	176	119	111	128
28	148	180	200	190	220	602	292	170	170	100	128	124
29	138	174	190	180	-	516	278	170	159	128	115	143
30	148	163	160	170	-	482	232	138	143	128	143	108
31	148	-	150	160	-	421	-	159	-	115	115	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,538	163	126	146	0.629	0.73
November	5,585	328	138	186	.802	.89
December	5,210	200	148	168	.724	.83
Calendar year 1948	68,492	800	100	187	.806	10.97
January	6,240	250	160	201	.866	1.00
February	5,600	270	160	200	.862	.90
March	7,895	602	150	255	1.10	1.27
April	6,835	347	164	228	.983	1.10
May	5,773	271	138	186	.802	.92
June	5,574	441	119	186	.802	.89
July	3,918	188	115	126	.543	.63
August	3,679	159	98	119	.513	.59
September	3,773	143	108	126	.543	.61
Water year 1948-49	64,620	602	98	177	.763	10.36

Peak discharge (base, 600 sec.-ft.).- Mar. 28 (9 a.m.) 653 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 24 to Mar. 5, Mar. 7, 15-21.

Thunder Bay River near Bolton, Mich.

Location.- Water-stage recorder, lat. 45°07'40", long. 83°38'30", in sec. 36, T. 32 N., R. 6 E., half a mile upstream from Orchard Hill bridge, 4 miles upstream from North Branch Thunder Bay River, 5 miles southwest of Bolton, and 11 miles northwest of Alpena.

Drainage area.- 588 square miles.

Records available.- March 1945 to September 1949.

Extremes.- Maximum discharge during year, 1,220 second-feet Mar. 29 (gage height, 5.96 feet); minimum, 114 second-feet Dec. 10 (gage height, 2.71 feet).
1945-49: Maximum discharge, 3,690 second-feet Mar. 15, 1946; maximum gage height, 9.08 feet Mar. 21, 1948 (backwater from ice); minimum discharge, that of Dec. 10, 1948.

Remarks.- Records good except those for periods of ice effect, which are fair. Diurnal fluctuation caused by power plant at Hillman and regulation by Fletcher Pond on Upper South Branch Thunder Bay River since 1930 (usable capacity, 1.75 billion cubic feet).

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

3.0	163	5.0	775
3.5	263	5.5	1,000
4.0	386	6.0	1,250
4.5	555		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	345	238	202	200	420	350	842	401	210	401	306	212
2	320	259	*194	230	*420	*350	662	401	208	401	332	176
3	345	272	196	240	430	370	535	447	198	416	292	214
4	320	265	188	*230	440	370	447	477	180	372	296	208
5	332	272	202	210	420	320	432	372	198	358	281	202
6	332	265	178	220	420	300	432	345	250	447	287	198
7	263	285	202	220	400	400	372	306	296	464	301	287
8	267	265	192	220	410	370	358	290	372	464	250	250
9	238	285	184	240	410	400	320	252	358	416	270	214
10	263	263	163	260	350	370	345	252	345	386	276	261
11	238	234	198	260	300	360	287	257	345	345	290	345
12	276	198	208	240	330	350	290	250	358	372	281	332
13	299	192	192	220	350	380	301	208	416	320	303	332
14	278	204	222	210	340	416	274	228	498	226	308	332
15	222	192	186	230	360	432	281	244	618	301	296	265
16	208	192	188	260	380	480	283	281	665	303	299	214
17	216	204	210	290	360	480	301	230	730	308	292	192
18	244	202	200	270	420	464	332	234	662	294	285	212
19	267	214	234	260	400	464	345	270	555	386	248	196
20	263	261	172	300	400	447	358	332	416	401	238	242
21	263	320	192	280	400	432	320	345	320	386	238	250
22	257	372	194	280	450	498	320	296	306	386	236	250
23	248	296	190	300	480	618	345	301	285	372	255	218
24	259	274	180	260	500	640	386	274	250	386	255	194
25	228	265	200	270	550	595	386	265	250	358	261	194
26	252	232	190	300	480	752	386	265	281	301	263	198
27	248	226	206	310	430	955	595	242	345	276	265	246
28	265	222	218	350	370	1,150	618	240	257	265	287	242
29	263	182	230	370	-	1,220	498	240	250	332	267	202
30	263	202	220	380	-	1,120	447	216	372	345	274	200
31	263	-	200	400	-	1,000	-	210	-	358	278	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	8,345	345	208	269		
November	7,353	372	182	245		
December	6,131	234	163	198		
Calendar year 1948	133,216	1,840	163	364		
January	8,310	400	200	268		
February	11,420	550	300	408		
March	16,853	1,220	300	544		
April	12,098	842	274	403		
May	8,941	447	208	288		
June	10,814	730	180	360		
July	11,146	464	226	360		
August	8,610	332	236	278		
September	7,078	345	176	236		
Water year 1948-49	117,099	1,220	163	321		

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 23-26, Dec. 29 to Mar. 13.

Upper South Branch Thunder Bay River near Lachine, Mich.

Location.- Water-stage recorder, lat. 45°03'30", long. 83°47'00", on line between secs. 23 and 25, T. 31 N., R. 5 E., just upstream from bridge on State Highway 32, 1 mile upstream from mouth 3½ miles downstream from Fletcher Pond, and 3½ miles southwest of Lachine. Datum of gage is 711.80 feet above mean sea level, datum of 1929.

Drainage area.- 171 square miles.

Records available.- March 1945 to September 1949.

Extremes.- Maximum daily discharge during year, 300 second-feet June 14; maximum gage height, 3.84 feet June 15 (backwater from Thunder Bay River); minimum daily, 1.7 second-feet May 12.
1945-49: Maximum daily discharge, 450 second-feet Mar. 15, 1946; maximum gage height, 4.60 feet Apr. 12, 1947 (backwater from Thunder Bay River); minimum daily discharge, 1.0 second-feet Sept. 13, 1946.

Remarks.- Records good except those below 10 second-feet and those for periods of backwater from Thunder Bay River, which are fair. Flow regulated by Fletcher Pond since 1930 (usable capacity, 1.75 billion cubic feet).

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	191	89	5.1	7.0	189	84	10	4.8	5.4	200	170	51
2	190	91	5.1	7.4	187	82	8.4	8.4	4.3	210	160	46
3	180	91	5.1	7.4	185	80	6.7	7.0	3.8	210	130	45
4	180	91	5.4	7.7	176	62	5.8	5.4	4.5	180	130	45
5	180	91	5.8	8.4	155	32	5.1	4.3	22	200	130	45
6	148	93	5.4	7.7	155	39	4.3	1.8	104	220	130	73
7	87	94	4.0	8.4	153	111	3.8	1.9	136	230	130	127
8	87	93	3.2	8.4	153	143	3.5	2.0	180	220	130	46
9	89	79	4.0	8.0	145	145	3.0	2.0	175	200	130	73
10	89	44	4.0	8.0	88	143	2.5	1.9	170	170	130	130
11	91	31	4.3	8.0	84	142	2.5	1.9	170	170	125	160
12	111	5.4	4.8	8.0	84	142	2.2	1.7	190	175	130	160
13	109	3.7	4.8	8.0	84	149	1.9	2.0	220	90	140	160
14	73	3.7	4.8	8.4	84	206	1.8	4.0	300	80	140	140
15	34	3.7	4.5	8.9	84	234	2.2	2.7	260	120	140	73
16	34	3.5	6.1	13	84	272	3.0	2.5	124	120	140	42
17	59	4.2	5.4	14	84	262	4.3	3.8	98	120	140	42
18	87	3.7	5.4	11	84	262	6.7	3.5	34	130	120	62
19	89	3.5	5.1	14	84	256	6.7	6.4	24	190	95	93
20	89	6.9	5.4	14	97	254	5.8	4.5	18	180	95	95
21	89	6.4	5.4	12	133	246	4.5	3.0	19	180	110	93
22	88	5.8	5.8	11	160	262	6.1	3.0	19	180	120	84
23	89	5.4	5.8	11	177	229	7.0	3.0	19	175	120	40
24	91	5.1	5.8	11	179	107	6.1	3.0	19	175	120	39
25	91	5.1	5.4	36	149	20	4.8	2.7	20	160	120	61
26	89	5.1	5.8	63	89	22	15	2.7	21	100	125	93
27	87	5.1	7.0	107	86	25	12	3.5	20	100	125	93
28	87	5.1	7.0	125	86	30	7.7	5.1	20	130	125	72
29	87	5.1	6.4	124	-	23	5.8	7.0	75	170	120	40
30	89	5.1	6.7	140	-	17	5.1	7.0	190	170	120	40
31	89	-	6.4	172	-	13	-	7.0	-	170	110	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,174	191	34	102		
November	978.6	94	3.5	32.6		
December	165.2	7.0	3.2	5.33		
Calendar year 1948	34,446.3	435	3.2	94.1		
January	997.7	172	7.0	32.2		
February	3,498	189	84	125		
March	4,094	272	13	132		
April	164.3	15	1.8	5.48		
May	119.5	8.4	1.7	3.85		
June	2,665	300	3.8	88.8		
July	5,125	230	80	165		
August	3,950	170	95	127		
September	2,363	160	39	78.8		
Water year 1948-49	27,294.3	300	1.7	74.8		

Note.- Discharge affected by backwater from Thunder Bay River Mar. 25 to Apr. 1, June 8-15, June 30 to Aug. 31, Sept. 10-14; discharge computed on basis of 2 discharge measurements, gage heights, weather records, record of gage operation at Fletcher Pond, and records for Thunder Bay River near Hillman and near Bolton.

North Branch Thunder Bay River near Bolton, Mich.

Location.- Water-stage recorder, lat. 45°08'55", long. 83°36'35", in sec. 29, T. 32 N., R. 7 E., 1½ miles upstream from mouth, 2½ miles south of Bolton, and 9 miles northwest of Alpena.

Drainage area.- 184 square miles.

Records available.- March 1945 to September 1949.

Extremes.- Maximum discharge during year, 808 second-feet Mar. 29 (gage height, 5.19 feet); minimum, 1.4 second-feet Oct. 4 (gage height, 2.48 feet).
1945-49: Maximum discharge, 2,330 second-feet Apr. 13, 1947; maximum gage height, 7.70 feet Mar. 22, 1948 (backwater from ice); minimum discharge, that of Oct. 4, 1948.

Remarks.- Records good except those below 10 second-feet and those for period of ice effect, which are fair.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.0	6.1	22	20	20	*38	410	196	48	40	9.8	5.2
2	2.2	5.8	*21	20	*21	40	343	157	42	32	10	5.2
3	1.8	6.7	21	17	21	43	285	146	40	29	11	4.9
4	1.5	7.8	21	*19	22	45	239	146	37	24	10	4.6
5	1.5	9.4	19	20	22	45	180	144	34	22	8.6	5.8
6	1.6	9.8	15	22	24	43	160	136	25	21	8.6	6.4
7	1.9	9.0	18	24	22	35	149	104	21	23	9.4	6.7
8	2.6	8.6	19	27	25	42	142	94	20	25	9.0	7.0
9	3.2	7.4	17	29	27	40	129	88	24	23	8.2	6.4
10	3.8	10	19	26	26	32	116	85	27	23	8.2	5.8
11	4.0	14	18	23	25	40	110	77	23	20	10	6.1
12	4.0	15	20	21	26	35	106	66	20	19	10	6.1
13	6.4	14	18	24	27	32	99	57	19	19	10	6.4
14	5.8	13	18	23	28	40	90	64	39	19	10	6.4
15	4.0	12	20	27	30	38	90	64	64	17	8.6	5.8
16	3.8	11	21	32	32	40	88	67	80	14	8.6	5.2
17	3.8	13	19	25	35	35	88	67	85	13	9.4	4.9
18	4.0	13	18	25	40	43	90	67	94	12	9.0	4.3
19	4.3	16	18	30	37	35	99	85	87	16	8.2	4.6
20	4.0	28	16	25	33	33	108	99	77	16	7.8	4.6
21	6.1	24	18	28	30	40	114	116	74	15	7.4	4.9
22	6.1	18	22	27	34	50	118	121	67	13	6.4	4.9
23	6.1	19	20	26	36	60	127	116	55	12	5.8	4.6
24	6.4	21	18	25	38	70	136	101	50	11	5.8	4.0
25	6.7	27	20	24	42	90	132	85	45	11	5.2	4.0
26	6.1	21	18	24	38	110	171	79	46	11	4.3	3.6
27	5.2	19	17	24	40	250	183	71	40	16	4.3	3.4
28	5.5	22	23	23	37	600	205	63	51	16	4.9	3.6
29	5.2	19	20	23	-	*794	235	60	51	12	4.9	3.4
30	4.6	23	20	22	-	719	229	54	41	12	4.9	3.2
31	5.2	-	18	21	-	533	-	50	-	12	5.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	129.4	6.7	1.5	4.17	0.023	0.03
November	442.6	28	5.8	14.8	.080	.09
December	592	23	15	19.1	.104	.12
Calendar year 1948	25,745.4	1,150	1.5	70.3	.382	5.22
January	746	32	17	24.1	.131	.15
February	838	42	20	29.9	.162	.17
March	4,090	794	32	132	.717	.83
April	4,771	410	88	159	.864	.96
May	2,925	196	50	94.4	.513	.59
June	1,426	94	19	47.5	.258	.29
July	568	40	11	18.3	.099	.11
August	243.5	11	4.3	7.85	.043	.05
September	152.0	7.0	3.2	5.07	.028	.03
Water year 1948-49	16,923.5	794	1.5	46.4	.252	3.42

Peak discharge (base, 500 sec.-ft.).- Mar. 29 (4:30 p.m.) 808 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 10 to Mar. 28.

Lower South Branch Thunder Bay River near Hubbard Lake, Mich.

Location.- Water-stage recorder, lat. 44°51'33", long. 83°35'40", in sec. 4, T. 28 N., R. 7 E., 50 feet downstream from Hubbard Lake and 1 mile south of town of Hubbard Lake. Datum of gage 701.08 feet (corrected) above mean sea level (levels by Michigan State Department of Conservation).

Drainage area.- 146 square miles.

Records available.- August 1945 to September 1949.

Extremes.- Maximum daily discharge during year, 170 second-feet Jan. 25, 26, 28; no flow May 25-27, 30, 31.
1945-49: Maximum daily discharge, 512 second-feet May 7, 8, 1947; no flow May 25-27, 30, 31, 1949.

Remarks.- Records good except those for period of ice effect and those below 10 second-feet, which are fair. Flow regulated by Hubbard Lake since 1915 (usable capacity, 1.31 billion cubic feet).

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	134	131	88	73	*160	3.9	0.3	0.2	0.1	22	37	74
2	131	128	88	73	155	3.9	.3	.2	.2	57	37	76
3	131	128	86	73	150	3.6	.2	.1	.1	82	96	76
4	130	126	86	73	150	3.6	.1	.1	.2	82	140	76
5	126	128	88	73	150	3.6	.2	.2	.2	111	140	96
6	124	126	86	73	150	3.6	.1	.2	.2	133	140	116
7	124	124	84	73	145	3.9	.1	.2	.1	133	140	96
8	122	124	82	73	145	3.9	.1	.2	12	133	140	78
9	120	125	82	73	140	3.9	.5	.2	25	133	140	110
10	119	98	82	73	140	3.9	.2	.2	27	133	144	136
11	118	80	82	73	140	3.9	.2	.2	29	133	144	136
12	118	78	76	73	135	3.9	.1	.2	81	87	81	136
13	116	40	75	71	135	3.9	.2	.2	165	41	35	139
14	107	14	75	71	135	4.2	.2	.2	169	41	35	136
15	101	43	76	73	125	4.2	.2	.2	91	41	59	115
16	100	82	76	73	110	4.2	.2	.1	25	41	70	66
17	98	82	75	75	110	4.2	.2	.2	24	41	70	41
18	96	82	73	75	80	2.0	.1	.1	23	41	70	83
19	95	82	73	80	6.5	1.0	.2	.2	22	41	70	114
20	94	88	73	80	4.2	1.2	.2	.4	22	41	94	114
21	94	90	73	82	4.2	1.2	.2	.2	22	41	120	116
22	92	87	73	82	4.2	1.3	.2	.1	22	41	122	70
23	98	90	73	82	4.2	1.2	.2	.1	22	41	120	41
24	104	93	73	121	3.9	1.2	.2	.1	22	41	120	41
25	102	95	73	170	3.9	1.0	.2	0	22	41	130	85
26	113	93	73	170	3.9	.6	.2	0	22	41	136	114
27	118	93	71	160	3.9	.3	.2	0	22	41	136	114
28	118	90	71	170	3.9	.2	.2	.1	22	41	136	114
29	125	90	75	165	-	.2	.2	.2	22	41	136	114
30	134	90	73	160	-	.3	.2	0	22	39	136	68
31	132	-	73	160	-	.3	-	0	-	38	102	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,536	134	92	114		
November	2,820	131	14	94.0		
December	2,407	88	71	77.6		
Calendar year 1948	39,202.3	242	.1	107		
January	2,996	170	71	96.6		
February	2,497.8	160	3.9	89.2		
March	78.3	4.2	.2	2.53		
April	5.9	.5	.1	.20		
May	4.6	.4	0	.15		
June	936.1	169	.1	31.2		
July	2,013	133	22	64.9		
August	3,276	144	35	106		
September	2,891	139	41	96.4		
Water yesr 1948-49	23,461.7	170	0	64.3		

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Jan. 25 to Feb. 17.

Middle Branch Au Sable River at Grayling, Mich.

Location.- Water-stage recorder, lat. 44°39'35", long. 84°42'45", in sec. 7, T. 26 N., R. 3 W., just upstream from bridge on U. S. Highway 27 at Grayling and three-quarters of a mile upstream from East Branch. Datum of gage is 1,123.49 feet above mean sea level, datum of 1929.

Drainage area.- 110 square miles.

Records available.- November 1942 to September 1949.

Extremes.- Maximum discharge during year, 165 second-feet Mar. 30 (gage height, 2.22 feet); minimum, 38 second-feet Sept. 21 (gage height, 0.96 foot).
1942-49: Maximum discharge, 274 second-feet June 2, 1943 (gage height, 3.00 feet); minimum, 28 second-feet Apr. 21, 1946 (gage height, 0.80 foot).

Remarks.- Records good except those for periods of no gage-height record, which are fair. Diurnal fluctuation caused by power plant above station.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 23 to Dec. 5)

1.0	41
1.2	56
1.4	75
2.0	141
2.2	165

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	50	67	60	71	63	119	81	66	68	60	54
2	54	53	66	61	68	73	110	87	63	64	60	50
3	49	50	66	62	67	77	108	86	64	60	60	51
4	51	54	67	63	67	75	102	83	65	69	58	51
5	54	67	68	66	68	a75	100	78	60	72	55	56
6	54	73	70	67	63	a75	98	80	61	77	53	53
7	55	69	72	61	70	a75	98	75	61	73	61	55
8	60	63	73	70	67	a75	95	76	59	69	63	57
9	62	62	72	70	66	a70	93	73	58	72	56	58
10	54	63	69	68	67	a70	92	71	58	82	55	56
11	54	60	65	66	62	a68	90	73	57	68	61	50
12	64	59	68	64	64	64	98	80	53	69	72	51
13	68	61	71	63	68	63	95	79	60	68	63	59
14	63	56	70	66	70	65	94	78	90	62	58	59
15	61	61	68	67	69	66	94	72	148	63	59	59
16	56	54	68	75	67	64	86	74	151	60	54	57
17	54	73	68	79	65	60	78	72	120	54	50	54
18	58	75	62	83	67	60	82	72	102	58	54	52
19	59	76	62	86	70	68	81	77	90	57	51	53
20	56	97	70	a85	69	62	80	70	84	54	50	61
21	54	106	68	a80	66	66	76	72	74	54	50	47
22	55	103	67	79	66	83	83	78	70	59	47	53
23	59	88	66	70	68	97	90	80	72	58	52	55
24	71	78	59	79	74	98	90	79	76	56	50	54
25	71	76	54	73	89	99	83	74	83	73	50	52
26	64	75	55	70	86	116	112	75	87	74	50	52
27	61	70	69	73	87	139	122	73	84	70	49	56
28	58	69	62	68	77	159	106	72	75	67	54	56
29	54	68	68	64	-	159	89	66	75	63	59	55
30	54	70	66	58	-	153	84	69	71	59	54	54
31	50	-	57	71	-	135	-	67	-	55	54	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,792	71	49	57.8	0.525	0.61
November	2,079	106	50	69.3	.630	.70
December	2,053	73	54	66.2	.602	.69
Calendar year 1948	27,280	177	44	74.5	.677	9.22
January	2,167	86	58	69.9	.635	.73
February	1,958	89	62	69.9	.635	.66
March	2,672	159	60	86.2	.784	.90
April	2,828	122	76	94.3	.857	.96
May	2,342	87	66	75.5	.686	.79
June	2,337	151	53	77.9	.708	.79
July	2,007	82	54	64.7	.588	.68
August	1,722	72	47	55.5	.505	.58
September	1,630	61	47	54.3	.494	.55
Water year 1948-49	25,587	159	47	70.1	.637	8.64

Peak discharge (base, 175 sec.-ft.).- No peak above base.
a No gage-height record; discharge computed on basis of weather records and records for Manistee River near Grayling.

Rifle River at Michigan Highway 70, near Sterling, Mich.

Location.- Water-stage recorder, lat. 44°04', long. 84°02', in sec. 5, T. 19 N., R. 4 E., at bridge on State Highway 70, 3 miles north of Sterling.

Drainage area.- 320 square miles.

Records available.- January 1937 to September 1949.

Average discharge.- 11 years (1937-39, 1940-49), 307 second-feet.

Extremes.- Maximum discharge during year, 1,110 second-feet Mar. 28; maximum gage height, 6.24 feet Feb. 25 (backwater from ice); minimum discharge, 99 second-feet Aug. 27 (gage height, 1.23 feet).
1937-49: Maximum discharge, 4,680 second-feet Mar. 21, 1948; maximum gage height, 13.90 feet Mar. 25, 1943 (backwater from ice); minimum discharge, 87 second-feet Dec. 2, 1946 (gage height, 1.14 feet).

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Diurnal fluctuation during low flow caused by power plant above station.

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Sept. 10-30)

1.3	109	2.5	325
1.4	123	3.5	570
1.5	138	4.5	865
2.0	220	5.2	1,110

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	146	148	177	180	190	450	558	270	172	167	128	177
2	144	156	175	190	190	420	470	545	164	163	126	159
3	136	155	179	190	*190	400	421	558	158	155	124	140
4	136	172	177	200	190	350	385	421	156	140	126	179
5	135	194	179	210	190	350	361	373	153	140	124	301
6	136	267	206	210	190	380	349	325	156	187	124	197
7	140	215	204	*200	180	350	349	276	141	385	158	175
8	155	180	194	210	180	*370	337	257	141	251	150	182
9	152	174	206	210	210	370	314	237	141	247	126	172
10	153	194	190	220	200	350	291	224	141	239	124	161
11	141	207	187	210	180	330	280	215	135	187	164	150
12	147	185	195	200	180	310	263	211	140	166	195	150
13	158	194	195	190	220	280	259	209	148	159	163	163
14	155	177	200	190	220	300	259	211	161	158	144	177
15	153	175	192	200	210	300	280	202	325	158	135	163
16	152	180	190	240	220	270	314	199	361	144	123	156
17	153	211	190	270	200	230	349	188	253	140	129	140
18	148	233	220	290	210	240	337	199	233	136	123	147
19	156	206	320	310	240	290	337	218	209	129	119	141
20	153	344	320	300	230	300	302	199	182	124	a115	142
21	153	409	300	280	210	380	280	194	182	128	a115	146
22	156	314	300	250	210	600	291	197	197	128	a110	140
23	153	247	300	220	210	700	337	224	169	129	a120	135
24	156	230	200	240	300	500	349	216	190	124	a115	134
25	159	218	210	230	1,000	550	270	204	230	132	a115	132
26	156	200	160	210	900	882	325	202	274	135	113	134
27	152	195	220	220	700	1,000	433	194	215	147	116	128
28	156	194	240	220	550	1,080	337	185	185	148	141	128
29	147	182	220	200	-	850	302	182	164	134	141	128
30	148	192	200	170	-	805	274	179	164	129	141	124
31	150	-	190	190	-	715	-	172	-	134	155	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,635	159	135	150	0.469	0.54
November	6,348	409	148	212	.662	.74
December	6,636	320	160	214	.669	.77
Calendar year 1948	101,947	3,920	109	279	.872	11.84
January	6,850	310	170	221	.691	.80
February	8,100	1,000	180	289	.903	.94
March	14,702	1,080	230	474	1.48	1.71
April	10,013	558	259	334	1.04	1.16
May	7,686	558	172	248	.775	.89
June	5,640	361	135	188	.588	.66
July	5,043	385	124	163	.509	.59
August	4,102	195	110	132	.412	.48
September	4,701	301	124	157	.491	.55
Water year 1948-49	84,456	1,080	110	231	.722	9.83

Peak discharge (base, 1,600 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records and records for Middle Branch Au Sable River at Grayling.
Note.- Stage-discharge relation affected by ice Dec. 18 to Mar. 25.

Shiawassee River at Byron, Mich.

Location.- Wire-weight gage, lat. 42°49'25", long. 83°56'45", on line between secs. 14 and 23, T. 5 N., R. 4 E., at highway bridge at Byron, a quarter of a mile downstream from mill dam, which is just upstream from South Branch Shiawassee River.
Drainage area.- 368 square miles (revised).
Records available.- January 1948 to September 1949.
Extremes.- Maximum discharge during year, 2,270 second-feet Feb. 17 (gage height, 11.39 feet); minimum observed, 54 second-feet Aug. 1 (gage height, 4.09 feet).
1948-49: Maximum discharge, 2,860 second-feet May 13, 1948 (gage height, 12.51 feet); minimum observed, 36 second-feet Sept. 6, 1948 (gage height, 4.01 feet).
Remarks.- Records good except those for period of ice effect, which are fair. Low flow slightly regulated at times by mill dam above station. Gage read twice daily.
Revisions.- Because of an erroneous figure of drainage area, figures of second-feet per square mile and runoff in inches for the period January to September 1948 as published in Water-Supply Paper 1114 are considerably in error. Revised figures are given herein.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	104	76	172	260	b200	470	900	270	160	280	64	112
2	90	80	175	211	b200	445	1,240	260	126	224	84	101
3	88	94	163	175	b200	470	1,140	250	120	170	86	101
4	74	112	146	242	b200	420	900	250	116	119	82	86
5	80	136	143	320	b200	420	770	242	106	108	80	68
6	83	211	146	330	b200	420	695	224	100	112	83	71
7	90	204	151	382	b200	370	632	216	101	120	224	92
8	106	187	148	320	b200	382	595	190	98	108	260	96
9	138	182	141	270	b200	370	558	170	84	106	224	100
10	119	197	126	233	b200	350	482	168	89	100	160	92
11	119	209	122	224	b220	310	420	156	92	98	143	94
12	114	204	112	216	260	320	350	151	88	112	185	76
13	119	192	113	197	582	290	290	150	76	101	201	88
14	116	189	125	194	930	270	260	134	145	100	160	98
15	118	177	134	189	1,770	270	330	124	182	112	112	92
16	113	146	170	224	1,870	250	532	104	280	110	119	84
17	110	162	197	242	2,170	194	470	106	350	86	113	82
18	96	167	192	260	2,070	204	482	107	382	76	216	98
19	96	184	182	470	1,520	192	570	136	350	84	290	120
20	100	192	151	595	1,140	179	582	224	250	83	300	131
21	100	201	160	845	*1,020	185	508	242	216	84	250	124
22	96	197	168	845	845	216	470	224	213	86	179	107
23	90	211	160	570	745	290	470	250	209	88	160	106
24	96	224	101	482	695	340	458	350	209	83	156	107
25	89	211	101	458	695	320	420	320	216	78	145	98
26	86	194	110	432	620	330	408	290	184	90	143	84
27	84	194	116	*420	620	360	382	270	150	88	131	95
28	82	175	138	432	545	432	370	242	134	86	120	95
29	89	167	211	b350	-	495	320	224	153	89	108	92
30	84	172	250	b250	-	495	280	197	250	78	113	89
31	82	*-	290	b200	-	645	-	180	-	77	110	-

Peak discharge (base, 1,200 sec.-ft.).- Feb. 17 (8 a.m.) 2,270 sec.-ft.; Apr. 2 (1 to 3 p.m.) 1,280 sec.-ft.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Monthly discharge, in second-feet, 1948-49

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
January 1948	5,701	231	140	184	0.500	0.58
February	13,055	1,720	110	450	1.22	1.32
March	35,630	2,470	400	1,149	3.12	3.60
April	17,514	1,020	350	584	1.59	1.77
May	28,338	2,800	246	914	2.48	2.86
June	14,192	1,870	115	473	1.29	1.44
July	8,389	965	111	271	.736	.85
August	2,660	118	46	85.8	.233	.27
September	2,155	97	37	71.8	.195	.22
Water year	-	-	-	-	-	-
October 1948	3,051	138	74	98.4	.267	.31
November	5,247	224	76	175	.476	.53
December	4,814	290	101	155	.421	.49
Calendar year 1948	140,746	2,800	37	385	1.05	14.24
January 1949	10,838	845	175	350	.951	1.10
February	20,317	2,170	200	726	1.97	2.05
March	10,704	645	179	345	.938	1.08
April	16,284	1,240	260	543	1.48	1.65
May	6,421	350	104	207	.562	.65
June	5,229	382	76	174	.473	.53
July	3,336	280	76	108	.293	.34
August	4,801	300	64	155	.421	.49
September	2,879	131	68	96.0	.261	.29
Water year 1948-49	93,921	2,170	64	257	.698	9.51

Shiawassee River at Owosso, Mich.

Location.- Water-stage recorder, lat. 43°00'54", long. 84°10'52", in SW¼ sec. 12, T. 7 N., R. 2 E., a quarter of a mile north of Owosso. Datum of gage is 707.25 feet above mean sea level, datum of 1929.

Drainage area.- 538 square miles.

Records available.- March 1931 to September 1949.

Average discharge.- 16 years (1931-33, 1935-49), 314 second-feet.

Extremes.- Maximum daily discharge during year, 3,000 second-feet Feb. 17; minimum, 53 second-feet Oct. 26, Nov. 1, 2, Sept. 7 (gage height, 1.77 feet); minimum daily, 76 second-feet Oct. 6.
1931-49: Maximum discharge, 6,240 second-feet Apr. 6, 1947 (gage height, 10.35 feet); minimum, 0.2 second-foot July 27, 1934 (gage height, 1.12 feet); minimum daily, 2.0 second-feet July 28, 1934.

Remarks.- Records good except those for periods of ice effect or doubtful, fragmentary, or no gage-height record, which are fair. Flow regulated below about 800 second-feet by power plant at Shiawasseetown for period of record.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	107	93	189	323	a250	a660	1,500	a370	225	439	92	140
2	114	94	186	293	a250	635	1,380	a350	216	351	99	129
3	105	92	174	282	a250	595	1,500	a350	162	284	82	126
4	100	107	192	194	a250	615	1,260	a350	253	219	98	116
5	88	129	161	468	250	555	995	a330	160	155	98	128
6	76	161	169	555	250	595	245	a310	135	136	90	103
7	90	191	136	431	250	595	795	a290	113	134	588	86
8	116	20a	182	491	250	535	725	a270	122	138	804	105
9	111	202	125	443	250	515	635	a250	115	170	491	117
10	111	186	143	348	a270	475	555	a230	113	251	344	108
11	118	192	144	284	a300	475	515	a210	99	177	271	108
12	118	211	155	278	318	435	435	a200	102	133	262	107
13	116	214	134	271	1,520	395	375	a190	115	133	246	109
14	123	205	122	231	1,800	395	395	173	121	164	231	112
15	118	189	143	234	f2,850	336	820	166	259	233	205	110
16	152	154	128	281	f2,400	318	770	155	632	166	124	110
17	105	161	*200	318	a3,000	284	725	f134	953	143	126	108
18	116	154	188	353	a2,500	284	870	f145	595	129	125	106
19	111	200	210	1,060	2,400	252	970	170	535	115	175	118
20	103	208	222	810	1,720	a250	870	284	387	106	262	121
21	103	194	198	848	1,290	a300	770	318	294	116	268	144
22	117	205	150	1,000	1,150	395	680	336	355	105	237	140
23	104	216	120	833	*1,020	a450	702	375	268	100	172	117
24	102	216	110	702	945	a500	658	455	237	108	146	119
25	102	252	100	575	1,040	a450	615	455	216	115	137	115
26	95	240	100	*491	895	a500	575	375	202	106	150	115
27	97	211	100	555	795	a550	a550	344	195	97	152	106
28	97	208	150	575	725	595	a500	311	143	112	153	101
29	88	205	253	450	-	615	a450	294	154	117	151	105
30	90	189	312	a350	-	615	a400	271	389	109	131	106
31	89	-	292	a300	-	1,210	-	246	-	98	147	-

Month	Second-feet-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,282	152	76	106	0.197	0.23
November	5,487	252	92	183	.340	.38
December	5,188	312	100	167	.310	.36
Calendar year 1948	184,725	5,310	56	505	.939	12.78
January	14,627	1,080	194	472	.877	1.01
February	29,188	3,000	250	1,042	1.94	2.02
March	15,379	1,210	250	496	.922	1.06
April	22,835	1,500	375	761	1.41	1.57
May	8,707	455	134	281	.522	.60
June	7,865	953	99	262	.487	.54
July	4,959	439	97	160	.297	.34
August	6,657	804	82	215	.400	.46
September	3,435	144	86	114	.212	.24
Water year 1948-49	127,609	3,000	76	350	.651	8.81

Peak discharge (base, 1,500 sec.-ft.).- Feb. 14 (12:30 a.m.) 2,580 sec.-ft.; Feb. 17 (time and discharge unknown); Mar. 31 (8 to 9 p.m.) 1,720 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for station at Byron and near Fergus.

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

Note.- Stage-discharge relation affected by ice Dec. 22-28, Jan. 29 to Feb. 11. Doubtful gage-height record Feb. 5-9, 12, 26-28, Mar. 2-19, 22, Mar. 31 to Apr. 26; discharge computed on basis of records for stations at Byron and near Fergus.

Shiawassee River near Fergus, Mich.

Location.- Wire-weight gage, lat. 43°15'17", long. 84°06'20", in sec. 22, T. 10 N., R. 3 E., at highway bridge 1.2 miles east of Fergus and 1¾ miles upstream from Bear Creek. Datum of gage is 587.80 feet above mean sea level, datum of 1929.

Drainage area.- 637 square miles.

Records available.- January 1940 to September 1949.

Extremes.- Maximum discharge during year, 4,900 second-feet Feb. 16 (gage height, 12.00 feet); minimum observed, 90 second-feet Oct. 7 (gage height, 4.21 feet); minimum daily, 95 second-feet Oct. 7.

1940-49: Maximum daily discharge, 7,290 second-feet Apr. 6, 1947 (includes overflow bypassing gage); maximum gage height observed, 12.55 feet Mar. 19, 1948; minimum discharge observed, 29 second-feet Aug. 31, 1946 (gage height, 3.10 feet).

Remarks.- Records good except those for period of ice effect, which are fair. Some regulation at lowest stages by hydroelectric plants above Owosso. Gage read twice daily.

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 13 to Nov. 13,
Dec. 1 to Jan. 4, July 10 to Aug. 10)

4.2	90	6.7	465	11.0	2,980
4.5	107	7.2	600	11.4	3,470
5.0	144	7.9	860	11.8	4,300
5.5	200	8.9	1,370		
6.0	290	10.0	2,110		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	110	110	222	352	300	900	1,890	515	222	428	110	136
2	118	107	208	328	300	780	1,750	502	200	402	104	140
3	121	110	208	302	300	800	1,640	465	186	340	104	148
4	121	118	193	302	300	800	1,520	378	153	260	101	144
5	107	128	186	452	300	800	1,250	378	168	200	98	140
6	107	153	180	760	300	780	1,050	328	168	158	107	128
7	95	174	174	630	300	740	925	328	144	148	200	110
8	140	193	174	555	300	645	880	302	128	148	950	104
9	136	215	163	555	300	615	800	280	128	240	630	107
10	140	230	140	528	320	600	740	250	132	555	452	114
11	144	230	132	440	*350	555	660	230	128	280	365	114
12	144	240	148	390	500	515	600	215	121	180	302	118
13	174	260	140	365	2,000	502	540	222	124	148	270	121
14	193	260	140	365	3,080	478	490	208	140	180	250	128
15	132	240	148	378	3,320	440	740	200	144	260	230	124
16	124	215	148	415	4,300	415	880	186	502	193	193	124
17	121	193	180	415	3,320	452	1,020	180	860	168	158	124
18	121	186	193	415	3,200	402	950	163	740	153	153	132
19	124	180	200	925	3,320	390	1,180	168	615	144	153	128
20	118	186	193	1,400	2,980	365	1,050	208	528	132	180	124
21	110	250	168	840	2,270	352	925	260	452	118	250	136
22	107	270	144	780	1,820	365	880	290	452	121	260	144
23	104	260	136	860	1,640	478	820	378	415	121	230	148
24	104	270	132	1,020	1,490	555	760	402	315	118	200	136
25	107	280	124	*700	1,430	528	660	440	270	114	163	128
26	114	302	118	600	1,370	555	630	428	222	118	158	121
27	110	290	121	550	1,280	600	585	378	158	114	140	121
28	104	270	180	600	1,220	700	540	340	163	110	132	121
29	104	250	328	500	-	700	528	302	186	124	140	118
30	104	240	415	400	-	660	502	290	186	114	153	114
31	107	-	352	300	-	840	-	270	-	110	140	-

Month	Second-feet-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,765	193	95	121	0.190	0.22
November	6,410	302	107	214	.336	.37
December	5,688	415	118	183	.287	.33
Calendar year 1948	217,136	6,000	79	593	.931	12.68
January	17,422	1,400	300	562	.882	1.02
February	41,910	4,300	300	1,497	2.35	2.45
March	18,307	900	352	591	.928	1.07
April	27,385	1,890	490	913	1.43	1.60
May	9,484	515	163	306	.480	.55
June	8,350	860	121	278	.436	.49
July	5,999	555	110	194	.305	.35
August	7,076	950	98	228	.358	.41
September	3,795	148	104	126	.198	.22
Water year 1948-49	155,591	4,300	95	426	.669	9.08

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Jan. 25 to Feb. 13.

Bad River near Brant, Mich.

Location.- Wire-weight gage, lat. 43°17'50", long. 84°13'45", in NW¼ sec. 3, T. 10 N., R. 2 E., on county road bridge 2½ miles north of Brant and 6 miles upstream from mouth of South Fork.

Drainage area.- 89 square miles.

Records available.- December 1948 to September 1949.

Extremes.- Maximum discharge during period, 1,110 second-feet Feb. 14 (gage height, 12.80 feet); no flow at times.

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

Rating table, Dec. 1, 1948, to Sept. 30, 1949, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Aug. 30 to Sept. 30)

5.6	0	6.1	3.5	8.1	47	10.5	290
5.7	.1	6.3	6.5	8.7	79	11.2	440
5.8	.9	6.7	13	9.1	110	11.8	630
5.9	1.6	7.6	32	9.8	185	12.4	870

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	19	8	54	120	12	1.0	2.3	36	0.6
2			0	24	7	44	140	12	.9	1.4	24	.6
3			0	15	6	32	86	19	.9	1.1	17	.4
4			0	11	5	27	52	17	.8	1.1	11	.2
5			0	10	5	27	41	12	.6	1.0	7.7	.3
6			0	9.4	5	35	33	9.8	.5	.8	5.6	.2
7			0	16	5	31	28	7.4	.4	.6	4.4	.3
8			0	29	5	34	25	6.0	.3	.5	3.1	.6
9			0	27	5	31	21	4.7	.2	1.4	2.8	.5
10			0	21	*5	27	18	3.3	.2	1.8	3.2	.5
11			0	16	5	25	16	3.4	.2	1.3	19	.5
12			0	12	6	20	13	2.6	.1	1.4	80	.4
13			0	11	200	19	12	2.4	.1	1.5	21	.4
14			0	9.4	870	22	11	2.0	.7	21	41	.6
15			0	8.8	750	17	15	2.1	5.4	50	29	.7
16			0	9.4	455	18	34	1.6	33	130	19	.6
17			0	14	310	6.8	62	1.7	93	96	12	.4
18			1.8	18	230	*8.8	67	1.7	96	47	7.8	.4
19			3.2	201	390	8.0	96	2.0	64	31	5.2	.3
20			3.4	350	500	6.6	115	1.8	40	23	3.6	.2
21			3.5	350	310	8.6	67	1.7	29	19	2.4	.1
22			3.1	180	102	13	50	2.5	26	16	1.8	.1
23			2.8	54	86	25	54	3.8	22	10	1.6	.1
24			2.7	*33	100	35	47	3.4	17	7.1	1.2	.1
25			2.5	25	292	33	37	3.2	13	5.8	1.0	.1
26			2.5	20	470	33	29	2.8	9.5	5.0	.9	.1
27			2.5	20	252	48	26	2.0	6.8	5.2	.7	0
28			2.6	20	96	115	23	1.7	4.4	6.4	.6	0
29			8.6	15	-	96	18	1.4	3.2	12	.6	0
30			10	10	-	54	15	1.2	2.9	18	.6	0
31			16	9	-	57	-	1.1	-	33	.6	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	65.2	16	0	2.10	0.024	0.03
Calendar year	-	-	-	-	-	-
January	1,567.0	350	8.8	50.5	.567	.65
February	5,480	870	5	196	2.20	2.29
March	1,010.8	115	6.6	32.6	.366	.42
April	1,371	140	11	45.7	.513	.57
May	149.3	19	1.1	4.82	.054	.06
June	472.1	96	.1	15.7	.176	.20
July	551.7	130	.5	17.8	.200	.23
August	364.4	80	.6	11.8	.133	.15
September	9.3	.7	0	.31	.0035	.004
Water year	-	-	-	-	-	-

Peak discharge (base, 215 sec.-ft.).- Jan. 20 (9 a.m.) 380 sec.-ft.; Feb. 14 (3 to 6 p.m.) 1,110 sec.-ft.; Feb. 20 (6 a.m.) 670 sec.-ft.; Feb. 26 (5 p.m.) 515 sec.-ft.

* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Jan. 24 to Feb. 13.

Flint River at Columbiaville, Mich.

Location.- Wire-weight gage, lat. 43°09'20", long. 83°24'40", in sec. 33, T. 9 N., R. 9 E., at highway bridge at Columbiaville. Datum of gage is 736.26 feet above mean sea level, datum of 1929.
Drainage area.- 486 square miles.
Records available.- January 1948 to September 1949. Gage-height records collected at site a third of a mile upstream, January 1932 to July 1933, are contained in reports of U. S. Weather Bureau.
Extremes.- Maximum discharge during year, 3,400 second-feet Feb. 16, 17 (gage height, 15.34 feet); minimum, 34 second-feet Sept. 30 (gage height, 6.20 feet).
1948-49: Maximum discharge, 6,690 second-feet Mar. 21, 1948 (gage height, 17.10 feet, from graph based on gage readings); minimum, 33 second-feet Sept. 5, 6, 8, 1948 (gage height, 6.40 feet).
Remarks.- Records good except those for periods of ice effect, which are fair. Gage read twice daily.

Rating tables, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Feb. 17						Feb. 18 to Sept. 30			
6.5	39	10.1	470	14.0	1,930	6.2	34	8.0	197
7.2	88	11.8	820	14.5	2,410	6.4	43	9.0	317
7.8	148	12.6	1,100	15.3	3,400	6.8	69	10.1	470
8.8	272	13.4	1,510			7.2	106		

Note.- Same as preceding table above 10.1 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	66	114	230	b250	530	610	245	96	62	53	44
2	45	72	109	196	b200	462	945	263	86	50	55	43
3	48	63	110	159	b170	418	1,020	305	78	52	54	40
4	44	77	102	147	b160	362	945	299	73	54	51	40
5	45	98	102	178	b150	330	730	269	71	52	52	40
6	41	117	106	208	b140	369	610	239	67	48	48	38
7	41	141	*102	214	b140	369	490	209	65	45	50	38
8	49	145	95	220	*b140	376	432	173	61	43	54	39
9	53	133	89	226	b150	369	403	149	60	60	55	38
10	60	139	80	233	b180	350	362	149	55	71	49	40
11	60	158	88	220	b170	324	324	138	51	149	48	40
12	59	147	96	196	b200	311	293	130	48	128	46	38
13	62	122	88	160	850	263	269	125	47	118	60	37
14	61	112	91	166	1,290	287	245	118	54	110	67	39
15	58	112	102	154	3,000	251	317	101	82	120	58	42
16	54	102	124	220	3,400	239	590	96	144	125	51	40
17	57	112	125	322	3,400	239	650	105	167	104	54	39
18	53	122	103	338	3,000	239	690	114	167	90	75	42
19	58	124	153	670	2,410	203	770	130	138	114	84	52
20	59	160	138	750	1,930	197	710	185	118	102	67	56
21	62	220	122	795	1,390	197	610	197	107	91	58	58
22	61	233	125	880	1,060	269	530	185	86	79	58	53
23	66	214	102	945	795	425	490	209	75	71	50	47
24	65	196	b90	795	710	490	448	215	66	78	45	45
25	72	172	b80	590	750	510	425	191	61	118	44	45
26	66	152	b75	428	710	490	389	173	55	105	42	42
27	70	142	b75	352	730	500	356	167	55	99	39	42
28	71	138	76	338	690	510	330	155	48	93	38	40
29	66	124	138	293	-	500	299	131	63	79	40	37
30	65	122	228	293	-	470	269	112	66	71	46	34
31	66	-	246	b290	-	570	-	97	-	62	40	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,777	72	40	57.3	0.118	0.14
November	4,035	233	63	134	.276	.31
December	3,472	246	75	112	.230	.27
Calendar year 1948	123,185	6,060	33	337	.693	9.43
January	11,206	945	147	361	.743	.86
February	28,165	3,400	140	1,006	2.07	2.16
March	11,419	570	197	368	.757	.87
April	15,551	1,020	245	518	1.07	1.19
May	5,374	305	96	173	.356	.41
June	2,410	167	47	80.3	.165	.18
July	2,643	149	43	85.3	.176	.20
August	1,631	84	38	52.6	.108	.12
September	1,268	58	34	42.3	.087	.10
Water year 1948-49	88,951	3,400	34	244	.502	6.81

Peak discharge (base, 1,200 sec.-ft.).- Feb. 16, 17, 3,400 sec.-ft.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Flint River at Genesee, Mich.

Location.- Wire-weight gage, lat. 43°06'25", long. 83°37'00", in sec. 10, T. 8 N., R. 7 E., at highway bridge at Genesee, three-quarters of a mile downstream from Butternut Creek. Datum of gage is 695.27 feet above mean sea level, datum of 1929.

Drainage area.- 593 square miles.

Records available.- March 1931 to September 1949.

Average discharge.- 18 years, 341 second-feet.

Extremes.- Maximum discharge during year, 3,440 second-feet Feb. 17 (gage height, 22.60 feet, from graph based on gage readings); minimum, 38 second-feet Oct. 1; minimum gage height, 13.01 feet Aug. 29.
1931-49: Maximum discharge, 8,650 second-feet Apr. 8, 1947 (gage height, 27.06 feet, from floodmark); minimum observed, about 10 second-feet Aug. 15, 1936.

Remarks.- Records good except those for periods of ice effect or doubtful or no gage-height record, and backwater from Utah Dam, which are fair. Gage read twice daily.

Revisions (water years).- W 1054: 1942.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	39	85	136	300	240	820	850	340	141	146	c80	69
2	44	d85	130	250	220	745	850	340	129	98	c80	74
3	47	d85	133	200	200	705	850	350	113	92	c80	70
4	54	90	137	200	190	668	910	360	113	82	c75	65
5	58	109	137	200	180	605	940	360	115	78	c70	63
6	50	152	*130	250	180	542	760	330	106	76	c100	56
7	42	201	126	270	*180	*505	680	290	101	73	180	58
8	40	197	124	280	180	468	580	260	96	72	199	60
9	40	172	121	290	180	430	a540	226	94	152	208	63
10	40	156	120	300	180	400	a500	208	94	214	167	63
11	44	147	125	270	200	390	442	194	86	194	143	60
12	45	143	124	250	500	380	410	178	79	194	122	59
13	45	144	120	200	1,500	380	410	159	73	178	110	63
14	46	150	113	200	2,550	390	455	154	75	192	103	69
15	48	140	134	200	2,870	360	718	152	91	178	101	71
16	49	129	180	250	3,050	330	1,060	141	110	159	97	68
17	50	133	196	*300	3,350	300	1,090	130	147	152	96	67
18	49	147	201	530	3,350	300	1,060	127	178	146	94	68
19	54	169	210	1,280	3,440	290	1,000	156	187	148	94	68
20	60	197	200	1,360	3,050	270	910	167	159	153	93	68
21	64	226	170	1,400	2,650	270	820	194	144	147	92	67
22	70	220	150	1,480	1,880	310	760	210	136	140	85	65
23	79	210	130	1,680	1,560	468	692	224	125	131	79	63
24	88	203	110	1,520	1,480	605	605	226	104	216	82	60
25	98	197	100	1,000	1,320	630	518	236	96	c200	73	59
26	93	187	100	800	1,180	655	492	244	93	c170	58	58
27	84	172	100	600	1,090	655	455	220	83	c150	56	58
28	d80	162	100	400	970	642	420	192	78	c130	57	57
29	d80	152	200	350	-	630	400	173	154	c120	55	56
30	d80	143	250	300	-	630	370	158	330	c100	60	55
31	83	-	300	270	-	760	-	152	-	c90	66	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,843	98	39	59.5	0.100	0.12
November	4,703	226	85	157	.265	.30
December	4,607	300	100	149	.251	.29
Calendar year 1948	162,178	5,190	35	443	.747	10.17
January	17,180	1,680	200	554	.934	1.08
February	37,920	3,440	180	1,354	2.28	2.37
March	15,533	820	270	501	.845	.97
April	20,547	1,090	370	685	1.16	1.29
May	6,851	360	127	221	.373	.43
June	3,630	330	73	121	.204	.23
July	4,371	216	72	141	.238	.27
August	3,055	208	55	98.5	.166	.19
September	1,900	74	55	63.3	.107	.12
Water year 1948-49	122,140	3,440	39	335	.565	7.66

Peak discharge (base, 1,300 sec.-ft.).- Jan. 23 (3 to 9 p.m.) 1,720 sec.-ft.; Feb. 17 (8 to 10 p.m.) 3,440 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge interpolated.

c Probable backwater from Utah Dam; discharge computed on basis of weather records and records for stations at Columbiaville and near Flint and Fosters.

d Doubtful gage-height record; discharge computed on basis of engineers' notes, weather records, and records for stations at Columbiaville and near Flint.

Note.- Stage-discharge relation affected by ice Dec. 20 to Jan. 17, Jan. 25 to Feb. 13.

Flint River near Flint, Mich.

Location.- Water-stage recorder, lat. 43°02'20", long. 83°46'10", in SW¼ sec. 4, T. 7 N., R. 6 E., at sewage-treatment plant 2 miles downstream from Flint and 5 miles downstream from Swartz Creek. Datum of gage is 678.80 feet above mean sea level (levels by U. S. Weather Bureau and city of Flint).

Drainage area.- 927 square miles.

Records available.- August 1932 to September 1949.

Average discharge.- 17 years, 521 second-feet.

Extremes.- Maximum discharge during year, 4,940 second-feet Feb. 15 (gage height, 9.37 feet); minimum, 46 second-feet Oct. 4 (gage height, 2.22 feet).
1932-49: Maximum discharge, 14,900 second-feet Apr. 6, 1947 (gage height, 16.35 feet); minimum, 9.0 second-feet Aug. 7, 1934.

Remarks.- Records good. Some regulation by reservoirs above station. City of Flint diverts water above station for municipal and industrial use, but sewage from city is included in flow at station.

Revisions (water years).- W 954: 1941.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	116	208	314	436	1,040	2,190	495	214	241	135	128
2	53	118	202	301	425	910	2,030	570	190	168	141	104
3	53	118	193	272	392	850	2,190	526	187	133	151	97
4	60	133	97	256	364	820	1,870	540	223	144	97	102
5	90	153	220	440	330	658	1,680	526	185	171	98	116
6	131	146	229	479	317	880	1,260	447	156	109	102	100
7	97	161	128	410	317	850	1,080	395	139	86	331	95
8	78	279	306	410	357	790	910	357	126	84	256	98
9	74	247	104	403	406	790	850	321	116	259	182	94
10	71	220	113	410	410	730	760	301	111	432	202	87
11	81	214	120	371	371	550	700	282	102	311	185	89
12	89	217	141	334	413	467	526	269	97	279	185	92
13	86	226	232	304	2,390	479	487	247	100	250	158	107
14	90	226	324	285	2,860	487	459	229	151	308	166	100
15	86	223	190	301	4,340	455	1,040	220	499	344	161	87
16	84	226	196	374	3,670	432	1,540	208	820	282	144	86
17	80	235	238	471	3,580	371	1,500	196	550	241	131	86
18	87	211	135	700	3,760	371	1,600	205	421	211	128	131
19	92	211	98	2,030	3,760	340	1,830	314	334	208	149	107
20	90	276	275	1,430	3,400	347	1,540	334	279	205	161	104
21	89	269	168	1,220	2,680	381	1,430	334	256	185	161	109
22	86	344	403	1,220	2,270	487	1,400	440	266	193	153	113
23	86	444	190	1,220	1,710	1,010	1,290	575	202	151	135	111
24	81	487	137	1,180	1,460	850	1,120	518	179	153	124	105
25	95	317	131	1,080	1,570	975	820	447	153	285	113	104
26	133	288	144	790	1,400	1,010	850	395	153	220	107	102
27	131	247	146	605	1,180	1,120	700	364	153	133	97	97
28	126	223	128	664	1,220	1,120	550	327	131	174	98	89
29	126	238	361	560	-	1,010	585	295	239	187	113	89
30	116	256	324	347	-	975	531	260	440	161	102	86
31	116	-	301	340	-	1,680	-	235	-	139	118	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,819	133	53	90.9	0.098	0.11
November	7,069	487	116	236	.255	.28
December	6,182	403	97	199	.215	.25
Calendar year 1948	253,823	9,600	53	694	.749	10.19
January	19,521	2,030	256	630	.680	.78
February	45,788	4,340	317	1,635	1.76	1.83
March	23,235	1,680	340	750	.809	.93
April	35,318	2,190	459	1,177	1.27	1.42
May	11,172	575	196	360	.388	.45
June	7,172	820	97	239	.258	.29
July	6,447	432	84	208	.224	.26
August	4,584	331	97	148	.160	.18
September	3,015	131	86	100	.108	.12
Water year 1948-49	172,322	4,340	53	472	.509	6.90

Peak discharge (base, 2,500 sec.-ft.).- Jan. 19 (2 to 3 p.m.) 2,510 sec.-ft.; Feb. 15 (3 p.m.) 4,940 sec.-ft.

Flint River near Fosters, Mich.

Location.- Wire-weight gage, lat. 43°17'56", long. 83°55'58", in sec. 6, T. 10 N., R. 5 E., at bridge on Sheridan Road, 1 mile west of Fosters and 4 miles downstream from Silver Creek. Datum of gage is 582.22 feet above mean sea level (levels by U. S. Weather Bureau).

Drainage area.- 1,120 square miles.

Records available.- January 1940 to September 1949.

Extremes.- Maximum discharge during year, 5,500 second-feet Feb. 16 (gage height, 17.13 feet); minimum, 68 second-feet Oct. 5 (gage height, 4.29 feet).

1940-49: Maximum daily discharge, 18,200 second-feet Apr. 7, 1947; maximum gage height, 17.97 feet Apr. 6, 1947 (from floodmark); minimum discharge observed, 27 second-feet Aug. 6, 1941 (gage height, 3.67 feet).

Maximum stage known, about 18.4 feet (from U. S. Weather Bureau data) in March 1904.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Records include flow bypassing station during high stages. Some regulation at times due to operation of reservoirs above Flint. Gage read twice daily.

Revisions (water years).- W 954: 1941.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used May 2 to June 16)

Oct. 1 to Jan. 19				Jan. 20 to Sept. 30			
4.3	70	7.0	620	4.3	90	10.0	1,750
5.2	215	9.0	1,190	4.7	150	11.0	2,150
6.0	370	11.0	1,800	5.6	335	13.0	3,020
				6.6	595	15.0	4,000
				7.8	970	16.8	5,240

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	107	163	328	488	450	1,460	2,930	655	228	422	145	123
2	96	156	280	512	450	1,280	2,840	775	206	276	144	156
3	81	152	260	488	450	1,110	2,620	775	196	192	144	129
4	76	165	338	452	450	1,040	2,390	825	190	140	135	115
5	72	121	139	464	400	1,040	2,150	810	184	147	142	100
6	112	217	228	660	400	970	1,790	550	176	284	98	108
7	230	190	242	782	400	1,140	1,390	448	149	174	111	118
8	157	201	*203	701	400	1,040	1,220	435	138	105	422	110
9	104	289	260	660	450	1,000	1,080	398	126	132	320	104
10	103	280	130	647	450	970	970	360	112	715	232	100
11	104	260	165	634	*450	865	900	320	104	535	214	94
12	107	242	183	a600	500	685	805	298	94	372	242	94
13	115	251	178	a550	2,660	670	670	276	87	300	232	94
14	117	242	280	a550	4,680	655	625	248	104	328	262	109
15	117	251	348	a550	5,000	625	730	234	264	510	198	132
16	120	260	242	a600	5,240	610	2,150	226	900	422	176	106
17	117	260	242	a600	4,920	595	2,150	202	900	310	164	94
18	112	251	260	620	4,920	460	2,070	194	730	266	147	98
19	117	242	220	1,800	4,600	472	2,520	220	595	274	138	114
20	130	280	233	2,480	4,240	485	2,270	360	398	224	140	136
21	130	298	381	1,670	3,750	460	1,950	372	310	210	174	114
22	130	318	260	1,560	3,160	510	2,110	372	360	200	186	112
23	131	452	359	1,460	2,570	835	1,870	535	310	196	162	115
24	122	539	250	1,600	2,030	1,040	1,750	655	248	170	156	120
25	120	476	200	1,600	2,070	1,110	1,390	535	190	180	138	115
26	112	338	150	1,180	1,950	1,280	1,040	472	174	272	122	108
27	136	308	150	*935	1,560	1,360	1,140	422	158	244	112	108
28	157	289	150	700	1,420	1,460	835	a400	149	166	111	108
29	160	260	250	600	-	1,320	685	a350	145	168	105	100
30	167	280	566	500	-	1,220	715	a300	320	170	108	90
31	157	-	526	450	-	1,420	-	258	-	164	115	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,816	230	72	123	0.110	0.13
November	8,091	539	152	270	.241	.27
December	8,001	566	130	258	.230	.27
Calendar year 1948	284,940	9,000	67	779	.696	9.47
January	27,093	2,480	450	874	.780	.90
February	60,020	5,240	400	2,144	1.91	1.99
March	29,187	1,460	460	942	.841	.97
April	47,755	2,930	625	1,592	1.42	1.58
May	12,880	775	194	415	.371	.43
June	8,245	900	87	275	.246	.27
July	8,268	715	105	267	.238	.27
August	5,295	422	98	171	.153	.18
September	3,324	156	90	111	.099	.11
Water year 1948-49	221,975	5,240	72	608	.543	7.37

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for station near Flint.

Note.- Stage-discharge relation affected by ice Dec. 24-29, Jan. 28 to Feb. 12.

Flint River near Alicia, Mich.

Location.- Water-stage recorder, lat. 43°18'40", long. 84°02'00", in SE¼ sec. 31, T. 11 N., R. 4 E., 2¾ miles north of Alicia and 4 miles upstream from mouth. Datum of gage is 577.00 feet above mean sea level, datum of 1929.

Records available.- November 1948 to September 1949.

Extremes.- Maximum gage height during period, 10.65 feet Feb. 16; minimum, 1.49 feet Dec. 7.

Gage height, in feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			2.46	3.10	3.35	5.74	8.48	3.25	2.65	2.97	2.52	2.01
2			2.29	3.04	3.49	5.04	8.27	3.22	2.26	3.09	2.47	1.80
3			2.31	2.85	3.56	4.75	7.61	-	2.25	2.82	2.70	2.01
4			2.25	2.65	3.54	4.57	7.21	-	2.32	2.77	2.64	1.90
5			2.11	2.55	3.51	4.44	6.79	3.09	2.92	2.96	2.47	1.90
6			1.64	4.02	3.37	4.62	6.13	3.04	2.69	3.07	2.36	2.45
7			2.00	4.59	3.21	4.85	5.32	3.57	2.85	3.19	3.32	2.21
8			2.13	4.12	3.21	4.48	4.88	2.77	2.64	3.13	4.02	2.33
9			2.14	3.98	3.23	4.38	4.58	3.19	2.47	2.73	4.02	2.19
10			2.19	3.85	3.57	4.45	4.26	3.51	2.30	4.74	3.22	1.93
11			2.00	3.55	3.77	3.98	4.14	2.68	2.19	4.05	2.95	1.99
12			1.93	3.12	3.65	3.61	3.78	2.58	2.22	2.96	3.28	1.92
13			2.33	2.89	6.88	3.41	3.49	2.35	1.98	2.97	3.18	1.74
14			2.62	2.84	9.89	3.34	3.81	2.95	2.59	3.52	2.90	1.77
15			2.97	2.65	10.20	3.26	4.90	2.88	3.42	4.45	2.91	1.87
16			2.11	2.78	10.62	2.92	7.19	2.46	5.14	3.57	2.78	1.72
17			1.94	3.58	10.37	3.03	7.15	2.40	6.21	3.02	2.56	1.72
18			2.32	3.43	10.04	2.97	6.73	2.11	5.55	2.61	2.79	1.89
19			2.33	6.37	9.87	2.82	7.84	2.80	4.42	3.16	2.96	1.69
20			2.26	7.77	9.79	2.62	7.62	3.45	3.87	2.90	2.53	2.21
21			2.36	6.21	9.57	2.57	6.48	2.72	3.32	2.64	2.44	1.83
22			2.32	5.53	9.17	3.22	5.91	2.80	3.81	2.34	2.35	1.86
23			2.32	5.28	8.55	4.26	6.30	2.95	3.75	2.68	2.35	2.16
24			2.17	5.18	7.66	4.60	5.75	3.18	3.10	2.17	2.70	2.06
25			2.48	5.18	7.54	4.48	5.05	3.19	2.90	2.50	2.07	1.85
26			2.13	4.72	7.38	4.83	4.38	3.23	2.69	2.43	2.17	1.74
27			1.87	3.95	6.71	4.97	4.45	3.11	2.85	2.33	1.99	1.68
28			2.09	4.02	6.20	5.67	4.09	2.88	2.65	2.34	2.43	2.26
29			2.42	4.15	-	5.17	3.57	2.77	2.86	2.56	2.44	2.15
30		2.13	3.90	4.03	-	4.91	3.47	2.57	2.72	3.10	2.05	1.70
31			3.80	3.79	-	5.39	-	2.65	-	2.93	2.15	-

Farmers Creek near Lapeer, Mich.

Location.- Staff gage and concrete control. lat. 43°02', long. 83°20', at sewage-treatment plant at Michigan Home and Training School, 2 miles west of Lapeer. Datum of gage is 805.79 feet above mean sea level, datum of 1929.

Drainage area.- 57 square miles.

Records available.- March 1933 to September 1949.

Average discharge.- 16 years, 28.0 second-feet.

Extremes.- Maximum discharge during year, 317 second-feet Feb. 16 (gage height, 17.46 feet); minimum, 2.4 second-feet July 8 (gage height, 15.04 feet).
1933-49: Maximum discharge, 1,280 second-feet Apr. 6, 1947 (gage height, 19.87 feet, from floodmark), by contracted-opening method; minimum not determined.

Remarks.- Records fair. Gage read twice daily. Occasional regulation by dam above station.

Revisions (water years).- W 924: 1938, 1940. W 1084: 1942(M), 1943

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)

15.0	1.6	15.4	16	16.0	76
15.1	3.5	15.5	22	16.5	158
15.2	6.4	15.6	30	17.0	248
15.3	10	15.8	50	17.4	310

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.7	7.1	15	24	24	66	104	28	9.1	4.8	5.4	5.1
2	5.7	7.9	13	21	20	50	165	31	8.3	4.5	5.7	4.5
3	5.7	8.7	14	16	17	44	140	33	7.5	3.9	6.4	4.2
4	5.1	9.5	13	14	17	43	100	37	6.7	3.4	6.0	3.5
5	5.1	12	13	18	16	43	80	36	6.0	3.1	5.1	3.5
6	5.1	15	13	19	16	48	65	31	5.4	2.9	4.5	3.5
7	5.1	17	14	22	16	56	58	28	4.8	2.7	4.8	4.2
8	5.4	21	13	29	16	57	55	23	4.5	2.6	5.1	5.1
9	5.7	21	13	31	17	54	50	20	3.9	3.1	5.1	5.1
10	5.7	22	11	30	19	44	47	18	3.9	7.1	4.2	4.5
11	5.7	21	11	28	20	38	40	16	3.9	14	3.7	4.5
12	5.7	21	13	25	28	37	36	14	3.5	19	5.4	3.9
13	6.0	19	17	22	66	55	33	12	3.5	17	6.4	3.7
14	6.4	16	12	19	203	37	29	12	3.9	19	5.7	4.5
15	6.4	14	13	20	276	36	39	11	5.7	19	5.7	4.5
16	6.4	14	15	28	288	34	62	10	9.9	20	6.7	4.5
17	6.4	16	17	36	297	28	90	10	12	20	14	3.9
18	6.0	16	17	43	225	24	89	9.9	13	16	17	5.7
19	5.4	19	17	75	154	21	82	13	12	13	16	8.3
20	4.8	24	16	98	120	21	80	21	9.9	9.9	14	10
21	9.5	29	16	151	97	27	73	24	8.7	7.5	12	9.1
22	7.1	36	16	115	82	41	62	24	9.1	7.1	9.9	7.9
23	7.9	35	16	90	76	57	56	25	7.1	7.9	8.3	6.4
24	8.7	30	13	50	73	73	52	23	5.7	7.9	6.7	6.4
25	8.7	26	11	42	79	72	49	21	5.1	9.1	5.7	5.7
26	8.3	22	8.3	33	79	63	44	19	5.7	8.3	5.1	5.1
27	7.9	21	6.7	33	77	62	40	17	6.7	6.7	4.5	4.5
28	7.1	19	6.7	34	62	58	37	15	5.7	7.1	4.5	4.5
29	7.1	18	16	30	-	54	34	13	5.4	6.7	4.5	4.5
30	7.1	16	18	36	-	50	31	12	5.1	6.4	4.5	3.9
31	7.1	-	22	24	-	65	-	10	-	6.4	4.5	-

Month	Second-feet-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	200.0	9.5	5.1	6.45	0.113	0.13
November	573.2	36	7.1	19.1	.335	.37
December	429.7	22	6.7	13.9	.244	.28
Calendar year 1948	14,845.9	392	2.7	40.6	.712	9.68
January	1,256	151	14	40.5	.711	.82
February	2,480	297	16	88.6	1.55	1.61
March	1,458	73	21	47.0	.825	.95
April	1,922	165	29	64.1	1.12	1.25
May	616.9	37	9.9	19.9	.349	.40
June	201.7	13	3.5	6.72	.118	.13
July	287.1	21	2.6	9.26	.162	.19
August	217.1	17	3.7	7.00	.123	.14
September	154.7	10	3.5	5.16	.091	.10
Water year 1948-49	9,796.4	297	2.6	26.8	.470	6.37

Peak discharge (base, 150 sec.-ft.).- Jan. 21 (4 a.m.) 165 sec.-ft.; Feb. 16 (4 to 5 p.m.) 317 sec.-ft.; Apr. 2 (12 m. to 2 p.m.) 172 sec.-ft.

Cass River at Cass City, Mich.

Location.- Wire-weight gage, lat. 43°35'05", long. 83°10'20", on line between secs. 3 and 4, T. 13 N., R. 11 E., at highway bridge, about 1,000 feet downstream from confluence of North Branch and East Branch and 1 mile south of Cass City.

Drainage area.- 370 square miles.

Records available.- January 1948 to September 1949.

Extremes.- 1948: Maximum discharge during period January to September, 9,600 second-feet Mar. 20 (gage height, 15.80 feet, from graph based on gage readings), from rating curve extended above 5,500 second-feet; minimum, 0.5 second-foot Sept. 26 (gage height, 4.34 feet).
1948-49: Maximum discharge during water year, 2,740 second-feet Feb. 15 (gage height, 10.58 feet); minimum, 1.1 second-feet Oct. 2, 3, 5 (gage height, 4.39 feet).

Remarks.- Records good except those for periods of ice effect or no gage-height record and those above 5,500 second-feet, which are fair. Gage read once daily.

Rating table, Jan. 15, 1948, to Sept. 30, 1949, except periods of ice effect or doubtful gage-height record (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Apr. 21 to June 15, Sept. 30, 1949)

4.4	1.3	5.2	55	8.5	1,200
4.5	3.9	5.8	150	9.5	1,850
4.6	7.4	6.3	255	11.0	3,100
4.7	12	6.7	365	12.5	4,750
4.8	18	7.1	510	14.0	6,800
5.0	33	7.9	870	15.0	8,300

Discharge, in second-feet, 1948-49

1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				a25	15	1,100	1,710	91	26	23	10	1.1
2				a25	15	900	1,500	74	27	20	7.8	2.1
3				a25	15	700	748	64	25	18	7.0	2.1
4				a25	15	600	395	54	22	17	6.2	1.5
5				a25	15	500	298	50	22	12	5.4	1.5
6				a25	16	400	242	53	19	9.0	4.5	1.7
7				a25	18	350	214	140	25	7.8	3.9	1.9
8				a25	18	300	214	510	27	7.4	3.6	1.9
9				a25	18	250	190	510	30	7.0	3.3	3.0
10				a25	15	220	174	478	30	6.2	2.4	2.4
11				a25	15	190	290	748	26	5.4	3.6	2.4
12				a25	15	170	550	945	23	5.1	7.4	1.1
13				a25	15	150	502	635	21	5.4	8.2	1.1
14				a25	15	170	260	389	19	7.0	5.4	1.3
15				*23	15	200	194	275	17	7.4	5.1	1.3
16				23	16	1,000	168	204	16	7.0	4.2	1.1
17				23	*14	2,000	142	160	13	6.2	2.7	1.3
18				23	14	2,500	124	127	10	5.8	3.3	1.1
19				22	15	6,240	118	108	12	6.2	4.8	.9
20				21	15	8,300	121	91	12	5.8	5.4	.9
21				20	50	*5,680	114	74	14	6.2	5.4	.9
22				19	200	4,270	97	66	16	9.5	5.4	.8
23				18	225	3,010	88	56	47	16	4.2	1.1
24				18	250	2,170	90	49	162	18	3.9	.7
25				18	400	1,380	90	40	106	28	2.7	.6
26				18	600	590	90	38	60	60	2.1	.5
27				20	1,000	412	98	39	38	58	1.7	.7
28				20	1,100	305	136	36	27	40	1.7	.9
29				18	1,200	341	122	33	30	24	1.5	.8
30				16	-	920	106	31	27	17	1.3	1.3
31				15	-	1,200	-	27	-	13	1.1	-

Peak discharge (base, 900 sec.-ft.).- Feb. 29 (time and discharge unknown); Mar. 20 (a:30 a.m.) 9,600 sec.-ft.; Apr. 1 (6 to 8 p.m.) 1,850 sec.-ft.; May 12 (6 to 8 a.m.) 970 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records and records for Cass River at Vassar and at Frankenmuth, on East Branch, and Flint River at Columbiaville.
Note.- Stage-discharge relation affected by ice Jan. 15 to Mar. 18.

Discharge, in second-feet, of Cass River at Cass City, Mich., 1948-49--Continued

1948-49

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.9	3.0	13	800	50	282	530	126	27	11	23	a5.0
2	1.3	3.0	13	612	45	250	402	109	24	6.6	16	a4.0
3	1.1	3.9	12	168	45	196	275	94	22	7.0	10	d3.5
4	1.3	3.9	12	120	45	150	200	88	20	6.2	8.6	3.3
5	1.1	5.8	13	128	45	127	166	80	a20	8.2	7.4	3.9
6	1.3	7.4	13	154	45	144	150	76	a20	17	6.2	3.6
7	2.1	9.5	14	272	45	202	148	60	12	37	4.8	3.3
8	2.4	11	*11	258	45	200	142	49	6.6	19	3.9	4.2
9	2.1	9.0	11	230	*45	*200	130	45	2.7	31	4.2	3.6
10	2.4	10	11	180	45	194	118	37	3.9	114	3.9	3.0
11	2.7	9.5	12	160	45	180	108	40	8.6	130	14	2.7
12	3.0	7.4	15	140	70	156	90	37	8.2	94	9.5	2.7
13	3.9	6.6	18	118	770	154	88	33	6.6	54	130	3.9
14	3.3	5.8	18	88	1,350	144	142	33	7.4	44	100	3.6
15	3.0	6.2	20	a90	2,250	128	174	32	14	32	a60	2.7
16	2.4	6.2	21	94	1,930	116	212	31	122	27	a30	3.6
17	1.7	9.0	23	88	1,570	116	278	30	134	19	16	4.2
18	2.4	7.8	25	160	1,600	115	371	28	90	17	16	4.8
19	2.4	7.4	27	1,710	1,290	115	389	21	51	19	15	4.2
20	2.4	7.4	24	1,020	1,140	103	300	18	33	44	16	3.6
21	2.1	9.5	23	680	845	88	258	28	23	33	14	3.6
22	2.4	9.5	21	430	423	242	262	30	18	23	7.4	3.6
23	2.7	12	19	248	359	612	265	33	16	19	6.6	3.6
24	3.3	14	17	220	383	395	280	37	13	23	4.8	4.5
25	3.3	16	15	200	530	347	275	43	12	17	a4.0	5.4
26	3.6	18	13	*120	680	338	235	45	10	20	a3.5	5.4
27	3.9	16	11	80	635	389	200	44	8.6	19	a3.0	4.8
28	3.6	16	10	80	570	502	168	40	6.6	24	a4.0	4.2
29	3.3	14	25	80	-	550	164	35	7.0	20	a3.5	3.3
30	3.9	12	400	70	-	590	154	31	37	48	a3.0	3.0
31	3.6	-	900	60	-	530	-	a30	-	55	a4.0	-

Peak discharge (base, 900 sec.-ft.).- Dec. 31 (time and discharge unknown); Jan. 19 (10 a.m. to 12 m.) 2,090 sec.-ft.; Feb. 15 (4 to 6 p.m.) 2,740 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for stations at Vassar and at Frankenmuth and on East Branch.

d Doubtful gage-height record.

Note.- Stage-discharge relation affected by ice Dec. 4-12, Dec. 22 to Jan. 1, Jan. 11, 12, Jan. 24 to Feb. 12.

Monthly discharge, in second-feet, 1948-49

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
January 1948	685	25	15	22.1	0.060	0.07
February	5,334	1,200	14	184	.497	.54
March	46,518	8,300	150	1,501	4.06	4.68
April	9,185	1,710	88	306	.827	.92
May	6,195	945	27	200	.541	.62
June	949	162	10	31.6	.085	.09
July	478.4	60	5.1	15.4	.042	.05
August	135.2	10	1.1	4.36	.012	.01
September	40.0	3.0	.5	1.33	.0036	.004
Water year	-	-	-	-	-	-
October 1948	79.9	3.9	1.1	2.58	.0070	.008
November	276.8	18	3.0	9.23	.025	.03
December	1,780	900	10	57.4	.155	.18
Calendar year 1948	71,656.3	8,300	.5	196	.530	7.20
January 1949	8,858	1,710	60	286	.773	.89
February	16,895	2,250	45	603	1.63	1.70
March	7,855	612	88	253	.684	.79
April	6,674	530	88	222	.600	.67
May	1,463	126	18	47.2	.128	.15
June	784.2	134	2.7	26.1	.071	.08
July	1,038	130	6.2	33.5	.091	.10
August	552.3	130	3.0	17.8	.048	.06
September	114.8	5.4	2.7	3.83	.010	.01
Water year 1948-49	46,371.0	2,250	1.0	127	.343	4.67

Cass River at Vassar, Mich.

Location.- Wire-weight gage, lat. 43°22'10", long. 83°34'55", in SW¼ sec. 7, T. 11 N., R. 8 E., at bridge on State Highway 15, at Vassar, 1¼ miles upstream from Goodings Creek. Datum of gage is 612.376 feet above mean sea level (levels by U. S. Weather Bureau).

Drainage area.- 700 square miles.

Records available.- December 1948 to September 1949.

Extremes.- Maximum discharge during period, 4,930 second-feet Feb. 16 (gage height, 11.64 feet); minimum, 26 second-feet Sept. 27, 29, 30 (gage height, 3.87 feet).
A stage of 20.8 feet, from U. S. Weather Bureau records, occurred Mar. 20. 1948 (discharge, 18,000 second-feet, from rating curve extended above 12,000 second-feet by logarithmic plotting).

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

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Dec. 1-13, Apr. 28 to May 22, Sept. 19-30)

3.8	21	4.4	120	6.5	980
3.9	32	4.6	170	7.5	1,550
4.0	45	4.9	270	9.0	2,610
4.2	77	5.5	510	10.3	3,680

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			85	260	b100	377	600	263	85	173	95	45
2			60	200	b100	488	980	266	70	128	79	44
3			56	158	b100	449	668	373	48	72	67	42
4			58	138	b100	353	453	349	38	48	54	38
5			48	128	b100	337	325	263	38	67	46	40
6			51	162	99	465	421	179	36	81	48	38
7			65	242	104	470	214	191	d50	108	85	41
8			d46	277	*108	*433	294	108	42	93	72	38
9			*d56	238	113	429	345	99	44	104	52	32
10			d40	221	b120	405	221	104	42	214	45	31
11			65	200	125	377	200	97	41	280	48	36
12			63	155	135	d321	210	87	33	214	104	36
13			60	135	712	277	207	87	40	152	128	37
14			d70	128	2,450	321	188	87	45	145	218	38
15			d120	118	3,090	333	305	77	51	135	145	35
16			d100	d200	3,680	337	1,550	74	132	85	95	32
17			97	d250	2,450	d300	1,680	79	280	89	72	32
18			132	373	2,100	242	955	79	278	77	62	30
19			115	1,370	2,450	102	712	104	132	75	63	31
20			102	2,450	2,030	130	546	108	65	67	57	32
21			91	1,550	1,310	158	622	104	75	65	54	37
22			93	1,140	855	256	537	104	48	68	46	31
23			74	805	668	690	980	210	63	56	44	31
24			74	488	645	780	d800	224	58	51	46	31
25			68	381	1,340	668	d600	194	54	72	42	30
26			63	280	1,960	600	501	142	44	72	41	31
27			57	*b150	1,110	645	550	138	37	63	38	28
28			56	b140	a700	805	501	118	44	81	44	29
29			87	b130	-	955	377	95	38	130	44	28
30			155	b120	-	622	385	83	36	140	44	26
31			291	b110	-	542	-	79	-	120	42	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	2,598	291	40	83.8	0.120	0.14
Calendar year	-	-	-	-	-	-
January	12,697	2,450	110	410	.586	.68
February	28,854	3,680	99	1,030	1.47	1.53
March	13,667	955	102	441	.630	.73
April	16,907	1,680	188	564	.806	.90
May	4,565	373	74	147	.210	.24
June	2,067	278	33	68.9	.098	.11
July	3,325	280	48	107	.153	.18
August	2,120	218	38	68.4	.098	.11
September	1,030	45	26	34.3	.049	.05
Water year	-	-	-	-	-	-

Peak discharge (base, 1,700 sec.-ft.).- Jan. 20 (5 a.m.) 2,770 sec.-ft.; Feb. 16 (3:30 p.m.) 4,930 sec.-ft.; Feb. 26 (5 a.m.) 3,010 sec.-ft.; Apr. 16 (7 p.m.) 2,170 sec.-ft.

* Winter discharge measurement made on this day.
a No gage-height record; discharge interpolated.
b Stage-discharge relation affected by ice.
d Doubtful gage-height record; discharge computed on basis of weather records and records for stations at Cass City and at Frankenmuth.

Cass River at Frankenmuth, Mich.

Location.- Water-stage recorder, lat. 43°19'42", long. 83°45'28", on line between secs. 27 and 28, T. 11 N., R. 6 E., at highway bridge 1 mile west of Frankenmuth and 2.6 miles upstream from Dead Creek. Datum of gage is 584.00 feet above mean sea level (levels by Michigan Department of Conservation).

Drainage area.- 848 square miles.

Records available.- February 1908 to March 1909, July 1935 to September 1936, June 1939 to September 1949.

Average discharge.- 11 years (1935-36, 1939-49), 429 second-feet.

Extremes.- Maximum discharge during year, 5,290 second-feet Feb. 16 (gage height, 15.22 feet); minimum, 20 second-feet Sept. 30 (gage height, 2.10 feet); minimum daily, 26 second-feet Oct. 10.

1908-9, 1935-36, 1939-49: Maximum discharge, 17,700 second-feet Mar. 18, 1942; maximum gage height, 20.91 feet Mar. 10, 1942 (backwater from ice); minimum daily discharge, about 1.5 second-feet Aug. 6, 1944.

Remarks.- Records fair. Flow regulated below about 500 second-feet by mill above station for period of record.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	68	117	384	140	700	755	406	114	150	150	58
2	48	62	98	288	140	600	1,100	330	105	176	110	58
3	44	62	95	240	140	500	830	439	97	125	90	56
4	51	67	83	187	140	450	680	461	80	101	80	55
5	47	75	82	224	140	417	450	373	79	101	80	56
6	45	104	88	259	140	461	572	308	90	130	150	67
7	49	94	79	308	140	500	319	259	78	126	220	87
8	75	106	77	362	*150	600	373	250	71	143	250	87
9	67	86	65	308	b160	550	439	146	67	167	150	49
10	26	80	61	259	b200	500	351	164	68	278	90	35
11	32	87	65	250	b230	450	250	155	59	330	70	33
12	40	75	65	213	268	483	278	144	40	300	100	33
13	48	73	81	196	1,630	406	259	140	68	250	138	42
14	49	70	72	168	3,230	395	240	135	64	220	217	58
15	48	82	84	158	4,450	395	331	124	88	340	122	67
16	49	71	104	199	5,070	319	1,870	122	174	200	134	49
17	41	74	115	278	3,500	330	2,280	115	268	150	99	42
18	53	78	95	384	2,750	330	1,330	124	330	150	78	37
19	65	83	122	1,470	2,970	298	1,440	139	212	140	71	59
20	59	100	111	2,730	3,020	250	950	160	134	130	75	48
21	41	143	88	1,830	2,110	240	805	143	114	120	66	46
22	37	142	86	1,300	1,360	319	655	148	115	110	63	45
23	32	130	81	1,000	1,040	730	1,130	220	105	100	57	32
24	45	114	97	631	920	890	950	238	92	90	56	45
25	55	102	79	527	1,440	805	705	226	81	100	53	45
26	56	235	74	b350	2,000	730	607	187	76	100	67	45
27	52	147	63	*b250	1,500	755	631	174	82	100	71	58
28	54	134	59	b200	1,000	890	631	155	78	150	58	49
29	56	121	143	200	-	950	505	139	72	180	67	41
30	62	121	205	150	-	730	428	125	54	200	49	49
31	59	-	308	140	-	527	-	119	-	170	33	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,525	75	26	49.2	0.058	0.07
November	2,986	235	62	99.5	.117	.13
December	3,042	308	59	98.1	.116	.13
Calendar year 1948	189,476	15,200	20	518	.611	8.28
January	15,443	2,730	140	498	.587	.68
February	39,978	5,070	140	1,428	1.68	1.75
March	16,500	950	240	532	.627	.72
April	22,144	2,280	240	738	.870	.97
May	6,368	461	115	205	.242	.28
June	3,155	330	40	105	.124	.14
July	5,127	340	90	165	.195	.22
August	3,114	250	33	100	.118	.14
September	1,531	87	32	51.0	.060	.07
Water year 1948-49	120,913	5,070	26	331	.390	5.30

Peak discharge (base, 2,000 sec.-ft.).- Jan. 20 (10 to 10:30 a.m.) 2,970 sec.-ft.; Feb. 16 (6 p m.) 5,290 sec.-ft.; Feb. 26 (time and discharge unknown); Apr. 17 (1:30 a.m.) 2,500 sec.-ft.

* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.- No gage-height record Jan. 22, 23, Jan. 29 to Feb. 8, Feb. 17, 18, Feb. 26 to Mar. 4, Mar. 7-10, July 12-14, July 16 to Aug. 9; doubtful gage-height record July 7-11, Aug. 10, 11, Aug. 26 to Sept. 30; discharge computed on basis of discharge measurements, weather records, and records for Cass River at Vassar and Flint River near Fosters.

East Branch Cass River near Cass City, Mich.

Location.- Wire-weight gage, lat. 43°33'10", long. 83°05'40", in E½ sec. 18, T. 13 N., R. 12 E., at bridge on State Highway 53, 5 miles southeast of Cass City and 5½ miles upstream from confluence with North Branch

Drainage area.- 247 square miles.

Records available.- December 1948 to September 1949.

Extremes.- Maximum discharge during period, 2,600 second-feet Feb. 15 (gage height, 20.50 feet, from graph based on gage readings); minimum, 1.3 second-feet Sept. 1; minimum gage height, 14.00 feet Sept. 16.

Remarks.- Records fair. Gage read twice daily.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			6.8	42	b34	124	410	57	17	70	8.7	1.8
2			6.8	24	b33	97	302	75	15	14	5.2	3.2
3			6.8	20	b32	84	184	136	13	10	3.4	3.2
4			4.8	18	b31	82	103	86	6.8	7.2	3.6	3.6
5			5.6	14	b30	88	86	59	6.0	6.0	2.6	3.6
6			6.0	100	b29	102	92	50	7.6	12	2.0	3.2
7			6.0	92	b28	114	86	35	6.8	40	1.8	3.4
8			*6.4	66	b27	112	80	31	6.0	29	1.8	3.6
9			6.0	47	*b27	*105	68	30	5.6	80	1.9	3.8
10			5.6	40	28	42	57	25	5.2	117	1.9	3.8
11			5.2	43	30	13	51	21	4.8	136	5.7	3.4
12			5.2	25	28	48	45	21	4.8	73	144	3.4
13			5.6	20	252	57	41	20	4.0	32	210	3.2
14			5.6	17	1,230	46	58	19	4.8	20	117	2.0
15			7.2	40	2,040	59	612	17	26	17	50	2.4
18			11	89	1,270	77	760	17	154	14	20	2.2
17			12	114	840	77	380	19	152	8.7	17	2.2
18			12	b80	1,040	41	228	24	68	8.0	37	3.8
19			12	b1,000	1,440	39	205	25	31	15	28	3.2
20			10	b575	673	39	178	18	14	28	19	3.8
21			7.2	b380	262	62	107	19	9.4	26	12	4.4
22			9.4	168	194	208	97	37	11	8.0	6.4	4.8
23			8.0	52	172	280	182	77	3.8	22	3.2	5.6
24			7.2	30	464	186	122	59	3.8	19	1.7	5.6
25			6.0	48	1,080	140	92	43	3.4	6.8	1.7	4.8
26			5.6	*34	485	166	103	31	3.4	4.4	1.8	3.4
27			5.2	b35	295	318	133	25	2.8	7.6	2.6	3.0
28			6.8	b35	152	325	102	24	2.0	32	6.0	3.6
29			52	b35	-	225	73	15	2.0	88	7.6	4.0
30		†6.3	136	b35	-	120	57	20	55	120	2.8	4.8
31		-	78	b35	-	160	-	20	-	28	2.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	468.0	136	4.8	15.1	0.061	0.07
Calendar year	-	-	-	-	-	-
January	3,353	1,000	14	108	.437	.50
February	12,246	2,040	27	437	1.77	1.84
March	3,636	325	13	117	.474	.55
April	5,094	760	41	170	.688	.77
May	1,155	136	15	37.3	.151	.17
June	649.0	154	2.0	21.6	.087	.10
July	1,098.7	136	4.4	35.4	.143	.16
August	728.6	210	1.7	23.5	.095	.11
September	106.8	5.6	1.8	3.56	.014	.02
Water year	-	-	-	-	-	-

Peak discharge (base, 600 sec.-ft.).- Jan. 19 (time and discharge unknown); Feb. 15 (7 to 9 p.m.) 2,600 sec.-ft.; Feb. 19 (7 to 11 a.m.) 1,500 sec.-ft.; Feb. 25 (4 to 11 a.m.) 1,160 sec.-ft.; Apr. 16 (8 a.m. to 2 p.m.) 800 sec.-ft.

* Winter discharge measurement made on this day.

† Result of discharge measurement.

b Stage-discharge relation affected by ice.

Tittabawassee River at Midland, Mich.

Location.- Water-stage recorder, lat. 43°36', long. 84°15', in NE¼ sec. 28, T. 14 N., R. 2 E., 0.5 mile south of Midland and 1 mile downstream from Chippewa River. Datum of gage is 590.28 feet above mean sea level, datum of 1929.

Drainage area.- 2,400 square miles.

Records available.- March 1936 to September 1949.

Average discharge.- 13 years, 1,362 second-feet (unadjusted).

Extremes.- Maximum discharge during year, 6,250 second-feet Feb. 26 (gage height, 7.86 feet); minimum, 90 second-feet Aug. 20 (gage height, -0.92 foot).
1936-49: Maximum discharge, 34,000 second-feet Mar. 21, 1948 (gage height, 19.50 feet); minimum, 39 second-feet Oct. 12, 1942; minimum gage height, -0.95 foot Aug. 1, 1948.

Remarks.- Records good except those below 400 second-feet, which are fair. Water is diverted from river a short distance above station for industrial use; small part returned to river a quarter of a mile below station; remainder returned 1 mile below control. Records of daily discharge not adjusted for diversion. Discharge below about 4,000 second-feet regulated by power plants above station.

Cooperation.- Gage-height record and records of diversion furnished by Dow Chemical Co.

Revisions (water years).- W 1054: 1945. Revised figures of discharge for the water year 1948, superseding those published in Water-Supply Paper 1114, are given herewith.

Discharge, in second-feet, 1947-49

1947-48

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	472	420	666	483	202	2,450	7,170	2,860	580	1,090	a310	192
2	530	304	1,200	470	326	2,320	6,550	1,690	520	1,000	370	204
3	410	540	1,470	a700	423	1,560	5,170	1,800	508	720	380	210
4	364	608	1,220	a1,200	354	1,230	4,450	1,650	426	524	297	195
5	430	638	1,740	a900	410	1,390	4,090	1,500	391	433	243	189
6	722	a540	1,150	a700	420	912	3,740	1,480	328	780	318	204
7	571	a700	982	826	338	822	3,580	1,750	698	752	243	249
8	794	a650	1,500	787	372	1,100	3,500	1,700	1,240	857	264	297
9	856	a500	2,190	918	517	1,270	3,020	1,320	1,650	962	370	282
10	650	a1,000	2,040	662	652	1,460	2,100	2,340	1,160	444	a430	216
11	584	a1,200	1,850	476	534	1,300	2,630	4,180	1,200	321	a480	201
12	260	a700	1,490	1,040	550	1,270	4,450	4,810	648	708	565	204
13	426	a500	1,570	1,140	579	816	4,000	4,450	460	752	363	314
14	656	a500	1,190	1,050	402	a1,000	3,580	3,420	874	529	408	288
15	416	a650	1,290	1,140	292	a1,500	2,530	2,350	984	681	234	468
16	270	a850	1,660	1,130	396	3,810	2,360	1,910	752	484	405	314
17	264	a700	1,410	564	1,230	6,980	2,050	1,880	742	388	681	267
18	296	a1,000	1,240	393	1,580	9,490	1,690	2,180	1,020	335	426	210
19	338	1,210	934	780	1,550	12,100	2,130	2,050	422	332	433	213
20	394	860	528	733	1,650	28,800	2,520	1,750	377	342	273	270
21	533	704	434	953	1,080	32,400	2,410	1,380	508	335	228	282
22	706	602	1,170	740	697	25,700	1,800	901	620	304	258	300
23	748	694	1,230	594	1,030	16,400	1,640	653	3,330	279	452	385
24	736	1,150	774	478	1,580	10,900	1,510	1,240	3,580	291	544	398
25	386	1,730	662	254	2,220	7,940	1,290	1,240	1,860	294	600	294
26	250	1,510	428	374	3,100	6,150	1,530	994	1,130	243	452	171
27	496	868	738	460	4,130	6,550	2,400	1,030	890	a250	405	171
28	805	489	718	463	3,650	6,350	4,000	1,180	1,480	a250	231	171
29	799	456	1,040	340	2,950	5,950	4,270	698	1,560	270	165	171
30	662	150	1,690	274	-	6,250	3,020	412	1,490	270	165	231
31	540	-	723	250	-	6,050	-	380	-	285	189	-

Peak discharge (base, 5,800 sec.-ft.).- Mar. 21 (2 to 3 a.m.) 34,000 sec.-ft.
a No gage-height record; discharge computed on basis of weather records and records for Chippewa River near Mount Pleasant and near Midland.

Discharge, in second-feet, of Tittabawassee River at Midland, Mich., 1947-49--Continued

1948-49

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	213	377	590	310	376	3,340	2,680	855	688	478	272	389
2	259	806	475	301	554	2,630	2,420	992	669	383	375	266
3	270	795	451	491	756	2,480	1,960	1,740	700	264	372	268
4	280	538	414	602	712	2,060	2,010	1,640	373	300	297	296
5	234	724	375	513	604	1,740	2,360	1,580	366	426	312	472
6	290	449	552	646	462	1,300	2,060	1,340	502	464	219	778
7	322	344	528	606	607	1,620	1,590	906	402	362	252	1,010
8	312	508	773	510	835	1,870	1,380	592	356	306	460	834
9	260	780	572	649	726	2,010	1,340	607	300	301	460	574
10	232	847	748	1,410	778	2,260	818	972	227	615	222	388
11	435	759	452	1,880	680	1,680	1,130	652	214	455	293	312
12	362	758	389	1,620	506	1,210	870	568	234	664	263	320
13	479	432	654	1,200	874	952	942	512	280	648	289	442
14	498	340	652	723	2,300	465	1,190	510	284	876	324	312
15	477	376	628	432	2,600	1,410	1,230	343	948	492	376	252
16	254	423	656	448	2,310	1,400	1,600	482	1,370	404	465	338
17	236	716	536	874	2,030	1,030	1,570	700	1,560	360	498	308
18	297	513	355	922	2,260	664	1,580	621	1,270	600	374	381
19	383	433	404	1,680	3,180	490	2,040	942	824	429	320	325
20	274	800	426	2,570	3,340	430	1,750	812	915	302	308	320
21	379	1,110	608	2,250	2,320	1,230	1,540	542	708	462	111	390
22	397	1,210	686	1,140	2,170	1,780	1,470	401	592	270	162	589
23	364	1,460	736	872	2,110	2,860	1,370	1,000	531	219	250	338
24	283	894	442	1,360	2,140	2,780	1,290	808	627	232	222	264
25	288	630	271	1,370	4,540	2,860	1,250	934	532	444	175	178
26	386	952	282	996	6,050	2,250	1,470	980	382	272	185	252
27	476	720	579	830	4,810	2,420	1,410	600	554	510	182	279
28	527	458	777	909	3,910	2,780	1,350	349	619	396	172	486
29	408	586	772	554	-	3,100	1,020	342	162	481	184	400
30	470	768	414	402	-	2,630	1,090	338	508	468	223	240
31	309	-	332	406	-	3,100	-	470	-	342	307	-

Peak discharge (base, 5,800 sec.-ft.).- Feb. 26 (7 to 11 a.m.) 6,250 sec.-ft.

Monthly discharge, in second-feet, 1947-49

Month	Observed				mean diversion (second-feet)†	Adjusted for diversion		
	Second-foot-days	Maximum	Minimum	Mean		Mean	Per square mile	Runoff in inches
October 1947	16,364	856	250	528	110	638	0.266	0.31
November	22,423	1,730	150	747	101	848	.353	.39
December	36,927	2,190	428	1,191	96	1,287	.536	.62
Calendar year 1947	634,373	12,000	125	1,738	103	1,841	.767	10.41
January 1948	21,272	1,200	250	686	100	786	.328	.38
February	33,214	4,130	202	1,145	101	1,246	.519	.56
March	212,220	32,400	816	6,846	94	6,940	2.89	3.33
April	95,180	7,170	1,290	3,173	104	3,277	1.37	1.53
May	57,178	4,810	380	1,844	111	1,955	.815	.94
June	31,428	3,580	328	1,048	120	1,168	.487	.54
July	15,505	1,090	243	500	27	527	.220	.25
August	11,182	681	165	361	91	452	.188	.22
September	7,511	468	171	250	114	364	.152	.17
Water year 1947-48	560,404	32,400	150	1,531	97	1,628	.678	9.24
October 1948	10,654	527	213	344	103	447	.186	.21
November	20,506	1,460	340	684	98	782	.326	.36
December	16,529	777	271	533	90	623	.260	.30
Calendar year 1948	532,379	32,400	165	1,455	96	1,551	.646	8.79
January 1949	29,476	2,570	301	951	88	1,039	.433	.50
February	54,540	6,050	378	1,948	89	2,037	.849	.88
March	58,831	3,340	430	1,898	90	1,988	.828	.95
April	45,780	2,680	818	1,526	93	1,619	.675	.75
May	24,130	1,740	338	778	94	872	.363	.42
June	18,147	1,560	214	605	98	703	.293	.33
July	13,225	876	219	427	98	525	.219	.25
August	8,924	498	111	288	93	381	.159	.18
September	12,001	1,010	178	400	84	484	.202	.23
Water year 1948-49	312,743	6,050	111	857	93	950	.396	5.36

† Diversion by Dow Chemical Co. for industrial use.

Tobacco River at Beaverton, Mich.

Location.- Water-stage recorder, lat. 43°52'45", long. 84°28'25", in sec. 7, T. 17 N., R. 1 W., at highway bridge, 1 mile downstream from dam at Beaverton.

Drainage area.- 487 square miles.

Records available.- July 1948 to September 1949.

Extremes.- 1948: Maximum discharge during period July to September, 730 second-feet July 13 (gage height, 4.26 feet); minimum, 12 second-feet Sept. 23-30 (gage height, 0 98 foot); minimum daily, 91 second-feet July 17.

1948-49: Maximum discharge during water year, 1,780 second-feet Feb. 25 (gage height, 6.34 feet); minimum, 6.5 second-feet Jan. 13 (gage height, 0.78 foot); minimum daily, 61 second-feet Jan. 22.

High water on Mar. 20, 1948, reached an observed stage of 12.00 feet (discharge, 6,630 second-feet).

Remarks.- Records excellent except those for periods of no gage-height record, which are fair. Regulation at all stages by power plant 1 mile upstream.

Discharge, in second-feet, 1948-49

1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						-				-	135	96
2						-				-	134	146
3						-				-	135	133
4						-				-	132	129
5						-				-	150	119
6						-				-	141	155
7						-	†712			-	135	121
8						-				-	127	136
9						-				-	148	173
10						†265				165	152	154
11						-				165	293	155
12						-				185	188	142
13						-				154	162	147
14						-				153	177	138
15						-				154	143	142
16						-				134	141	143
17						-			†18	91	141	153
18						-				178	156	176
19						-				117	165	135
20						†6,100		†244		188	162	148
21				†122		†5,880				a170	155	144
22						-				a150	128	122
23						†2,130				169	137	134
24						†1,280				157	143	133
25						-				156	162	135
26						-				200	136	117
27						-				148	128	134
28						-				154	139	135
29						-				133	137	136
30						-				160	128	139
31						-	-		-	134	118	-

† Result of discharge measurement.

a No gage-height record; discharge computed on basis of weather records and records for Chippewa River near Mount Pleasant.

Discharge, in second-feet, of Tobacco River at Beaverton, Mich., 1948-49--Continued.

1948-49

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	216	159	202	178	345	467	740	259	163	152	139	165
2	152	170	180	206	478	401	690	362	163	162	158	168
3	136	198	195	179	382	322	612	355	156	153	161	159
4	140	208	229	178	208	404	392	355	88	160	144	220
5	154	216	234	227	227	343	371	286	90	158	107	233
6	144	274	235	214	249	424	398	235	105	159	175	186
7	170	277	221	224	249	367	342	272	126	153	129	278
8	179	214	200	245	229	470	314	231	161	152	199	240
9	196	229	171	265	237	549	336	211	109	212	162	195
10	166	230	177	268	234	339	272	212	116	311	134	176
11	165	232	201	244	193	351	276	232	116	222	154	160
12	158	178	216	235	241	342	291	154	123	190	174	171
13	171	209	224	201	292	290	463	242	217	178	185	239
14	171	208	226	188	255	315	286	193	267	177	158	161
15	161	196	265	226	286	274	295	186	500	179	136	163
16	166	210	233	457	254	259	453	205	734	181	138	167
17	146	280	259	459	272	241	329	203	642	154	126	179
18	146	242	158	331	284	241	377	222	252	145	131	145
19	193	263	146	700	317	240	352	202	203	126	127	136
20	159	453	156	692	415	219	137	212	187	152	117	152
21	141	459	214	485	350	283	225	221	228	125	127	151
22	195	369	200	61	338	540	344	192	201	112	119	a150
23	189	393	199	211	338	723	407	208	248	171	110	a150
24	165	234	160	278	489	734	262	205	254	112	116	a150
25	161	244	140	301	1,660	730	260	211	167	158	118	a150
26	143	236	120	214	1,500	730	347	205	287	241	118	a150
27	177	212	165	252	1,000	782	312	202	221	397	131	a150
28	167	225	192	249	688	969	293	196	222	148	146	a150
29	148	219	201	231	-	750	292	177	206	189	164	a150
30	168	202	184	192	-	750	245	181	170	190	170	a150
31	177	-	188	253	-	752	-	160	-	169	169	-

a No gage-height record; discharge computed on basis of weather records and records for Chippewa River near Mount Pleasant and Salt River near North Bradley.

Monthly discharge, in second-feet, 1948-49

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October						
November						
December						
Calendar year						
January	-	-	-	-	-	-
February	-	-	-	-	-	-
March	-	-	-	-	-	-
April	-	-	-	-	-	-
May	-	-	-	-	-	-
June	-	-	-	-	-	-
July 10-31, 1948	3,415	200	91	155	0.318	0.26
August	4,628	293	118	149	.306	.35
September	4,170	176	96	139	.285	.32
Water year	-	-	-	-	-	-
October 1948	5,120	216	136	165	.339	.39
November	7,489	459	159	250	.513	.57
December	6,091	265	120	196	.402	.46
Calendar year	-	-	-	-	-	-
January 1949	8,644	700	61	279	.573	.66
February	12,010	1,660	193	429	.881	.92
March	14,711	969	219	475	.975	1.12
April	10,713	740	137	357	.733	.82
May	6,987	362	154	225	.462	.53
June	6,722	734	88	224	.460	.51
July	5,488	397	112	177	.363	.42
August	4,442	199	107	143	.294	.34
September	5,195	278	136	173	.355	.40
Water year 1948-49	93,612	1,660	61	256	.526	7.14

Salt River near North Bradley, Mich.

Location.- Wire-weight gage, lat. 43°42', long. 84°28', on bridge on U. S. Highway 10, 1½ miles southeast of North Bradley. Datum of gage is 618.01 feet above mean sea level (levels by Michigan Department of Conservation).

Drainage area.- 138 square miles.

Records available.- June 1934 to September 1949.

Average discharge.- 15 years, 68.1 second-feet.

Extremes.- Maximum daily discharge during year, 1,000 second-feet Feb. 25; maximum gage height observed, 8.09 feet Feb. 25 (backwater from ice); minimum discharge, 3.4 second-feet Aug. 22, 23 (gage height, 0.32 foot).
1934-49: Maximum discharge, 8,200 second-feet Mar. 20, 1948 (gage height, 14.95 feet, from graph based on gage readings), from rating curve extended above 4,500 second-feet; minimum observed, 1.1 second-feet Aug. 14, 1944 (gage height, 0.21 foot).

Remarks.- Records good except those for periods of ice effect and those below 10 second-feet, which are fair. Gage read twice daily.

Revisions (water years).- W 924: 1938.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.4	7.0	8.6	9.0	18	200	164	33	10	7.8	6.2	5.0
2	8.6	7.4	9.4	10	17	170	159	73	9.8	7.4	6.0	4.9
3	7.0	7.4	7.0	10	17	146	115	72	9.5	7.3	5.9	4.9
4	6.1	8.6	5.8	11	17	93	85	49	9.5	7.0	5.6	4.7
5	5.8	11	9.8	12	17	90	69	38	8.8	7.3	5.5	5.3
6	5.2	13	10	13	17	142	60	31	7.9	7.9	5.3	13
7	5.5	13	6.7	14	17	192	55	26	7.8	7.6	5.4	8.0
8	7.4	9.8	6.1	20	17	181	55	22	7.4	7.6	5.5	7.8
9	6.7	8.2	*5.8	25	*17	176	48	22	7.3	8.4	5.2	7.8
10	8.4	9.4	9.0	40	17	146	40	19	7.3	9.5	5.2	6.8
11	6.1	9.4	8.6	80	18	88	37	18	7.4	9.0	5.3	6.2
12	7.0	9.4	9.4	*35	20	78	35	17	7.3	8.2	6.3	6.1
13	6.7	9.0	7.8	30	35	66	33	17	7.3	7.6	6.2	6.5
14	6.4	8.2	5.5	30	100	62	a35	18	9.8	8.0	5.2	7.2
15	6.7	8.2	13	24	150	60	39	17	20	8.4	4.6	6.8
16	6.7	9.4	11	54	120	*55	73	15	74	7.9	4.3	6.6
17	6.4	11	7.0	100	100	51	75	15	47	a7.5	4.1	6.4
18	6.1	11	9.4	67	120	38	79	16	34	7.3	3.9	6.3
19	6.1	13	12	117	200	30	128	20	23	7.0	3.8	6.4
20	5.8	17	10	150	400	35	105	21	15	6.9	3.7	6.3
21	6.1	23	9.8	120	250	35	70	18	14	6.8	3.6	6.3
22	6.4	19	11	100	150	95	58	17	16	6.6	3.5	6.3
23	6.4	15	6.7	64	110	203	57	20	13	6.4	3.4	6.4
24	6.4	13	7.8	42	250	123	49	19	13	6.5	3.5	6.4
25	6.7	11	a6.0	35	1,000	93	41	17	11	6.8	3.5	6.3
26	6.7	11	6.1	32	800	108	41	15	9.8	7.3	3.5	6.3
27	6.7	10	6.1	29	500	146	43	14	9.0	7.2	3.5	6.3
28	6.4	9.8	6.7	30	300	203	39	13	8.4	8.2	a4.0	6.2
29	6.4	8.6	8.6	25	-	140	33	12	8.0	7.4	4.4	6.2
30	7.0	9.0	8.2	23	-	110	32	11	7.9	7.2	4.8	6.2
31	7.0	-	7.8	20	-	115	-	11	-	6.7	4.6	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	204.3	9.4	5.2	6.59	0.048	0.06
November	329.8	23	7.0	11.0	.080	.09
December	256.7	13	5.5	8.28	.060	.07
Calendar year 1948	30,611.3	5,500	4.6	83.6	.606	8.25
January	1,371.0	150	9.0	44.2	.320	.37
February	4,794	1,000	17	171	1.24	1.29
March	3,470	203	30	112	.812	.94
April	1,952	164	32	65.1	.472	.53
May	726	73	11	23.4	.170	.20
June	440.2	74	7.3	14.7	.107	.12
July	232.7	9.5	6.4	7.51	.054	.06
August	145.5	6.3	3.4	4.69	.034	.04
September	195.9	13	4.7	6.53	.047	.05
Water year 1948-49	14,118.1	1,000	3.4	38.7	.280	3.82

Peak discharge (base, 550 sec.-ft.).- Feb. 25 (time and discharge unknown).
* Winter discharge measurement made on this day.
a No gage-height record; discharge interpolated.
Note.- Stage-discharge relation affected by ice Jan. 8-14, 17, 20-22, Jan. 29 to Mar. 2, Mar. 14-16.

Chippewa River near Mount Pleasant, Mich.

Location.- Water-stage recorder, lat. 43°37'35", long. 84°42'30", on line between secs. 7 and 8, T. 14 N., R. 3 W., 4 miles northeast of Mount Pleasant. Datum of gage is 710.38 feet above mean sea level (levels by Michigan Department of Conservation).

Drainage area.- 416 square miles.

Records available.- October 1930 to July 1931, October 1932 to September 1949.

Average discharge.- 17 years (1932-49), 281 second-feet.

Extremes.- Maximum discharge during year, 1,800 second-feet Feb. 25 (gage height, 8.13 feet); minimum, 36 second-feet Aug. 5, 9; minimum, daily, 48 second-feet Aug. 11; minimum gage height, 3.10 feet Oct. 4.
1930-31, 1932-49: Maximum discharge, 4,960 second-feet Mar. 8, 1946 (gage height, 12.78 feet); minimum, 12 second-feet Aug. 18, 1945; minimum daily (observed), 19 second-feet Aug. 16, 1936; minimum gage height, 2.82 feet Dec. 21, 1944.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Diurnal fluctuation below about 750 second-feet caused by power plant at Mount Pleasant.

Revisions (water years).- W 744: Drainage area. W 824: 1932-35.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	191	191	210	160	180	400	599	244	125	161	113	129
2	191	159	197	170	180	350	631	282	125	129	129	129
3	165	150	191	160	180	300	567	295	113	167	97	100
4	146	168	191	150	180	350	519	285	106	173	84	122
5	162	153	191	200	180	362	455	273	113	148	87	170
6	168	197	200	200	180	378	423	253	125	132	75	177
7	150	203	191	200	180	362	397	237	97	148	75	157
8	175	226	*203	210	*180	375	391	221	93	151	75	193
9	175	175	181	230	180	397	369	221	100	173	90	180
10	175	200	162	230	180	359	343	221	72	180	78	167
11	146	187	210	210	180	330	321	215	122	173	48	170
12	181	187	187	*180	200	317	314	205	84	157	113	161
13	d140	197	191	213	250	308	300	193	81	145	196	154
14	120	178	162	178	300	305	300	196	183	154	116	151
15	100	171	171	194	400	292	320	199	276	164	103	170
16	90	150	184	274	350	260	337	202	394	151	109	167
17	80	d184	181	350	300	263	337	183	362	138	97	145
18	90	230	200	459	350	263	337	193	285	132	109	157
19	120	300	168	400	500	231	404	196	247	129	63	151
20	d137	350	207	492	700	253	369	202	202	116	103	122
21	146	350	175	428	600	225	321	177	199	103	66	151
22	153	300	171	360	400	378	314	183	173	103	87	119
23	146	d245	150	327	274	599	317	186	186	97	66	122
24	181	242	130	284	442	583	311	189	154	90	66	116
25	137	264	110	278	1,460	535	305	183	161	103	69	122
26	150	226	100	239	1,180	535	295	177	161	93	66	125
27	111	219	120	216	900	599	298	154	157	93	69	132
28	187	229	150	235	700	679	276	154	161	97	75	129
29	219	191	170	200	-	663	276	145	164	132	106	122
30	200	207	170	190	-	599	260	145	164	100	106	119
31	171	-	160	180	-	567	-	135	-	139	119	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,693	219	80	151	0.363	0.42
November	6,429	350	150	214	.514	.57
December	5,384	210	100	174	.418	.48
Calendar year 1948	102,685	4,100	68	281	.675	9.16
January	7,805	492	150	252	.606	.70
February	11,288	1,460	180	403	.969	1.01
March	12,417	679	225	401	.964	1.11
April	11,006	631	260	367	.882	.98
May	6,344	295	135	205	.493	.57
June	4,985	394	72	166	.399	.45
July	4,170	180	90	135	.325	.37
August	2,855	196	48	92.1	.221	.25
September	4,329	193	100	144	.346	.39
Water year 1948-49	81,730	1,460	48	224	.538	7.30

Peak discharge (base, 850 sec.-ft.).- Feb. 25 (3 p.m.) 1,800 sec.-ft.
* Winter discharge measurement made on this day.
d Doubtful gage-height record.
Note.- Stage-discharge relation affected by ice Dec. 23-29, Jan. 29 to Feb. 12. No gage-height record Oct. 14-19, Nov. 18, 22, Dec. 30 to Jan. 12, Feb. 13-22, Feb. 27 to Mar. 4, Apr. 13-15; discharge computed on basis of recorded range in stage, weather records and records for Chippewa River near Midland and Tobacco River at Beaverton.

Chippewa River near Midland, Mich.

Location.- Wire-weight gage, lat. 43°35'40", long. 84°22'10", on line between sec. 24, T. 14 N., R. 1 W., and sec. 28, T. 14 N., R. 1 E., at highway bridge 5 miles upstream from Pine River and 6 miles southwest of Midland. Datum of gage is 612.35 feet above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Drainage area.- 597 square miles.

Records available.- January 1948 to September 1949.

Extremes.- Maximum daily discharge during year, 2,000 second-feet Feb. 26; maximum gage height observed, 6.66 feet Feb. 26 (backwater from ice); minimum discharge, 49 second-feet Sept. 24.

1948-49: Maximum discharge, 8,510 second-feet Mar. 20, 1948 (computed from graph based on gage readings); maximum gage height observed, 12.43 feet Mar. 19, 1948 (ice jam); minimum daily discharge, 44 second-feet Aug. 16, 1948.

Remarks.- Records good except those for periods of ice effect or no gage-height record and those below 200 second-feet, which are fair. Flow below about 500 second-feet partly regulated by power plant at Mount Pleasant. Gage read twice daily.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	157	168	202	250	250	1,100	910	324	152	166	170	108
2	184	190	202	250	250	900	920	345	157	125	175	116
3	174	179	202	250	250	800	878	423	157	a170	193	134
4	140	152	190	250	250	689	774	390	144	184	152	a120
5	120	196	208	300	230	700	689	352	a150	a170	121	103
6	135	162	244	300	230	d1,000	595	294	152	162	a150	198
7	152	220	202	300	230	842	565	260	170	130	a140	170
8	110	238	*214	300	230	545	525	240	148	139	130	148
9	146	244	238	350	*230	595	495	250	148	152	148	188
10	146	168	a200	350	230	575	450	250	157	162	157	157
11	174	220	162	300	a230	450	423	240	121	170	130	144
12	130	196	238	300	a250	398	*382	220	139	162	112	148
13	146	208	285	310	300	382	382	225	116	148	166	170
14	125	202	306	320	500	382	318	270	162	157	245	184
15	140	174	250	320	900	398	a400	180	240	170	126	a170
16	95	179	174	376	800	423	459	184	382	166	139	157
17	85	130	190	630	700	345	545	211	535	170	139	148
18	a90	190	214	920	600	318	a600	216	450	157	121	a135
19	100	271	264	750	1,000	282	d742	255	352	162	148	126
20	120	271	271	900	1,200	282	700	235	300	157	116	162
21	120	344	238	600	900	265	565	a210	245	152	152	103
22	140	376	226	500	800	338	486	188	240	148	90	148
23	130	352	200	450	700	721	459	240	216	126	98	77
24	135	271	190	400	600	794	a450	270	216	a130	98	49
25	196	299	a180	*350	1,200	752	441	245	175	139	94	73
26	115	264	150	330	2,000	732	414	225	157	162	103	94
27	168	264	180	300	1,700	847	405	211	162	162	94	94
28	85	202	230	300	a1,300	1,020	398	206	180	157	94	121
29	208	208	250	300	-	952	352	a190	175	139	108	112
30	162	220	a250	250	-	878	345	170	184	198	130	81
31	196	-	a250	250	-	826	-	175	-	134	121	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,324	208	85	139	0.233	0.27
November	6,758	376	130	225	.377	.42
December	6,800	306	150	219	.367	.42
Calendar year 1948	160,298	8,020	44	438	.734	9.97
January	12,056	928	250	389	.652	.75
February	18,460	2,000	230	659	1.10	1.14
March	19,531	1,100	265	630	1.06	1.22
April	16,067	920	318	536	.898	1.00
May	7,694	423	170	248	.415	.48
June	6,282	535	116	209	.350	.39
July	4,653	198	126	157	.263	.30
August	4,160	245	90	134	.224	.26
September	3,938	198	49	131	.219	.24
Water year 1948-49	110,923	2,000	49	304	.509	6.89

Peak discharge (base, 1,600 sec.-ft.).- Feb. 20 (9 a.m.) discharge unknown; Feb. 26 (time and discharge unknown).

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for station near Mount Pleasant, or interpolated.

d Doubtful gage-height record.

Note.- Stage-discharge relation affected by ice Dec. 23 to Jan. 13, Jan. 20 to Mar. 3.

Pine River at Alma, Mich.

Location.- Water-stage recorder, lat. 43°23", long. 84°39', in sec. 34, T. 12 N., R. 3 W., at Alma, 270 feet downstream from highway bridge. Datum of gage is 718.37 feet above mean sea level, datum of 1929.

Drainage area.- 288 square miles.

Records available.- October 1930 to September 1949.

Average discharge.- 19 years, 178 second-feet.

Extremes.- Maximum daily discharge during year, 1,000 second-feet Feb. 28; minimum daily, 46 second-feet July 4, 5.
1930-49: Maximum discharge, 4,400 second-feet Mar. 19, 1948 (gage height, 10.81 feet); minimum daily, 2 second-feet July 23, 1938.

Remarks.- Records fair except those for periods of ice effect or doubtful or no gage-height record and those below 75 second-feet, which are poor. Occasional regulation below 400 second-feet by dam above station for period of record.

Revisions (water years).- W 744: Drainage area. W 1054: 1945(M).

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	69	99	118	102	94	500	485	143	80	55	105	59
2	82	102	111	100	138	450	495	166	80	49	92	64
3	88	107	111	89	300	400	476	175	80	58	82	66
4	81	113	112	89	188	d334	438	216	70	46	77	60
5	64	120	110	117	b125	309	376	175	70	46	70	55
6	66	130	120	150	b110	d301	262	137	60	48	66	54
7	68	129	119	150	b110	d301	289	112	60	50	92	62
8	65	131	132	150	*b110	d301	261	107	60	51	109	62
9	78	123	128	150	b120	400	246	97	60	64	137	78
10	63	124	110	200	b120	300	224	86	60	85	113	73
11	60	128	100	200	b120	250	153	80	70	128	131	64
12	62	134	120	*156	129	254	118	80	80	105	156	60
13	59	130	140	134	620	230	143	80	90	79	140	61
14	61	116	150	113	750	200	168	90	100	130	145	70
15	60	119	150	124	602	170	368	100	150	195	114	84
16	63	117	125	150	535	*d156	317	100	209	202	92	76
17	62	117	100	182	500	138	342	100	285	154	71	68
18	60	134	100	238	700	156	384	100	325	117	63	64
19	70	125	110	619	d910	144	429	100	269	102	59	65
20	58	195	130	466	800	150	411	100	175	93	56	61
21	60	224	150	342	600	150	393	100	126	75	54	63
22	68	285	125	334	500	209	350	100	105	73	54	60
23	71	285	100	334	450	285	293	100	90	66	52	58
24	82	254	90	301	d505	342	254	100	68	63	51	58
25	86	195	80	269	795	384	224	100	59	72	51	59
26	95	175	80	216	700	368	195	90	73	97	51	59
27	88	144	90	195	d810	402	120	90	68	109	50	58
28	92	131	115	277	1,000	429	95	90	60	113	48	58
29	88	138	129	161	-	466	143	90	53	114	50	58
30	97	126	142	149	-	466	131	90	59	128	53	58
31	97	-	112	119	-	476	-	90	-	128	58	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,263	97	58	73.0	0.253	0.29
November	4,450	285	99	148	.514	.57
December	3,609	150	80	116	.403	.46
Calendar year 1948	84,646.6	3,540	7.6	231	.802	10.92
January	6,376	619	89	206	.715	.82
February	12,441	1,000	94	444	1.54	1.60
March	9,421	500	138	304	1.06	1.22
April	8,563	495	95	285	.990	1.10
May	3,384	216	80	109	.378	.44
June	3,194	325	53	106	.368	.41
July	2,895	202	46	93.4	.324	.37
August	2,542	156	48	82.0	.285	.33
September	1,895	84	54	63.2	.219	.24
Water year 1948-49	61,033	1,000	46	167	.580	7.85

Peak discharge (base, 700 sec.-ft.).- Jan. 19 (10 to 11 a.m.) 750 sec.-ft.; Feb. 3 (2:30 p.m.) 720 sec.-ft.; Feb. 13 (10 to 11 p.m.) 1,060 sec.-ft.; Feb. 19 (time and discharge unknown); Feb. 25 (time and discharge unknown); Feb. 28 (time unknown) about 1,100 sec.-ft.

* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

Note.- No gage-height record Dec. 10-27, Jan. 6-11, Feb. 17, 18, 20-23, 26, Feb. 28 to Mar. 3, Mar. 9-11, 13-15, 20, May 11 to June 15; discharge computed on basis of weather records, discharge measurements, recorded range in stage, and records for Chippewa River near Mount Pleasant and near Midland and Cedar River at East Lansing.

Sebewaing River (State drain) near Sebewaing, Mich.

Location.- Water-stage recorder, lat. 43°43', long. 83°26', on line between secs. 16 and 21, T. 15 N., R. 9 E., at highway bridge on Rescue Road, 1½ miles upstream from East Fork and 1½ miles southeast of Sebewaing. Datum of gage is 590.0 feet above mean sea level (levels by Corps of Engineers).

Drainage area.- 62 square miles.

Average discharge.- 10 years (1939-49), 33.0 second-feet.

Extremes.- Maximum discharge during year, 910 second-feet Feb. 15; maximum gage height, 6.88 feet Jan. 19 (ice jam); no flow for long periods.
1940-49: Maximum discharge not determined; maximum gage height, 12.81 feet Mar. 9, 1942 (ice jam), but may have been higher during period of no gage-height record in April 1947; no flow for long periods.

Remarks.- Records fair.

Rating tables, water year 1948-49, except periods of ice effect (gage height, in feet, and discharge, in second-feet) (Shifting-control method used Aug. 26 to Sept. 30)

Oct. 1 to Feb. 13

1.4	0	1.9	4.0	3.6	102
1.5	.02	2.1	11	3.8	137
1.6	.2	2.4	25	4.1	200
1.7	.6	2.7	41		
1.8	1.6	3.4	84		

Feb. 14 to Sept. 30

1.4	0	2.0	11	4.3	244
1.5	1.1	2.1	15	4.9	397
1.7	4.3	3.4	81	5.6	600
1.8	6.0	3.5	89		
1.9	8.0	3.7	117		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.4	45	4	26	36	7.4	0.5	0.2	1.3	1.0
2		0	.4	16	3	18	22	8.6	.4	.1	.8	.1
3		0	.4	5.4	2.0	16	16	8.9	.2	0	.2	0
4		0	.4	2.6	1.5	15	12	6.2	.2	0	0	0
5		0	.4	35	1.5	28	9.8	5.0	0	0	0	0
6		0	.4	190	1.5	61	9.2	4.1	0	0	0	0
7		.4	.5	75	1.5	38	8.6	3.3	0	0	0	0
8		.4	.5	42	2.0	28	8.6	2.9	0	d.8	4.2	0
9		.3	*.4	33	*2.5	*34	7.8	2.5	0	d2.2	4.0	0
10		.3	.3	32	3.0	25	6.6	2.4	0	3.8	2.2	0
11		.2	.3	24	5	22	6.0	2.2	0	6.0	1.4	0
12		.3	.4	11	10	26	5.7	1.9	0	3.2	.6	0
13		.3	.4	6.1	100	24	5.3	1.7	0	1.7	.2	.5
14		.3	.4	4.0	290	35	5.0	1.6	.1	1.4	.1	a.4
15		.3	.7	6.8	602	35	7.0	1.4	1.7	1.1	0	a.3
16		.3	2.2	30	277	24	59	1.4	5.2	1.4	0	a.2
17		.4	4.6	35	160	20	154	1.3	7.0	1.1	0	a.1
18		.2	4.7	28	198	13	110	1.3	6.4	.6	0	a0
19		.5	1.8	300	397	9.2	109	1.4	4.6	.4	0	0
20		3.7	1.1	150	111	7.2	56	1.4	3.7	0	0	0
21		5.0	1.1	78	57	7.6	32	1.4	3.3	0	0	0
22		3.7	1.2	52	42	39	40	1.4	3.5	0	0	0
23		2.0	1.0	33	40	96	113	1.6	3.5	0	0	0
24		1.3	.6	23	92	43	45	1.7	2.5	0	0	0
25		1.0	.3	19	400	38	26	1.7	1.9	0	0	0
26		.8	.1	16	72	39	26	1.6	1.3	0	0	0
27		.8	.1	14	48	89	24	1.3	.8	0	0	0
28		.7	.1	10	36	62	15	1.3	.4	0	0	0
29		.6	34	8	-	32	11	1.0	.2	0	0	0
30		.6	81	6	-	23	8.9	.8	.8	0	0	0
31		-	67	5	-	24	-	.6	-	0	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	0	0	0	0	0	0
November	24.8	5.0	0	.83	0.013	.01
December	207.2	81	.1	6.68	.108	.12
Calendar year 1948	11,642.2	1,330	0	31.8	.513	6.97
January	1,334.9	300	2.6	43.1	.695	.80
February	2,959.5	602	1.5	106	1.71	1.78
March	997.0	96	7.2	32.2	.519	.60
April	994.5	154	5.0	33.2	.535	.60
May	81.3	8.9	.6	2.62	.042	.05
June	48.2	7.0	0	1.61	.026	.03
July	24.0	6.0	0	.77	.012	.01
August	15.0	4.2	0	.48	.0077	.009
September	2.6	1.0	0	.09	.0015	.002
Water year 1948-49	6,689.0	602	0	18.3	.295	4.01

Peak discharge (base, 500 sec.-ft.).- Jan. 19 (time and discharge unknown); Feb. 15 (10 a.m.) 910 sec.-ft.; Feb. 19 (12:30 a.m.) 770 sec.-ft.; Feb. 25 (5:30 a.m.) 682 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for East Fork Sebewaing River near Sebewaing and Black River near Fargo.

d Doubtful gage-height record.

Note.- Stage-discharge relation affected by ice Jan. 19, 20, Jan. 28 to Feb. 13.

East Fork Sebewaing River (Columbia drain) near Sebewaing, Mich.

Location.- Water-stage recorder, lat. 43°44', long. 83°24', on line between secs. 10 and 11, T. 15 N., R. 9 E., at highway bridge on Gettel Road, 2¼ miles upstream from mouth and 2½ miles southeast of Sebewaing. Datum of gage is 607.00 feet above mean sea level (levels by Corps of Engineers).
Drainage area.- 38 square miles.
Records available.- January 1940 to September 1949.
Extremes.- Maximum discharge during year, 525 second-feet Feb. 15; maximum gage height, 4.50 feet Feb. 13 (backwater from ice); no flow for long periods.
1940-49: Maximum discharge not determined, occurred during period of no gage-height record in April 1947; maximum gage height, 9.70 feet Mar. 15, 1943 (ice jam); no flow for long periods.
Remarks.- Records fair.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Jan. 19

1.3	0.8	1.7	10	2.2	40
1.4	1.7	1.8	14	2.3	52
1.5	3.5	1.9	20	2.4	67
1.6	6.0	2.1	31		

Note.- Same as following table below 1.3 and above 2.4 feet.

Jan. 20 to Sept. 30

1.1	0.05	1.7	8.0	2.3	53
1.2	.25	1.8	12	2.4	67
1.3	.8	1.9	17	2.6	102
1.4	1.7	2.0	23	2.9	162
1.5	3.1	2.1	31	3.3	256
1.6	5.2	2.2	41	3.7	366

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	1.0	29	b1.5	11	22	4.2	0.2	0.3		
2		0	.9	5.8	1.4	7.7	14	3.3	0	0		
3		0	.7	1.9	.9	6.3	9.2	6.3	0	0		
4		0	.6	1.3	.7	6.3	7.2	4.6	0	0		
5		0	.6	5.9	.6	8.8	5.8	3.0	0	0		
6		0	.7	151	.6	38	5.2	2.1	0	0		
7		.2	.9	114	.7	29	5.2	1.5	0	0		
8		.5	1.0	16	.8	14	6.0	1.2	0	0		
9		.6	*.9	10	*1.2	*14	6.9	.9	0	0		
10		.4	.6	9.2	1.2	14	4.6	.6	0	..2		
11		.4	.4	6.8	1.4	7.4	3.3	.6	0	6.6		
12		.2	.4	4.0	2.1	6.9	2.8	.5	0	2.5		
13		.2	.4	2.8	b15	7.4	2.5	.4	0	1.0		
14		.3	.4	2.1	b100	16	2.1	.4	0	.4		
15		.3	1.0	2.4	362	33	2.7	.4	.3	.3		
16		.3	2.6	18	251	15	29	.4	1.5	.2		
17		.4	7.2	25	145	7.4	76	.4	5.5	.1		
18		.4	5.5	14	b100	5.0	43	.4	6.9	0		
19		.9	3.0	b150	b300	4.2	45	.4	3.5	0		
20		2.4	1.6	*b140	112	3.3	28	.3	2.0	0		
21		8.4	1.3	b80	46	4.6	14	.3	1.6	0		
22		5.5	1.1	51	16	29	11	.3	2.0	0		
23		3.1	1.1	16	14	79	59	.4	1.4	0		
24		2.4	1.2	5.5	35	33	25	.3	1.6	0		
25		1.7	1.0	5.5	293	21	14	.3	1.0	0		
26		1.5	.4	4.8	137	23	11	1.2	.4	0		
27		1.3	0	3.3	41	46	15	.7	.2	0		
28		1.1	0	b3.5	20	53	11	.6	0	0		
29		1.0	16	b3.0	-	23	6.9	.5	0	0		
30		1.3	196	b2.5	-	16	5.2	.4	.1	0		
31		-	98	b2.0	-	14	-	.4	-	0		

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	0	0	0	0	0	0
November	34.8	8.4	0	1.16	.031	.03
December	346.5	196	0	11.2	.295	.34
Calendar year 1948	6,951.8	700	0	19.0	.500	6.79
January	886.3	151	1.3	28.6	.753	.87
February	2,000.1	362	.6	71.4	1.88	1.96
March	596.3	79	3.3	19.2	.505	.58
April	492.6	76	2.1	16.4	.432	.48
May	37.3	6.3	.3	1.20	.032	.04
June	28.2	6.9	0	.94	.025	.03
July	11.6	6.6	0	.37	.0097	.01
August	0	0	0	0	0	0
September	0	0	0	0	0	0
Water year 1948-49	4,433.7	362	0	12.1	.318	4.34

Peak discharge (base, 200 sec.-ft.).- Dec. 30 (3:30 p.m.) 236 sec.-ft.; Jan. 6 (5 p.m.) 234 sec.-ft.; Feb. 15 (2 to 4 p.m.) 525 sec.-ft.; Feb. 19 (time and discharge unknown); Feb. 25 (6:30 a.m.) 343 sec.-ft.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.- No gage-height record July 12, 13, 15-25, 27-31, Aug. 2-10; doubtful gage-height record Aug. 13, 14, 19-22; discharge computed on basis of weather records and records for Sebewaing River near Sebewaing.

Pigeon River near Pigeon, Mich.

Location.- Wire-weight gage, lat. 43°48'55", long. 83°17'10", in NE¼ sec. 15, T. 16 N., R. 10 E., on highway bridge 1 mile southwest of Pigeon.

Drainage area.- 86 square miles.

Records available.- December 1946 to September 1949.

Extremes.- 1946-47: Maximum discharge observed during period December to September, 2,040 second-feet Mar. 23 (gage height, 12.66 feet); maximum gage height observed, 12.75 feet Apr. 5 (ice jam); minimum discharge, 0.2 second-foot Aug. 24, Sept. 8; minimum gage height, 5.68 feet Aug. 24.

1947-48: Maximum daily discharge during water year, 3,380 second-feet Mar. 20; maximum gage height, 14.90 feet about Mar. 17, from high-water mark (ice jam); no flow for long periods.

1948-49: Maximum daily discharge during water year, 1,000 second-feet Feb. 15; maximum gage height observed, 12.15 feet Jan. 19 (ice jam); no flow at times.

Remarks.- Records fair except those for December 1946 to September 1947, which are poor. Gage read once daily until March 1948 and twice daily thereafter.

Rating table, Mar. 19, 1948 to Jan. 17, 1949 (gage height, in feet, and discharge, in second-feet)

5.6	0	6.2	1.7	6.8	7.5	8.2	80	11.3	930
5.7	.1	6.3	2.3	6.9	9.5	8.8	140	11.9	1,340
5.8	.3	6.4	3.0	7.0	12	9.4	230	12.7	2,040
5.9	.5	6.5	3.8	7.1	15	9.9	330	13.3	2,700
6.0	.8	6.6	4.8	7.4	27	10.4	490	13.8	3,380
6.1	1.2	6.7	6.0	7.7	42	10.8	660		

Discharge, in second-feet, 1946-49

1946-47

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			(a)	7	30		200	180	128	3.3	2.8	0.4
2			(a)	5	20		300	1,120	310	3.3	2.8	.8
3			(*)	5			*500	490	370	3.3	2.8	.6
4				5			700	202	230	3.2	3.1	.5
5				4			1,000	202	54	3.3	3.1	.5
6				4	10	(*) 5	1,180	100	54	3.3	2.3	.3
7				4			550	70	54	6.0	2.4	.3
8				4			a300	57	32	5.6	2.8	.2
9				4			100	70	38	4.5	1.9	5.1
10				4			180	39	24	4.4	1.9	14
11				3	(*)		550	210	30	3.9	2.9	16
12				3		20	1,180	490	12	6.0	2.5	8.2
13				3		50	290	330	12	4.5	2.3	7.8
14			1.5	*4		100	128	330	165	4.5	2.3	7.4
15				10		150	75	490	75	4.5	2.8	1.0
16						240	44	520	44	6.0	3.0	1.0
17						188	41	330	30	4.5	.8	1.1
18						460	64	310	27	2.8	.6	1.1
19						460	55	210	22	4.3	.5	1.3
20						5 165	41	400	14	5.2	.3	1.1
21						620	44	430	11	5.7	.3	6.9
22						700	48	400	9.0	4.5	.3	5.6
23						2,040	44	150	9.0	3.9	.3	8.2
24				30		1,940	70	188	7.5	3.9	.2	4.1
25						1,760	65	180	7.5	2.8	.3	3.9
26						1,760	65	250	6.8	2.8	.3	2.9
27			100			740	55	250	6.8	5.0	.4	2.0
28			50			350	65	250	6.0	9.0	.3	1.6
29			20		-	300	210	150	5.7	9.2	.3	1.4
30			10		-	200	172	85	5.2	4.5	.4	2.0
31			9		-	100	-	85	-	4.5	.4	-

* Winter discharge measurement made on this day.
a No gage-height record.
Note.- Stage-discharge relation affected by ice or doubtful gage-height record Dec. 3 to Mar. 14, Mar. 29 to Apr. 5, Apr. 9.

Discharge, in second-feet, of Pigeon River near Pigeon, Mich., 1946-49--Continued

1947-48

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.5	3.7	3.3	5	8	150	660	7.7	4.4	4.8	0.7	
2	1.9	4.8	3.4	5	8	130	230	6.6	4.6	4.2	.6	
3	1.5	2.3	4.5	5	8	110	90	5.5	4.8	3.6	.4	
4	1.4	3.2	5.4	5	8	90	42	4.6	4.8	3.8	.4	
5	1.4	2.9	7.8	5	8	80	32	4.2	5.0	3.0	.3	
6	1.3	2.9	7.4	5	6	60	30	4.8	5.5	2.6	.3	
7	2.9	2.9	8.1	5	6	50	21	11	4.8	2.3	.2	
8	3.1	3.0	6.0	5	6	40	17	420	7.5	2.2	.2	
9	7.0	2.8	34	5	6	*35	12	185	16	1.9	.1	
10	6.3	2.1	*15	5	6	30	8.7	230	12	1.7	0	
11	1.3	3.8	8	5	4	25	17	240	8.7	2.1	0	
12	1.1	*3.1	8	5	4	20	140	250	7.2	1.9	0	
13	1.4	3.0	8	5	4	20	42	125	6.0	1.7	.3	
14	2.0	3.0	8	5	4	20	23	63	5.3	3.8	.4	
15	2.5	3.9	7	5	4	50	18	32	4.8	2.6	.3	
16	2.6	3.8	6	6	4	500	11	22	3.8	1.9	.2	
17	3.0	2.9	6	6	4	1,000	8.7	19	3.6	1.6	.3	
18	2.3	3.4	6	6	*4	800	8.7	16	3.5	1.4	.3	
19	2.3	4.1	6	6	10	3,240	9.1	10	3.5	1.3	1.0	
20	1.0	3.9	6	6	20	3,380	12	8.7	4.2	1.1	1.8	
21	1.0	4.0	5	8	40	470	8.7	8.3	4.5	1.2	1.3	
22	1.2	4.3	5	8	100	280	6.3	7.0	4.3	1.1	.6	
23	1.7	4.0	5	8	150	170	5.8	6.3	6.0	1.9	.7	
24	1.5	5.7	5	8	100	80	6.4	5.5	15	7.0	.4	
25	1.2	4.1	5	8	80	*39	7.5	5.3	8.3	12	.3	
26	1.3	4.1	5	10	400	27	6.3	4.9	4.8	4.4	.2	
27	1.7	4.3	5	*10	300	990	19	5.3	4.1	3.2	.1	
28	2.4	4.1	5	10	250	148	30	5.2	5.6	2.3	0	
29	3.5	4.3	5	10	200	140	16	4.8	5.9	1.6	0	
30	5.8	4.4	5	10	-	470	8.3	4.6	6.0	1.4	0	
31	6.0	-	5	10	-	470	-	4.3	-	1.0	0	

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 10 to Mar. 18.

1948-49

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	1.9	2.3	16	8	80	45	9.6	5.3	0.9	3.4	0
2	0	1.9	2.2	8.1	7	60	30	11	4.4	5.2	1.7	0
3	0	2.1	2.2	4.6	6	40	21	14	3.2	6.4	1.0	0
4	0	2.3	1.9	3.3	6	30	18	11	3.2	1.7	.8	.3
5	0	2.4	2.0	14	6	50	11	9.2	2.2	3.3	.7	.4
6	0	3.5	2.0	80	6	70	12	8.2	2.0	3.7	.5	.3
7	0	3.8	1.7	75	6	50	14	6.7	1.7	5.0	.5	.1
8	.1	3.3	*2.1	29	6	40	14	5.8	1.4	3.9	.6	.1
9	0	2.6	2.1	14	*8	*35	13	6.4	1.3	2.4	.5	.1
10	0	2.6	1.9	9.1	10	35	9.2	6.6	1.4	120	.6	.3
11	.1	2.4	1.9	6.0	10	35	8.0	5.9	1.2	130	.8	.5
12	.5	2.3	1.9	4.1	10	35	6.9	5.3	1.0	56	1.0	.4
13	2.2	2.6	2.1	3.5	100	35	7.3	5.9	.9	22	1.1	.5
14	2.3	2.5	2.1	3.0	300	50	7.8	5.8	2.5	9.2	.8	1.1
15	2.4	2.2	2.4	3.3	1,000	73	8.2	5.6	11	7.5	.6	1.3
16	2.9	2.0	3.0	25	700	59	66	5.2	76	6.0	.7	1.4
17	2.3	2.1	2.3	27	500	38	115	5.6	66	3.8	.2	1.1
18	2.2	2.1	3.0	8	600	28	62	6.0	45	2.2	.1	.7
19	2.0	2.3	2.6	*900	700	24	56	7.3	22	1.6	0	.5
20	1.9	3.8	2.6	400	500	21	38	7.8	9.0	3.9	0	.4
21	1.8	7.5	2.6	250	400	32	22	7.5	4.8	3.5	0	.5
22	1.8	4.6	2.6	200	300	150	18	7.3	22	2.0	0	.5
23	2.3	3.6	2.6	100	200	145	38	8.0	42	1.2	0	.8
24	2.2	3.2	2.2	40	350	85	45	9.8	16	.9	0	1.6
25	2.6	2.7	1.7	30	500	52	25	9.2	6.6	.7	0	2.0
26	2.9	2.7	1.2	20	300	59	30	9.4	3.9	.9	0	1.5
27	2.6	2.6	1.0	15	200	90	30	9.6	2.3	1.3	0	1.4
28	2.4	2.6	1.2	10	100	125	20	9.0	1.5	.8	0	.8
29	2.2	2.6	2.3	10	-	*56	12	8.4	1.2	.5	0	.7
30	2.2	2.3	42	10	-	38	10	7.5	1.1	.4	0	.4
31	1.9	-	36	9	-	33	-	6.0	-	6.2	0	-

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Jan. 18 to Feb. 13, Mar. 8-14; no gage-height record Feb. 14 to Mar. 7, Aug. 10, 11; discharge computed on basis of weather records and records for Black River near Fargo and Sebewaing River near Sebewaing.

Monthly discharge, in second-feet, of Pigeon River near Pigeon, Mich., 1946-49

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December 1946	228.0	100	1.5	7.35	0.085	0.10
Calendar year	-	-	-	-	-	-
January 1947	549	30	3	17.7	.206	.24
February	220	30	5	7.9	.092	.10
March	12,398	2,040	5	400	4.65	5.36
April	8,316	1,180	41	277	3.22	3.59
May	8,568	1,120	39	276	3.21	3.70
June	1,799.5	370	5.2	60.0	.698	.78
July	142.2	9.2	2.8	4.59	.053	.06
August	47.4	3.1	.2	1.53	.018	.02
September	107.3	16	.2	3.58	.042	.05
Water year	-	-	-	-	-	-
October 1947	75.1	7.0	1.0	2.42	.028	.03
November	108.8	5.7	2.1	3.63	.042	.05
December	218.9	34	3.3	7.06	.082	.09
Calendar year 1947	32,550.2	2,040	.2	89.2	1.04	14.07
January 1948	205	10	5	6.6	.077	.09
February	1,752	400	4	60.4	.702	.76
March	13,114	3,380	20	423	4.92	5.67
April	1,546.5	660	5.8	51.6	.600	.67
May	1,726.6	420	4.2	55.7	.648	.75
June	184.5	16	3.5	6.15	.072	.08
July	86.6	12	1.0	2.79	.032	.04
August	11.4	1.8	0	.37	.0043	.005
September	0	0	0	0	0	0
Water year 1947-48	19,029.4	3,380	0	52.0	.605	8.23
October 1948	43.8	2.9	0	1.41	.016	.02
November	85.1	7.5	1.9	2.84	.033	.04
December	139.7	42	1.0	4.51	.052	.06
Calendar year 1948	18,895.2	3,380	0	51.6	.600	8.19
January 1949	2,327.0	900	3.0	75.1	.873	1.01
February	6,839	1,000	6	244	2.84	2.98
March	1,753	150	21	56.5	.657	.76
April	812.4	115	6.9	27.1	.315	.35
May	240.6	14	5.2	7.76	.090	.10
June	362.1	76	.9	12.1	.141	.16
July	415.1	130	.4	13.3	.155	.18
August	15.6	3.4	0	.50	.0058	.007
September	19.7	2.0	0	.66	.0077	.009
Water year 1948-49	13,051.1	1,000	0	35.8	.416	5.64

Black River near Fargo, Mich.

Location.- Wire-weight gage, lat. 43°06', long. 82°37', in sec. 32, T. 8 N., R. 16 E., at highway bridge on Norman Road, 2½ miles southeast of Fargo, 4½ miles upstream from Mill Creek, and 12 miles northwest of Port Huron.

Drainage area.- 475 square miles.

Records available.- February 1944 to September 1949.

Extremes.- Maximum daily discharge during year, 5,500 second-feet Feb. 16; maximum gage height observed, 11.95 feet Feb. 15 (backwater from ice); minimum discharge, 4.5 second-feet Oct. 5, 6 (gage height, 1.53 feet).
1944-49: Maximum discharge, 14,400 second-feet Apr. 5, 1947 (gage height, 16.06 feet, from floodmark), from rating curve extended above 10,000 second-feet; minimum observed, 1.8 second-feet Sept. 18, 19, 1946.

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

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Nov. 18 to Dec. 23)

Oct. 1 to Feb. 15

1.5	3.0	2.0	37	3.2	259
1.7	13	2.1	49	3.7	422
1.8	19	2.6	121	4.2	630
1.9	27	2.9	181		

Note.- Same as following table above 4.2 feet.

Feb. 16 to Sept. 30

1.5	3.5	2.1	46	5.3	1,210
1.6	7.5	2.3	74	6.5	2,050
1.7	12	2.5	110	8.9	4,050
1.8	18	3.0	215	10.3	5,580
1.9	26	3.5	350		
2.0	35	4.2	630		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.5	10	13	52	50	496	1,210	77	30	18	18	14
2	8.0	12	14	70	45	464	705	86	25	15	18	12
3	6.5	12	14	73	40	268	464	368	22	12	18	10
4	5.5	13	14	62	35	130	317	302	21	12	17	10
5	5.5	15	15	59	35	118	476	188	21	14	15	12
6	5.0	19	14	139	35	174	238	134	18	28	14	12
7	5.5	22	*12	228	35	168	215	70	17	47	16	11
8	9.5	21	12	149	35	208	202	66	16	32	12	12
9	14	19	13	125	35	208	182	56	14	164	10	11
10	10	19	13	102	*35	*176	132	54	12	408	8.0	10
11	15	18	13	99	35	140	114	42	9.0	160	9.0	9.0
12	14	17	12	67	100	108	102	30	11	79	66	7.5
13	14	15	12	48	900	86	68	25	14	66	134	7.5
14	12	14	12	38	2,500	124	70	30	16	59	81	7.5
15	12	13	15	37	5,000	86	122	29	20	51	39	7.1
16	11	14	16	52	5,500	142	374	29	26	36	35	6.7
17	12	11	17	170	4,150	95	444	27	31	33	38	5.9
18	10	14	17	*130	2,850	86	388	24	30	30	46	14
19	10	22	17	181	2,290	79	452	24	30	37	49	14
20	10	21	17	930	1,330	58	368	39	29	47	43	24
21	11	22	17	705	680	76	225	26	29	31	33	23
22	11	22	17	422	472	329	168	49	31	32	28	14
23	11	24	15	352	371	830	164	212	30	46	24	12
24	12	22	14	205	353	625	188	124	27	39	21	11
25	12	21	13	139	980	371	172	79	23	55	15	11
26	12	19	12	101	880	371	148	59	21	47	12	10
27	10	18	11	98	484	476	164	46	18	34	12	8.0
28	10	18	11	105	335	528	186	39	17	24	12	7.5
29	10	17	12	77	-	396	138	39	40	21	12	7.1
30	10	15	16	70	-	270	88	33	24	22	10	5.9
31	11	-	a35	60	-	544	-	31	-	19	12	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	319.0	15	5.0	10.3	0.022	0.03
November	519	24	10	17.3	.036	.04
December	455	35	11	14.7	.031	.04
Calendar year 1948	119,749.5	9,240	2.0	327	.688	9.38
January	5,145	930	37	166	.349	.40
February	29,590	5,500	35	1,057	2.23	2.32
March	8,230	830	58	265	.558	.64
April	8,284	1,210	68	276	.581	.65
May	2,437	368	24	78.6	.165	.19
June	672.0	40	9.0	22.4	.047	.05
July	1,718	408	12	55.4	.117	.13
August	877.0	134	8.0	28.3	.060	.07
September	326.7	24	5.9	10.9	.023	.03
Water year 1948-49	58,572.7	5,500	5.0	160	.337	4.59

* Winter discharge measurement made on this day.
a No gage-height record; discharge interpolated.
Note.- Stage-discharge relation affected by ice Dec. 24-29, Jan. 30 to Feb. 16.

Mill Creek near Abbottsford, Mich.

Location.- Staff gage, lat. 43°03', long. 82°37', in NW¼ sec. 17, T. 7 N., R. 16 E., at county highway bridge 1 mile upstream from mouth and 2 miles northeast of Abbottsford.

Drainage area.- 138 square miles.

Records available.- May 1947 to September 1949.

Extremes.- Maximum discharge during year, 1,650 second-feet Feb. 15 (gage height, 7.26 feet); minimum, 3.8 second-feet Aug. 11 (gage height, 2.28 feet).
1947-49: Maximum discharge, 3,050 second-feet Mar. 20, 1948, from floodmark; maximum gage height observed, 10.10 feet Feb. 28, 1948 (backwater from ice); minimum discharge, that of Aug. 11, 1949.

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

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Dec. 19)

2.3	4.5	2.8	37	3.7	190
2.4	8.5	2.9	48	4.1	290
2.5	13	3.0	60	4.8	510
2.6	19	3.1	75	5.7	855
2.7	27	3.3	105	6.6	1,270

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.0	10	15	50	35	a150	580	a50	16	8.5	7.7	10
2	7.6	10	16	70	35	a100	562	a80	14	14	7.3	8.1
3	7.2	11	15	70	a35	86	440	235	14	8.1	7.7	7.7
4	7.2	13	13	60	35	62	317	141	14	5.3	6.9	7.7
5	7.2	a15	12	137	a35	93	202	87	13	5.3	6.1	6.9
6	7.2	19	13	316	a30	218	159	68	12	8.5	6.1	6.9
7	7.2	19	*13	260	a30	222	157	a50	10	8.5	6.1	6.9
8	9.0	21	13	151	a30	131	155	a40	9.8	8.1	5.3	6.9
9	10	16	13	113	a30	129	143	28	9.0	14	4.5	6.9
10	8.5	15	a15	92	*33	*125	115	27	9.0	27	4.5	6.9
11	9.0	16	14	75	35	a120	93	26	9.0	a25	5.7	6.5
12	12	14	13	76	50	109	80	25	9.4	21	28	6.5
13	9.6	14	13	59	100	96	70	23	9.4	19	25	6.5
14	9.6	12	13	49	250	117	66	21	9.4	13	13	6.5
15	9.6	12	a15	50	1,270	105	125	19	13	12	11	6.1
16	8.5	11	18	59	1,040	60	350	17	14	11	9.0	6.5
17	9.6	10	21	84	735	54	356	16	13	9.4	9.0	6.1
18	9.0	9.6	21	*135	735	50	a300	14	12	10	39	48
19	9.0	13	18	615	775	a45	245	18	13	11	45	18
20	9.6	20	17	380	695	50	202	27	13	15	25	12
21	9.6	20	16	341	475	58	137	26	11	11	23	9.4
22	9.0	20	15	308	380	94	113	34	9.4	10	18	7.7
23	9.6	21	14	252	265	215	117	66	9.4	10	14	7.3
24	10	20	a13	168	230	235	113	32	7.7	10	12	7.3
25	10	20	11	109	296	192	94	27	8.1	a15	11	7.7
26	10	19	10	81	270	175	81	25	7.7	26	9.8	8.1
27	10	18	10	63	232	235	75	24	8.5	21	9.4	8.1
28	10	18	10	63	a200	232	75	22	7.3	16	8.5	7.7
29	10	18	13	50	-	182	a70	21	6.1	12	8.5	7.3
30	10	16	15	45	-	131	a65	21	6.5	9.0	a8.5	7.7
31	10	-	30	40	-	335	- -	18	-	7.7	8.5	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	282.8	12	7.2	9.12	0.066	0.08
November	470.6	21	9.6	15.7	.114	.13
December	458	30	10	14.8	.107	.12
Calendar year 1948	40,715.3	2,360	5.4	111	.804	10.97
January	4,421	615	40	143	1.04	1.20
February	8,361	1,270	30	299	2.17	2.26
March	4,206	335	45	136	.986	1.14
April	5,658	580	65	189	1.37	1.53
May	1,328	235	14	42.8	.310	.36
June	317.7	16	6.1	10.6	.077	.09
July	401.4	27	5.3	12.9	.093	.11
August	403.1	45	4.5	13.0	.094	.11
September	275.9	48	6.1	9.20	.067	.07
Water year 1948-49	26,583.5	1,270	4.5	72.8	.528	7.20

Peak discharge (base, 400 sec.-ft.).- Jan. 19 (8 a.m.) 735 sec.-ft.; Feb. 15 (12 m.) 1,620 sec.-ft.; Mar. 31 (10 p.m.) 635 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 20 to Jan. 4, Jan. 30 to Feb. 14.
a No gage-height record; discharge computed on basis of weather records and records for Black River near Fargo.

Clinton River near Fraser, Mich.

Location.- Wire-weight gage, lat. 42°34'40", long. 82°57'00", on line between secs. 19 and 20, T. 2 N., R. 13 E., on Garfield Road bridge, 2¾ miles north of Fraser and 4 miles upstream from North Branch. Datum of gage is 577.71 feet above mean sea level, datum of 1929.
Drainage area.- 454 square miles.
Records available.- May 1947 to September 1949.
Extremes.- Maximum discharge during year, 3,850 second-feet Feb. 15 (gage height, 15.70 feet, from graph based on gage readings); minimum observed, 65 second-feet Aug. 22 (gage height, 4.48 feet).
1947-49: Maximum discharge, 8,000 second-feet May 11, 1948, from rating curve extended above 4,000 second-feet (gage height, 19.5 feet, from graph based on gage readings); minimum observed, that of Aug. 22, 1949.
Remarks.- Records good except those for periods of ice effect, which are fair. Gage read twice daily.

Rating tables, water year 1948-49, except periods of ice effect
(gage-height, in feet, and discharge, in second-feet)
(Shifting-control method used Nov. 21 to Dec. 23)

Oct. 1 to Feb. 15				Feb. 16 to Sept. 30			
4.9	88	10.6	1,080	4.5	66	6.1	217
5.6	152	12.2	1,510	5.4	138	6.8	330
5.9	188	13.0	1,800	5.8	178	7.8	516
6.5	282	13.8	2,250				
7.8	516	14.6	2,880				

Note.- Same as preceding table above 7.8 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	138	92	202	300	250	573	2,060	286	142	108	83	120
2	115	111	195	282	200	516	1,180	840	138	104	95	93
3	98	195	188	240	200	497	782	630	134	97	124	87
4	94	309	188	240	200	497	649	421	129	86	98	80
5	96	354	175	592	200	516	592	312	124	88	89	95
6	108	516	175	725	200	516	668	286	116	116	90	79
7	133	372	175	*399	200	459	630	254	116	217	134	82
8	142	240	175	336	200	459	573	231	112	112	134	120
9	133	202	169	300	250	468	516	217	112	112	86	85
10	113	232	163	274	250	450	459	203	112	254	79	82
11	92	256	158	240	250	430	430	198	108	254	142	78
12	113	202	152	224	291	430	412	190	93	108	134	72
13	101	195	158	217	1,220	393	402	178	79	104	120	79
14	99	182	158	224	2,620	384	393	147	112	100	77	138
15	95	175	163	224	2,860	357	592	152	124	112	72	91
16	93	175	*256	381	2,780	321	744	162	210	100	78	98
17	91	265	282	444	1,510	295	573	157	162	90	81	104
18	86	256	248	363	1,050	304	611	157	124	83	134	440
19	88	240	202	1,150	920	278	611	217	112	86	94	535
20	88	611	175	860	801	270	516	554	95	83	85	217
21	88	426	163	554	649	270	468	312	101	85	72	172
22	93	318	195	480	687	366	478	402	124	120	67	162
23	99	282	169	372	860	611	573	573	116	124	69	152
24	97	248	150	390	782	497	478	348	112	88	72	152
25	96	232	130	399	*980	459	421	246	116	120	72	147
26	95	217	130	354	782	450	393	217	129	138	72	134
27	92	232	150	345	668	516	384	190	112	104	80	138
28	93	224	200	400	630	478	304	167	112	96	84	138
29	94	202	500	400	-	421	321	157	108	134	138	138
30	93	202	668	350	-	393	278	138	120	129	108	134
31	92	-	372	300	-	1,120	-	138	-	91	94	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,148	142	86	102	0.225	0.26
November	7,763	611	92	259	.570	.64
December	6,584	668	130	212	.467	.54
Calendar year 1948	149,411	6,930	76	408	.899	12.23
January	12,359	1,150	217	399	.879	1.01
February	22,490	2,860	200	803	1.77	1.84
March	13,994	1,120	270	451	.993	1.14
April	17,491	2,060	278	583	1.28	1.43
May	8,678	840	138	280	.617	.71
June	3,604	210	79	120	.264	.29
July	3,643	254	83	118	.260	.30
August	2,957	142	67	95.4	.210	.24
September	4,242	535	72	141	.311	.35
Water year 1948-49	106,953	2,860	67	293	.645	8.75

Peak discharge (base, 1,100 sec.-ft.).- Jan. 19 (6 to 8 p.m.) 1,280 sec.-ft.; Feb. 15 (10 p.m.) 3,850 sec.-ft.; Apr. 1 (5 to 6 a.m.) 2,390 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 24-29, Jan. 28 to Feb. 11.

Clinton River at Mount Clemens, Mich.

Location.- Water-stage recorder, lat. 42°35'45", long. 82°54'35", 20 feet downstream from Moravian Drive Bridge, a quarter of a mile downstream from North Branch, and half a mile west of Mount Clemens. Auxiliary wire-weight gage 8,500 feet downstream on Gratiot Avenue Bridge. Datum of both gages is 570.43 feet above mean sea level, datum of 1929.

Drainage area.- 733 square miles.

Records available.- May 1934 to September 1949.

Average discharge.- 15 years, 464 second-feet.

Extremes.- Maximum discharge during year, 7,870 second-feet Feb. 15 (gage height, 16.30 feet); minimum daily, 83 second-feet Aug. 10; minimum gage height, 3.84 feet Sept. 1.
1934-49: Maximum discharge, 21,200 second-feet Apr. 6, 1947 (gage height, 23.55 feet, from floodmark); minimum gage height, 2.90 feet Oct. 15, 1934.

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

Revisions (water years).- W 1084: 1938, 1943, 1945, 1946.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	115	177	295	630	400	690	4,370	402	167	138	112	127
2	85	191	315	645	300	690	2,700	920	163	139	103	157
3	106	261	295	555	*300	660	1,400	960	154	136	107	154
4	120	312	295	525	300	660	1,000	645	143	130	99	160
5	127	340	328	1,050	300	660	812	465	138	136	95	151
6	112	480	288	1,530	300	742	882	402	131	149	95	143
7	131	378	263	960	300	675	900	352	127	179	103	159
8	112	302	249	690	300	645	830	328	131	165	101	151
9	107	282	245	555	500	630	725	308	125	181	85	151
10	106	275	235	480	550	*585	645	285	119	253	83	155
11	114	300	285	420	500	555	600	288	115	203	99	160
12	103	285	249	390	600	540	570	282	112	162	114	165
13	88	231	249	390	2,290	480	540	278	112	149	111	163
14	99	255	251	365	4,970	480	525	241	133	138	111	144
15	133	231	*305	378	5,910	420	725	235	149	141	114	143
16	136	282	352	540	6,410	378	1,140	239	175	138	114	144
17	111	272	365	675	3,390	352	980	229	163	135	117	154
18	127	295	308	615	1,930	340	848	219	158	133	130	298
19	133	328	420	1,630	1,530	310	848	243	130	123	106	495
20	136	585	390	1,440	1,220	298	725	510	123	120	106	253
21	159	510	328	980	960	302	630	340	125	127	106	205
22	160	378	315	708	960	402	615	340	127	138	107	165
23	160	340	250	555	1,260	830	760	510	130	133	107	141
24	162	328	220	570	1,350	760	1,020	340	128	122	104	135
25	169	340	200	570	1,530	660	600	257	135	127	112	146
26	171	328	200	510	1,300	645	540	223	131	141	114	143
27	173	300	250	510	960	742	525	211	131	136	117	139
28	173	315	300	660	812	742	480	197	135	120	125	122
29	177	312	700	645	-	630	450	187	131	122	147	119
30	191	315	1,370	600	-	555	402	160	138	112	152	119
31	183	-	882	500	-	1,930	-	163	-	99	146	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,179	191	85	135	0.184	0.21
November	9,528	585	177	318	.434	.48
December	10,997	1,370	200	355	.484	.56
Calendar year 1948	229,535	12,400	85	627	.855	11.63
January	21,271	1,630	365	686	.936	1.08
February	41,432	6,410	300	1,480	2.02	2.10
March	18,988	1,930	298	613	.836	.96
April	27,787	4,370	402	926	1.26	1.41
May	10,759	960	160	347	.473	.55
June	4,059	175	112	135	.184	.21
July	4,425	253	99	143	.195	.22
August	3,442	152	83	111	.151	.17
Septsmber	5,061	495	119	169	.231	.26
Water year 1948-49	161,928	6,410	83	444	.606	8.21

Peak discharge (base, 3,000 sec.-ft.).- Feb. 15 (10:30 p.m.) 7,870 sec.-ft.; Apr. 1 (10 to 11 a.m.) 4,650 sec.-ft.

* Winter discharge measurement mede on this day.

Note.- Shifting-control method used Oct. 1 to Nov. 29, Apr. 10 to Sept. 30; stage-discharge relation affected by ice Dec. 23-29, Jan. 30 to Feb. 11.

North Branch Clinton River near Mount Clemens, Mich.

Location.- Wire-weight gage, lat. 42°37'45", long. 82°53'25", in NW¼ sec. 2, T. 2 N., R. 13 E., at bridge on State Highway 59, 2 miles north of Mount Clemens and 3½ miles upstream from mouth.

Drainage area.- 185 square miles.

Records available.- May 1947 to September 1949.

Extremes.- Maximum discharge during year, 3,000 second-feet Feb. 16 (gage height, 14.60 feet); minimum, 1.4 second-feet Aug. 15, 22; minimum gage height, 3.24 feet Sept. 10. 1947-49: Maximum discharge not determined; maximum gage height, 16.9 feet May 11, 1948 (backwater); minimum discharge observed, 0.9 second-foot Sept. 1, 1948.

Remarks.- Records fair. Some regulation at times from Wolcott Milling Co., about 10 miles upstream. Gage read twice daily.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.2	20	27	60	35	123	1,350	66	18	6.1	7.0	7.4
2	7.0	20	25	40	30	127	915	97	17	3.0	13	8.6
3	7.2	19	24	35	30	119	425	269	16	6.7	11	7.8
4	6.8	22	24	30	30	115	221	142	13	6.4	9.8	6.1
5	7.0	22	24	40	30	94	127	85	14	5.2	9.8	6.1
6	7.2	26	27	*250	30	137	137	73	9.0	4.6	4.0	6.4
7	7.2	25	26	200	30	127	167	66	12	4.0	4.3	8.2
8	9.0	28	24	165	31	111	147	59	9.0	4.3	8.6	8.6
9	10	28	23	94	32	102	127	52	9.4	19	7.8	4.3
10	8.0	26	22	71	46	*100	103	50	9.8	39	7.8	2.2
11	7.2	26	22	51	44	101	92	49	3.8	54	8.6	4.3
12	7.8	28	23	39	48	90	85	46	7.0	26	12	4.9
13	7.5	27	24	37	566	80	81	43	7.0	15	12	4.6
14	7.5	26	24	37	1,860	80	78	40	6.4	11	6.4	4.9
15	7.0	24	*24	32	3,070	70	103	39	11	10	1.7	5.5
16	7.0	24	27	48	2,620	70	317	37	15	11	3.4	5.8
17	8.2	26	50	171	1,350	60	299	36	18	9.4	3.6	5.2
18	7.8	31	40	80	775	60	162	34	a16	8.2	9.0	15
19	6.0	29	35	370	425	80	157	34	a14	6.7	8.6	52
20	9.2	54	32	454	281	60	142	42	a12	6.1	4.9	42
21	9.8	67	29	384	177	60	103	46	a11	6.1	4.0	23
22	10	44	26	113	152	73	91	40	9.0	7.4	1.6	16
23	10	35	25	72	245	197	157	52	5.5	6.7	2.8	11
24	10	32	20	65	233	215	137	43	5.8	7.0	3.0	12
25	10	29	15	56	*353	142	101	33	5.5	10	2.8	10
26	12	28	15	50	353	142	88	28	8.2	21	2.8	4.3
27	14	27	20	50	162	172	82	25	3.6	50	2.6	9.4
28	14	29	30	60	107	209	76	23	7.8	21	4.3	7.4
29	15	28	50	60	-	157	71	21	4.0	14	6.7	4.3
30	16	27	200	60	-	101	68	20	6.4	15	6.4	7.8
31	16	-	100	45	-	424	-	18	-	13	7.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	293.6	18	6.8	9.47	0.051	0.06
November	879	67	19	29.3	.158	.18
December	1,079	200	15	34.8	.188	.22
Calendar year 1948	51,343.4	4,000	1.2	140	.757	10.31
January	3,319	454	30	107	.578	.67
February	12,147	2,620	30	434	2.35	2.44
March	3,758	424	60	121	.654	.76
April	6,209	1,350	68	207	1.12	1.25
May	1,708	269	18	55.1	.298	.34
June	304.2	18	3.6	10.1	.055	.06
July	426.9	54	3.0	13.8	.075	.09
August	201.9	14	1.6	6.51	.035	.04
September	315.1	52	2.2	10.5	.057	.06
Water year 1948-49	30,640.7	2,620	1.6	83.9	.454	6.17

Peak discharge (base, 650 sec.-ft.).- Feb. 16 (4 a.m.) 3,000 sec.-ft.; Apr. 1 (12 m.) 1,580 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for Clinton River at Mt. Clemens and near Fraser.

Note.- Stage-discharge relation affected by ice Dec. 9, 10, 13, 14, 16, 19, Dec. 23 to Jan. 7, Jan. 26 to Feb. 7, Mar. 13-21.

Middle Branch Clinton River near Mount Clemens, Mich.

Location.- Wire-weight gage, lat. 42°37'40", long. 82°55'50", in NW¼ sec. 4, T. 2 N., R. 13 E., at bridge on State Highway 59, 3½ miles northwest of Mount Clemens and 3½ miles upstream from mouth. Datum of gage is 580.987 feet above mean sea level, datum of 1929.

Drainage area.- 51 square miles.

Records available.- May 1948 to June 1949 (discontinued).

Extremes.- Maximum discharge observed during period October 1948 to June 1949, 1,220 second-feet Feb. 15 (gage height, 10.35 feet); minimum daily discharge, 2.5 second-feet June 13.

1947-49: Maximum discharge not determined; maximum gage height, 12.1 feet May 11, 1948, from graph based on gage readings (backwater); minimum discharge observed, 1.5 second-feet Aug. 2, 1948 (gage height, 2.18 feet).

Remarks.- Records good except those for periods of ice effect or no gage-height record, and those above 50 second-feet, which are fair. Gage read twice daily.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.5	4.0	9.2	20	9	27	166	12	5.0			
2	3.6	4.0	8.7	15	9	20	71	131	4.9			
3	3.5	4.2	7.9	15	*9	18	45	45	4.2			
4	3.2	10	9.2	15	9	20	35	28	3.7			
5	3.2	19	10	20	9	20	30	18	3.8			
6	3.2	24	9.6	*35	9	20	53	12	3.7			
7	3.4	12	8.7	25	9	16	41	11	3.8			
8	5.7	8.1	*7.9	20	9	16	31	10	3.5			
9	4.9	8.3	7.1	17	20	16	26	8	3.5			
10	4.4	8.7	7.5	15	30	*16	21	7	3.4			
11	4.1	11	9.2	12	46	16	19	7	3.3			
12	6.7	8.5	12	12	62	16	28	7	3.0			
13	4.7	8.1	12	12	470	16	35	6	2.5			
14	4.6	7.7	12	12	236	16	45	5	3.5			
15	4.4	7.9	12	17	690	15	59	5	4.0			
16	4.4	8.3	19	20	191	15	55	5	5.0			
17	4.7	11	22	27	115	12	32	5	4.0			
18	4.7	8.9	19	35	65	12	44	7	3.5			
19	4.7	11	15	50	53	12	33	8	3.0			
20	4.6	46	10	35	43	13	22	9	3.0			
21	4.6	20	9	30	33	14	19	10	3.5			
22	4.6	16	9	25	55	41	32	15	4.0			
23	4.4	13	8	20	59	57	45	37	4.0			
24	4.4	11	8	20	47	35	35	14	3.5			
25	4.4	10	8	20	107	31	25	9.8	3.5			
26	4.4	12	8	25	65	29	20	9.0	4.0			
27	4.1	11	8	25	41	47	15	8.2	3.5			
28	4.1	10	8	20	30	34	13	7.4	3.5			
29	3.8	10	15	15	-	22	12	6.7	3.5			
30	3.6	9.8	35	10	-	36	12	6.0	3.5			
31	3.8	-	25	9	-	191	-	6.2	-			

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	134.4	6.7	3.2	4.34	0.085	0.10
November	353.5	46	4.0	11.8	.231	.26
December	369.0	35	7.1	11.9	.233	.27
Calendar year 1948	12,283.2	1,000	1.5	33.6	.659	8.96
January	648	50	9	20.9	.410	.47
February	2,530	690	9	90.4	1.77	1.84
March	869	191	12	28.0	.549	.63
April	1,119	166	12	37.3	.731	.82
May	475.3	131	5	15.3	.300	.35
June	110.8	5.0	2.5	3.69	.072	.08
July	-	-	-	-	-	-
August	-	-	-	-	-	-
September	-	-	-	-	-	-
Water year	-	-	-	-	-	-

* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Dec. 19 to Jan. 4, Jan. 31 to Feb. 10, Mar. 2-18. No gage-height record Jan. 5-16, 19-30, Apr. 13, 14, 24-30, May 8-21, June 12-30; doubtful gage height record Jan. 31 to Feb. 7; discharge computed on basis of weather records and records for Clinton River near Fraser and at Mount Clemens and North Branch Clinton River near Mount Clemens.

River Rouge at Detroit, Mich.

Location.- Water-stage recorder, lat. 42°22'20", long. 83°15'20", in SW¼ sec. 27, T. 1 S., R. 10 E., at Detroit and 4 miles upstream from Middle River Rouge. Datum of gage is 584.00 feet above mean sea level, datum of 1929. Prior to Oct 16, 1948, staff gage at site 1 mile downstream. Datum of gage was 579.90 feet above mean sea level, datum of 1929.

Drainage area.- 193 square miles (revised).

Records available.- October 1948 to September 1949. November 1930 to September 1948 at site 1 mile downstream.

Average discharge.- 19 years, 102 second-feet.

Extremes.- Maximum discharge during year, 2,420 second-feet Feb. 15 (gage height, 13.86 feet); minimum, 11 second-feet Sept. 11 (gage height, 2.57 feet).

1930-49: Maximum discharge, 13,000 second-feet Apr. 5, 1947; maximum gage height, 23.0 feet, site and datum then in use, Apr. 6, 1947, from floodmark; minimum discharge observed, 2.7 second-feet Aug. 11, 1934 (gage height, 3.50 feet, site and datum then in use).

A computed peak discharge of 28,000 second-feet occurred during the April 1947 flood at Michigan Avenue; drainage area, 400 square miles, from an unpublished report by the Geological Survey.

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

Revisions (water years).- W 1034: 1933(M). W 1054: 1937-39, 1943, 1945(M).

Rating table, Oct. 16, 1948, to Sept. 30, 1949, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 19 to Nov. 19, Sept. 18-30)

2.6	12	2.9	36	8.5	775
2.7	19	3.5	97	10.2	1,140
2.8	27	5.5	331	12.2	1,690

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	18	43	200	90	158	1,480	84	40	16	17	25
2	a20	21	39	100	80	141	490	271	36	15	14	25
3	20	21	38	70	80	136	319	199	32	14	18	21
4	19	a50	39	100	80	128	247	129	30	14	16	18
5	17	a100	44	*250	80	141	211	104	27	13	14	12
6	17	a250	43	400	80	163	253	87	26	25	14	12
7	18	a150	41	271	80	131	235	75	21	36	35	12
8	23	a100	*37	175	100	127	205	66	20	20	54	17
9	35	a50	34	128	140	124	169	62	21	17	25	17
10	26	a60	32	112	140	121	146	65	18	27	18	12
11	28	a60	34	110	140	106	133	55	17	21	48	11
12	31	a50	37	90	141	114	123	51	16	16	62	12
13	41	a50	40	84	842	99	115	51	16	14	34	12
14	26	a45	40	75	1,220	99	107	47	20	14	23	14
15	26	a40	54	72	*1,690	87	199	44	32	16	17	15
16	23	a50	98	149	1,450	78	319	43	59	14	a15	14
17	26	a70	106	199	460	76	223	43	54	13	a15	12
18	28	64	66	163	319	76	265	42	48	13	a14	84
19	25	61	81	*619	289	71	277	136	38	12	14	169
20	26	223	55	*388	259	67	193	271	31	12	14	63
21	25	169	54	223	211	73	152	139	30	12	13	31
22	23	94	66	152	241	110	146	132	26	117	14	21
23	23	75	60	115	319	259	199	277	26	34	16	18
24	23	63	60	109	253	193	158	163	21	18	14	15
25	23	57	50	120	400	163	133	101	18	15	16	14
26	21	52	40	*106	289	152	119	80	25	15	16	15
27	19	53	35	101	223	169	116	69	21	14	16	12
28	18	55	34	181	199	158	101	61	18	12	18	12
29	18	50	192	150	-	127	87	54	17	17	25	12
30	18	46	445	120	-	111	83	48	17	18	23	12
31	18	-	271	*100	-	1,120	-	45	-	15	23	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	725	41	17	23.4	0.121	0.14
November	2,247	250	18	74.9	.388	.43
December	2,308	445	32	74.5	.386	.44
Calendar year 1948	59,406	3,560	12	162	.839	11.39
January	5,232	619	70	169	.876	1.01
February	9,895	1,690	80	353	1.83	1.91
March	4,878	1,120	67	157	.813	.94
April	7,003	1,480	83	233	1.21	1.35
May	3,094	277	42	99.8	.517	.60
June	821	59	16	27.4	.142	.16
July	629	117	12	20.3	.105	.12
August	675	62	13	21.8	.113	.13
September	739	169	11	24.6	.127	.14
Water year 1948-49	38,246	1,690	11	105	.544	7.37

Peak discharge (base, 800 sec.-ft.).- Feb. 15 (10 p.m.) 2,420 sec.-ft.; Mar. 31 (12 p.m.) 2,120 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for Middle River Rouge near Garden City and Lower River Rouge at Inkster.

Note.- Stage-discharge relation affected by ice Dec. 24-26, Jan. 1-6, Jan. 29 to Feb. 11.

Middle River Rouge near Garden City, Mich.

Location.- Water-stage recorder, lat. 42°20'55", long. 83°18'45", in W½ sec. 6, T. 2 S., R. 10 E., at Inkster Road bridge, 1¾ miles northeast of Garden City and 6¼ miles upstream from mouth. Datum of gage is 600.95 feet above mean sea level, datum of 1929. From June 5, 1947, to Oct. 18, 1948, wire-weight gage at site 500 feet upstream, at same datum.

Drainage area.- 89 square miles.

Records available.- June 1947 to September 1949. November 1930 to September 1933 at site 4¾ miles downstream, published as Middle River Rouge at Detroit.

Extremes.- Maximum daily discharge during year, 1,000 second-feet Feb. 15; maximum gage height, 9.38 feet Feb. 15 (ice jam); minimum, 7.4 second-feet Aug. 1 (gage height, 1.29 feet).

1930-33, 1947-49: Maximum discharge, 2,150 second-feet Mat 10, 1948 (gage height, 10.50 feet, from floodmark); minimum observed, 1.4 second-feet Aug. 21, 24, 28, Sept. 21, 1931.

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

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1-18		Oct. 19 to Sept. 30					
1.7	17	1.3	7.5	1.8	22	7.9	740
2.0	32	1.4	9.5	2.0	32	8.4	890
		1.5	12	2.9	96	8.7	1,030
		1.6	14	3.3	138		
		1.7	18	6.6	543		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	18	28	52	b50	92	895	50	24	13	8.3	15
2	24	21	26	46	b45	80	414	103	22	13	14	12
3	18	21	26	41	b45	76	222	92	21	11	16	12
4	17	33	26	*32	44	78	150	74	20	11	13	9.5
5	20	47	23	185	41	86	120	61	17	11	11	13
6	19	115	27	214	47	95	148	53	17	12	10	13
7	16	68	26	95	42	87	124	46	17	15	44	14
8	26	40	*24	76	45	*78	104	39	15	14	50	19
9	22	32	22	68	61	79	90	39	15	12	26	14
10	17	37	21	66	73	78	78	38	15	14	16	13
11	20	34	20	59	68	70	75	34	15	13	35	10
12	24	29	20	51	58	66	70	32	14	12	45	9.5
13	21	29	24	46	b400	59	67	31	15	11	27	14
14	20	26	26	42	b700	60	62	30	19	11	17	15
15	18	24	38	45	b1,000	57	113	28	24	12	14	14
16	17	26	59	84	*b900	51	174	28	31	12	14	13
17	a20	43	47	93	*b300	50	132	28	31	9.3	15	12
18	a20	36	36	99	198	47	168	26	30	9.6	21	34
19	20	38	31	378	168	45	162	41	24	12	16	59
20	19	82	31	248	148	42	112	81	21	12	12	36
21	18	68	34	122	120	46	90	64	21	11	10	22
22	18	49	37	92	140	73	88	66	24	61	10	17
23	18	40	30	72	174	126	96	80	17	32	12	16
24	17	35	29	69	*143	104	84	61	15	18	12	14
25	17	31	29	70	252	92	77	46	16	14	11	12
26	20	30	b25	*69	174	83	70	40	19	14	11	12
27	19	33	24	66	122	92	68	35	16	13	11	14
28	18	30	24	98	112	82	60	32	16	11	9.5	14
29	18	29	95	b80	-	72	54	30	15	10	12	14
30	18	29	162	b70	-	63	50	28	14	10	15	13
31	17	-	73	*b50	-	542	-	26	-	9.8	14	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	606	30	16	19.5	0.219	0.25
November	1,173	115	18	39.1	.439	.49
December	1,143	162	20	36.9	.415	.48
Calendar year 1948	30,935.8	1,630	9.0	84.5	.949	12.94
January	2,876	378	32	92.8	1.04	1.20
February	5,670	1,000	41	202.	2.27	2.36
March	2,751	542	42	88.7	.997	1.15
April	4,217	895	50	141	1.58	1.76
May	1,462	103	26	47.2	.530	.61
June	580	31	14	19.3	.217	.24
July	443.6	61	9.3	14.3	.161	.19
August	551.8	50	8.3	17.8	.200	.23
September	499.0	59	9.5	18.6	.187	.21
Water year 1948-49	21,972.4	1,000	8.3	60.2	.676	9.17

Peak discharge (base, 500 sec.-ft.).- Feb. 15 (time unknown) about 1,200 sec.-ft.; Apr. 1 (1 a.m.) 1,090 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for Middle River near Garden City and Lower River Rouge at Inkster.

b Stage-discharge relation affected by ice.

Lower River Rouge at Inkster, Mich.

Location.- Water-stage recorder, lat. 42°18'00", long. 83°18'00", in S½ sec. 19, T. 2 S., R. 10 E., at John Daly Road bridge, 0.6 mile northeast of Inkster and 4¾ miles upstream from mouth. Datum of gage is 593.135 feet above mean sea level, datum of 1929. From June 5, 1947, to Oct. 19, 1948, wire-weight gage at same site and datum.
Drainage area.- 90 square miles.
Records available.- June 1947 to September 1949. November 1930 to September 1933 at site 3½ miles downstream, published as Lower River Rouge at Dearborn.
Extremes.- Maximum discharge during year, 1,980 second-feet Feb. 15 (gage height, 11.37 feet); minimum, 0.4 second-foot Dec. 2-4 (gage height, 3.15 feet).
1930-33, 1947-49: Maximum discharge, 2,300 second-feet May 11, 1948 (gage height, 12.16 feet, from floodmark), from rating curve extended above 1,800 second-feet; minimum, 0.3 second-foot Sept. 2, 1933 (gage height, 1.42 feet, site and datum then in use).
Remarks.- Records good except those for periods of ice effect, no gage-height record, or shifting control, which are fair.

Rating tables, water year 1948-49, except period of ice effect or shifting control (gage height, in feet, and discharge, in second-feet)

Oct. 1 to Jan. 19

3.0	0.7	3.5	10	4.0	40
3.1	1.7	3.6	14	4.2	60
3.2	3.0	3.7	19	4.8	150
3.3	4.5	3.8	25		
3.4	7.0	3.9	32		

Jan. 20 to Sept. 30

3.0	1.5	3.6	19	5.0	180
3.1	2.5	3.7	24	7.4	670
3.2	4.0	3.8	31	8.5	960
3.3	6.5	3.9	39	9.4	1,240
3.4	10	4.1	57		
3.5	14	4.3	77		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.3	1.6	0.6	41	20	45	1,020	17	3.0	1.8	1.1	3.6
2	1.3	1.2	.5	18	15	44	217	73	2.8	1.6	2.1	2.3
3	2.0	1.2	.5	10	14	37	123	37	2.4	1.5	1.8	2.5
4	2.9	2.9	.6	100	14	37	77	24	2.1	1.4	1.3	3.4
5	3.3	8.5	.9	300	14	52	61	18	1.9	2.2	1.4	6.5
6	3.3	39	4.0	200	12	72	115	14	1.9	2.8	1.3	2.2
7	3.6	13	5.0	100	13	43	87	11	1.5	63	28	2.9
8	3.4	3.6	*4.1	50	31	*38	61	8.6	1.7	20	42	6.0
9	5.2	2.0	2.2	40	76	41	45	8.9	1.9	8.2	9.0	3.0
10	7.0	2.0	2.0	30	108	38	36	7.6	1.9	6.2	4.0	2.6
11	9.4	2.2	1.7	25	58	29	32	6.2	1.9	5.2	5.9	2.8
12	12	1.8	1.8	20	42	32	29	5.8	2.0	3.2	9.6	2.4
13	3.3	1.3	2.1	15	550	26	28	5.5	2.0	2.2	8.6	3.7
14	1.1	.9	2.8	10	582	27	24	5.5	2.3	1.9	4.5	5.5
15	1.0	.6	9.6	20	1,250	20	100	4.8	3.1	1.7	3.1	3.8
16	1.0	.7	30	60	*684	16	162	4.2	6.2	1.5	2.3	3.6
17	2.0	2.7	18	70	*147	14	99	4.0	6.5	1.4	2.4	3.6
18	3.6	4.5	7.1	80	110	14	193	3.8	6.5	1.4	2.6	13
19	3.9	4.4	7.3	400	94	14	133	12	3.8	1.3	7.2	13
20	3.9	30	5.0	94	89	12	93	30	3.1	1.3	3.6	9.3
21	3.6	14	5.8	75	62	14	47	20	3.2	1.5	2.4	4.5
22	3.4	4.4	8.5	47	102	41	43	24	3.4	51	1.9	3.2
23	4.5	2.9	6.1	38	161	146	51	30	2.4	24	1.6	3.0
24	4.8	2.0	6.5	34	*101	73	39	18	2.2	5.5	2.0	2.5
25	3.8	1.4	3.8	40	310	60	34	11	2.5	3.0	2.2	2.3
26	3.6	1.1	2.2	*35	116	52	29	7.9	2.3	2.2	1.7	2.3
27	3.6	1.1	1.6	33	106	62	26	5.8	1.9	1.8	1.5	2.4
28	3.3	1.1	1.7	129	69	50	22	5.2	1.8	1.4	1.9	3.0
29	2.7	.8	106	80	-	34	18	4.2	1.6	1.3	2.2	3.4
30	2.2	.7	154	50	-	28	16	3.7	2.6	1.3	2.3	3.2
31	2.0	-	49	*30	-	815	-	3.4	-	1.3	3.0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	112.0	12	1.0	3.61	0.040	0.05
November	153.6	39	.6	5.12	.057	.06
December	451.0	154	.5	14.5	.161	.19
Calendar year 1948	23,542.9	1,520	.5	64.3	.714	9.74
January	2,274	400	10	73.4	.816	.94
February	4,950	1,250	12	177	1.97	2.05
March	2,026	815	12	65.4	.727	.84
April	3,058	1,020	16	102	1.13	1.26
May	434.1	73	3.4	14.0	.156	.18
June	82.4	6.5	1.5	2.75	.031	.03
July	224.1	63	1.3	7.23	.080	.09
August	164.5	42	1.1	5.31	.059	.07
September	125.3	13	2.2	4.18	.046	.05
Water year 1948-49	14,055.0	1,250	.5	38.5	.428	5.81

Peak discharge (base, 600 sec.-ft.).- Jan. 19 (time and discharge unknown); Feb. 15 (10 p.m.) 1,980 sec.-ft.; Apr. 1 (1:30 a.m.) 1,860 sec.-ft.
* Winter discharge measurement made on this day.
Note.- No gage-height record Jan. 3-19; discharge computed on basis of weather records and records for Middle River Rouge near Garden City and River Rouge at Detroit. Stage-discharge relation affected by ice Jan. 29 to Feb. 2. Shifting-control method used Oct. 14 to Dec. 8, July 7, 8.

Huron River at Commerce, Mich.

Location.- Staff gage, lat. 42°32'25", long. 83°29'05", on line between NE¼ and SE¼ sec. 10, T. 2 N., R. 8 E., at first bridge on Commerce Road east of Commerce, at mouth of Hayes Creek.

Drainage area.- 51 square miles, including that of Hayes Creek.

Records available.- March 1946 to September 1949 (includes flow of Hayes Creek).

Extremes.- Maximum discharge during year, 156 second-feet Feb. 17 (gage height, 2.56 feet); minimum, 12 second-feet Aug. 5, 6, Sept. 2-6; minimum gage height, 1.12 feet Aug. 5, 6. 1946-49: Maximum discharge, 266 second-feet Apr. 7, 1947 (gage height, 2.98 feet, from graph based on gage readings); maximum gage height, 3.10 feet May 12, 1948, from graph based on gage readings (backwater from debris); minimum observed, 7.2 second-feet Aug. 18, Sept. 28, 1946 (gage height, 0.84 foot).

Remarks.- Records fair. Gage read twice daily.

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Aug. 14 to Sept. 30)

Oct. 1 to Feb. 17				Feb. 18 to Sept. 30			
1.2	18	1.8	62	1.1	11	1.7	51
1.4	30	2.1	94	1.3	21	1.9	71
1.6	45	2.5	146	1.5	34	2.1	94

Note.- Same as preceding table above 2.1 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	20	53	51	58	71	104	61	28	18	13	14
2	19	20	53	51	47	69	99	61	25	18	14	12
3	19	22	51	51	55	67	90	61	23	16	14	12
4	19	29	51	51	54	66	87	62	22	16	14	12
5	19	34	50	46	52	65	83	56	22	14	12	12
6	19	38	50	51	47	65	79	57	21	15	12	12
7	20	28	48	51	47	65	72	55	21	15	20	13
8	21	28	47	51	45	67	75	53	20	14	20	13
9	20	29	46	51	45	69	73	52	18	15	20	13
10	19	44	45	50	45	71	70	49	17	15	20	14
11	18	43	46	48	47	74	69	45	18	15	20	14
12	19	43	45	48	57	80	67	41	18	15	20	14
13	20	43	45	48	83	82	67	39	19	15	18	15
14	20	43	44	47	93	82	65	36	20	14	17	15
15	19	45	43	47	122	82	65	34	20	14	16	14
16	19	45	43	45	131	82	63	35	21	14	16	14
17	19	46	43	52	145	82	63	36	21	14	17	14
18	18	47	43	57	128	82	61	37	22	13	17	25
19	18	51	43	59	115	83	61	38	22	13	16	25
20	19	57	43	60	110	87	61	39	22	14	16	25
21	19	64	43	60	99	82	59	40	22	14	14	24
22	19	63	43	60	94	87	59	40	21	14	14	23
23	19	60	43	60	83	87	59	40	21	14	14	23
24	19	58	43	60	81	87	59	42	20	14	14	23
25	19	56	43	60	80	86	59	40	20	15	14	23
26	19	53	43	60	76	84	59	37	20	15	14	22
27	19	53	44	60	76	82	59	34	19	15	14	21
28	19	55	45	60	73	82	59	33	18	15	14	20
29	20	55	46	60	-	83	59	31	18	15	14	20
30	20	54	48	60	-	89	59	29	16	15	14	18
31	20	-	50	58	-	105	-	28	-	15	14	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	595	21	18	19.2	0.376	0.43
November	1,326	64	20	44.2	.867	.97
December	1,423	53	43	45.9	.900	1.04
Calendar year 1948	20,923	199	17	57.2	1.12	15.26
January	1,673	60	45	54.0	1.06	1.22
February	2,188	145	45	78.1	1.53	1.59
March	2,445	105	65	78.9	1.55	1.79
April	2,064	104	59	68.8	1.35	1.51
May	1,341	62	28	43.3	.849	.98
June	615	28	16	20.5	.402	.45
July	458	18	13	14.8	.290	.33
August	486	20	12	15.7	.308	.36
September	519	25	12	17.3	.339	.38
Water year 1948-49	15,133	145	12	41.5	.814	11.05

Huron River at Milford, Mich.

Location.- Water-stage recorder, lat. 42°34'45", long. 83°37'35", in SE¼ sec. 9, T. 2 N., R. 7 E., 200 feet upstream from highway bridge on General Motors Road and ½ mile west of Milford. Datum of gage is 880.00 feet above mean sea level, datum of 1929.
Drainage area.- 125 square miles.
Records available.- September 1948 to September 1949.
Extremes.- 1948: Maximum discharge during period in September, 124 second-feet Sept. 24 (gage height, 5.62 feet); minimum, 8.2 second-feet Sept. 29 (gage height, 4.14 feet); minimum daily, 34 second-feet Sept. 26.
1948-49: Maximum discharge during water year, 414 second-feet Feb. 15, 16 (gage height, 7.48 feet); minimum daily, 8.3 second-feet Sept. 17; minimum gage height, 4.08 feet Oct. 28.
Remarks.- Records good.

Discharge, in second-feet, 1948-49

1948

Day	Aug.	Sept.	Day	Aug.	Sept.
23	-	60	27	-	69
24	-	78	28	-	65
25	-	43	29	-	64
26	†74	34	30	-	63
			31	-	-

† Result of discharge measurement.

1948-49

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	91	116	88	134	194	298	94	90	74	72	52
2	42	78	115	80	121	178	283	156	80	19	62	62
3	35	78	111	124	123	172	255	154	82	25	51	19
4	67	98	86	111	127	173	234	155	58	40	55	31
5	70	112	86	135	86	121	218	144	67	56	59	28
6	67	109	124	131	85	136	209	154	113	48	21	64
7	68	96	115	125	126	175	210	65	90	52	66	54
8	75	124	115	83	114	168	204	76	77	45	104	a50
9	42	111	113	89	120	148	154	89	72	22	85	a60
10	43	119	112	128	116	146	134	79	82	35	82	13
11	89	120	73	122	116	166	178	89	24	62	81	16
12	78	124	75	111	83	99	152	88	27	49	88	58
13	74	83	108	111	240	119	142	79	78	46	26	48
14	76	82	112	119	335	149	139	81	73	57	74	47
15	76	115	111	83	398	151	176	81	99	47	76	47
16	46	109	123	87	398	153	144	104	89	17	60	54
17	47	126	127	151	342	145	169	79	96	25	62	8.3
18	89	124	90	139	328	154	186	87	50	61	69	50
19	78	121	81	216	283	88	172	94	61	47	70	108
20	78	124	131	313	262	114	170	113	100	46	20	82
21	79	125	106	199	248	160	162	104	87	48	39	77
22	74	144	114	129	241	174	178	107	79	54	70	74
23	45	148	125	134	234	185	110	135	66	13	58	73
24	51	150	80	157	a27	193	131	126	75	26	55	13
25	86	107	73	153	234	166	167	117	24	77	53	40
26	77	107	68	152	207	169	161	112	50	45	54	83
27	76	111	109	142	185	162	143	98	88	52	19	60
28	74	117	100	158	206	191	140	79	64	55	33	60
29	54	133	125	106	-	186	143	86	47	67	68	60
30	59	123	155	97	-	176	84	86	47	22	54	59
31	51	-	100	133	-	229	-	99	-	35	51	-

a No gage-height record; discharge interpolated in accordance with usual regulation pattern.

Monthly discharge, in second-feet, 1948-49

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
September 23-30, 1948	476	78	34	59.5	0.476	0.14
October 1948	2,030	89	35	65.5	.524	.60
November	3,409	150	78	114	.912	1.02
December	3,279	155	68	106	.848	.98
Calendar year	-	-	-	-	-	-
January 1949	4,106	313	80	132	1.06	1.22
February	5,719	398	83	204	1.63	1.70
March	4,940	229	88	159	1.27	1.46
April	5,216	298	84	174	1.39	1.55
May	3,210	156	65	104	.832	.96
June	2,155	113	24	71.8	.574	.64
July	1,367	77	13	44.1	.353	.41
August	1,837	104	19	59.3	.474	.55
September	1,550.3	108	8.3	51.7	.414	.46
Water year 1948-49	38,818.3	398	8.3	106	.848	11.55

Huron River near New Hudson, Mich.

Location.- Water-stage recorder, lat. 42°30'45", long. 83°40'35", in NE¼ sec. 1, T. 1 N., R. 6 E., 150 feet below Kent Lake Dam and 3 miles west of New Hudson. Datum of gage is 868.00 feet above mean sea level, datum of 1929.
Drainage area.- 143 square miles.
Records available.- August 1948 to September 1949.
Extremes.- 1948: Maximum daily discharge during period August to September, 100 second-feet Sept. 26-28; minimum daily, 50 second-feet Sept. 1-6.
1948-49: Maximum discharge during water year, 432 second-feet Feb. 16 (gage height, 3.61 feet); minimum, 9.2 second-feet June 26 (gage height, 0.83 foot).
Remarks.- Records fair. Occasional regulation by dam at Kent Lake.

Discharge, in second-feet, 1948-49

1948

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	-	50	11	-	90	21	70	80
2	-	50	12	-	90	22	70	80
3	-	50	13	-	90	23	70	80
4	-	50	14	-	90	24	70	80
5	-	50	15	-	90	25	70	80
6	-	50	16	-	90	26	65	100
7	-	60	17	-	90	27	60	100
8	-	70	18	-	90	28	60	100
9	-	90	19	-	90	29	60	90
10	-	90	20	70	80	30	60	87
						31	60	-

Note.- Doubtful or no gage-height record Aug. 20 to Sept. 29; discharge computed on basis of weather records, 2 discharge measurements, and records for station near Dexter.

1948-49

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	86	101	130	150	147	206	264	129	75	33	34	55
2	81	111	130	140	144	198	281	141	76	38	55	54
3	73	118	130	134	147	190	272	159	76	24	59	56
4	69	126	230	136	150	188	256	160	76	22	60	38
5	71	140	159	144	146	180	238	160	75	26	64	39
6	74	140	196	150	134	168	230	113	74	31	58	38
7	75	130	264	148	134	168	222	86	73	36	95	49
8	79	100	192	144	138	176	213	86	75	39	122	57
9	75	90	164	134	138	178	198	86	74	41	123	55
10	68	100	238	132	140	172	177	83	74	43	119	48
11	70	120	272	136	140	166	171	83	73	38	138	26
12	76	130	184	138	138	160	176	81	73	41	158	23
13	79	130	154	136	189	148	168	81	73	45	123	39
14	80	130	147	136	264	152	165	81	72	46	101	51
15	80	130	150	136	c330	156	172	82	72	45	97	52
16	77	130	144	132	c410	162	183	83	72	40	97	47
17	71	138	146	135	402	164	170	83	72	26	87	39
18	70	130	142	150	382	160	176	82	72	24	98	83
19	74	130	130	183	342	153	184	83	72	33	91	110
20	76	140	128	206	306	158	178	83	72	33	75	109
21	76	150	136	206	281	146	178	83	73	36	54	95
22	80	160	206	195	238	165	177	82	74	61	55	91
23	82	170	264	172	222	184	183	81	56	54	65	85
24	81	160	190	168	230	192	159	77	16	35	71	68
25	83	150	147	171	238	186	156	76	9.6	43	69	40
26	94	140	128	172	230	186	164	76	9.6	48	68	42
27	112	130	121	174	213	172	166	76	10	46	63	53
28	119	130	128	171	206	183	158	76	15	50	48	56
29	106	130	168	166	-	189	152	75	22	57	52	51
30	98	140	194	150	-	195	142	75	26	53	58	45
31	98	-	171	142	-	238	-	75	-	36	61	-

c Stage-discharge relation affected by backwater; discharge computed on basis of 1 discharge measurement and records for stations at Milford and near Dexter.
Note.- No gage-height record Nov. 6-11, 13-16, Nov. 18 to Dec. 1, Dec. 3; discharge computed on basis of 2 discharge measurements, weather records, and records for stations at Milford and near Dexter.

Monthly discharge, in second-feet, 1948-49

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile.	Runoff in inches
August 20-31, 1948	785	70	60	65.4	0.457	0.20
September	2,377	100	50	79.2	.554	.62
October 1948	2,533	119	68	81.7	.571	.66
November	3,924	170	90	131	.916	1.02
December	5,283	272	121	170	1.19	1.37
Calendar year	-	-	-	-	-	-
January 1949	4,787	206	132	154	1.08	1.24
February	6,179	410	134	221	1.55	1.61
March	5,419	238	138	175	1.22	1.41
April	5,729	281	142	191	1.34	1.49
May	2,877	160	75	92.8	.649	.75
June	1,782.2	76	9.6	59.4	.415	.46
July	1,223	61	22	39.5	.276	.32
August	2,518	158	34	81.2	.568	.65
September	1,694	110	23	56.5	.395	.44
Water year 1948-49	43,948.2	410	9.6	120	.839	11.42

Huron River near Dexter, Mich.

Location.- Wire-weight gage, lat. 42°23'10", long. 83°54'40", in S½ sec. 13, T. 1 S., R. 4 E., at highway bridge on North Territorial Road, half a mile east of Husdon Mills, 4 miles north of Dexter, and 12 miles northwest of Ann Arbor. Datum of gage is 837.11 feet above mean sea level (levels by Michigan Department of Conservation).

Drainage area.- 506 square miles.

Records available.- March 1946 to September 1949. August to December 1904 (gage heights only) at site 1 mile upstream, published as Huron River at Dover.

Extremes.- Maximum discharge during year, 1,450 second-feet Feb. 20 (gage height, 5.89 feet); minimum daily, 100 second-feet Aug. 5; minimum gage height observed, 3.18 feet Aug. 2-4.

1946-49: Maximum discharge, 3,120 second-feet Apr. 9, 1947 (gage height, 8.17 feet, from graph based on gage readings); minimum observed, 56 second-feet Sept. 6, 9, 10, 1946; minimum gage height, 2.97 feet Aug. 9, 14, 15, 1946.

Remarks.- Records good except those for periods of no gage-height record, which are fair. Gage read once or twice daily.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	184	211	304	389	495	970	828	a500	204	152	105	121
2	184	204	324	a390	475	855	910	495	197	142	103	a120
3	175	208	a350	389	a450	800	970	495	184	133	103	123
4	178	225	a350	389	450	745	1,030	480	181	125	103	a120
5	169	250	a350	398	430	690	1,060	470	172	117	a100	a120
6	169	250	a350	402	425	718	1,060	455	172	113	107	119
7	172	304	364	407	416	674	1,060	440	163	115	111	121
8	160	312	a370	412	407	657	1,030	416	160	121	115	123
9	166	a310	a370	412	402	640	970	376	152	125	a120	123
10	166	308	a370	416	398	618	910	332	150	127	131	121
11	163	312	a380	416	a400	613	855	292	158	127	142	a160
12	163	316	a380	412	394	574	800	264	163	125	a160	204
13	166	316	394	407	402	558	745	232	166	123	166	239
14	a170	316	398	420	416	536	690	197	a170	121	172	242
15	169	312	398	407	586	525	690	181	187	117	178	239
16	169	312	389	a450	970	515	718	175	246	113	178	a230
17	163	312	384	495	1,090	500	718	166	284	113	178	214
18	160	312	380	490	1,270	485	718	169	300	111	175	211
19	160	316	380	480	1,420	455	718	178	a300	111	169	208
20	a160	328	380	470	1,450	450	718	211	a300	109	160	208
21	160	336	376	455	1,390	440	718	253	a300	109	160	200
22	160	336	376	455	1,330	445	718	276	a250	113	155	200
23	160	348	380	569	1,270	485	718	292	a250	123	152	a200
24	a170	352	380	a600	1,210	515	684	300	a250	135	148	a200
25	175	356	a380	608	1,150	542	668	288	a250	135	142	194
26	172	364	a380	613	1,060	564	624	250	288	127	135	194
27	172	a360	a380	586	1,030	580	602	232	222	123	129	190
28	172	360	380	574	970	580	a600	228	211	115	125	a190
29	169	348	376	558	-	586	a500	225	190	113	123	187
30	200	336	380	525	-	580	a500	a220	178	107	123	184
31	204	-	384	510	-	674	-	214	-	107	121	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	5,280	204	160	170	0.336	0.39
November	9,230	364	204	308	.609	.68
December	11,537	398	304	372	.735	.85
Calendar year 1948	174,351	1,750	105	476	.941	12.80
January	14,504	613	389	468	.925	1.07
February	22,156	1,450	394	791	1.56	1.62
March	18,569	970	440	599	1.18	1.36
April	23,530	1,060	500	784	1.55	1.73
May	9,302	500	166	300	.593	.68
June	6,338	300	150	211	.417	.47
July	3,747	152	107	121	.239	.28
August	4,289	178	100	138	.273	.31
September	5,305	242	119	177	.350	.39
Water year 1948-49	133,787	1,450	100	367	.725	9.83

a No gage-height record; discharge computed on basis of weather records and records for stations near New Hudson and at Ann Arbor.

Huron River at Ann Arbor, Mich.

Location.- Water-stage recorder, lat. 42°17'10", long. 83°44'00", in NW¼ sec. 28, T. 2 S., R. 6 E., at Wall Street Bridge, in Ann Arbor, three-quarters of a mile downstream from Argo Dam and 4 miles upstream from Geddes Dam.

Drainage area.- 711 square miles.

Records available.- August 1948 to September 1949. February 1904 to December 1914 at site at Geddes Dam, 4 miles below, published as Huron River at Geddes. January 1914 to September 1940 at site at Barton Dam, 3 miles above, published as Huron River at Barton.

Extremes.- 1948: Maximum discharge during period August to September, 910 second-feet Aug. 31 (gage height, 13.35 feet); minimum, 15 second-feet Aug. 7 (gage height, 11.41 feet); minimum daily, 100 second-feet Sept. 1.
1948-49: Maximum discharge during water year, 3,610 second-feet Feb. 15 (gage height, 15.99 feet); minimum, 14 second-feet Oct. 30, 31 (gage height, 11.40 feet); minimum daily, 44 second-feet Aug. 4.

Remarks.- Records excellent. Flow regulated at all stages at Argo Dam by Detroit Edison Co.

Discharge, in second-feet, 1948-49

1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								-			-	100
2								-			-	134
3								-			†321	137
4								-			-	130
5								-			-	144
6								-			-	140
7								-			181	197
8								-		†458	181	223
9								-			173	241
10								-			197	254
11								-	†458		197	282
12								-			228	205
13								-			210	259
14								-			232	254
15								-			214	246
16								-			223	259
17								-			210	223
18								-			201	232
19								-			189	210
20								†1,550			185	214
21								-			181	205
22								-			177	205
23								-			173	197
24								-			181	185
25								-			173	181
26								†1,060			165	189
27								-			158	246
28								-			154	330
29								-			158	223
30								-			214	236
31								-	-		181	-

† Result of discharge measurement.

Discharge, in second-feet, of Huron River at Ann Arbor, Mich., 1948-49--Continued

1948-49

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	272	250	350	503	610	1,080	2,350	655	254	232	134	140
2	218	250	378	433	548	1,010	1,780	675	259	158	118	124
3	232	259	350	455	541	958	1,580	624	218	158	151	115
4	236	315	310	444	528	902	1,110	528	236	151	44	124
5	185	384	350	806	534	870	1,380	666	218	144	60	137
6	214	433	384	926	554	902	1,330	479	189	169	144	127
7	210	473	394	602	467	854	1,280	541	197	367	205	151
8	185	367	422	606	467	790	1,180	491	201	394	95	137
9	193	473	400	541	467	776	1,130	497	169	246	185	130
10	214	389	362	560	554	727	1,090	335	151	335	112	130
11	197	485	394	479	411	691	942	444	140	305	181	112
12	210	384	384	497	534	654	942	330	148	228	210	134
13	214	433	406	491	1,790	653	878	310	173	177	181	134
14	134	411	416	367	1,800	515	783	310	214	197	181	154
15	214	424	467	444	3,050	620	926	185	254	177	169	134
16	232	473	663	528	2,370	572	1,010	268	277	193	228	148
17	158	378	554	567	1,870	497	950	193	455	158	218	124
18	189	356	406	580	1,830	497	998	218	485	151	134	305
19	193	416	515	1,160	1,930	503	982	345	422	154	177	218
20	205	541	384	1,110	1,930	473	926	384	438	148	181	223
21	189	473	433	1,040	1,700	485	870	330	340	165	162	241
22	189	467	422	878	1,730	528	862	485	416	340	144	259
23	210	461	394	902	1,730	748	886	467	345	330	158	264
24	189	522	428	790	1,580	694	814	497	335	201	162	315
25	218	461	315	686	1,630	690	830	411	345	177	137	286
26	197	411	335	769	1,500	707	762	389	330	185	134	315
27	210	461	394	724	1,230	748	734	305	272	185	130	315
28	189	406	438	790	1,230	748	723	378	259	169	134	330
29	228	444	548	830	-	694	673	300	250	165	124	232
30	197	345	645	631	-	727	629	254	210	201	144	223
31	223	-	515	734	-	1,760	-	310	-	290	137	-

Monthly discharge, in second-feet, 1948-49

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
August 7-31, 1948	4,736	232	154	189	0.266	0.25
September	6,281	330	100	209	.294	.33
Water year	-	-	-	-	-	-
October 1948	6,344	272	134	205	.288	.33
November	12,343	541	250	411	.578	.64
December	13,156	663	310	424	.596	.69
Calendar year	-	-	-	-	-	-
January 1949	20,873	1,160	367	673	.947	1.09
February	35,115	3,050	411	1,254	1.76	1.83
March	23,073	1,760	473	744	1.05	1.21
April	31,330	2,350	629	1,044	1.47	1.64
May	12,604	675	185	407	.572	.66
June	8,200	485	140	273	.384	.43
July	6,650	394	144	215	.302	.35
August	4,654	228	44	150	.211	.24
September	5,781	330	112	193	.271	.30
Water year 1948-49	180,123	3,050	44	493	.693	9.41

Hayes Creek at Commerce, Mich.

Location.- Staff gage, lat. 42°35'25", long. 83°28'45", on line between NW¼ and SW¼ sec. 11, T. 2 N., R. 8 E., at bridge 600 feet upstream from mouth and half a mile east of Commerce.

Drainage area.- 7.5 square miles.

Records available.- March 1946 to September 1949.

Extremes.- Maximum discharge during year, 46 second-feet Feb. 17 (gage height, 3.20 feet); minimum, 4.0 second-feet Sept. 29, 30 (gage height, 1.74 feet).
1946-49: Maximum discharge, 154 second-feet Apr. 7, 1947 (gage height, 4.25 feet, from graph based on gage readings); minimum observed, 1.2 second-feet Oct. 2, 3, 1946 (gage height, 1.62 feet).

Remarks.- Records fair. Gage read twice daily.

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Nov. 11 to Feb. 16, June 12 to Aug. 22)

Oct. 1 to June 11		June 12 to Sept. 30	
1.8	6.0	1.7	3.5
2.1	12	1.8	4.8
2.5	22	1.9	6.5
2.9	34	2.1	10.5
3.2	46		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.0	6.0	10	11	12	19	32	16	9.2	8.3	5.1	4.4
2	6.0	6.0	9.8	11	11	18	24	16	7.4	7.7	5.3	4.3
3	6.0	7.0	9.2	11	12	18	21	17	6.8	7.1	5.0	4.3
4	6.0	8.8	9.0	11	12	18	20	16	6.8	6.3	4.7	4.3
5	6.0	9.2	9.2	11	12	18	19	13	6.4	6.5	4.7	4.3
6	6.0	9.8	9.2	10	11	17	18	13	6.4	6.0	4.3	4.4
7	6.0	7.4	9.2	11	11	17	18	12	6.4	5.5	7.1	4.5
8	6.6	8.0	9.2	11	11	17	18	12	6.0	5.5	7.3	4.5
9	6.4	9.6	9.2	12	11	18	17	12	5.6	5.6	7.5	4.7
10	6.2	11	9.2	11	11	18	17	12	5.8	5.6	7.5	4.8
11	6.0	9.2	9.4	11	11	18	16	11	6.2	5.8	7.5	5.1
12	6.0	8.8	9.2	11	12	18	16	10	5.1	5.8	7.7	5.3
13	6.4	9.2	9.2	11	14	18	16	10	5.5	6.0	5.5	5.6
14	6.4	9.6	9.2	11	18	18	16	10	5.8	5.8	4.8	5.8
15	6.0	9.4	9.0	11	34	18	16	10	7.3	5.8	4.8	5.1
16	6.0	9.8	9.0	11	39	19	16	10	8.1	6.0	4.8	5.1
17	6.0	10	8.6	12	44	19	16	10	8.3	5.8	5.3	5.5
18	6.0	10	8.8	12	33	19	16	11	8.5	5.8	5.0	6.0
19	6.0	11	8.8	12	30	19	16	11	8.7	5.6	4.8	5.6
20	6.0	12	8.8	13	28	19	16	12	7.9	5.6	4.7	5.5
21	6.0	12	8.8	13	26	19	15	12	7.3	5.6	4.4	5.5
22	6.0	12	8.8	13	25	18	15	11	6.7	5.6	4.4	5.5
23	6.0	13	8.8	13	23	18	14	11	6.5	5.3	4.5	5.5
24	6.0	12	8.8	14	21	18	14	11	6.0	5.5	4.5	5.5
25	6.0	11	8.8	13	21	18	14	10	6.0	5.5	4.5	5.1
26	6.0	11	9.0	13	20	18	14	9.6	6.9	5.3	4.5	4.8
27	6.0	11	9.0	13	20	18	14	9.6	7.1	5.1	4.7	4.8
28	6.0	11	9.2	13	19	18	15	8.8	7.1	5.1	5.0	4.4
29	6.0	11	9.4	13	-	19	16	8.2	7.3	5.3	5.0	4.2
30	6.0	9.6	10	13	-	22	16	8.6	7.5	5.3	4.5	4.0
31	6.0	-	10	12	-	26	-	9.0	-	5.1	4.5	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	188.0	6.6	6.0	6.06	0.808	0.93
November	295.4	13	6.0	9.85	1.31	1.46
December	283.8	10	8.6	9.15	1.22	1.41
Calendar year 1948	7,196.4	98	5.6	19.7	2.63	35.67
January	368	14	10	11.9	1.59	1.82
February	552	44	11	19.7	2.63	2.74
March	575	26	17	18.5	2.47	2.85
April	511	32	14	17.0	2.27	2.53
May	352.8	17	8.2	11.4	1.52	1.75
June	206.6	9.2	5.1	6.89	.919	1.02
July	180.8	8.3	5.1	5.83	.777	.90
August	163.9	7.7	4.3	5.29	.705	.81
September	148.4	6.0	4.0	4.95	.660	.74
Water year 1948-49	3,825.7	44	4.0	10.5	1.40	18.96

Portage Creek near Pinckney, Mich.

Location.- Staff gage, lat. 42°25'40", long. 83°57'35", in sec. 34, T. 1 N., R. 4 E., at highway bridge 2 miles upstream from Little Portage Lake and 2¼ miles southwest of Pinckney. Datum of gage is 860.38 feet above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Drainage area.- 79 square miles.

Records available.- November 1944 to September 1949.

Extremes.- Maximum discharge during year, 211 second-feet Feb. 21, 22 (gage height, 4.10 feet); minimum observed, 2.7 second-feet Aug. 1 (gage height, 0.78 foot).
1944-49: Maximum discharge, 529 second-feet Apr. 9, 10, 1947 (gage height, 5.72 feet, from graph based on gage readings); minimum observed, 0.6 second-foot Oct. 5, 1946 (gage height, 0.56 foot).

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

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1-29)

Oct. 1 to Feb. 13				Feb. 14 to Sept. 30					
1.1	9.7	2.7	60	0.8	3.0	2.5	50	3.2	99
1.3	14	2.9	73	.9	5.0	2.7	59	3.6	145
1.9	30	3.2	105	1.8	28	2.9	72	4.1	211
2.3	43								

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	27	36	94	70	197	131	76	25	38	2.7	8.8
2	11	26	35	88	70	190	139	77	24	36	4.2	7.0
3	11	26	35	88	70	176	150	74	24	32	3.8	7.5
4	10	28	35	73	70	150	152	68	24	24	3.8	7.0
5	10	31	35	58	70	131	160	54	24	24	3.8	7.5
6	10	35	39	51	60	126	160	56	22	24	3.4	7.5
7	10	35	*38	53	60	119	155	50	a20	22	7.5	7.0
8	12	34	37	53	60	116	167	37	20	20	8.0	8.5
9	12	34	35	55	60	112	160	36	24	20	7.0	7.5
10	12	39	34	56	60	106	165	36	23	22	7.0	7.0
11	11	39	32	57	60	103	145	34	20	15	7.5	8.0
12	12	38	32	58	60	99	138	32	18	14	14	7.0
13	12	39	32	59	80	94	131	31	18	12	12	7.0
14	12	39	32	58	101	87	135	30	19	12	11	8.8
15	12	39	36	56	*145	80	176	29	18	12	9.5	8.0
16	12	38	40	60	153	*77	137	28	30	11	9.5	8.0
17	12	39	39	59	197	76	123	27	37	9.5	6.5	7.5
18	25	41	46	58	204	71	119	29	36	9.0	7.0	21
19	24	41	39	88	204	66	116	27	38	9.0	8.0	18
20	22	46	40	100	211	64	95	36	48	8.8	7.5	14
21	20	46	41	92	211	63	101	31	57	10	8.5	14
22	19	46	44	98	211	62	103	32	65	19	14	15
23	19	47	43	100	204	71	116	35	66	15	12	16
24	19	48	40	100	197	68	106	35	62	14	9.5	17
25	18	49	35	*100	197	66	94	34	58	12	9.5	16
26	18	49	35	100	190	72	80	34	56	7.0	9.0	16
27	18	49	35	100	176	76	87	33	52	6.5	8.8	16
28	17	46	40	100	170	78	82	33	45	6.5	8.0	16
29	17	34	46	100	-	80	a80	32	41	6.2	8.0	16
30	32	35	62	90	-	80	80	26	38	6.2	7.5	15
31	29	-	78	80	-	117	-	26	-	3.4	6.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	490	32	10	15.8	0.200	0.23
November	1,163	49	26	38.8	.491	.55
December	1,226	78	32	39.5	.500	.58
Calendar year 1948	22,733.8	264	5.2	62.1	.786	10.72
January	2,382	100	51	76.8	.972	1.12
February	3,621	211	80	129	1.63	1.70
March	3,073	197	62	99.1	1.25	1.44
April	3,783	176	80	126	1.59	1.77
May	1,218	77	26	39.3	.497	.57
June	1,052	66	18	35.1	.444	.50
July	480.1	38	3.4	15.5	.196	.23
August	244.7	14	2.7	7.89	.100	.12
September	339.6	21	7.00	11.3	.143	.16
Water year 1948-49	19,072.4	211	2.7	52.3	.662	8.97

* Winter discharge measurement made on this day.
a No gage-height record; discharge interpolated.
Note.- Stage-discharge relation affected by ice Dec. 24-28, Jan. 23 to Feb. 13.

Raisin River at Monroe, Mich.

Location.- Water-stage recorder and concrete dam, lat. 41°54'50", long. 83°23'15", at municipal water-supply plant at Monroe, 4 miles upstream from mouth. Datum of gage is 570.00 feet above mean sea level (city of Monroe bench mark).
Drainage area.- 1,020 square miles.
Records available.- September 1937 to September 1949.
Average discharge.- 12 years, 673 second-feet.
Extremes.- Maximum discharge during year, 7,100 second-feet Feb. 16; maximum gage height, 10.7 feet Feb. 1 (ice jam); minimum discharge, 32 second-feet July 31; minimum gage height, 4.94 feet Sept. 14 (gates in dam open).
1937-49: Maximum discharge observed, 12,900 second-feet May 19, 1945 (gage height, 10.10 feet); minimum, about 2 second-feet Sept. 19, 20, 1941; minimum gage height, 3.06 feet Oct. 12, 1946 (gates in dam open).
Remarks.- Records good except those below 1,500 second-feet and those for periods of ice effect or no gage-height record, which are fair. Slight regulation from power plants upstream.
Cooperation.- Water-stage recorder inspected by employees of city of Monroe.
Revisions (water years).- W 954: 1938(m), 1939(m), 1940(m), 1941.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 19 to Nov. 5, July 13 to Sept. 28)

5.6	32	6.0	328	7.4	2,610
5.7	87	6.2	550	8.1	4,260
5.8	156	6.5	970	8.8	6,350
5.9	237	6.9	1,630		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	142	142	328	1,220	b900	1,590	4,130	550	301	237	63	128
2	122	149	310	985	b900	1,300	3,880	589	282	246	94	94
3	135	135	282	736	b800	1,090	3,510	654	273	196	94	108
4	172	142	237	*615	b700	1,030	3,270	895	213	180	94	69
5	164	149	237	b900	b650	970	2,690	820	180	205	101	149
6	112	328	282	b1,500	b600	1,020	2,060	589	180	196	115	128
7	119	563	282	1,960	b600	1,040	1,670	470	205	371	87	122
8	142	615	237	2,200	b700	*985	1,350	435	172	349	87	156
9	156	550	264	2,120	b800	910	1,120	403	164	576	81	164
10	122	435	246	1,700	b1,000	865	940	360	180	481	94	a150
11	156	446	229	1,250	b1,000	806	850	264	188	349	115	142
12	142	435	246	1,080	1,000	708	750	292	149	310	149	142
13	135	414	246	925	1,150	654	694	273	164	264	128	142
14	149	301	237	778	1,900	641	667	229	156	246	142	81
15	164	301	205	641	5,100	589	835	229	180	229	156	101
16	a150	319	382	654	6,180	538	1,260	237	237	196	164	115
17	a150	339	680	970	5,550	527	1,220	221	282	135	172	128
18	a150	339	722	1,140	b5,000	481	1,420	188	424	172	142	115
19	135	371	667	2,820	b4,500	435	1,670	237	722	172	246	128
20	115	458	576	2,930	4,000	446	1,540	292	792	126	273	164
21	135	615	481	2,820	2,930	424	1,310	446	654	135	188	205
22	135	708	435	2,780	2,380	435	1,140	680	516	180	164	221
23	149	680	435	2,420	2,300	850	970	940	424	149	172	221
24	122	589	424	1,810	2,140	1,080	850	1,080	360	101	122	a200
25	164	458	301	1,360	2,480	1,180	778	925	310	108	94	a150
26	149	414	221	1,310	2,300	1,090	722	764	301	128	87	128
27	122	403	246	1,260	2,120	1,000	641	641	339	115	122	164
28	122	371	319	1,850	1,980	955	628	527	319	75	94	156
29	108	371	414	2,360	-	880	641	424	292	108	128	a150
30	135	339	1,060	b1,800	-	750	576	360	273	94	135	a150
31	142	-	1,150	b900	-	1,870	-	349	-	42	135	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,315	172	108	139	0.136	0.16
November	11,879	708	135	396	.388	.43
December	12,381	1,150	205	399	.391	.45
Calendar year 1948	291,140	7,700	47	795	.779	10.60
January	47,794	2,930	615	1,542	1.51	1.74
February	61.660	6,180	600	2,202	2.16	2.25
March	27,139	1,870	424	875	.858	.99
April	43,782	4,130	576	1,459	1.43	1.60
May	15,363	1,080	188	496	.486	.56
June	9,232	792	149	308	.302	.34
July	6,471	576	42	209	.205	.24
August	4,038	273	63	130	.127	.15
September	4,271	221	69	142	.139	.16
Water year 1948-49	248,325	6,180	42	680	.667	9.07

Peak discharge (base, 2,200 sec.-ft.).- Jan. 8 (3 to 5 a.m.) 2,240 sec.-ft.; Jan. 19 (8 to 12 p.m.) 3,510 sec.-ft.; Jan. 28 (11 p.m.) to Jan. 29 (4 a.m.) 2,440 sec.-ft.; Feb. 16 (1 to 2 a.m.) 7,100 sec.-ft.; Apr. 1 (5 to 8 a.m.) 4,530 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records and records for Grand River at Jackson and Cedar River at East Lansing.
b Stage-discharge relation affected by ice.

St. Joseph River near Newville, Ind.

Location.- Water-stage recorder, lat. 41°23'10", long. 84°48'05", in Ohio, in SW¼ sec. 18, T. 5 N., R. 1 E., at bridge on Ohio State Highway 249 and 3½ miles northeast of Newville.

Drainage area.- 614 square miles.

Records available.- November 1946 to September 1949.

Extremes.- Maximum discharge during year 4,950 second-feet Feb. 17 (gage height, 14.24 feet); minimum, 28 second-feet Oct. 20; minimum gage height, 1.68 feet Oct. 7.
1946-49: Maximum discharge, 6,050 second-feet Apr. 23, 1947 (gage height, 15.32 feet); minimum, 22 second-feet Sept. 2-4, 1948 (gage height, 1.56 feet).

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

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 5 to Dec. 9, Dec. 11-15, Apr. 29 to May 14, Sept. 11-30)

1.6	25	3.4	236	11.9	2,810
1.7	32	4.3	390	13.3	4,050
2.0	57	6.8	890	14.2	4,950
2.4	98	8.5	1,330		
2.8	148	10.5	2,080		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	33	86	810	g1,240	1,090	870	284	190	345	75	42
2	42	34	*82	690	g870	830	1,040	292	166	260	69	43
3	42	38	78	510	bg600	690	1,090	292	145	212	147	39
4	38	43	75	420	bg450	610	940	252	129	172	121	39
5	34	61	75	1,410	bg350	590	730	212	117	147	92	118
6	31	118	74	2,120	b325	610	570	190	106	141	71	220
7	31	126	71	2,040	b300	590	500	172	95	244	59	158
8	31	134	72	1,760	b400	550	440	155	86	212	53	111
9	32	116	71	1,640	b550	500	400	145	81	183	47	89
10	31	96	b65	1,480	b500	490	354	138	77	183	44	72
11	36	88	63	1,120	b450	490	318	129	73	204	42	58
12	38	85	73	850	b400	450	292	122	74	163	47	50
13	36	91	72	670	b375	400	276	116	75	123	42	52
14	35	86	75	530	890	372	268	112	78	102	43	63
15	34	78	190	460	2,800	354	276	108	89	89	43	64
16	34	75	550	530	4,450	327	327	104	221	81	41	61
17	35	75	530	710	4,850	284	381	99	1,040	73	41	53
18	34	75	430	830	4,950	276	440	97	1,140	67	143	62
19	31	90	318	1,840	4,550	284	480	135	890	63	190	118
20	30	166	244	2,360	3,650	260	470	530	630	62	114	135
21	31	190	228	a2,200	3,620	244	420	690	430	63	75	109
22	33	228	212	a2,000	2,000	276	363	850	354	85	55	86
23	36	197	190	g1,800	*1,640	530	345	1,160	450	106	46	71
24	37	165	183	g1,520	1,450	710	327	1,040	400	87	41	60
25	36	135	176	1,390	1,600	690	300	850	300	70	38	53
26	36	117	163	1,240	1,640	590	276	590	236	61	35	48
27	35	109	b155	1,300	1,560	530	300	450	204	55	34	46
28	33	98	b145	a2,700	1,390	530	500	354	236	52	35	43
29	32	94	488	a2,250	-	490	460	292	590	47	42	42
30	32	91	940	a1,850	-	440	345	252	440	49	42	39
31	35	-	870	a1,500	-	570	-	220	-	67	44	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,069	42*	30	34.5	0.056	0.06
November	3,132	228	33	104	.169	.19
December	7,044	940	63	227	.370	.43
Calendar year 1948	161,666	3,470	22	442	.720	9.81
January	42,530	2,700	420	1,372	2.23	2.58
February	47,850	4,950	300	1,709	2.78	2.90
March	15,647	1,090	244	505	.822	.95
April	14,098	1,090	268	470	.765	.85
May	10,432	1,160	97	337	.549	.63
June	9,142	1,140	73	305	.497	.55
July	3,868	345	47	125	.204	.23
August	2,011	190	34	64.9	.106	.12
September	2,244	220	39	74.8	.122	.14
Water year 1948-49	159,067	4,950	30	436	.710	9.63

Peak discharge (base, 2,500 sec.-ft.).- Jan. 28 (time and discharge unknown); Feb. 17 (9:30 a.m.) 4,950 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for station near Fort Wayne.

b Stage-discharge relation affected by ice.

g Computed from graph based on once-daily readings of wire-weight gage.

St. Joseph River near Fort Wayne, Ind.

Location.- Water-stage recorder, lat. 41°10', long. 85°04', in SW¼NW¼SE¼ sec. 4, T. 31 N., R. 13 E., at Ely Bridge on Mayhew Road, 3½ miles downstream from Cedar Creek and 8 miles northeast of Fort Wayne. Auxiliary water-stage recorder at St. Joe Dam, 5½ miles downstream.

Drainage area.- 1,060 square miles.

Records available.- August 1941 to September 1949.

Extremes.- Maximum discharge during year, 8,620 second-feet Feb. 16 (gage height, 14.20 feet); minimum daily, 63 second-feet Sept. 28; minimum gage height, 1.71 feet Nov. 3. 1941-49: Maximum discharge, 10,600 second-feet May 18, 1943 (gage height, 16.70 feet); minimum daily, 27 second-feet Aug. 21, 1941; minimum gage height, 1.40 feet Sept. 20, 29, 1941.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Discharge below 825 second-feet computed by using fall as determined from auxiliary recorder as a factor. Flow affected at low stage by pumping plant 5½ miles below station.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	108	93	*a170	1,400	1,900	*1,970	1,420	551	407	557	92	87
2	75	89	164	1,100	1,300	1,570	1,470	534	364	437	158	84
3	76	106	157	850	1,000	1,290	1,520	551	321	347	167	79
4	82	115	155	*750	800	1,130	1,470	518	294	293	171	89
5	84	139	153	3,500	650	1,060	1,240	447	265	251	171	116
6	87	230	153	4,860	600	1,020	1,020	388	242	221	143	139
7	92	221	146	3,820	580	985	845	347	227	222	114	258
8	95	210	147	3,020	750	945	740	318	201	287	104	197
9	98	205	146	2,590	*1,150	885	664	302	196	306	96	145
10	98	208	135	2,390	900	865	590	281	183	290	75	128
11	87	201	130	2,210	750	845	534	262	178	268	77	112
12	84	176	132	1,670	700	808	487	248	173	280	76	98
13	84	163	146	1,340	900	723	457	239	165	320	72	98
14	77	170	147	1,090	1,460	664	437	222	177	208	72	109
15	74	163	421	925	6,650	613	457	215	216	166	71	109
16	87	157	1,620	1,130	8,400	580	503	206	447	138	67	84
17	87	172	1,340	1,380	7,850	523	540	202	1,340	139	84	98
18	90	168	1,380	1,900	6,850	490	706	193	1,820	143	89	124
19	87	182	740	5,130	6,250	472	905	491	1,570	132	101	112
20	79	457	574	5,310	5,760	457	845	1,770	1,160	139	197	112
21	79	422	447	4,140	4,860	437	757	1,820	845	143	128	169
22	77	354	400	3,260	3,900	477	664	3,420	630	120	106	125
23	82	372	350	2,800	3,100	747	630	3,420	523	214	79	116
24	90	317	325	2,500	2,520	1,000	568	2,450	597	171	76	103
25	90	283	300	2,300	3,020	1,090	523	1,920	518	151	76	90
26	90	249	280	2,200	2,800	1,000	487	1,420	487	147	98	77
27	96	220	270	2,860	2,450	965	597	1,060	432	105	87	71
28	93	202	250	4,500	2,270	945	648	845	337	135	82	63
29	96	a190	1,500	4,230	-	865	774	681	436	74	77	75
30	90	a180	2,250	3,260	-	757	681	571	698	135	75	65
31	108	-	1,600	2,500	-	985	-	482	-	107	93	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,722	108	74	87.8	0.083	0.10
November	6,414	457	89	214	.202	.23
December	16,128	2,250	130	520	.491	.57
Calendar year 1948	296,942	6,550	58	811	.765	10.44
January	80,715	5,310	750	2,604	2.46	2.83
February	80,120	8,400	580	2,861	2.70	2.81
March	27,163	1,970	437	876	.826	.95
April	23,179	1,520	437	773	.729	.81
May	26,377	3,420	193	851	.803	.93
June	15,449	1,820	165	515	.486	.54
July	6,646	557	74	214	.202	.23
August	3,174	197	67	102	.096	.11
September	3,330	258	63	111	.105	.12
Water year 1948-49	291,417	8,400	63	796	.753	10.23

Peak discharge (base, 6,000 sec.-ft.).- Feb. 16 (5 p.m.) 8,620 sec.-ft.

* Winter discharge measurement made on this day.

a Nc gage-height record at auxiliary gage; discharge computed on basis of 1 discharge measurement, weather records, and records for station near Newville.

Note.- Stage-discharge relation affected by ice Dec. 10, 11, Dec. 22 to Jan. 5, Jan. 24-26, Jan. 31 to Feb. 13.

Maumee River at New Haven, Ind.

Location.- Wire-weight gage, lat. 41°05', long. 85°01', in SW¼ sec. 1, T. 30 N., R. 13 E., at highway bridge a quarter of a mile upstream from Wabash Railroad bridge, half a mile north of New Haven, and 6 miles downstream from confluence of St. Marys and St. Joseph Rivers.

Drainage area.- 1,940 square miles.

Records available.- December 1946 to September 1949 (high-water records only).

Extremes.- Maximum discharge during year, 13,200 second-feet Feb. 17 (gage height, 18.2 feet).
1946-49: Maximum discharge, that of Feb. 17, 1949.

Remarks.- Records good except those for period of ice effect, which are fair. Flow regulated at low stage by power plants above station. Flow slightly regulated by Lake St. Marys and by diversion from or into Wabash River Basin and into Miami & Erie Canal. Gage read twice daily.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-	-	3,010	4,970	3,640	3,710	1,350	-	2,030		
2		-	†896	2,520	b3,250	2,800	3,500	1,410	-	2,030		
3		-	-	2,170	b2,400	2,240	2,310	-	-	-		
4		-	-	2,170	b1,850	1,650	2,520	-	-	-		
5		-	-	7,550	b1,350	1,680	2,100	†958	-	-		
6		-	-	8,600	-	1,620	1,620	-	-	-		
7		-	-	7,160	-	1,500	1,350	-	-	-		
8		-	-	5,740	1,350	1,410	-	-	-	1,410		
9		-	-	5,900	1,820	1,410	-	-	-	-		
10		-	-	5,980	1,820	1,380	-	-	-	-		
11		-	-	5,980	1,650	-	-	-	-	-		
12		-	-	4,830	1,530	-	-	-	-	-		
13		-	-	3,640	1,750	-	-	-	-	-		
14		-	-	2,380	2,450	-	-	-	-	-		
15		-	-	2,310	10,200	-	-	-	-	-		
16		-	4,410	3,430	13,000	-	-	-	-	-		
17		-	4,550	4,200	13,100	-	-	-	3,430	-		
18		-	3,290	5,610	11,900	-	-	-	4,130	-		
19		-	2,800	*10,200	10,200	-	2,030	-	3,290	-		
20		-	2,940	10,600	9,100	-	1,650	2,450	2,380	-		
21		2,100	2,800	9,000	7,250	-	1,410	2,520	1,750	-		
22		1,560	2,450	7,790	*5,820	-	1,410	8,350	1,350	-		
23		-	1,890	6,460	5,660	1,650	-	9,800	-	-		
24		-	1,380	5,980	4,830	1,820	-	7,610	-	-		
25		-	-	5,420	5,180	1,960	-	4,830	-	-		
26		-	-	5,980	4,970	1,960	-	3,080	-	-		
27		-	-	6,710	4,480	2,520	1,440	2,240	-	-		
28		-	-	9,800	3,920	3,570	1,820	1,890	1,820	-		
29		-	4,270	8,900	-	3,220	1,590	1,440	2,170	-		
30		-	6,140	7,520	-	2,940	1,410	-	2,240	-		
31		-	4,620	6,300	-	3,430	-	-	-	-		

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	-	-	-	-	-	-
November	-	2,100	-	-	-	-
December	-	6,140	-	-	-	-
Calendar year 1948	-	11,800	-	-	-	-
January	184,400	10,800	2,170	5,950	3.07	3.54
February	-	13,100	-	-	-	-
March	-	3,640	-	-	-	-
April	-	3,710	-	-	-	-
May	-	9,800	-	-	-	-
June	-	4,130	-	-	-	-
July	-	2,030	-	-	-	-
August	-	-	-	-	-	-
September	-	-	-	-	-	-
Water year 1948-49	-	13,100	-	-	-	-

Peak discharge (base, 9,000 sec.-ft.).- Jan. 19 (5:30 p.m.) 11,200 sec.-ft.; Jan. 28 (5 p.m.) 10,100 sec.-ft.; Feb. 17 (6 a.m.) 13,200 sec.-ft.; May 23 (8 a.m.) 10,100 sec.-ft.
* Winter discharge measurement made on this day.
† Result of discharge measurement.
b Stage-discharge relation affected by ice.
Note.- Discharge not computed below a stage of 5 feet.

Maumee River at Antwerp, Ohio

Location.- Water-stage recorder, lat. 41°11'56", long. 84°44'40", in sec. 22, T. 3 N., R. 1 E., just downstream from highway bridge, 1 mile north of Antwerp, 7 miles downstream from Indiana State line, and 10 miles upstream from Marie DeLarme Creek. Datum of gage is 695.49 feet above mean sea level, adjustment of 1912.

Drainage area.- 2,049 square miles.

Records available.- September 1921 to December 1935, April 1939 to September 1949.

Average discharge.- 24 years, 1,571 second-feet.

Extremes.- Maximum discharge during year, 13,700 second-feet Feb. 17 (gage height, 16.00 feet); minimum, 114 second-feet Oct. 5 (gage height, 0.87 foot).
1921-35, 1939-49: Maximum discharge, 26,200 second-feet May 20, 1943 (gage height, 20.29 feet); minimum, 24 second-feet Oct. 17, 1930, June 21, 22, 1933 (gage height, 0.32 foot).

Remarks.- Records good except those for periods of no gage-height record, which are fair. Low flow slightly regulated by power plant at Fort Wayne, Ind. Records of chemical analyses and water temperatures for the water year 1949 are given in Water-Supply Paper 1162.

Revisions.- W 759: Drainage area.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Nov. 7)

0.8	106	2.6	689	9.0	5,380
1.0	148	3.4	1,080	14.0	10,900
1.4	251	5.0	2,100	16.0	13,700
2.0	446	6.0	2,850		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	177	260	758	3,730	6,290	3,650	3,650	1,450	854	2,310	830	501
2	158	215	854	2,690	4,810	3,090	3,650	1,450	735	1,840	581	442
3	167	137	806	2,530	3,490	2,530	3,250	1,450	602	1,260	468	338
4	124	190	806	2,170	2,610	2,170	2,690	1,230	540	904	520	284
5	114	229	782	6,150	2,170	1,970	2,310	1,080	482	712	468	502
6	120	344	689	9,620	1,710	a1,800	1,900	980	418	560	391	954
7	122	830	520	8,710	1,640	a1,700	1,580	929	387	453	325	520
8	130	954	450	6,840	1,520	a1,600	1,320	782	344	974	269	450
9	137	689	397	6,080	1,680	a1,500	1,140	667	312	1,380	245	404
10	130	581	360	6,180	1,970	a1,500	1,010	581	300	1,110	210	334
11	128	602	341	6,400	1,840	a1,400	904	520	257	1,060	202	275
12	174	581	293	5,580	1,640	1,350	830	464	287	879	194	257
13	165	520	318	4,130	1,710	1,260	782	428	331	667	218	257
14	128	418	287	3,090	2,170	1,200	735	408	384	457	194	263
15	120	364	414	2,530	8,890	1,170	735	374	478	446	167	287
16	128	357	3,240	2,930	13,300	1,140	758	357	1,410	367	150	251
17	167	354	4,990	4,210	13,700	1,110	782	374	3,410	303	197	231
18	190	360	3,890	4,720	13,300	1,080	1,010	360	4,370	266	549	240
19	160	414	2,930	11,300	12,100	1,110	1,710	370	3,970	278	782	284
20	139	624	2,850	12,200	10,600	1,030	1,900	1,840	2,930	446	602	296
21	135	1,610	2,930	11,100	8,930	1,010	1,640	2,770	2,170	425	450	275
22	130	1,840	2,690	9,380	7,060	1,030	1,450	6,370	1,740	357	344	300
23	133	1,320	2,240	7,940	6,180	1,520	1,320	11,100	1,290	384	284	290
24	155	1,290	1,780	7,060	5,580	1,780	1,200	10,200	929	384	243	275
25	137	1,170	1,320	6,290	a5,500	1,970	1,080	6,840	854	464	229	251
26	137	1,140	980	6,290	a5,500	1,970	1,010	4,050	782	540	213	226
27	158	980	980	7,720	4,630	2,100	1,080	2,930	806	520	197	229
28	137	758	1,480	10,300	4,130	3,250	1,520	2,240	1,380	401	197	220
29	130	645	2,710	11,200	-	3,990	1,900	1,780	2,450	312	287	223
30	139	624	6,400	9,500	-	2,950	1,640	1,350	2,240	275	290	215
31	141	-	5,780	7,610	-	3,010	-	1,030	-	360	290	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	4,410	190	114	142	0.069	0.08
November	20,400	1,840	137	680	.332	.37
December	55,265	6,400	287	1,783	.870	1.00
Calendar year 1948	670,363	13,200	101	1,832	.894	12.18
January	206,180	12,200	2,170	6,651	3.25	3.75
February	154,650	13,700	1,520	5,523	2.70	2.81
March	57,400	3,650	1,010	1,852	.904	1.04
April	46,486	3,650	735	1,550	.756	.84
May	66,754	11,100	357	2,153	1.05	1.21
June	37,442	4,370	257	1,248	.609	.68
July	21,094	2,310	266	680	.332	.38
August	10,577	830	150	341	.166	.19
September	9,874	954	215	329	.161	.18
Water year 1948-49	690,532	13,700	114	1,892	.923	12.53

Peak discharge (base, 8,000 sec.-ft.).- Jan. 6 (7 a.m.) 9,740 sec.-ft.; Jan. 19 (11 p.m.) 12,500 sec.-ft.; Jan. 29 (1 a.m.) 11,400 sec.-ft.; Feb. 17 (1 p.m.) 13,700 sec.-ft.; May 23 (4 p.m.) 11,200 sec.-ft.

a No gage-height record; discharge computed on basis of weather records and records for station near Defiance.

Maumee River near Defiance, Ohio

Location.- Water-stage recorder and concrete dam, lat. 41°17'30", long. 84°16'50", in NW¼ sec. 22, T. 4 N., R. 5 E., 40 feet upstream from Independence Dam, 275 feet downstream from point of diversion to Miami & Erie Canal, 4 miles downstream from Auglaize River, and 4½ miles east of Defiance. Datum of gage is 659.12 feet above mean sea level.

Drainage area.- 5,530 square miles.

Records available.- October 1924 to December 1935, March 1939 to September 1949.

Average discharge.- 21 years, 3,714 second-feet (not including flow in Miami & Erie Canal).

Extremes.- Maximum discharge during year, 43,200 second-feet Feb. 17 (gage height, 8.05 feet, from recorded range in stage); minimum, 130 second-feet Oct. 9 (gage height, 1.49 feet).

1924-35, 1939-49: Maximum discharge, 80,800 second-feet May 19, 1943 (gage height, 13.1 feet); minimum, 18 second-feet Aug. 2, 1934 (gage height, 1.24 feet).

Remarks.- Records good except those for period of no gage-height record, which are fair. Flow affected by regulation of Auglaize River at hydroelectric plant of Toledo Edison Co., 3 miles south of Defiance. Diversions into Miami & Erie Canal above station not included in records; for miscellaneous measurements of this canal, see page 315.

Revisions (water years).- W 974: 1926, 1927, 1929, 1930.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used May 28 to June 16, Aug. 30 to Sept. 30)

1.5	140	2.1	1,300	4.0	9,720
1.6	270	2.4	2,140	5.0	16,200
1.7	430	2.8	3,540	6.5	29,200
1.8	625	3.2	5,290	8.0	43,200

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	405	366	3,700	13,400	12,500	7,700	8,260	3,310	1,160	3,240	2,110	1,030
2	318	513	3,020	9,420	8,000	6,150	8,840	4,040	950	2,980	2,430	754
3	270	662	2,410	6,690	5,800	4,500	8,260	4,950	797	2,360	1,570	797
4	257	414	1,350	4,630	4,400	4,320	6,470	4,190	690	1,730	1,000	689
5	257	688	1,700	8,440	3,700	3,240	5,240	2,660	776	1,280	625	906
6	286	1,400	2,260	21,500	3,200	3,460	4,540	2,080	754	1,220	547	613
7	323	1,230	1,400	25,500	3,000	3,310	3,430	2,080	606	3,740	488	1,400
8	322	2,720	1,040	22,000	3,000	2,730	2,840	1,640	586	2,910	547	928
9	244	3,240	1,160	15,200	3,200	2,660	2,430	1,900	586	2,620	450	711
10	192	2,630	1,070	13,400	3,800	2,400	1,930	1,620	547	4,680	318	646
11	363	1,380	792	13,100	3,900	2,490	1,810	1,280	469	2,800	302	488
12	302	1,400	586	12,800	3,100	2,460	1,590	1,250	488	1,510	865	508
13	318	1,380	783	10,600	2,800	2,360	1,510	1,080	586	1,510	318	488
14	334	1,600	867	7,980	4,500	2,240	1,620	1,020	712	1,160	384	414
15	270	711	2,980	6,100	23,000	2,330	2,190	884	882	690	578	382
16	257	906	10,000	6,420	42,000	2,770	1,560	928	4,300	668	306	398
17	257	994	17,800	8,840	43,000	2,530	2,400	1,080	16,400	586	619	408
18	355	994	15,500	12,800	39,000	2,300	4,020	994	19,000	811	401	398
19	302	1,850	11,200	27,300	31,000	2,200	5,390	1,180	13,100	469	816	318
20	405	4,540	7,980	37,100	25,000	2,170	6,000	4,170	8,840	562	1,560	450
21	286	5,540	5,950	33,100	19,800	2,140	4,400	5,590	5,790	668	1,350	606
22	412	6,360	5,190	22,000	16,200	3,270	3,900	16,100	3,660	1,060	732	450
23	270	5,240	4,680	16,200	13,800	3,820	3,820	35,100	2,330	797	732	414
24	244	3,160	4,360	13,100	11,800	4,450	3,240	37,100	2,050	873	547	398
25	257	1,810	2,700	14,800	12,400	4,450	3,120	25,500	1,640	778	366	366
26	374	2,580	2,040	17,000	13,100	3,860	1,640	14,000	1,160	668	398	334
27	302	2,020	1,710	20,000	12,100	4,860	3,620	10,900	1,160	754	464	302
28	286	2,120	1,470	32,000	9,420	10,600	4,360	4,780	1,900	646	318	286
29	302	2,980	5,730	35,000	-	12,400	5,000	3,120	5,640	732	401	740
30	286	3,280	14,400	28,000	-	8,840	3,310	2,770	5,290	469	1,350	430
31	286	-	17,800	19,000	-	7,410	-	1,930	-	980	1,180	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	9,342	412	192	301		
November	64,708	6,360	366	2,157		
December	153,628	17,800	586	4,956		
Calendar year 1948	1,736,260	49,400	153	4,744		
January	533,420	37,100	4,630	17,210		
February	376,520	43,000	2,800	13,450		
March	130,420	12,400	2,140	4,207		
April	116,740	8,840	1,510	3,891		
May	199,326	37,100	884	6,430		
June	102,849	19,000	469	3,428		
July	45,951	4,680	469	1,482		
August	24,072	2,430	302	777		
September	17,152	1,400	286	572		
Water year 1948-49	1,774,128	43,000	192	4,861		

Peak discharge (base, 25,000 sec.-ft.).- Jan. 6 (8 p.m.) 26,400 sec.-ft.; Jan. 20 (1 p.m.) 38,100 sec.-ft.; Jan. 29 (time unknown) 36,100 sec.-ft.; Feb. 17 (time unknown) 43,200 sec.-ft.; May 24 (4 a.m.) 39,000 sec.-ft.

Note.- No gage-height record Jan. 26 to Feb. 20; discharge computed on basis of once-daily readings of U. S. Weather Bureau gage 4 miles upstream, weather records, recorded range in stage, and records for station at Waterville.

Maumee River at Waterville, Ohio

Location.- Water-stage recorder, lat. 41°30'00", long.83°42'46", at highway bridge in Waterville, Lucas County, 3 miles downstream from Tontogany Creek. Datum of gage is 596.33 feet above mean sea level, adjustment of 1912.
Drainage area.- 6,314 square miles.
Records available.- November 1898 to December 1901, August 1921 to December 1935, March 1939 to September 1949.
Average discharge.- 24 years (1921-35, 1949-49), 4,343 second-feet (does not include flow in Miami & Erie Canal; canal was abandoned in 1929 and was filled in prior to March 1939).
Extremes.- Maximum discharge during year, 45,900 second-feet Feb. 17 (gage height, 10.50 feet); minimum, 113 second-feet Oct. 11 (gage height, 1.56 feet).
1921-35, 1939-49: Maximum discharge, 78,000 second-feet May 20, 1943 (gage height, 13.9 feet); minimum, 32 second-feet Sept. 29, 1941.
Remarks.- Records good except those for periods of no gage-height record, which are fair. Low flow slightly regulated by power plants above station.
Revisions (water years).- W 759: Drainage area. W 894: 1930(M). W 1084: 1946.

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1-9, Sept. 2-30)

Oct. 1 to Jan. 28						Jan. 29 to Sept. 30					
1.7	175	2.4	1,100	6.4	16,200	1.8	290	2.9	2,180	7.0	20,100
1.8	250	3.0	2,440	8.0	26,900	1.9	390	3.5	3,890	9.0	33,900
1.9	350	3.8	4,500	9.7	39,800	2.0	510	4.2	6,350	10.4	45,100
2.0	470	4.4	6,450			2.2	800	5.0	9,830		
2.2	755	5.4	10,800			2.5	1,310	6.0	14,700		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	470	h362	h4,220	14,700	15,200	8,230	9,600	3,400	1,810	4,080	1,330	1,350
2	422	h422	h3,550	10,300	11,800	6,960	9,830	4,540	1,290	3,310	2,630	816
3	300	h578	h3,420	6,850	7,160	5,590	9,380	5,780	1,080	3,020	2,230	896
4	235	h1,090	h2,540	4,800	5,590	4,540	7,370	5,080	960	2,010	1,530	770
5	242	a950	h1,560	7,700	5,880	4,210	5,960	3,740	800	1,510	1,100	1,110
6	250	a1,200	h1,970	21,300	3,700	3,280	5,410	2,180	960	1,180	695	1,010
7	235	a2,000	h2,020	27,600	3,550	3,490	4,540	1,960	710	1,850	580	960
8	350	h1,900	a1,400	24,800	3,770	3,280	3,190	1,920	580	3,890	552	1,410
9	502	h4,220	a1,100	16,800	3,550	2,520	2,710	1,660	636	2,210	566	994
10	267	h4,080	a1,200	13,800	3,640	2,930	2,390	1,330	665	3,370	498	710
11	177	h2,870	a1,000	13,600	4,380	2,630	2,040	1,260	636	4,080	390	622
12	410	h2,080	a700	13,000	3,830	2,520	1,810	1,170	538	2,160	450	486
13	350	a1,200	a650	11,000	2,770	2,410	1,720	1,130	594	1,450	832	524
14	300	a1,200	725	7,850	3,950	2,360	1,660	816	785	1,200	462	524
15	320	h434	2,020	6,100	24,800	2,360	2,440	832	994	994	402	402
16	300	h398	12,300	6,100	45,100	2,490	2,600	816	2,600	650	538	380
17	410	h920	19,900	8,950	45,100	2,680	1,990	816	16,400	650	486	402
18	340	h1,430	16,800	12,000	38,700	2,550	4,180	960	24,100	680	800	566
19	374	h1,860	13,300	31,800	29,000	2,280	5,780	912	18,300	770	622	538
20	340	a3,500	8,280	39,800	22,700	2,210	6,350	3,660	13,200	426	960	320
21	394	a6,000	6,280	36,600	17,700	2,440	5,780	6,750	8,450	552	1,620	510
22	340	h7,050	5,400	27,600	15,700	2,600	4,180	16,000	5,590	800	1,220	580
23	458	h6,280	4,950	25,500	14,200	4,380	5,080	40,300	3,640	880	785	524
24	340	h3,420	4,500	13,800	13,200	4,210	3,740	42,700	2,440	800	665	414
25	290	h3,000	3,810	14,100	14,700	5,080	3,460	33,200	2,310	896	510	380
26	290	h2,110	2,800	19,900	14,700	4,210	2,770	18,900	1,700	848	390	380
27	350	h2,920	2,420	26,200	13,200	5,080	2,990	12,700	1,220	785	402	380
28	h260	h2,560	2,340	37,400	11,000	8,230	4,540	8,580	1,200	816	426	360
29	h228	h3,550	5,350	39,500	-	13,200	5,590	3,490	2,910	770	450	320
30	a230	h3,680	17,400	31,800	-	10,800	4,540	3,770	6,550	770	782	785
31	a260	-	24,100	22,700	-	8,900	-	2,710	-	650	1,430	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	10,034	502	177	324	0.051	0.06
November	73,264	7,050	362	2,442	.387	.43
December	178,005	24,100	650	5,742	.909	1.05
Calendar year 1948	1,900,184	54,100	145	5,192	.822	11.20
January	593,950	39,800	4,800	19,160	3.03	3.49
February	397,570	45,100	2,770	14,200	2.25	2.34
March	138,610	13,200	2,210	4,471	.708	.82
April	133,580	9,830	1,660	4,453	.705	.79
May	233,042	42,700	816	7,517	1.19	1.37
June	123,648	24,100	538	4,122	.653	.73
July	48,057	4,080	426	1,550	.245	.28
August	26,333	2,630	390	849	.134	.15
September	19,423	1,410	320	647	.102	.11
Water year 1948-49	1,975,516	45,100	177	5,412	.857	11.62

Peak discharge (base, 28,000 sec.-ft.).- Jan. 7 (1:30 a.m.) 28,300 sec.-ft.; Jan. 20, 39,000 sec.-ft.; Jan. 28 (11 p.m.) 40,600 sec.-ft.; Feb. 17 (3 p.m.) 45,900 sec.-ft.; May 24 (3 a.m.) 44,300 sec.-ft.
a No gage-height record; discharge computed on basis of weather records and records for station near Defiance.
h Computed from once- or twice-daily wire-weight gage readings.

Cedar Creek at Auburn, Ind.

Location.- Wire-weight gage, lat. 41°21', long. 85°03', in SW¼ sec. 29, T. 34 N., R. 13 E., at Ninth Street Bridge in Auburn, 2 miles upstream from Peckhart ditch.

Drainage area.- 93 square miles.

Records available.- July 1943 to September 1949.

Extremes.- Maximum discharge during year, 995 second-feet Feb. 16 (gage height, 9.21 feet); minimum, 2.0 second-feet Sept. 26; minimum gage height, 0.97 foot Sept. 10, 11.
1943-49: Maximum discharge, 1,010 second-feet Apr. 12, 1944 (gage height, 9.30 feet, from graph based on gage readings); minimum, that of Sept. 26, 1949; minimum gage height, 0.91 foot Sept. 25, 1946.

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

Rating tables, water year 1948-49 except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Nov. 27, Nov. 29 to Dec. 15, Sept. 6-19, 21-30)

Oct. 1 to Dec. 29				Dec. 30 to Sept. 20					
0.9	2.0	1.4	28	0.9	2.0	1.4	24	2.6	122
1.0	4.0	1.7	53	1.0	4.0	1.5	29	3.4	212
1.1	8.0	2.3	109	1.1	8.0	1.7	42	7.0	679
1.2	14	4.0	294	1.3	18	2.1	75	8.6	905

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.8	4.4	6.8	84	110	116	119	40	30	24	11	4.0
2	3.6	4.0	*6.4	61	86	99	89	44	28	18	26	3.6
3	3.4	6.8	6.0	47	77	86	70	39	25	16	28	3.8
4	3.4	12	6.0	*56	63	85	60	34	23	14	19	46
5	3.8	17	6.4	637	53	92	54	31	22	13	14	26
6	4.0	15	7.6	533	48	100	50	28	20	12	11	9.5
7	5.2	10	7.2	325	42	77	46	26	18	12	9.5	6.8
8	6.0	9.2	6.8	224	66	67	41	25	16	12	8.0	6.4
9	5.6	6.8	6.0	165	132	71	38	24	16	12	7.6	4.8
10	6.0	9.2	6.0	154	86	68	34	22	15	16	7.2	4.0
11	7.6	9.8	6.4	132	56	59	34	21	14	16	12	3.6
12	7.2	9.2	7.6	103	56	53	32	20	14	14	7.6	3.8
13	6.8	8.0	9.2	83	126	48	31	19	14	12	6.4	4.4
14	6.4	7.6	9.8	68	143	47	31	18	16	10	5.6	4.8
15	6.0	7.6	87	63	833	42	46	17	22	9.5	6.4	4.8
16	4.4	8.0	156	105	905	38	51	18	127	8.5	6.4	4.4
17	4.8	11	97	109	665	37	50	17	273	7.2	7.2	4.4
18	4.4	10	65	160	481	36	108	23	165	6.8	7.2	12
19	4.4	12	50	735	390	33	99	54	93	6.4	6.0	8.7
20	5.6	27	42	559	312	32	78	206	63	6.4	5.6	20
21	5.6	26	36	338	254	34	62	138	47	8.0	4.8	8.0
22	5.2	18	34	212	286	52	56	292	36	40	4.8	4.4
23	5.6	13	32	165	248	90	53	260	31	35	4.8	3.8
24	6.4	11	27	170	248	73	46	212	26	24	4.4	3.4
25	6.4	9.2	22	160	377	63	39	140	23	17	4.4	2.6
26	6.8	8.6	b21	170	230	60	40	98	22	14	4.0	2.4
27	6.0	8.0	20	200	170	71	70	75	20	12	3.8	2.4
28	5.6	a7.5	24	533	143	69	62	60	20	9.0	4.0	2.6
29	6.0	6.8	294	325	-	58	50	48	47	8.0	5.2	2.6
30	6.0	6.4	254	224	-	53	44	39	35	14	4.0	2.4
31	6.0	-	128	154	-	136	-	34	-	16	4.8	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	168.0	7.6	3.4	5.42	0.058	0.07
November	319.1	27	4.0	10.6	.114	.13
Decsmber	1,487.2	294	6.0	48.0	.516	.59
Calendar year 1948	27,518.1	875	3.2	75.2	.809	11.01
January	7,054	735	47	228	2.45	2.82
February	6,685	905	42	239	2.57	2.67
March	2,045	136	32	66.0	.710	.82
April	1,683	119	31	56.1	.603	.67
May	2,122	292	17	68.5	.737	.85
June	1,321	273	14	44.0	.473	.53
July	442.8	40	6.4	14.3	..154	.18
August	260.7	28	3.8	8.41	.090	.10
Ssptember	220.4	46	2.4	7.35	.079	.09
Water year 1948-49	23,808.2	905	2.4	65.2	.701	9.52

Peak discharge (base, 850 sec.-ft.).- Feb. 16 (1 a.m.) 995 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records and records for station near Cedarville.
b Stage-discharge relation affected by ice.

Cedar Creek near Cedarville, Ind.

Location.- Water-stage recorder, lat. 41°13, long. 85°05', in NW¼ sec. 19, T. 32 N., R. 13 E., at bridge on State Highway 427, 2⅔ miles northwest of Cedarville, and 4 miles upstream from mouth. Datum of gage is 779.75 feet above mean sea level (unadjusted).

Drainage area.- 279 square miles.

Records available.- October 1946 to September 1949.

Extremes.- Maximum discharge during year, 3,980 second-feet Feb. 16 (gage height, 10.75 feet); minimum, 17 second-feet Aug. 26-28, Sept. 29; minimum gage height, 1.40 feet Aug. 26-28.
1946-49: Maximum discharge, that of Feb. 16, 1949; minimum, that of Sept. 29, 1949; minimum gage height, 1.38 feet Sept. 14, 1948.

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

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet).
(Shifting-control method used Oct. 6 to Dec. 15, Apr. 28 to May 19, May 25 to July 22, July 27 to Sept. 5, Sept. 11-30)

1.3	9.0	2.5	260
1.4	22	2.8	360
1.6	51	5.4	1,400
1.8	87	8.0	2,580
2.0	131	10.2	3,680

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	30	35	322	356	353	368	136	146	79	35	25
2	30	28	*35	220	275	297	284	151	134	65	45	21
3	26	32	35	171	249	269	236	136	122	56	68	19
4	25	45	33	*188	217	260	201	124	110	50	58	19
5	25	51	33	1,700	188	269	186	113	100	50	45	81
6	26	72	33	1,980	171	252	171	106	91	48	38	74
7	28	51	33	1,120	174	222	158	100	83	48	32	48
8	32	40	32	720	191	209	146	89	78	46	30	44
9	32	38	30	512	408	217	131	85	72	72	29	36
10	25	46	30	448	266	217	122	79	70	93	28	30
11	29	50	29	428	194	204	117	70	68	70	28	28
12	33	44	30	332	174	186	115	65	65	56	39	25
13	30	42	35	269	283	171	113	61	66	50	29	25
14	28	39	36	228	500	164	110	58	70	45	25	26
15	28	36	175	206	2,680	154	134	56	95	40	23	23
16	29	36	560	311	3,680	141	151	56	219	38	23	22
17	33	48	350	353	2,480	134	146	53	472	36	26	23
18	28	48	225	469	1,530	134	214	48	372	35	38	33
19	26	53	171	2,040	1,120	124	272	109	249	33	32	35
20	28	98	141	2,160	880	117	222	972	188	36	25	33
21	28	95	122	1,160	720	117	188	700	151	39	21	32
22	28	74	115	760	740	144	171	1,160	129	64	19	26
23	32	61	104	540	720	318	171	1,240	106	102	19	23
24	30	53	95	560	620	260	156	780	93	76	19	22
25	28	48	b80	540	980	225	141	540	85	56	19	19
26	28	44	b75	620	680	201	141	392	108	48	18	21
27	28	42	b70	820	520	255	233	300	108	40	18	19
28	28	39	b60	1,620	452	252	214	252	83	36	19	18
29	28	38	782	1,530	-	209	168	217	93	29	23	21
30	26	38	940	860	-	186	146	186	102	36	23	21
31	28	-	496	600	-	284	-	166	-	42	26	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	886	33	25	28.6	0.103	0.12
November	1,459	98	28	48.6	.174	.19
December	5,020	940	29	162	.581	.67
Calendar year 1948	83,252	2,550	21	227	.814	11.10
January	23,787	2,180	171	767	2.75	3.17
February	21,428	3,680	171	765	2.74	2.86
March	6,545	353	117	211	.756	.87
April	5,326	368	110	178	.638	.71
May	8,600	1,240	48	277	.993	1.15
June	3,928	472	65	131	.470	.52
July	1,614	102	29	52.1	.187	.22
August	920	68	18	29.7	.106	.12
September	890	81	18	29.7	.106	.12
Water year 1948-49	80,403	3,680	18	220	.789	10.72

Peak discharge (base, 1,600 sec.-ft.).- Jan. 6 (1:30 a.m.) 2,300 sec.-ft.; Jan. 20 (1 a.m.) 2,630 sec.-ft.; Jan. 28 (10:30 p.m.) 1,980 sec.-ft.; Feb. 16 (4:30 a.m.) 3,980 sec.-ft.

* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

St. Marys River at Decatur, Ind.

Location.- Water-stage recorder, lat. 40°51', long. 84°56', in SW¼ sec. 27, T. 28 N., R. 14 E., at bridge on U. S. Highway 27, half a mile north of city limits of Decatur and half a mile upstream from Holthouse ditch.
Drainage area.- 615 square miles.
Records available.- November 1946 to September 1949.
Extremes.- Maximum discharge during year, 4,060 second-feet Feb. 15 (gage height, 18.29 feet); minimum, 22 second-feet Oct. 11 (gage height, 2.05 feet).
1946-49: Maximum discharge, 6,430 second-feet Mar. 22, 1948 (gage height, 20.43 feet); minimum, 12 second-feet Nov. 6, 1946 (gage height, 1.91 feet).
Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by Lake St. Marys. Some diversion from or into Wabash River Basin and into Miami & Erie Canal.

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Aug. 1-17)

2.1	23	3.7	140	8.0	852
2.4	36	4.6	245	13.0	2,010
2.7	53	5.5	371	16.0	2,880
3.1	83	6.5	547	18.2	4,000

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov..	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	29	547	1,090	1,870	831	1,580	625	122	831	232	196
2	28	29	547	1,120	1,280	685	1,250	566	104	455	258	146
3	34	32	547	1,050	918	566	810	437	88	305	208	126
4	36	38	446	874	685	473	566	395	73	202	125	109
5	36	170	305	*2,040	b475	420	428	403	64	130	81	97
6	34	645	226	2,220	b400	387	348	348	57	142	59	86
7	33	428	184	1,960	b375	341	284	252	52	1,250	49	84
8	31	284	158	2,470	*420	319	245	196	46	585	46	82
9	28	252	135	2,740	491	305	220	168	41	412	43	77
10	24	258	115	2,640	428	312	190	151	38	528	40	73
11	26	245	87	2,350	379	312	173	130	36	371	38	73
12	36	168	95	1,670	348	312	168	119	36	252	35	73
13	38	135	108	1,230	364	312	162	108	48	182	36	79
14	36	130	202	1,050	473	364	162	100	49	107	37	77
15	38	119	1,060	1,050	3,260	395	178	97	89	77	69	73
16	40	114	2,140	1,650	4,000	395	190	98	1,020	80	127	69
17	42	151	1,840	1,890	3,540	428	204	95	1,670	108	183	69
18	41	135	1,480	1,990	3,090	446	768	89	1,370	271	504	75
19	36	229	1,790	3,760	2,580	428	645	94	898	226	162	73
20	34	1,180	1,980	3,940	1,820	403	509	184	705	146	102	67
21	40	1,050	1,670	3,650	1,140	412	473	278	566	151	92	67
22	46	768	1,350	3,180	1,350	473	428	3,240	322	162	90	69
23	42	768	984	2,440	1,650	625	387	3,170	178	184	85	73
24	38	769	705	1,870	1,280	605	348	2,010	118	252	77	73
25	36	685	566	1,820	1,530	625	305	1,280	96	271	72	73
26	34	491	420	2,090	1,300	744	319	984	255	184	71	71
27	33	348	312	2,580	1,120	1,980	852	789	1,120	116	73	71
28	32	326	298	3,540	1,010	1,910	852	566	1,140	87	84	68
29	31	446	1,890	3,660	-	1,600	585	341	1,030	69	183	65
30	29	566	2,350	a3,200	-	1,770	605	220	1,250	334	387	91
31	29	-	1,530	a2,550	-	1,720	-	156	-	426	291	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
Octcber	1,069	46	24	34.5		
November	11,008	1,180	29	367		
December	26,045	2,350	87	840		
Calendar year 1948	219,948	6,070	19	601		
January	69,304	3,940	874	2,236		
February	37,576	4,000	348	1,342		
March	20,878	1,960	305	673		
April	14,234	1,580	162	474		
May	17,689	3,240	89	571		
June	12,677	1,670	38	423		
July	8,854	1,250	60	286		
August	3,899	504	35	126		
September	2,525	196	65	84.2		
Water year 1948-49	225,758	4,000	24	619		

Peak discharge (base, 2,900 sec.-ft.).- Jan. 19 (5 p.m.) 4,000 sec.-ft.; Jan. 29 (2 a.m.) 3,650 sec.-ft.; Feb. 15 (12 p.m.) 4,060 sec.-ft.; May 22 (7 p.m.) 3,760 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records and records for station near Fort Wayne.
b Stage-discharge relation affected by ice.

St. Marys River near Fort Wayne, Ind.

Location.- Water-stage recorder, lat. 41°00', long. 85°08', in sec. 25, T. 30 N., R. 12 E., 130 feet downstream from highway bridge, 4 miles south of Fort Wayne, and 12 miles upstream from mouth.
Drainage area.- 753 square miles.
Records available.- November 1930 to September 1949 in reports of Geological Survey. October 1924 to October 1925 and July to September 1927 in reports of Indiana Department of Conservation.
Average discharge.- 17 years (1931-33, 1934-49), 534 second-feet.
Extremes.- Maximum discharge during year, 5,150 second-feet May 23 (gage height, 12.85 feet); minimum, 22 second-feet Oct. 12; minimum gage height, 0.82 foot Oct. 3, 12.
1930-49: Maximum discharge, 13,400 second-feet May 19, 1943 (gage height, 18.79 feet); minimum observed, 3.4 second-feet Oct. 19, 1934 (gage height, 0.28 foot).
Remarks.- Records good except those for periods of ice effect, which are fair. Flow regulated by Lake St. Marys. Some diversion from or into Wabash River Basin and into Miami & Erie Canal.
Revisions (water year).- W 824: Drainage area. W 974: 1942.

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Nov. 5, July 3-7)

0.7	18	2.2	196	6.8	1,680
.8	28	2.7	290	9.0	2,720
.9	39	3.8	575	11.0	3,880
1.8	140	5.0	955	12.5	4,920

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	28	*605	1,420	2,670	990	1,950	665	159	1,140	295	254
2	35	27	590	1,300	1,820	815	1,640	755	136	650	258	172
3	27	32	605	*1,260	1,260	680	1,060	560	118	402	284	142
4	32	38	545	1,100	885	560	725	452	105	268	183	133
5	37	122	415	2,880	b550	515	560	440	90	176	122	554
6	37	680	288	3,050	b480	465	452	415	79	126	88	173
7	34	695	221	2,470	b450	415	352	328	71	790	68	116
8	33	378	183	2,670	b500	378	288	232	63	990	56	109
9	31	290	165	3,100	*560	365	250	190	57	490	50	103
10	27	305	146	3,390	515	352	217	166	50	650	44	93
11	25	328	132	3,270	452	365	194	150	56	490	41	87
12	23	238	114	2,470	428	365	180	136	70	352	39	85
13	32	173	118	1,640	440	352	174	127	85	221	36	110
14	40	152	147	1,260	647	378	172	118	74	151	34	123
15	37	146	1,100	1,220	4,270	428	176	113	140	113	35	100
16	41	135	2,880	2,080	4,700	440	196	112	809	88	172	91
17	45	158	2,620	2,420	4,550	452	202	110	2,040	73	148	86
18	47	177	1,860	2,870	4,010	478	690	107	1,820	179	695	106
19	47	211	1,900	4,840	3,510	478	850	124	1,180	268	340	120
20	42	1,100	2,220	4,550	2,870	452	635	254	832	196	146	97
21	37	1,380	2,130	4,270	1,590	452	545	328	695	151	115	87
22	39	955	1,720	3,940	1,540	575	502	4,120	478	158	104	85
23	51	832	1,260	3,390	2,040	770	452	4,920	256	167	101	85
24	49	850	885	2,570	1,720	710	415	3,510	163	206	95	85
25	42	800	680	2,320	1,900	695	352	1,950	129	278	87	85
26	38	650	b550	2,720	1,680	725	328	1,260	216	244	83	84
27	36	452	b450	3,390	1,340	1,890	658	955	854	159	83	83
28	35	378	b425	4,620	1,180	2,420	1,060	755	1,460	116	87	82
29	32	402	b2,000	4,340	-	1,900	710	502	1,460	98	103	81
30	31	590	3,160	3,940	-	1,950	620	308	1,420	215	290	76
31	32	-	2,370	3,450	-	2,080	-	207	-	680	390	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,132	51	23	36.5		
November	12,702	1,380	27	423		
December	32,484	3,160	114	1,048		
Calendar year 1948	268,490	6,470	18	734		
January	88,210	4,840	1,100	2,845		
February	48,357	4,700	428	1,727		
March	23,890	2,420	352	771		
April	16,605	1,950	172	554		
May	24,369	4,920	107	786		
June	15,165	2,040	50	506		
July	10,283	1,140	73	332		
August	4,672	695	34	151		
September	3,687	554	76	123		
Water year 1948-49	281,556	4,920	23	771		

Peak discharge (base, 3,550 sec.-ft.).- Jan. 19 (10 a.m.) 5,000 sec.-ft.; Jan. 28 (8:30 a.m.) 4,770 sec.-ft.; Feb. 15 (5:30 p.m.) 4,770 sec.-ft.; May 23 (2 a.m.) 5,150 sec.-ft.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Bean Creek at Powers, Ohio

Location.- Water-stage recorder, lat. 41°40'40", long. 84°13'50", in NE¼ sec. 24, T. 9 S., R. 1 E., at bridge on U. S. Highway 20, 1 mile east of Powers and 2¼ miles upstream from Iron Creek. Datum of gage is 722.6 feet above mean sea level, adjustment of 1912.

Drainage area.- 238 square miles.

Records available.- October 1940 to September 1949.

Extremes.- Maximum discharge during year, 2,980 second-feet Feb. 15 (gage height, 12.47 feet); minimum, 12 second-feet Aug. 11 (gage height, 0.53 foot).
1940-49: Maximum discharge, 3,650 second-feet May 18, 1945 (gage height, 12.66 feet); minimum, 6.4 second-feet Sept. 17, 1941.

Remarks.- Records good.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Dec. 15)

Oct. 1 to Feb. 14						Feb. 15 to Sept. 30					
0.7	12	1.2	38	3.0	254	0.5	11	1.2	56	9.0	1,330
.8	16	1.4	54	4.5	482	.6	15	2.0	142	10.0	1,640
.9	20	1.7	84	7.0	922	.7	20	3.0	258	11.0	2,080
1.0	26	2.3	159	7.8	1,080	.9	31	4.0	400	11.6	2,370
						1.0	38	6.0	740		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	18	34	156	b210	264	776	112	52	53	15	19
2	17	18	33	154	b180	245	600	180	48	43	20	18
3	16	19	32	118	b160	221	464	127	46	38	20	17
4	15	25	*32	91	b140	209	339	110	40	35	19	15
5	15	35	33	683	133	221	271	100	37	31	17	61
6	16	56	34	758	124	227	245	90	35	46	16	39
7	16	46	33	498	132	215	221	80	32	112	15	31
8	17	34	32	450	142	192	203	75	32	51	14	30
9	17	29	29	318	289	186	180	70	31	52	14	23
10	16	31	28	261	261	180	164	62	30	66	13	21
11	17	32	32	233	198	170	148	63	29	49	14	18
12	17	31	30	185	172	158	142	61	29	38	18	17
13	17	29	28	155	362	153	136	61	30	35	16	20
14	17	27	28	136	583	148	131	51	36	31	15	22
15	16	27	56	119	*2,330	142	186	48	46	30	14	21
16	17	27	123	168	2,080	130	245	47	71	27	13	19
17	18	28	112	226	1,200	120	227	44	298	25	54	18
18	17	30	76	238	794	123	239	43	258	24	105	45
19	17	43	65	1,080	583	116	258	50	197	21	53	47
20	17	104	61	848	481	109	221	110	142	21	31	48
21	17	92	56	*532	400	105	192	153	116	22	23	34
22	17	70	60	386	400	127	175	175	142	23	20	28
23	17	58	58	296	408	297	175	209	122	21	18	25
24	17	50	51	254	369	245	158	186	90	20	16	23
25	17	43	46	261	583	209	142	136	73	19	15	22
26	17	40	b45	254	448	186	142	112	66	18	14	20
27	17	40	b40	261	354	197	153	94	63	17	15	20
28	17	39	b40	630	311	203	136	96	61	16	14	20
29	17	37	282	617	-	170	119	76	86	15	15	19
30	17	35	326	356	-	158	110	66	71	16	20	19
31	18	-	192	282	-	541	-	59	-	16	27	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	521	18	15	16.8	0.071	0.08
November	1,193	104	18	39.8	.167	.19
December	2,127	326	28	68.6	.288	.33
Calendar year 1948	59,638	2,220	13	163	.685	9.33
January	11,004	1,080	91	355	1.49	1.72
February	13,827	2,330	124	494	2.08	2.17
March	5,967	541	105	192	.807	.93
April	6,898	776	110	230	.966	1.08
May	2,946	209	43	95.0	.399	.46
June	2,409	298	29	80.3	.337	.38
July	1,031	112	15	33.3	.140	.16
August	693	105	13	22.4	.094	.11
September	779	61	15	26.0	.109	.12
Water year 1948-49	49,395	2,330	13	135	.567	7.73

Peak discharge (base, 1,200 sec.-ft.).- Jan. 19 (7:30 p.m.) 1,300 sec.-ft.; Feb. 15 (7 p.m.) 2,980 sec.-ft.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Tiffin River at Stryker, Ohio

Location.- Water-stage recorder, lat. 41°30'05", long. 84°25'50", in SW¼ sec. 5, T. 6 N., R. 4 E., at electric railroad bridge at west edge of Stryker. Datum of gage is 685.5 feet above mean sea level, adjustment of 1912.
Drainage area.- 444 square miles.
Records available.- October 1940 to September 1949. September 1921 to September 1928 at site about 3 miles downstream, published as Tiffin River near Stryker.
Average discharge.- 16 years, 306 second-feet.
Extremes.- Maximum discharge during year, 4,240 second-feet Feb. 16 (gage height, 13.81 feet); minimum, 18 second-feet Aug. 11 (gage height, 1.22 feet).
1921-28, 1940-49: Maximum discharge, 5,690 second-feet May 18, 1945 (gage height, 14.80 feet); minimum, 5.0 second-feet Sept. 20, 1941.
Flood of March 1913 reached a stage of 16.0 feet, from floodmarks (discharge, 7,600 second-feet).
Revisions.- The figures of maximum discharge for some water years have been revised, as shown in the following table. They supersede those published as Tiffin River near Stryker in the water-supply papers indicated.

Water-Supply Paper	Water year	Date	Gage height (feet)	Discharge (second-feet)
544.....	1921-22	Apr. 1	13.0	4,820
564.....	1922-23	Mar. 17	12.23	3,650
584.....	1923-24	Mar. 7	12.97	4,820
604.....	1924-25	Mar. 16	12.2	3,650
624.....	1925-26	Feb. 27	12.6	4,220
644.....	1926-27	Feb. 8	10.9	2,140
664.....	1927-28	Dec. 15	13.1	4,970

Remarks.- Records good except those for periods of no gage-height record, which are fair.
Revisions (water years).- W 564: Drainage area. Revised figures of discharge for high-water periods in the water years 1922-28 are given herein. They supersede those published as Tiffin River near Stryker in Water-Supply Papers 544, 564, 584, 604, 624, 644, and 664.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Nov. 20, May 28 to June 16, Sept. 7-30)

1.2	17	2.6	165	10.5	1,390
1.3	24	3.2	216	11.5	1,790
1.4	32	6.5	573	12.0	2,060
1.5	42	8.0	802	12.5	2,540
2.2	128	9.5	1,090	13.5	3,820

Discharge, in second-feet, 1921-28, 1948-49

1921-22

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	275	335	152		275	4,520	412	173	57	31	24
2	43	201	320	152		290	4,370	365	152	46	39	78
3	44	140	365	107		275	3,240	275	133	61	35	305
4	39	114	380	275	(*)	260	2,140	412	120	78	36	133
5	40	101	290	808	290	275	1,260	524	107	72	33	78
6	39	78	230	916		335	1,130	412	101	66	26	53
7	47	72	230	1,020		790	880	320	83	54	31	44
8	120	61	230	688		844	654	260	78	46	33	37
9	133	52	215	476	201	705	508	230	72	42	29	32
10	126	66	215	396	245	722	476	604	101	46	33	35
11	107	89	187	320	350	916	1,350	572	146	41	26	89
12	89	66	173	275	476	1,240	3,110	428	107	51	26	166
13	83	66	230		412	1,380	2,740	350	61	52	25	114
14	72	83	305		320	1,400	3,370	320	78	47	25	72
15	72	72	305		230	*1,330	3,110	201	78	36	22	47
16	53	83	290		173	1,100	2,630	159	83	40	19	42
17	53	89	588	130	120	880	2,520	146	101	38	27	36
18	41	173	1,170		107	540	2,420	146	101	57	24	32
19	45	620	1,240		78	492	2,520	260	101	140	22	29
20	50	1,130	1,310		95	508	2,420	916	83	107	24	26
21	47	1,220	1,080		126	540	2,060	970	78	72	28	32
22	46	934	705		230	492	1,610	688	68	48	23	32
23	46	637	508		335	492	1,170	412	66	44	21	28
24	50	350	365		476	588	705	335	57	42	25	24
25	41	444	290		476	671	604	444	42	39	24	26
26	36	556	230	30	335	671	540	808	46	44	28	26
27	39	826	201		275	952	508	970	40	40	28	20
28	44	688	215		260	1,100	460	637	66	36	33	26
29	54	524	201		-	1,290	380	350	72	36	36	25
30	120	396	187		-	1,380	412	245	66	32	28	21
31	215	-	133		-	2,860	-	201	-	34	31	-

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Jan. 13 to Feb. 8.

Discharge, in second-feet, of Tiffin River at Stryker, Ohio. 1921-28, 1948-49--Continued

1922-23

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	46	61	588	187	722	133	78	72	31	18	31
2	24	61	56	556	380	756	152	78	66	31	21	24
3	24	72	62	305	556	773	152	72	59	28	16	30
4	22	78	72	187	508	988	173	72	60	29	16	28
5	27	78	83	140		1,170	275	66	47	32	120	25
6	26	78	95	173		1,200	654	72	89	27	83	34
7	39	72	78	126		722	826	66	215	30	39	72
8	51	72	107	83		476	671	59	245	40	25	95
9	44	72	101	89		320	492	66	215	38	22	66
10	44	72	66	89	200	444	365	66	187	40	18	55
11	39	66	61	101		756	320	78	126	50	19	46
12	38	66	60	66		1,310	275	95	101	78	556	40
13	47	66	66	72		2,140	215	140	89	66	773	36
14	57	66	66	89		3,110	201	133	78	61	844	26
15	59	72	58	126		2,420	201	572	72	47	396	28
16	52	83	51	290		2,740	230	1,020	78	33	187	24
17	49	78	54	396		3,240	260	1,170	215	32	83	20
18	40	78	52	201		2,980	230	1,020	72	28	61	19
19	46	83	48	335		2,140	187	722	53	25	53	22
20	49	83	46	380	150	1,370	159	671	52	21	42	51
21	48	78	44	412		916	146	688	48	24	34	350
22	49	72	54	396		620	140	492	38	22	29	808
23	58	72	57	350		790	133	320	43	24	28	492
24	58	66	58	166		540	120	215	36	24	26	215
25	51	66	61	140	72	476	107	166	34	25	24	114
26	53	66	61	120	201	412	107	146	31	26	22	83
27	53	66	72	107	588	350	95	120	36	25	28	78
28	51	56	126	107	705	290	101	107	37	31	30	72
29	55	60	140	101	-	230	95	95	40	28	29	89
30	57	61	120	95	-	201	89	95	42	25	37	95
31	61	-	173	107	-	173	-	78	-	24	39	-

Note.- Stage-discharge relation affected by ice Feb. 5-24.

1923-24

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	72	128	329	1,150	520	2,860	134	94	1,460	54	33
2	54	62	134	245	990	704	1,360	122	88	1,660	48	34
3	40	62	116	203	791	536	863	116	82	845	43	34
4	40	58	154	203	536	971	670	110	88	399	41	36
5	31	67	773	189	474	1,360	552	110	88	273	37	40
6	28	82	990	99	399	2,520	520	99	82	217	44	29
7	30	88	1,070	54	357	4,070	459	94	88	231	47	30
8	31	82	687	50	259	2,520	429	122	140	357	46	33
9	27	77	399	50	245	1,660	429	203	203	385	43	40
10	25	67	301	72	140	971	474	287	371	259	41	43
11	26	62	245	935	128	536	414	273	301	231	41	39
12	27	58	315	1,150	116	504	329	245	189	203	33	31
13	23	58	827	1,150	116	687	287	203	128	168	31	27
14	29	54	1,300	953	122	881	287	189	128	140	34	28
15	35	54	1,980	738	134	845	231	175	110	116	36	28
16	40	58	1,780	459	203	568	203	154	99	110	31	30
17	41	58	1,130	585	189	474	175	134	82	94	33	30
18	42	62	602	687	128	429	175	122	619	88	28	27
19	45	62	371	414	122	399	168	116	1,030	77	28	25
20	67	62	399	301	116	414	161	110	738	72	40	28
21	94	54	687	245	41	329	175	99	568	67	287	31
22	77	58	670	175	54	273	385	88	755	62	203	50
23	62	58	670	140	38	414	489	88	520	62	94	99
24	54	54	1,070	122	29	602	399	203	329	58	58	62
25	58	58	1,190	82	44	755	273	429	385	54	48	43
26	58	54	1,010	94	67	881	203	329	504	50	40	33
27	48	54	670	67	77	1,050	175	203	357	54	39	30
28	50	54	791	47	77	1,190	154	168	429	54	38	29
29	50	54	845	110	217	1,780	154	134	1,030	47	32	38
30	58	67	670	881	-	2,980	147	116	1,270	47	27	34
31	67	-	414	1,110	-	3,510	-	104	-	50	29	-

Note.- Stage-discharge relation affected by ice Jan. 5-10, 21-30, Feb. 19-25.

Discharge, in second-feet, of Tiffin River at Stryker, Ohio, 1921-28, 1948-49--Continued

1924-25

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	31	27	19	40	357	198	92	40	21	24	14
2	40	32	27	17	43	343	185	92	36	18	33	21
3	35	33	33	19	41	273	172	92	38	18	32	17
4	28	38	38	20	41	175	152	86	35	22	43	14
5	31	31	38	20	44	175	140	86	36	30	23	13
6	31	36	41	21	140	189	133	109	32	38	17	14
7	28	37	46	20	385	231	127	109	30	45	16	14
8	27	34	72	19	899	287	115	97	30	75	18	16
9	30	29	175	18	1,170	287	109	92	24	58	19	17
10	27	31	147	18	1,230	315	109	86	26	56	21	16
11	27	36	50	18	1,840	399	115	80	29	51	17	15
12	25	33	62	19	1,400	602	109	75	29	75	17	21
13	25	37	58	22	1,050	474	109	70	23	133	21	40
14	25	35	50	21	687	1,720	92	61	38	211	26	50
15	24	38	38	22	273	3,370	97	61	49	267	23	49
16	26	41	43	20	231	3,370	103	60	46	55	26	44
17	27	41	48	21	189	2,860	97	92	70	45	24	51
18	28	35	58	20	128	2,860	86	121	70	39	18	48
19	29	27	147	23	140	2,980	97	97	59	38	17	44
20	30	31	357	18	128	3,370	97	86	40	27	19	44
21	29	41	399	14	168	2,980	92	70	25	23	16	45
22	28	41	315	16	357	2,630	92	63	24	24	13	36
23	28	42	245	23	738	1,720	86	56	22	21	12	27
24	30	41	189	21	1,110	1,030	86	53	26	19	12	24
25	34	38	82	23	1,360	752	80	46	29	20	11	21
26	31	27	58	23	1,380	598	70	43	35	21	10	20
27	29	34	38	29	1,320	485	70	48	46	22	10	29
28	30	34	30	24	881	380	65	44	36	19	10	58
29	27	25	27	22	-	309	65	50	29	18	10	80
30	25	25	18	25	-	253	70	46	22	15	10	70
31	29	-	20	31	-	225	-	43	-	17	10	-

1925-26

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44	90	150	63	365	3,510	1,310	208	68	47	21	48
2	30	80	150	68	517	2,230	1,500	169	68	44	38	320
3	32	74	150	63	425	1,910	1,840	156	63	38	44	364
4	40	80	182	62	320	1,330	1,780	143	58	36	36	250
5	63	74	365	68	236	989	1,840	131	49	38	32	306
6	131	74	683	119	195	632	1,910	125	49	32	26	320
7	102	80	598	143	222	485	2,230	119	58	30	25	156
8	80	320	440	222	264	1,010	3,510	113	54	31	22	107
9	68	700	278	182	195	717	3,650	107	57	34	21	85
10	52	615	236	63	195	485	3,240	102	48	35	20	63
11	59	350	169	68	222	365	2,060	85	49	42	20	55
12	55	278	195	74	150	485	1,500	85	48	41	29	49
13	50	700	169	68	119	549	1,210	85	182	41	53	51
14	48	1,070	150	62	107	410	770	80	717	35	85	48
15	47	1,170	107	58	125	306	533	85	395	32	42	46
16	46	1,150	113	59	156	250	455	80	169	29	44	80
17	45	989	107	51	169	222	395	80	102	28	36	85
18	48	824	113	470	425	169	306	74	80	26	29	68
19	63	683	113	1,170	914	278	264	80	74	26	29	59
20	59	788	85	1,270	860	806	222	80	60	23	32	53
21	55	806	107	1,400	632	1,090	195	74	52	18	150	46
22	53	632	96	1,460	395	1,230	195	74	42	18	74	42
23	47	485	96	1,420	335	1,380	195	74	46	25	51	292
24	53	380	113	951	278	1,460	222	80	42	25	39	1,050
25	55	306	85	598	1,480	1,480	236	74	37	19	32	1,250
26	53	264	119	440	2,860	1,440	264	90	33	18	29	1,420
27	68	236	107	350	4,070	1,150	236	150	33	20	28	1,360
28	131	208	85	365	3,930	842	222	107	36	19	28	1,190
29	102	195	74	264	-	565	264	85	36	16	24	770
30	102	169	68	208	-	470	250	68	29	16	63	470
31	90	-	63	236	-	717	-	68	-	18	96	-

Discharge, in second-feet, of Tiffin River at Stryker, Ohio, 1921-28, 1948-49--Continued

1926-27

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	335	565	425	169	1,480	278	264	208	85	74	33	14
2	970	365	320	222	1,720	250	335	182	74	68	27	14
3	1,110	278	236	107	1,460	222	440	150	80	57	20	14
4	989	208	222	107	1,380	222	425	137	788	55	21	14
5	717	182	182	107	1,360	250	970	125	806	49	17	12
6	565	156	150	119	1,480	335	1,170	119	335	45	17	13
7	440	150	131	131	1,720	632	989	113	143	48	18	13
8	306	137	169	102	2,140	1,010	517	102	113	44	17	14
9	236	131	195	102	1,780	1,090	350	96	380	41	23	13
10	195	156	169	119	1,380	860	264	96	365	38	21	17
11	169	195	182	74	842	565	222	96	137	36	20	28
12	143	195	182	90	549	598	169	85	102	35	17	37
13	137	169	264	74	395	951	169	80	90	31	16	31
14	131	169	683	68	306	1,250	182	80	74	32	17	31
15	125	156	581		292	1,330	195	90	74	35	16	43
16	113	156	440		365	1,270	169	102	63	32	23	32
17	113	156	470		649	914	182	96	59	44	18	25
18	119	222	440	60	896	598	208	113	74	46	16	26
19	143	306	365		914	615	365	137	90	36	18	32
20	156	278	278		666	806	455	150	85	32	16	30
21	143	222	195		533	1,290	395	131	80	30	16	25
22	131	182	169		425	1,360	320	113	1,050	34	16	26
23	143	169	143		425	1,210	278	102	1,360	35	17	23
24	169	156	156		440	788	236	107	1,170	31	18	20
25	264	169	278	90	734	501	208	131	649	30	19	20
26	264	517	455		700	440	292	143	410	28	19	22
27	208	1,070	335		410	485	485	182	169	23	18	21
28	169	1,130	222	74	320	485	501	131	119	23	16	20
29	156	878	182	156	-	395	365	113	102	25	15	29
30	306	565	208	1,290	-	335	278	102	80	21	15	59
31	615	-	182	1,460	-	278	-	96	-	28	15	-

Note.- Stage-discharge relation affected by ice Jan. 15-27.

1927-28

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	102	57	1,980				878	156	90	581	48	38
2	102	53	3,790		300		1,110	156	90	501	42	30
3	137	53	3,510			300	1,150	137	80	320	39	32
4	113	55	2,630		292		1,030	131	85	195	38	31
5	74	58	1,840		951		788	131	102	143	38	24
6	61	58	1,310	550	1,090	182	649	125	250	107	48	22
7	51	58	1,070		1,170	222	752	131	683	96	53	25
8	42	59	1,380		1,190	264	1,130	119	752	90	48	20
9	39	53	2,140		1,230	208	1,250	113	549	80	41	20
10	45	57	2,980		1,250	264	1,230	107	410	85	36	23
11	42	55	3,110	1,010	1,230	182	878	107	278	90	34	27
12	42	60	2,060	1,110	970	182	598	102	182	74	32	24
13	42	61	1,440	1,190	683	306	470	96	143	63	30	25
14	48	80	2,740	1,050	649	842	425	90	113	59	29	28
15	63	68	4,970	1,010	1,270	989	455	85	113	49	26	32
16	63	63	4,520	951	1,440	842	440	90	96	63	26	35
17	58	62	3,110	770	1,310	598	350	107	80	55	27	37
18	49	63	2,860	615	1,150	440	306	131	74	48	28	35
19	48	57		734	666	395	278	182	85	45	26	28
20	44	50		1,190		335	250	250	96	102	25	26
21	44	52		1,250		306	236	264	85	250	27	28
22	44	54		1,230		306	410	208	80	131	23	30
23	42	53	600	1,130		335	549	156	80	107	23	28
24	42	68		896		365	470	131	74	102	31	28
25	45	85		824	400	425	365	250	68	85	32	30
26	42	96		824		501	292	264	63	68	30	32
27	48	102		752		581	236	222	61	61	30	30
28	49	380	350	632		598	208	150	61	107	28	32
29	55	734	470			485	195	119	74	85	20	35
30	49	1,110	717	400	-	440	169	107	250	68	28	32
31	53	-	951		-	455	-	102	-	54	48	-

Note.- Stage-discharge relation affected by ice Dec. 19-27, Jan. 1-10, Jan. 29 to Feb. 3, Feb. 20 to Mar. 5.

Discharge, in second-feet, of Tiffin River at Stryker, Ohio, 1921-28, 1948-49--Continued

1948-49

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	26	81	702	a600	536	838	a260	85	85	27	42
2	32	26	74	425	a450	414	1,110	288	76	68	27	31
3	29	30	71	299	a360	362	a1,400	383	70	58	34	27
4	24	36	68	206	299	320	1,090	246	66	50	32	27
5	23	52	68	853	288	320	785	192	60	45	29	59
6	23	125	71	1,260	252	341	468	165	55	40	27	128
7	a25	192	79	1,430	241	330	372	a140	51	64	23	80
8	23	148	70	1,510	257	299	a310	a120	46	102	23	55
9	27	85	60	1,230	404	278	a270	107	45	65	20	49
10	29	64	58	856	524	268	a240	102	44	69	19	38
11	34	72	55	586	457	257	216	85	42	75	19	31
12	32	72	64	468	352	231	197	81	42	61	20	27
13	32	61	65	382	372	211	188	79	48	49	27	27
14	32	56	66	299	586	197	180	76	102	45	24	36
15	a30	51	165	262	1,930	188	241	69	101	40	23	40
16	a30	49	468	330	3,820	176	a350	65	202	38	20	36
17	a35	49	468	524	3,680	161	a450	64	425	34	24	32
18	32	64	320	657	2,840	161	404	59	457	32	85	48
19	30	82	216	1,550	2,060	152	457	81	479	32	107	148
20	31	278	176	1,790	1,630	143	414	278	310	32	66	126
21	a30	414	157	2,060	1,290	138	341	310	197	32	44	75
22	29	310	161	1,790	990	148	288	404	188	38	38	54
23	29	206	169	1,320	856	320	a260	512	216	45	28	42
24	29	161	133	820	802	501	a230	446	165	34	26	36
25	29	133	a110	586	874	436	216	320	120	31	23	32
26	27	111	a100	560	912	a380	192	221	102	27	21	29
27	27	105	98	656	912	a350	330	169	90	26	20	27
28	27	102	92	1,140	751	a400	436	148	84	24	22	26
29	27	96	412	1,350	-	299	299	138	94	23	25	25
30	26	88	718	a1,200	-	268	a240	111	101	25	23	24
31	27	-	785	a900	-	436	-	94	-	27	27	-

Peak discharge (base, 1,400 sec.-ft.).- Jan. 8 (6 a.m.) 1,550 sec.-ft.; Jan. 21 (4 p.m.) 2,060 sec.-ft.; Feb. 16 (9 p.m.) 4,240 sec.-ft.

a No gage-height record; discharge computed on basis of weather records and records for Maumee River at Antwerp.

Note.- Computed from graph based on once-daily staff-gage readings Mar. 29 to Apr. 2, Apr. 4-7, 11-15, 18-22, 25-29, May 2-6, 9-11.

Monthly discharge, in second-feet, 1921-28, 1948-49

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October 1921	2,086	215	36	67.3	0.150	0.17
November	10,206	1,220	52	340	.756	.84
December	12,723	1,310	133	410	.911	1.05
Calendar year	-	-	-	-	-	-
January 1922	7,055	1,020	-	228	.507	.58
February	7,640	476	-	273	.607	.63
March	25,593	2,860	260	826	1.84	2.12
April	53,817	4,520	380	1,794	3.99	4.45
May	13,372	970	146	431	.958	1.10
June	2,658	173	40	88.6	.197	.22
July	1,644	140	32	53.0	.118	.14
August	871	39	19	28.1	.062	.07
September	1,732	305	20	57.7	.128	.14
Water year 1921-22	139,397	4,520	19	382	.849	11.51
October 1922	1,393	61	22	44.9	.100	.12
November	2,105	83	46	70.2	.156	.17
December	2,309	173	44	74.5	.166	.19
Calendar year	-	-	-	-	-	-
January 1923	6,493	588	66	209	.464	.53
February	6,697	-	-	239	.531	.55
March	34,775	3,240	173	1,122	2.49	2.87
April	7,304	826	89	243	.540	.60
May	8,838	1,170	59	285	.633	.73
June	2,576	245	31	85.9	.191	.21
July	1,045	78	21	33.7	.075	.09
August	3,718	844	16	120	.267	.31
September	3,168	808	19	106	.236	.26
Water year 1922-23	80,421	3,240	16	220	.489	6.63
October 1923	1,424	94	23	45.9	.102	.12
November	1,870	88	54	62.3	.138	.15
December	22,388	1,980	116	722	1.60	1.84
Calendar year	-	-	-	-	-	-
January 1924	11,939	1,150	-	385	.856	.99
February	7,359	1,150	-	254	.564	.61
March	35,333	4,070	273	1,140	2.53	2.92
April	13,600	2,860	147	453	1.01	1.13
May	5,079	429	88	164	.364	.42
June	10,895	1,270	82	363	.807	.90
July	7,990	1,660	47	258	.573	.66
August	1,674	287	27	54.0	.120	.14
September	1,094	99	25	36.5	.081	.09
Water year 1923-24	120,645	4,070	23	330	.733	9.97

Monthly discharge, in second-feet, of Tiffin River at Stryker, Ohio, 1921-28, 1948-49--Continued

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October 1924	897	40	24	28.9	0.064	0.07
November	1,034	42	25	34.5	.077	.09
December	2,976	399	18	96.0	.213	.25
Calendar year	-	-	-	-	-	-
January 1925	646	31	14	20.8	.046	.05
February	17,413	1,840	40	622	1.38	1.44
March	35,999	3,370	175	1,161	2.58	2.97
April	3,218	198	65	107	.238	.27
May	2,306	121	43	74.4	.165	.19
June	1,074	70	22	35.8	.080	.09
July	1,541	267	15	49.7	.110	.13
August	578	43	10	18.6	.041	.05
September	972	80	13	32.4	.072	.08
Water year 1924-25	68,654	3,370	10	188	.418	5.68
October 1925	1,971	131	30	63.6	.141	.16
November	13,870	1,170	74	462	1.03	1.15
December	5,566	683	63	180	.400	.46
Calendar year	-	-	-	-	-	-
January 1926	12,095	1,460	51	390	.867	1.00
February	20,161	4,070	107	720	1.60	1.67
March	28,962	3,510	169	934	2.08	2.40
April	32,804	3,650	195	1,093	2.43	2.71
May	3,131	208	68	101	.224	.26
June	2,834	717	29	94.5	.210	.23
July	900	47	16	29.0	.064	.07
August	1,298	150	20	41.9	.093	.11
September	10,403	1,420	42	347	.771	.86
Water year 1925-26	133,995	4,070	16	367	.816	11.08
October 1926	9,780	1,110	113	315	.700	.81
November	9,388	1,130	131	313	.696	.78
December	8,609	683	131	278	.618	.71
Calendar year	-	-	-	-	-	-
January 1927	5,531	1,460	-	178	.396	.46
February	25,761	2,140	292	920	2.04	2.12
March	21,613	1,360	222	697	1.55	1.79
April	11,398	1,170	169	380	.844	.94
May	3,708	208	80	120	.267	.31
June	9,206	1,360	59	307	.682	.76
July	1,186	74	21	38.3	.085	.10
August	575	33	15	18.5	.041	.05
September	718	59	12	23.9	.053	.06
Water year 1926-27	107,473	2,140	12	294	.653	8.89
October 1927	1,778	137	39	57.4	.128	.15
November	3,914	1,110	50	130	.289	.32
December	55,328	4,970	350	1,785	3.97	4.58
Calendar year	-	-	-	-	-	-
January 1928	23,868	1,250	-	770	1.71	1.97
February	21,441	1,440	-	739	1.64	1.77
March	12,548	989	182	405	.900	1.04
April	17,547	1,250	169	585	1.30	1.45
May	4,519	264	85	146	.324	.37
June	5,247	752	61	175	.389	.43
July	3,964	581	45	128	.284	.33
August	1,034	53	20	33.4	.074	.09
September	867	38	20	28.9	.064	.07
Water year 1927-28	152,055	4,970	20	415	.922	12.57
October 1948	894	35	23	28.8	.065	.07
November	3,344	414	26	111	.250	.28
December	5,698	785	55	184	.414	.48
Calendar year 1948	112,735	2,760	15	308	.694	9.43
January 1949	27,981	2,060	206	903	2.03	2.34
February	28,789	3,820	241	1,028	2.32	2.42
March	9,021	536	138	291	.655	.76
April	12,812	1,400	180	427	.962	1.07
May	5,813	512	59	188	.423	.49
June	4,163	479	42	139	.313	.35
July	1,416	102	23	45.7	.103	.12
August	973	107	19	31.4	.071	.08
September	1,457	148	24	48.6	.109	.12
Water year 1948-49	102,361	3,820	19	280	.631	8.58

Auglaize River near Fort Jennings, Ohio

Location.- Water-stage recorder, lat. 40°56'55", long. 84°15'58", in SE¼ sec. 15, T. 1 S., R. 5 E., at highway bridge 3½ miles northeast of Fort Jennings and 6 miles upstream from Ottawa River. Datum of gage is 713.9 feet above mean sea level, adjustment of 1912.
Drainage area.- 333 square miles.
Records available.- August 1921 to December 1935, October 1940 to September 1949.
Average discharge.- 23 years, 283 second-feet.
Extremes.- Maximum discharge during year, 5,180 second-feet Jan. 6 (gage height, 14.40 feet); minimum, 6.6 second-feet Oct. 10, 11 (gage height, 1.20 feet).
1921-35, 1940-49: Maximum discharge, 8,200 second-feet Jan. 15, 1930 (gage height, 16.6 feet); minimum, 5.0 second-feet Aug. 28, 1932 (gage height, 0.75 foot).
Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Some diversion from Lake St. Marys by Miami & Erie Canal into Jennings Creek, tributary to Auglaize River above station.
Revisions (water years).- W 744: 1932. W 974: 1930(M).

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Nov. 8, May 28 to June 16, Aug. 2-18, Sept. 11-30)

1.2	7.0	1.8	40	6.5	990
1.3	10	1.9	50	8.5	1,620
1.4	13	2.1	75	11.0	2,640
1.5	18	3.0	208	12.5	3,450
1.6	24	4.2	406	13.4	4,160
1.7	31	5.0	578		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	10	454	a400	a250	280	519	208	78	232	753	180
2	18	10	280	a350	*b170	232	406	328	71	174	280	208
3	13	12	208	a300	b160	216	312	415	63	106	152	96
4	11	25	168	a250	b170	194	248	232	56	60	83	66
5	11	34	142	1,390	b180	200	205	171	50	46	56	61
6	11	70	129	4,070	b190	200	190	140	48	42	46	46
7	11	184	120	4,160	b210	168	174	117	45	41	37	39
8	10	216	109	1,170	b200	140	154	103	39	36	33	39
9	8.5	116	92	814	b200	135	135	95	36	182	29	40
10	7.0	90	86	730	206	146	120	89	36	194	23	33
11	9.7	76	90	990	184	148	110	86	36	89	28	30
12	11	88	75	704	177	156	104	79	35	62	30	30
13	14	79	169	508	160	178	106	72	35	45	47	30
14	16	78	497	434	190	216	106	68	37	37	40	29
15	22	100	644	415	1,750	320	116	68	40	31	36	26
16	19	106	2,240	680	3,740	362	124	66	120	33	33	24
17	19	86	2,830	1,260	2,880	264	146	122	982	146	38	25
18	20	74	2,180	1,510	758	248	495	122	1,020	89	54	29
19	16	170	614	*3,000	486	304	639	96	434	52	280	30
20	14	1,170	397	3,660	362	272	388	129	256	46	232	28
21	36	1,020	320	a1,400	280	406	272	134	166	49	122	28
22	40	397	362	a700	438	614	224	997	107	45	67	28
23	32	240	354	a600	1,200	578	224	1,580	76	248	49	27
24	25	174	264	a1,000	*870	415	296	900	62	202	39	26
25	20	136	200	1,580	900	304	240	486	56	106	33	25
26	17	114	202	1,440	814	272	183	328	50	62	31	23
27	14	164	177	2,460	444	1,430	493	224	49	48	28	23
28	12	388	159	3,140	354	2,730	1,050	172	57	40	33	30
29	11	493	794	3,380	-	1,400	424	135	90	36	454	244
30	11	930	2,200	a1,500	-	497	272	109	146	41	566	240
31	10	-	1,200	a600	-	454	-	88	-	483	362	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	510.2	40	7.0	16.5		
November	6,850	1,170	10	228		
December	17,756	2,830	75	573		
Calendar year 1948	130,067.8	3,920	7.0	355		
January	44,595	4,160	250	1,439		
February	17,923	3,740	160	640		
March	13,479	2,730	135	435		
April	8,475	1,050	104	282		
May	7,959	1,580	66	257		
June	4,376	1,020	35	146		
July	3,103	483	31	100		
August	4,094	753	23	132		
September	1,783	244	23	59.4		
Water year 1948-49	130,903.2	4,160	7.0	359		

Peak discharge (base, 2,700 sec.-ft.).- Dec. 18 (2 a.m.) 2,980 sec.-ft.; Jan. 6 (12 p.m.) 5,180 sec.-ft.; Jan. 20 (3 a.m.) 3,900 sec.-ft.; Jan. 29 (6 a.m.) 3,590 sec.-ft.; Feb. 16 (8 p.m.) 3,980 sec.-ft.; Mar. 28 (1 p.m.) 2,830 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records and records for Ottawa River at Allentown and Blanchard River near Findlay.
b Stage-discharge relation affected by ice.

Auglaize River near Defiance, Ohio

Location.- Water-stage recorder, lat. 41°14'15", long. 84°24'02", in NE¼ sec. 9, T. 3 N., R. 4 E., 125 feet downstream from dam and power plant of Toledo Edison Co., a quarter of a mile upstream from Jackson ditch, and 3 miles south of Defiance. Datum of gage is 660.00 feet above mean sea level, adjustment of 1912.
Drainage area.- 2,329 square miles.
Records available.- April 1915 to December 1935, October 1940 to September 1949. May to August 1903 at site at highway bridge 1½ miles downstream.
Average discharge.- 29 years (1915-35, 1940-49), 1,627 second-feet.
Extremes.- Maximum discharge during year, 22,600 second-feet May 23 (gage height, 17.61 feet); minimum daily, 28 second-feet Oct. 2.
1915-35, 1940-49: Maximum discharge, 48,000 second-feet May 19, 1943 (gage height, 25.5 feet, from floodmark); minimum daily, 6 second-feet Oct. 17, 1923.
Flood of March 1913 reached a stage of 38.8 feet, from reading on power plant tail-water gage at present datum (discharge, 120,000 second-feet, from rating curve extended above 51,000 second-feet).
Remarks.- Records good except those for periods of no gage-height record, which are fair. Flow regulated by power plant above station. Some diversion by Miami & Erie Canal from Lake St. Marys into Jennings Creek, tributary to Auglaize River above station.
Revisions (water years).- W 759: Drainage area. W 954: 1941.

Rating table, water year 1948-49
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to May 23						May 24 to Sept. 30			
4.5	28	6.0	765	11.0	7,500	4.6	38	5.1	210
4.6	57	6.5	1,170	13.0	11,400	4.7	58	5.5	430
4.8	130	7.0	1,640	16.8	20,500	4.8	86	6.0	765
5.1	256	8.0	2,720			4.9	121		
5.5	455	9.0	4,070						

Note.- Same as preceding table above 6.0 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	177	134	2,510	4,700	a4,500	2,140	3,350	1,220	42	602	1,890	578
2	28	236	1,900	3,700	a2,500	1,610	3,350	2,290	47	634	1,570	444
3	33	280	1,250	a2,300	1,400	1,010	2,720	2,580	51	323	980	212
4	36	115	380	1,590	1,430	1,440	1,820	1,960	49	414	492	298
5	36	388	664	2,840	832	592	1,340	696	260	290	51	546
6	96	74	1,450	9,400	1,070	1,170	1,310	778	260	762	47	42
7	127	358	316	12,300	1,400	1,160	850	720	190	3,160	47	408
8	114	1,820	358	9,400	1,070	631	833	494	184	1,890	166	298
9	28	1,950	478	5,370	1,050	860	834	604	223	1,000	121	43
10	31	1,460	551	4,700	1,200	610	590	341	171	2,990	51	150
11	152	421	68	4,540	1,190	788	556	417	202	1,230	47	42
12	74	613	68	4,540	260	739	587	444	102	296	736	188
13	120	546	379	3,630	896	798	576	228	186	484	45	151
14	36	938	480	2,660	1,750	868	608	344	364	284	193	43
15	41	57	2,050	2,260	8,450	954	1,130	241	539	164	462	43
16	36	428	6,060	2,780	17,000	1,450	408	287	2,630	127	49	43
17	36	476	9,800	3,350	20,200	1,170	1,230	312	9,300	219	542	152
18	156	462	8,640	7,140	13,800	1,040	2,550	375	10,600	326	250	43
19	38	1,150	5,540	13,800	7,320	1,030	3,280	861	6,960	107	282	54
20	176	2,680	3,630	17,000	4,700	1,070	3,170	2,740	4,180	244	719	47
21	36	3,420	2,150	14,600	3,490	944	1,770	1,720	2,790	242	468	162
22	210	3,490	1,490	7,690	3,160	2,300	1,920	11,300	1,360	508	222	47
23	33	2,510	1,640	4,700	3,280	2,210	1,940	20,500	520	272	268	49
24	33	1,390	1,550	3,280	4,860	2,290	1,490	20,500	638	380	172	54
25	36	240	534	5,710	5,370	1,900	1,390	12,700	472	343	49	54
26	155	1,310	432	8,640	5,540	1,420	398	7,140	56	156	149	54
27	36	510	992	11,200	4,220	2,520	2,160	5,710	178	152	200	56
28	36	1,240	737	16,500	3,090	7,690	2,760	832	841	116	42	56
29	36	2,050	3,050	17,200	-	7,880	2,400	1,210	2,670	302	426	584
30	33	2,620	8,260	12,700	-	4,380	790	872	1,870	49	1,200	206
31	36	-	8,450	a9,000	-	3,560	-	498	-	949	877	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,251	210	28	72.6		
November	33,366	3,490	57	1,112		
December	75,857	9,800	68	2,447		
Calendar year 1948	770,236	30,100	28	2,104		
January	229,220	17,200	1,590	7,394		
February	125,028	20,200	260	4,465		
March	58,224	7,880	592	1,878		
April	48,110	3,350	398	1,604		
May	100,914	20,500	228	3,255		
June	47,935	10,600	42	1,598		
July	19,015	3,160	49	613		
August	12,813	1,890	42	413		
September	5,147	584	42	172		
Water year 1948-49	757,880	20,500	28	2,076		

Peak discharge (base, 13,000 sec.-ft.).- Jan. 20 (3 p.m.) 17,400 sec.-ft.; Jan. 29 (12 m.) 17,900 sec.-ft.; Feb. 17 (11 a.m.) 20,700 sec.-ft.; May 23 (12 p.m.) 22,600 sec.-ft.; June 17 (3 p.m.) 13,200 sec.-ft.
a No gage-height record; discharge computed on basis of power-plant records and records for Maumee River near Defiance.

Ottawa River at Allentown, Ohio

Location.- Water-stage recorder and concrete control, lat. 40°45'18", long. 84°11'41", in NW¼ sec. 29, T. 3 S., R. 6 E., at highway bridge at Allentown, Allen County, 0.3 mile downstream from Kessler Run. Datum of gage is 789.67 feet above mean sea level, adjustment of 1912.
Drainage area.- 168 square miles.
Records available.- October 1923 to December 1935, August 1943 to September 1949.
Average discharge.- 18 years, 122 second-feet.
Extremes.- Maximum discharge during year, 2,380 second-feet Feb. 15 (gage height, 7.30 feet); minimum, 9.2 second-feet Oct. 25 (gage height, 2.32 feet).
1923-35, 1943-49: Maximum discharge, 4,490 second-feet (revised) Apr. 11, 1944 (gage height, 9.00 feet); minimum, 1.4 second-feet June 28, 29, 1933.
Flood of Mar. 15, 1939, reached a stage of 10.1 feet and flood of May 1943, a stage of about 10 feet (discharge not determined).
Revisions.- The maximum discharge for the water year 1944 has been revised to 4,490 second-feet Apr. 11, 1944, superseding figure published in Water-Supply Paper 1004.
Remarks.- Records good except those for periods of no gage-height record, which are fair. Diurnal fluctuation and some regulation due to operation of water supply and sewage-treatment plants of city of Lima above station.
Revisions (water years).- W 744: 1927(M). W 1004: 1924.

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Nov. 5, May 28 to June 14, June 24 to July 29)

Oct. 1 to Feb. 14

2.3	9.5	3.0	50	3.6	189
2.4	12	3.1	63	3.8	277
2.5	16	3.2	79	4.0	392
2.7	26	3.3	99	4.6	815
2.8	32	3.4	124	6.0	1,550
2.9	40	3.5	154	6.8	2,000

Feb. 15 to Sept. 30

3.2	79	3.7	248
3.3	100	3.9	370
3.4	126	4.4	740
3.5	158	5.0	1,120
3.6	199	6.6	1,920

Note.- Same as preceding table below 3.2 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	22	151	139	a130	108	183	104	27	54	29	29
2	16	16	99	89	91	90	145	265	28	24	24	25
3	14	22	89	a65	85	79	96	186	24	30	24	35
4	14	34	73	a150	95	73	79	108	22	26	24	31
5	17	33	63	1,760	58	59	77	76	21	24	21	27
6	17	133	66	1,220	76	81	69	59	21	40	20	22
7	18	97	60	580	79	69	65	48	22	74	17	24
8	19	35	41	468	79	47	65	46	19	26	19	35
9	19	27	38	380	77	51	53	48	18	22	24	23
10	14	48	34	392	83	62	44	38	18	22	20	20
11	58	39	27	440	69	74	42	30	18	17	32	18
12	24	30	52	263	66	71	40	30	20	19	64	17
13	18	37	139	172	74	87	44	30	19	18	34	22
14	18	33	154	178	113	113	44	29	128	19	28	23
15	17	27	852	158	1,890	126	62	45	132	19	28	19
16	28	24	990	293	1,120	90	94	33	305	18	43	17
17	54	26	550	645	600	87	162	28	635	16	30	17
18	24	23	263	1,030	364	116	408	26	585	20	36	26
19	20	265	154	2,000	209	123	271	28	408	21	54	17
20	17	446	119	875	118	129	142	79	209	19	41	17
21	15	244	104	498	79	248	103	45	116	21	32	17
22	14	124	130	a350	369	294	105	334	77	20	29	17
23	14	79	114	a400	548	248	162	271	62	18	27	20
24	12	59	87	a600	294	136	162	199	44	16	25	16
25	10	51	65	a800	370	98	105	121	37	16	22	14
26	14	58	48	a750	224	105	83	90	39	18	22	14
27	14	182	53	1,020	183	1,100	470	63	47	18	21	17
28	14	201	43	1,760	142	663	259	47	31	19	24	24
29	16	406	904	845	-	344	136	41	30	24	48	20
30	14	277	776	460	-	158	92	39	32	127	26	20
31	15	-	304	255	-	100	-	35	-	104	62	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	597	58	10	19.3	0.115	0.13
November	3,098	446	16	103	.613	.68
December	6,642	990	27	214	1.27	1.46
Calendar year 1948	55,790	2,070	10	152	.905	12.33
January	19,015	2,000	65	613	3.65	4.21
February	7,685	1,890	58	274	1.63	1.70
March	5,229	1,100	47	169	1.01	1.16
April	3,862	470	40	129	.768	.86
May	2,601	334	26	83.9	.499	.58
June	3,194	635	18	106	.631	.70
July	929	127	16	30.0	.179	.21
August	950	64	17	30.6	.182	.21
September	643	35	14	21.4	.127	.14
Water year 1948-49	54,445	2,000	10	149	.887	12.04

Peak discharge (base, 1,600 sec.-ft.).- Jan. 5 (7 p.m.) 2,140 sec.-ft.; Jan. 19 (9:30 a.m.) 2,280 sec.-ft.; Jan. 28 (9:30 a.m.) 2,070 sec.-ft.; Feb. 15 (4 p.m.) 2,380 sec.-ft.
a No gage-height record; discharge computed on basis of weather records and records for Auglaize River at Fort Jennings and Blanchard River near Findlay.

Blanchard River near Findlay, Ohio

Location.- Water-stage recorder, lat. 41°03'21", long. 83°41'17", on east line sec. 10, T. 1 N., R. 10 E., at highway bridge 2 miles west of Findlay. Datum of gage is 754.55 feet above mean sea level.
Drainage area.- 343 square miles.
Records available.- November 1923 to December 1935, October 1940 to September 1949.
Average discharge.- 20 years (1924-35, 1940-49), 228 second-feet.
Extremes.- Maximum discharge during year, 3,900 second-feet Feb. 16 (gage height, 10.17 feet); minimum, 4.5 second-feet Sept. 30 (gage height, 0.85 foot).
1923-35, 1940-49: Maximum discharge, 9,300 second-feet Dec. 1, 1927 (gage height, 14.5 feet); minimum, 0.4 second-foot Aug. 26, 27, Sept. 3, 1934.
Flood of March 1913 reached a stage of 18.5 feet (discharge, 22,000 second-feet, from rating curve extended above 9,500 second-feet).
Remarks.- Records good.
Revisions (water years).- W 974: 1942. W 1054: 1927-30, 1933(M), 1945.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used May 27 to June 15, Aug. 20-30, Sept. 3-30)

0.7	2.5	1.1	23	1.5	76	3.0	595
.8	5.0	1.2	33	1.7	118	5.0	1,300
.9	9.0	1.3	45	2.0	195	7.0	2,100
1.0	15	1.4	59	2.2	263	9.0	3,070

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	392	24	426	346	259	224	648	137	71	112	440	45
2	132	18	245	263	189	195	435	778	62	144	123	109
3	52	26	173	175	162	175	271	770	53	92	59	55
4	31	30	144	152	181	162	198	346	46	48	34	32
5	20	63	130	1,620	164	164	162	187	41	34	24	28
6	16	837	118	2,570	150	157	164	132	39	31	15	14
7	14	1,540	98	1,740	170	125	175	105	37	419	14	15
8	13	1,340	80	682	157	109	160	82	31	290	14	22
9	10	414	73	630	178	100	125	74	29	123	13	13
10	10	234	59	612	160	114	105	64	28	111	12	13
11	28	217	43	682	107	116	94	56	27	94	20	13
12	55	175	59	535	109	120	86	53	34	48	20	12
13	142	142	195	364	140	137	90	46	72	33	67	13
14	64	227	471	291	221	162	88	45	69	26	56	11
15	38	205	902	252	2,410	221	192	49	105	22	39	7.8
16	31	142	2,220	351	3,070	224	346	59	868	17	30	7.8
17	31	109	1,780	910	1,740	178	299	56	1,300	21	175	7.4
18	254	96	875	1,340	648	187	648	45	1,050	16	224	10
19	254	348	422	3,020	459	214	630	48	503	16	342	7.8
20	111	980	275	1,980	346	192	360	128	224	32	144	7.0
21	62	980	231	752	263	299	224	178	137	39	66	6.6
22	44	463	303	443	548	491	234	1,820	92	31	37	6.6
23	35	234	263	387	1,050	515	387	2,370	62	22	28	6.2
24	31	167	189	858	805	426	329	1,020	48	21	22	6.2
25	29	125	123	1,160	875	263	211	575	43	15	17	5.4
26	27	118	105	1,500	665	221	180	342	39	11	16	6.2
27	26	502	98	2,140	439	1,540	252	211	38	13	16	13
28	24	630	96	5,020	337	1,780	503	167	34	12	21	17
29	23	700	1,200	2,180	-	910	256	125	31	14	18	5.4
30	21	735	1,860	910	-	401	160	100	29	27	14	4.8
31	21	-	875	435	-	515	-	86	-	528	31	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,041	392	10	65.8	0.192	0.22
November	11,821	1,540	18	394	1.15	1.28
December	13,931	2,220	43	449	1.31	1.51
Calendar year 1948	123,690.0	4,290	4.2	338	.985	13.40
January	32,300	3,020	152	1,042	3.04	3.50
February	16,002	3,070	107	572	1.67	1.74
March	10,637	1,780	100	343	1.00	1.15
April	7,992	648	86	266	.776	.87
May	10,254	2,370	45	331	.965	1.11
June	5,242	1,300	27	175	.510	.57
July	2,462	528	11	79.4	.231	.27
August	2,149	440	12	69.3	.202	.23
September	520.2	109	4.8	17.3	.050	.06
Water year 1948-49	115,351.2	3,070	4.8	316	.921	12.51

Peak discharge (base, 2,400 sec.-ft.).- Jan. 6 (2 a.m.) 2,720 sec.-ft.; Jan. 19 (12 m.) 3,190 sec.-ft.; Jan. 28 (3 p.m.) 3,310 sec.-ft.; Feb. 16 (1 a.m.) 3,900 sec.-ft.; May 23 (4 a.m.) 2,870 sec.-ft.

Blanchard River at Glandorf, Ohio

Location.- Wire-weight gage, lat. 41°02'40", long. 84°04'55", in NE¼ sec. 17, T. 1 N., R. 7 E., at highway bridge half a mile upstream from Pike Run and three-quarters of a mile north of Glandorf.
Drainage area.- 643 square miles.
Records available.- August 1921 to July 1928, January 1947 to September 1949.
Extremes.- Maximum discharge during year, 5,310 second-feet Feb. 17 (gage height, 20.2 feet, from graph based on gage readings); minimum observed, 4.7 second-feet Sept. 24, 25 (gage height, 1.48 feet).
1921-28, 1947-49: Maximum discharge, 12,500 second-feet Mar. 22, 1927 (gage height, 24.4 feet); minimum observed, 4.4 second-feet Sept. 16, 1948 (gage height, 1.45 feet).
Remarks.- Records good except those below 10 second-feet, which are fair. Gage read twice daily.
Revisions (water years).- W 1084: 1922, 1924, 1926-28.

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 20 to Nov. 7, June 1-16, Sept. 29, 30)

1.5	4.9	2.0	21	3.8	211	13.0	2,140
1.6	6.0	2.2	36	4.6	324	17.0	3,420
1.7	7.8	2.5	63	7.0	746	19.0	4,400
1.8	11	3.0	115	10.0	1,360	19.9	5,050

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	29	*954	1,730	1,010	566	1,260	279	173	59	602	53
2	251	25	584	764	566	440	1,070	512	149	59	476	83
3	237	27	372	440	372	372	802	1,090	126	161	211	98
4	104	32	279	324	389	324	476	954	110	126	120	98
5	73	28	251	1,090	406	324	389	494	93	88	78	73
6	47	63	211	2,740	372	340	340	309	83	64	53	55
7	37	785	198	3,100	340	294	324	237	72	59	41	39
8	30	1,360	173	2,890	372	251	309	198	65	265	29	44
9	68	1,400	155	1,760	340	224	279	161	55	324	24	40
10	24	674	132	1,130	340	224	237	143	48	185	22	34
11	25	324	115	1,210	279	237	198	126	44	173	20	24
12	26	294	104	1,030	224	224	185	115	43	143	50	18
13	51	251	104	802	237	224	185	104	41	93	104	17
14	198	211	173	584	324	251	185	93	55	67	115	15
15	132	251	728	476	2,300	324	198	88	161	52	110	16
16	83	265	2,080	494	4,810	372	389	88	478	41	83	17
17	64	198	2,770	1,010	5,050	372	566	98	2,020	35	56	16
18	52	161	2,740	1,760	3,850	324	566	93	2,830	29	104	15
19	104	279	1,860	*3,460	2,200	340	1,110	88	2,290	26	265	14
20	279	954	783	4,600	1,050	356	878	110	916	31	309	13
21	161	1,260	423	4,000	602	389	548	294	389	47	198	16
22	110	1,150	476	2,530	620	602	406	2,380	265	120	110	13
23	78	638	530	992	1,530	746	476	4,280	185	83	69	12
24	59	356	423	992	1,780	728	602	4,530	143	56	46	5.8
25	53	251	279	1,880	1,700	584	458	3,500	115	37	33	5.6
26	42	211	b220	2,320	1,600	423	340	1,960	98	28	26	12
27	37	279	b190	3,260	1,190	1,090	340	764	88	25	22	16
28	35	a700	b180	4,400	802	2,710	584	440	78	19	20	6.4
29	32	897	1,210	4,970	-	2,650	620	340	73	17	74	33
30	31	1,090	2,740	4,050	-	1,660	389	251	65	17	132	43
31	30	-	2,800	2,680	-	878	-	198	-	266	73	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,583	279	24	83.3	0.130	0.15
November	14,443	1,400	25	481	.748	.83
December	24,237	2,800	104	782	1.22	1.41
Calendar year 1948	235,248.1	8,570	4.5	643	1.00	13.62
January	63,468	4,970	324	2,047	3.18	3.67
February	34,605	5,050	224	1,236	1.92	2.00
March	18,843	2,710	224	608	.946	1.09
April	14,709	1,260	185	490	.762	.85
May	24,317	4,530	88	784	1.22	1.41
June	11,351	2,830	41	378	.588	.66
July	2,797	324	17	90.2	.140	.16
August	3,675	602	20	119	.185	.21
September	944.8	98	5.6	31.5	.049	.05
Water year 1948-49	215,972.8	5,050	5.6	592	.921	12.49

Peak discharge (base, 3,500 sec.-ft.).- Jan. 20 (1 p.m.) 4,670 sec.-ft.; Jan. 29 (6 a.m.) 5,050 sec.-ft.; Feb. 17 (2 a.m.) 5,310 sec.-ft.; May 24 (4 a.m.) 4,740 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge interpolated.
b Stage-discharge relation affected by ice.

Eagle Creek near Findlay, Ohio

Location.- Water-stage recorder, lat. 40°59'35", long. 83°39'05", on line between sec. 1, T. 1 S., R. 10 E., and sec. 36, T. 1 N., R. 10 E., at county highway bridge 3¼ miles south of Findlay, Hancock County, and 4¼ miles upstream from mouth. Prior to Jan. 1, 1949, wire-weight gage at same site and datum.
Drainage area.- 46.5 square miles.
Records available.- January 1947 to September 1949.
Extremes.- Maximum discharge during year, 1,680 second-feet Feb. 15 (gage height, 11.75 feet); minimum daily, 0.1 second-foot Oct. 9, Sept. 27, 29, 30.
1947-49: Maximum discharge observed, 2,920 second-feet June 7, 1947 (gage height, 13.38 feet); no flow on days in August, September 1948.
Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Gage read twice daily Oct. 1 to Dec. 31.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Nov. 5, May 26 to June 13, Sept. 27-30)

Oct. 1 to Jan. 5

2.35	0	3.0	10	7.0	285
2.4	.2	3.3	19	8.0	427
2.5	.9	4.2	56	9.0	604
2.6	2.0	5.0	98	10.0	845
2.7	3.6	5.6	137	10.5	1,000
2.8	5.6	6.2	191		

Jan. 6 to Sept. 30

2.35	0	2.7	4.7
2.4	.3	3.0	12
2.5	1.1	3.3	21
2.6	2.5	4.2	56

Note.- Same as preceding table above 4.2 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.4	1.1	47	33	a25	31	84	18	7.6	6.4	26	7.6
2	2.8	1.3	31	31	a18	25	43	143	6.6	12	12	6.4
3	1.8	2.0	25	22	b15	23	31	58	5.2	6.9	5.9	3.8
4	.8	4.8	21	31	b17	21	23	28	4.0	4.0	3.6	2.2
5	.6	19	19	829	b17	24	20	19	3.4	2.3	2.2	1.6
6	.4	498	18	*305	b18	21	21	15	2.9	1.9	1.6	.9
7	.3	136	14	86	b20	*16	21	12	2.3	28	1.1	.7
8	.2	47	11	86	*b18	14	18	11	2.0	14	1.1	1.1
9	.1	29	9.4	98	b18	14	15	9.6	2.3	6.9	.8	1.1
10	.3	29	8.9	106	16	17	13	8.6	2.7	8.8	.7	.9
11	3.4	31	8.4	114	b15	15	12	7.4	3.4	5.9	.8	.7
12	13	22	10	60	b14	17	12	6.1	4.3	3.2	8.0	.5
13	6.5	31	56	46	20	18	12	5.4	47	1.6	55	.4
14	3.1	39	39	40	38	26	13	5.2	21	1.3	12	.4
15	1.8	24	381	38	1,000	36	24	5.9	38	1.1	4.5	.3
16	1.0	17	396	78	368	26	38	11	109	.8	28	.3
17	3.4	14	120	247	106	22	33	6.9	130	.6	34	.3
18	31	12	51	405	60	33	138	5.7	66	.5	121	.6
19	12	153	37	780	46	32	64	5.7	27	3.3	37	.8
20	6.8	272	29	139	37	28	37	28	16	7.2	15	.5
21	4.8	76	29	57	28	e6	26	23	11	7.3	8.1	.4
22	3.3	43	51	48	165	84	31	579	8.1	2.7	4.9	.3
23	2.8	27	29	44	171	76	54	356	5.9	1.7	3.2	.4
24	2.0	21	20	231	81	39	39	95	4.3	1.2	2.0	.3
25	1.9	16	17	174	160	30	23	64	3.4	1.1	1.5	.2
26	1.6	14	16	461	66	28	20	34	4.7	.6	1.1	.2
27	1.3	123	14	370	46	584	74	22	4.3	.4	.8	.1
28	1.3	76	11	792	40	143	46	17	2.9	.3	.9	.2
29	1.1	213	472	157	-	56	25	13	2.0	.7	1.0	.1
30	.9	92	228	a60	-	37	19	11	1.9	61	1.1	.1
31	.9	-	64	a35	-	86	-	9.1	-	127	22	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	120.6	31	0.1	3.89	0.084	0.10
November	2,083.2	498	1.1	69.4	1.49	1.66
December	2,282.7	472	8.4	73.6	1.58	1.82
Calendar year 1948	20,959.5	1,270	0	57.3	1.23	16.76
January	6,001	829	22	194	4.17	4.81
February	2,641	1,000	14	94.3	2.03	2.11
March	1,708	584	14	55.1	1.18	1.36
April	1,029	138	12	34.3	.738	.82
May	1,632.6	579	5.2	52.7	1.13	1.30
June	549.2	130	1.9	18.3	.394	.44
July	320.7	127	.3	10.3	.222	.26
August	416.9	121	.7	13.4	.288	.33
September	33.4	7.6	.1	1.11	.024	.03
Water year 1948-49	18,818.3	1,000	.1	51.6	1.11	15.04

Peak discharge (base, 800 sec.-ft.).- Jan. 5 (6 p.m.) 1,110 sec.-ft.; Jan. 19 (3 a.m.) 1,280 sec.-ft.; Jan. 26 (7 p.m.) 890 sec.-ft.; Jan. 28 (8 a.m.) 1,200 sec.-ft.; Feb. 15 (4 p.m.) 1,680 sec.-ft.; Mar. 27 (10 a.m.) 1,000 sec.-ft.; May 22 (9 p.m.) 920 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records and records for Blanchard River near Findlay.
b Stage-discharge relation affected by ice.

Portage River at Woodville, Ohio

Location.- Water-stage recorder, lat. 41°26'55", long. 83°21'41", in sec. 28, T. 6 N., R. 13 E., at bridge on U. S. Highway 20 in Woodville. Datum of gage is 615.14 feet above mean sea level, adjustment of 1912.
Drainage area.- 433 square miles.
Records available.- July 1928 to December 1935, October 1939 to September 1949.
Average discharge.- 17 years, 273 second-feet.
Extremes.- Maximum discharge during year, 6,180 second-feet Feb. 16 (gage height, 10.99 feet); minimum, 3.3 second-feet July 28, 29 (gage height, 1.89 feet).
1928-35, 1939-49: Maximum discharge, 10,600 second-feet Mar. 23, 1948 (gage height, 13.98 feet); minimum, 0.3 second-foot Aug. 28, 1931; minimum gage height, 1.60 feet July 25, 26, 1934.
Flood of March 1913 reached a stage of 17 feet, from information by local residents (discharge, 17,000 second-feet, from rating curve extended above 11,500 second-feet).
Remarks.- Records good except those for periods of ice effect, which are fair.
Revisions (water years).- W 894: 1929, 1930.

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Nov. 6, Mar. 1-27, Aug. 20 to Sept. 30)

1.9	3.5	2.5	59	5.6	1,240
2.0	7.7	2.7	92	6.6	1,880
2.1	14	3.0	152	8.0	3,000
2.2	22	3.4	248	10.0	5,000
2.3	33	3.7	339	10.6	5,700
2.4	45	4.2	543		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	102	17	245	552	336	256	1,000	217	94	20	11	73
2	61	17	174	364	214	251	570	1,510	77	18	10	53
3	34	17	139	217	212	230	353	1,670	64	14	6.4	32
4	19	18	123	183	227	188	256	706	53	13	4.8	21
5	13	22	105	470	265	200	200	364	45	11	4.3	35
6	10	83	98	1,880	230	220	212	238	38	15	3.9	167
7	8.3	443	92	*805	248	172	220	176	33	16	5.6	100
8	9.0	212	73	512	273	131	188	137	29	14	6.0	64
9	9.6	117	51	611	245	129	156	105	26	38	5.6	69
10	11	87	46	611	172	135	125	89	22	85	5.6	53
11	15	103	40	611	197	125	103	75	20	53	7.6	30
12	19	117	45	465	139	129	102	62	19	31	10	18
13	37	85	49	329	167	129	105	52	18	20	28	13
14	29	69	51	254	241	186	113	45	22	14	25	11
15	20	56	101	202	3,090	268	308	40	29	10	15	9.6
16	17	48	2,190	271	5,700	240	905	35	474	6.9	9.0	10
17	16	41	2,100	1,000	2,370	190	574	33	1,100	6.0	7.7	10
18	14	41	880	1,210	1,080	200	634	33	955	5.6	6.9	11
19	16	171	478	3,360	780	174	730	34	508	5.6	51	13
20	17	1,300	326	2,530	588	139	418	221	243	5.2	33	12
21	17	855	240	830	387	142	288	478	144	4.3	21	13
22	16	379	332	508	402	204	254	1,920	111	6.4	17	11
23	16	*240	368	379	1,080	220	590	4,890	82	9.6	11	10
24	15	174	232	518	730	197	780	3,280	58	7.7	8.3	9.6
25	14	135	b130	1,300	1,210	152	368	1,330	44	6.0	7.7	8.3
26	14	107	b100	1,440	980	144	262	706	40	5.2	6.9	7.7
27	13	267	b90	2,740	552	670	500	391	41	4.8	5.6	8.3
28	12	611	90	3,360	435	1,160	706	270	44	3.9	37	13
29	11	357	904	2,780	-	452	350	197	33	3.5	92	22
30	11	350	2,660	855	-	273	256	146	26	3.9	188	35
31	14	-	1,160	543	-	294	-	115	-	4.8	100	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	629.9	102	8.3	20.3	0.047	0.05
November	6,539	1,300	17	218	.503	.56
December	13,712	2,660	40	442	1.02	1.18
Calendar year 1948	152,302.0	8,850	5.2	416	.961	13.08
January	31,690	3,360	183	1,022	2.36	2.72
February	22,550	5,700	139	805	1.86	1.94
March	7,600	1,160	125	245	.566	.65
April	11,626	1,000	102	388	.896	1.00
May	19,565	4,890	33	631	1.46	1.68
June	4,492	1,100	18	150	.346	.39
July	461.4	85	3.5	14.9	.034	.04
August	750.9	188	3.9	24.2	.056	.06
September	942.5	167	7.7	31.4	.073	.08
Water year 1948-49	120,558.7	5,700	3.5	330	.762	10.35

Peak discharge (base, 3,500 sec.-ft.).- Jan. 19 (9:30 p.m.) 3,940 sec.-ft.; Jan. 28 (10 p.m.) 3,940 sec.-ft.; Feb. 16 (1 p.m.) 6,180 sec.-ft.; May 23 (9 p.m.) 5,340 sec.-ft.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Sandusky River near Bucyrus, Ohio

Location.- Water-stage recorder, lat. 40°48'13", long. 83°00'21", in NE¼ sec. 10, T. 3 S., R. 16 E., at highway bridge 1½ miles west of Bucyrus and 12 miles downstream from Loss Creek. Datum of gage is 955.9 feet above mean sea level, adjustment of 1912.
Drainage area.- 89.8 square miles.
Records available.- August 1925 to November 1935, July 1938 to September 1949.
Average discharge.- 21 years, 78.5 second-feet.
Extremes.- Maximum discharge during year, 1,580 second-feet Feb. 15 (gage height, 6.59 feet); minimum, 1.8 second-feet Aug. 4 (gage height, 0.85 foot).
1925-35, 1938-49: Maximum discharge observed, 6,900 second-feet Dec. 14, 1927 (gage height, 9.15 feet); minimum discharge, 0.4 second-foot Sept. 29, 1941, July 16, 1942.
Flood of Mar. 23, 1913, reached a stage of 14.5 feet, from floodmarks.
Remarks.- Records good. Low flow slightly regulated by reservoirs for municipal supply of Bucyrus.
Revisions (water years).- W 744: 1925-32, W 874: 1938.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used June 1-12)

0.8	1.0	1.3	18	2.8	206
.9	2.6	1.5	30	3.4	334
1.0	5.0	1.7	47	4.2	545
1.1	8.6	2.0	80	5.0	805
1.2	13	2.4	137	5.5	1,000

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	10	108	62	66	60	188	66	11	7.2	12	144
2	6.8	8.6	73	65	54	50	103	64	11	10	5.9	50
3	3.6	12	58	41	47	46	76	51	10	6.1	2.6	23
4	3.6	15	50	78	53	43	59	41	9.5	4.3	48	17
5	3.6	30	43	722	54	46	53	34	8.2	2.8	28	13
6	3.3	425	41	566	55	46	192	29	7.5	12	9.5	11
7	6.3	247	33	163	64	39	282	27	6.8	8.3	4.0	9.1
8	4.8	97	29	137	57	35	124	24	5.0	10	2.6	11
9	3.6	59	24	162	60	34	83	22	4.0	7.5	2.4	11
10	2.6	79	23	134	62	44	66	21	3.8	133	2.6	10
11	14	114	20	122	46	62	52	18	2.8	70	2.6	7.9
12	13	64	91	96	39	74	45	17	9.3	22	4.4	6.4
13	14	69	434	78	46	67	58	16	3.6	13	7.6	5.4
14	5.7	85	167	67	98	92	174	15	2.8	8.6	13	5.0
15	3.8	60	429	61	986	137	231	15	15	6.4	5.0	4.5
16	3.8	45	960	107	723	83	311	17	13	5.4	2.8	4.5
17	24	41	436	258	201	64	168	18	19	2.8	4.9	4.5
18	67	45	151	385	119	73	229	16	12	2.6	11	7.5
19	31	68	104	910	93	70	168	17	9.5	2.6	10	8.6
20	21	186	84	265	79	57	113	21	9.1	3.9	5.7	8.2
21	21	108	76	126	66	86	83	22	10	5.8	4.3	6.4
22	16	66	104	197	106	120	138	54	6.8	14	3.8	4.8
23	14	49	75	167	245	227	256	89	6.4	14	3.6	4.8
24	12	38	55	476	139	131	160	46	5.7	9.1	3.3	4.3
25	15	34	34	383	246	89	97	29	7.5	6.4	3.3	3.8
26	14	35	34	529	155	83	100	25	6.4	5.0	3.3	4.0
27	13	201	30	652	101	1,000	679	21	7.5	4.3	2.8	4.0
28	11	150	27	960	84	446	253	17	61	4.3	36	9.5
29	11	210	220	350	-	153	113	16	16	4.4	26	15
30	9.5	223	334	126	-	100	78	14	9.1	13	73	11
31	10	-	114	93	-	156	-	12	-	11	396	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	398.0	67	2.6	12.8	0.143	0.16
November	2,873.6	425	8.6	95.8	1.07	1.19
December	4,461	960	20	144	1.60	1.84
Calendar year 1948	32,628.0	2,400	1.2	89.1	.992	13.50
January	8,538	960	41	275	3.06	3.53
February	4,144	986	39	148	1.65	1.72
March	3,813	1,000	34	123	1.37	1.58
April	4,732	679	45	158	1.76	1.96
May	894	89	12	28.8	.321	.37
June	309.3	61	2.8	10.3	.115	.13
July	429.8	133	2.6	13.9	.155	.18
August	740.0	396	2.4	23.9	.266	.31
September	429.2	144	3.8	14.3	.159	.18
Water year 1948-49	37,761.9	1,000	2.4	87.0	.969	13.15

Peak discharge (base, 1,200 sec.-ft.).- Feb. 15 (12 p.m.) 1,580 sec.-ft.; Mar. 27 (7 p.m.) 1,490 sec.-ft.

Sandusky River near Upper Sandusky, Ohio

Location.- Water-stage recorder, lat. 40°51'02", long. 83°15'23", in sec. 21, T. 2 S., R. 14 E., at highway bridge three-quarters of a mile upstream from Rock Run and 2 miles northeast of Upper Sandusky. Datum of gage is 792.8 feet above mean sea level, adjustment of 1912.
Drainage area.- 299 square miles.
Records available.- October 1921 to December 1935, January 1938 to September 1949.
Average discharge.- 25 years, 242 second-feet.
Extremes.- Maximum discharge during year, 2,780 second-feet Feb. 16 (gage height, 6.54 feet); minimum, 5.6 second-feet Aug. 28 (gage height, 0.96 foot).
1921-35, 1938-49: Maximum discharge, 8,900 second-feet Dec. 15, 1927 (gage height, 10.5 feet); minimum, 0.9 second-foot Sept. 24, 1939; minimum gage height, 0.67 foot Sept. 6, 7, 1934.
Flood in June 1937 reached a stage of 14.3 feet, from marks in gage well.
Remarks. Records good except those for periods of ice effect or no gage-height record, which are fair.
Revisions (water years).- W 874: 1927-30, 1933.

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 11 to Nov. 6, Apr. 30 to June 6, June 14 to July 15, Aug. 6 to Sept. 30)

0.9	3.7	1.4	47	2.6	400
1.0	7.5	1.5	65	3.2	685
1.1	14	1.7	109	4.0	1,140
1.2	22	2.0	187	5.6	2,130
1.3	33	2.3	283	6.4	2,700

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	20	422	294	a250	230	735	227	43	126	22	489
2	17	18	256	273	a200	199	427	217	37	71	18	184
3	20	22	193	214	a180	176	287	187	33	43	21	80
4	17	23	159	232	*208	156	223	146	30	36	16	47
5	13	32	141	1,800	181	151	184	121	26	28	12	37
6	12	550	128	2,130	187	156	208	104	25	23	40	30
7	9.3	930	111	872	205	141	735	93	22	78	23	24
8	8.7	404	98	535	208	123	432	86	21	65	15	25
9	8.1	214	80	545	202	119	273	80	19	49	12	21
10	10	162	71	535	187	131	208	76	18	37	9.9	19
11	24	220	56	*450	156	141	176	65	16	133	7.5	17
12	18	214	101	375	146	167	151	63	18	93	10	19
13	31	187	738	301	146	181	141	60	25	44	28	15
14	23	287	685	259	193	202	190	58	32	32	19	14
15	25	227	845	227	1,700	294	409	58	146	25	13	12
16	21	159	2,130	252	2,700	283	735	60	550	21	15	12
17	28	131	1,860	660	1,050	211	620	67	312	19	14	10
18	63	119	735	1,020	517	187	660	58	294	18	12	12
19	109	141	450	2,130	362	196	660	54	138	19	9.9	14
20	67	305	338	1,530	297	173	400	61	86	16	7.5	14
21	44	404	280	570	249	170	290	65	60	19	14	14
22	37	233	301	468	329	263	259	98	52	20	12	13
23	39	162	301	555	818	358	490	246	44	19	9.3	14
24	32	126	223	872	585	414	535	259	34	22	9.3	12
25	30	104	b130	1,380	685	266	323	141	31	22	7.5	13
26	24	95	b120	1,230	685	220	249	102	33	16	8.1	11
27	26	314	b110	2,200	400	1,330	1,170	84	32	13	6.7	9.3
28	24	585	b100	2,550	312	1,920	1,520	69	32	11	6.7	14
29	23	508	415	1,990	-	660	490	61	96	11	34	11
30	22	660	1,230	a800	-	375	301	52	119	18	61	22
31	20	-	590	a380	-	432	-	51	-	20	370	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	855.1	109	8.1	27.6	0.092	0.11
November	7,556	930	18	252	.843	.94
December	13,397	2,130	56	432	1.44	1.66
Calendar year 1948	99,537.8	3,000	3.2	272	.910	12.36
January	27,629	2,550	214	891	2.98	3.44
February	13,338	2,700	146	476	1.59	1.66
March	10,025	1,920	119	323	1.08	1.24
April	13,281	1,320	141	443	1.48	1.65
May	3,169	259	51	102	.341	.39
June	2,424	550	16	80.8	.270	.30
July	1,167	133	11	37.6	.126	.15
August	863.4	370	6.7	27.9	.093	.11
September	1,238.3	499	9.3	41.3	.138	.15
Water year 1948-49	94,942.8	2,700	6.7	260	.870	11.80

Peak discharge (base, 2,500 sec.-ft.).- Jan. 6 (2 a.m.) 2,550 sec.-ft.; Jan. 28 (12 p.m.) 2,620 sec.-ft.; Feb. 16 (10 a.m.) 2,780 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records and records for station near Bucyrus.
b Stage-discharge relation affected by ice.

Sandusky River near Mexico, Ohio

Location.- Water-stage recorder, lat. 41°02'39", long. 83°11'42", in sec. 13, T. 1 N., R. 14 E., at highway bridge 3 miles upstream from Honey Creek and 4½ miles north of Mexico. Datum of gage is 733.1 feet above mean sea level, adjustment of 1912.
Drainage area.- 776 square miles.
Records available.- March 1923 to December 1935, July 1938 to September 1949.
Average discharge.- 23 years, 555 second-feet.
Extremes.- Maximum discharge during year, 5,730 second-feet Jan. 28 (gage height, 12.43 feet); minimum, 18 second-feet Oct. 11; minimum gage height, 1.74 feet Aug. 28.
1923-35, 1938-49: Maximum discharge observed, 15,200 second-feet Mar. 22, 1927 (gage height, 19.9 feet); minimum discharge, 1.8 second-feet (regulated during repairs to small dam above station) Oct. 31, 1942.
Flood in June 1937 reached a stage of 22.5 feet, from information by local residents.
Remarks.- Records good.
Revisions (water years).- W 714: 1929, 1930. W 874: 1927(M).

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Nov. 6, Sept. 29, 30)

1.7	19	3.1	275	9.0	3,100
1.8	28	4.0	545	12.0	5,370
2.0	54	4.8	840	12.2	5,550
2.3	102	6.0	1,370		
2.7	181	7.5	2,160		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	37	1,470	1,180	a850	650	1,770	513	116	218	185	587
2	21	39	820	685	a600	513	1,370	780	102	389	107	598
3	21	40	545	562	b500	449	840	920	90	223	79	297
4	26	42	434	434	529	404	615	545	80	134	77	168
5	38	51	359	2,090	481	377	481	365	74	102	53	132
6	32	981	317	4,650	419	374	481	278	69	99	45	83
7	28	2,210	275	4,570	434	356	860	230	62	340	54	63
8	26	1,670	249	3,100	434	309	1,000	203	57	297	58	68
9	22	800	210	1,670	481	275	632	181	54	201	46	58
10	21	465	181	1,470	*449	297	465	166	53	192	38	50
11	27	434	144	*1,370	383	309	380	152	50	122	33	42
12	42	434	144	1,180	342	345	331	134	51	196	45	39
13	50	419	607	900	345	389	303	122	57	142	46	34
14	45	562	1,570	720	449	449	309	113	83	87	47	37
15	49	545	1,670	632	2,930	580	529	107	308	69	66	34
16	45	419	3,800	615	5,210	720	1,050	111	1,720	54	68	33
17	58	325	4,250	1,280	5,050	615	1,230	116	1,820	51	68	32
18	74	286	3,800	2,270	2,990	513	1,320	111	1,820	166	64	34
19	122	297	2,210	4,490	1,230	497	1,520	104	1,470	102	57	34
20	148	1,360	1,000	4,330	860	481	1,180	177	720	77	50	29
21	102	1,770	702	3,030	685	481	740	212	374	199	38	28
22	85	1,320	685	1,420	760	650	580	690	247	102	32	28
23	71	*668	685	1,100	2,040	940	760	1,570	179	71	36	29
24	68	419	580	1,570	1,990	1,070	1,050	960	144	57	36	29
25	60	325	419	2,630	1,880	840	820	702	120	53	28	29
26	53	267	359	3,030	1,820	598	545	404	106	53	26	28
27	49	675	b300	4,250	1,320	2,580	1,210	283	109	47	25	27
28	43	1,280	b280	5,370	880	4,010	2,450	225	102	40	23	47
29	42	1,370	746	5,550	-	3,380	1,570	183	88	38	39	62
30	40	1,570	2,330	a5,000	-	1,620	760	150	158	130	43	51
31	39	-	2,100	a1,500	-	1,100	-	130	-	237	143	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,569	148	21	50.6	0.065	0.07
November	21,080	2,210	37	703	.906	1.01
December	33,241	4,250	144	1,072	1.38	1.59
Calendar year 1948	264,468	7,700	11	723	.932	12.65
January	70,648	5,550	434	2,279	2.94	3.39
February	36,341	5,210	342	1,298	1.67	1.74
March	26,171	4,010	275	844	1.09	1.26
April	27,151	2,450	303	905	1.17	1.30
May	10,937	1,570	104	353	.455	.52
June	10,483	1,820	50	349	.450	.50
July	4,288	389	38	138	.178	.21
August	1,755	185	23	56.6	.073	.08
September	2,810	598	27	93.7	.121	.14
Water year 1948-49	246,474	5,550	21	675	.870	11.81

Peak discharge (base, 4,200 sec.-ft.).- Dec. 17 (5 a.m.) 4,250 sec.-ft.; Jan. 7 (8 a.m.) 4,730 sec.-ft.; Jan. 19 (5 p.m.) 4,650 sec.-ft.; Jan. 28 (8 p.m.) 5,730 sec.-ft.; Feb. 16 (6 a.m.) 5,290 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for station near Bucyrus.

b Stage-discharge relation affected by ice.

Sandusky River near Fremont, Ohio

Location.- Water-stage recorder, lat. 41°18'28", long. 83°09'32", in sec. 17, T. 4 N., R. 15 E., at highway bridge 2½ miles downstream from Wolf Creek and 3½ miles southwest of Fremont. Datum of gage is 626.3 feet above mean sea level, adjustment of 1912.

Drainage area.- 1,248 square miles.

Records available.- November 1923 to December 1935, July 1938 to September 1949. November 1898 to March 1901 at site 4 miles downstream.

Average discharge.- 23 years (1923-35, 1938-49), 915 second-feet.

Extremes.- Maximum discharge during year, 11,100 second-feet Feb. 16 (gage height, 6.32 feet); minimum, 26 second-feet Oct. 4, 5; minimum gage height, 0.98 foot Aug. 29, 30.
1923-35, 1938-49: Maximum discharge, 27,300 second-feet Jan. 15, 1930 (gage height, 11.1 feet); maximum gage height, 11.4 feet Mar. 3, 1940 (ice jam); minimum discharge, 5.0 second-feet Sept. 27, 28, 1941 (gage height, 0.80 foot).
Revisions.- The figures of maximum discharge for some water years have been revised, as shown in the following table. They supersede those published in the water-supply papers indicated.

Water-Supply Paper	Water year	Date	Gage height (feet)	Discharge (second-feet)
584.....	1923-24	Jan. 11	7.6	14,800
604.....	1924-25	Feb. 24	6.2	10,200
624.....	1925-26	Apr. 9	†7.4	13,100
644.....	1926-27	Mar. 22	9.1	20,000
664.....	1927-28	Dec. 16	7.4	14,100
684.....	1928-29	Feb. 28	8.4	17,500
699.....	1929-30	Jan. 15	11.1	27,300

† Occurred Feb. 26 (backwater from ice)

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

Revisions (water years).- W 744: 1931, 1932. W 759: Drainage area. W 874: 1938.
Revised figures of discharge for high-water periods in the water years 1924-30 are given herein. They supersede those published in Water-Supply Papers 584, 604, 624, 644, 664, 684, and 699.

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Nov. 5, June 20 to Sept. 1)

1.0	28	1.6	324	3.2	2,740
1.1	56	1.9	566	4.0	4,650
1.2	94	2.2	905	5.0	7,320
1.4	194	2.6	1,560	5.8	9,600

Discharge, in second-feet, 1923-30, 1948-49

1923-24

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-	184	1,920		2,000	8,290	474	522	2,000	83	63
2		-	238	1,920	3,250	2,240	2,780	575	490	1,140	80	250
3		-	289	1,200		2,080	1,840	670	474	670	70	220
4		-	354	950	2,080	4,140	1,470	1,540	490	474	80	146
5		-	1,260		2,240	8,600	1,260	1,770	602	367	94	104
6		-	3,370		4,140	6,500	1,070	950	670	308	90	83
7		-	5,940	850	3,040	4,140	890	775	670	367	99	73
8		263	4,140		1,770	2,080	775	670	1,400	1,260	126	70
9		250	2,560		890	1,330	775	1,200	7,080	1,330	104	130
10		202	3,200		720	1,070	720	1,140	8,910	775	80	415
11		179	3,370	11,400	720	1,070	670	1,070	9,530	506	63	276
12		152	2,400	9,530	720	*1,470	584	775	8,910	380	50	152
13		117	3,040	7,980	602	1,470	506	775	7,380	322	66	112
14		112	7,680	6,220	548	1,540	443	775	4,880	296	73	99
15		104	5,400	2,560	482	1,260	387	1,140	2,000	276	42	104
16		99	4,140	1,620	466	890	360	1,770	1,470	232	34	152
17		99	1,770	*3,040	415	720	360	1,400	950	196	42	130
18		112	1,330	2,720	443	611	367	890	950	168	34	94
19		99	1,140		490	548	367	775	720	117	28	80
20		104	1,010			522	360	1,140	522	135	23	76
21		90	1,140	1,000		575	394	950	429	190	21	162
22		90	5,140			602	2,560	670	348	263	56	238
23		99	8,600		600	2,400	2,400	498	354	214	66	238
24		94	8,600			4,380	1,770	498	348	184	66	162
25		90	6,790			4,880	1,140	1,070	1,010	135	56	108
26		90	4,380			5,670	775	1,010	1,330	117	56	90
27		90	2,400		498	5,940	584	720	1,400	99	63	73
28		90	2,720		557	5,140	506	557	1,330	99	53	76
29		94	2,880	2,150	950	9,530	466	490	4,880	104	39	94
30		104	2,080		-	13,400	450	530	2,400	99	36	108
31		-	1,400		-	10,500	-	593	-	83	39	-

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Jan. 5-10, Jan. 19 to Feb. 3, Feb. 20-26.

Discharge, in second-feet, of Sandusky River near Fremont, Ohio, 1923-30, 1948-49--Continued

1924-25

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	112	45	60			890	387	108	63	168	73	15
2	108	42	63			670	374	117	36	94	83	23
3	104	39	67			615	315	130	94	99	83	26
4	104	39	70			561	289	162	66	104	220	26
5	104	39	70		1,110	506	244	184	53	73	244	23
6	94	39	70		(*)	429	226	190	42	66	244	23
7	83	56	70	330		436	202	190	53	70	250	28
8	76	48	76			548	196	152	48	94	168	15
9	70	36	162			775	196	174	73	196	157	31
10	66	31	214		6,500	1,070	202	157	39	415	179	23
11	73	34	220		5,400	3,040	190	157	28	950	602	23
12	56	50	168		4,880	5,140	190	135	28	890	360	28
13	56	56	146		2,880	4,380	184	135	36	950	226	63
14	63	56	179	289	1,700	5,940	168	140	42	950	354	890
15	63	58	170		1,070	7,080	190	135	45	890	232	1,140
16	63	56	162		775	5,670	168	135	56	1,620	220	1,920
17	50	50	162		670	3,200	168	190	168	322	162	1,840
18	45	56	450		584	1,920	168	334	244	263	94	1,140
19	39	66	5,670		539	2,000	146	256	174	226	80	775
20	39	63	6,500		450	2,720	152	174	135	196	99	775
21	34	48	3,370		593	2,400	152	140	73	157	66	548
22	39	70	1,330	270	2,400	1,540	135	157	83	126	59	387
23	45	70	1,200		7,380	1,010	146	135	70	99	66	276
24	45	56			9,530	720	146	130	53	179	45	184
25	39	76			7,080	670	130	63	87	514	59	130
26	39	76			5,670	548	157	99	202	302	28	108
27	39	*70	450		2,240	522	76	94	202	184	28	108
28	48	56			1,200	575	108	126	830	152	42	76
29	50	53			-	575	130	108	482	117	34	112
30	48	56			-	530	146	94	220	94	26	108
31	45	-			-	443	-	87	-	108	24	-

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Nov. 30 to Dec. 3, Dec. 15, Dec. 24 to Jan. 13, Jan. 15 to Feb. 9, Mar. 3, 4.

1925-26

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	104	270	1,010			2,000	1,840	498	162	56	250	90
2	112	374	720			1,330	1,840	436	135	80	168	122
3	168	466	611			1,010	3,370	367	108	56	140	315
4	162	443	584			1,010	7,380	322	117	36	157	466
5	720	367	670	300		1,010	4,140	282	90	73	135	4,630
6	1,470	308	1,400			1,010	2,400	256	90	48	126	6,790
7	830	308	1,400		1,500	620	4,380	226	126	34	168	6,220
8	466	1,330	890			614	11,400	214	73	36	539	5,400
9	328	2,240	670			608	12,100	202	94	48	670	3,040
10	263	2,080	575			602	9,850	184	80	66	360	2,080
11	226	1,070	522			522	7,680	168	70	59	202	2,400
12	202	775	443			458	2,880	168	104	39	168	2,000
13	184	3,200	415			415	1,620	174	59	53	140	1,330
14	157	4,880	380			371	1,200	168	226	148	530	1,070
15	157	4,140	348	1,000		328	890	190	890	80	620	830
16	122	5,940	289			334	775	184	890	99	482	670
17	146	3,370	282			250	620	179	566	73	830	775
18	443	2,240	408			270	557	168	394	73	566	1,700
19	720	1,260	670		3,500	276	498	238	334	94	315	1,260
20	620	1,010	557			443	422	436	226	83	184	670
21	401	890	256			775	374	611	179	63	220	450
22	296	775	238			1,140	354	490	422	53	302	354
23	232	602				5,940	360	328	202	36	575	593
24	179	522				7,680	367	270	202	42	670	4,380
25	196	450			8,360	6,500	354	196	226	28	401	6,220
26	302	387	170	1,300	*9,310	3,540	328	174	174	19	238	8,910
27	670	436			6,650	2,080	302	196	122	28	157	4,880
28	593	2,880			3,880	1,400	401	341	122	56	130	2,400
29	415	3,040			-	1,070	820	322	76	152	117	1,920
30	334	1,840			-	890	566	232	80	443	90	1,700
31	289	-			-	890	-	179	-	308	76	-

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 23 to Feb. 28, Mar. 4, 5, 8, 9, 13, 14.

Discharge, in second-feet, of Sandusky River near Fremont, Ohio, 1923-30, 1948-49--Continued

1926-27

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,320	3,740	1,120		8,910	1,540	775	1,320	1,250	178	592	33
2	2,240	2,560	935		5,940	1,180	2,890	1,250	935	146	392	31
3	2,400	1,770	725		3,400	1,060	2,720	725	635	88	430	63
4	2,000	1,180	592		3,400	880	3,060	550	1,250	43	297	45
5	5,140	825	518	350	5,140	880	3,230	469	2,240	63	222	97
6	8,910	725	377		8,290	3,230	5,400	400	1,320	129	190	80
7	7,980	635	446		7,680	5,400	3,230	355	825	69	184	43
8	7,980	550	454		5,940	4,880	1,840	325	592	92	88	37
9	4,880	510	635		3,400	3,230	1,180	325	461	162	156	29
10	1,840	534	680		2,400	2,240	2,080	362	377	156	276	92
11	1,250	680	592		1,770	1,390	2,080	377	304	162	168	325
12	880	635	550		1,180	1,120	1,390	362	262	73	162	255
13	775	542	725		935	1,060	935	370	242	59	92	304
14	680	423	2,890		880	2,240	825	385	222	76	59	400
15	635	423	1,920	300	5,400	2,560	880	446	210	156	124	518
16	518	454			5,140	2,000	825	592	190	124	73	477
17	469	592			4,880	1,390	725	680	197	52	41	290
18	446	1,250			2,890	1,120	725	680	216	73	83	197
19	400	680			2,080	2,560	635	3,060	173	76	69	140
20	385	592	400	2,000	1,250	9,530	592	7,080	178	83	47	134
21	348	550		7,000	825	17,500	550	7,980	248	76	43	111
22	362	501		13,000	775	19,600	501	5,670	340	80	111	106
23	415	423		13,400	825	16,800	430	2,240	635	392	97	47
24	725	400		10,800	1,620	8,290	400	1,320	1,120	370	47	83
25	4,380	385		7,080	2,000	2,890	385	2,890	825	775	37	41
26	5,140	1,180		3,740	3,400	2,240	362	2,890	454	469	43	97
27	4,380	3,570	350	3,230	3,400	1,700	392	2,080	297	269	56	140
28	2,240	2,890		2,240	2,400	1,250	392	1,620	229	190	37	41
29	1,770	2,080		1,180	-	1,120	438	995	216	190	69	37
30	2,890	1,390		11,400	-	935	542	1,250	197	140	73	56
31	4,380	-		13,400	-	825	-	1,390	-	534	41	-

Note.- Stage-discharge relation affected by ice Dec. 16 to Jan. 21.

1927-28

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	51	10,200			995	8,290	534	178	297	88	162
2	45	43	10,500			825	5,400	461	168	242	83	129
3	64	35	12,100	500	500	775	2,720	415	162	216	80	67
4	67	33	7,680			725	1,840	370	168	222	67	64
5	67	39	2,400			680	1,250	370	362	276	67	54
6	140	41	1,390		6,000	493	935	370	4,630	333	97	39
7	92	39	1,120		6,000	550	825	348	8,600	880	70	47
8	67	35	1,250	1,000	8,290	477	935	348	6,790	550	67	47
9	57	43			7,380	430	1,120	325	6,220	362	57	41
10	115	41	1,000		3,570	469	995	318	5,670	235	80	28
11	70	49			1,840	550	725	355	3,740	184	129	39
12	51	61	880		1,120	550	680	362	2,560	311	80	39
13	45	51	1,180	1,500	880	534	550	377	1,390	325	61	35
14	49	43	12,100		935	5,670	477	377	825	775	64	39
15	67	49	12,100		5,140	5,140	518	340	592	2,890	37	33
16	51	45	13,800	1,470	5,670	3,060	438	333	469	2,890	51	31
17	92	97	7,980	1,120	4,380	1,770	377	355	370	1,250	51	26
18	47	235	2,560	1,060	2,240	1,120	348	526	333	680	39	23
19	61	1,540	1,390	995	1,320	775	311	592	348	454	41	28
20	67	1,060	1,180	5,140	825	680	304	526	469	415	41	33
21	43	635	1,060	2,720	1,060	592	333	407	400	454	39	35
22	39	477	825		825	550	5,940	348	370	725	45	30
23	41	392	592	900	995	550	6,220	304	325	775	39	30
24	57	493			1,770	592	5,400	269	297	501	37	28
25	54	935			2,400	592	3,230	304	276	348	43	26
26	37	1,060			2,080	635	1,770	318	276	229	41	27
27	37	880	300		1,320	1,060	1,180	304	197	184	33	28
28	33	680		1,000	935	1,250	880	235	173	156	39	28
29	31	1,840			880	935	825	242	156	120	45	28
30	39	4,630			-	9,530	635	203	222	92	61	26
31	49	-			-	10,800	-	190	-	61	124	-

Note.- Stage-discharge relation affected by ice Dec. 9-11, Dec. 24 to Jan. 15, Jan. 22 to Feb. 7.

Discharge, in second-feet, of Sandusky River near Fremont, Ohio, 1923-30, 1948-49--Continued

1928-29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	53	130			12,800	2,400	1,060	334	213	363	51
2	29	45	120			4,880	4,380	880	293	725	241	56
3	34	84	134			2,560	3,230	2,720	279	686	202	37
4	26	207	125			2,080	1,920	3,570	266	550	165	40
5	26	196	175			2,400	2,240	2,720	246	518	139	40
6	29	154	170			2,400	2,400	1,700	252	3,740	125	42
7	29	134	106			1,920	1,700	1,700	252	3,570	125	53
8	26	120				1,250	1,060	1,060	230	3,230	115	64
9	22	88		180		880	995	725	230	3,060	423	51
10	24	84	80			725	1,390	534	246	2,240	106	48
11	22	80				592	2,400	489	218	1,120	101	34
12	22	45				469	3,060	446	224	775	60	34
13	22	68				501	2,400	592	207	550	45	45
14	22	64	160		400	825	2,240	1,320	202	635	130	51
15	22	48	825			3,060	1,700	2,720	180	725	88	34
16	24	64	1,390			4,380	1,250	3,570	170	493	101	29
17	40	51	1,620	450		4,380	935	2,240	160	363	134	37
18	53	64	3,740	2,400		2,400	775	1,320	154	272	125	42
19	45	76	3,570	15,500		1,620	635	1,470	149	207	106	40
20	34	101	2,400	13,400		1,390	592	2,240	144	170	106	32
21	29	207	995	12,100		2,000	3,230	1,320	110	149	64	27
22	32	286	592	9,220		2,240	5,940	1,060	134	134	37	32
23	80	327	518	4,630		2,890	4,880	825	115	110	101	27
24	80	279	485	3,230		2,720	2,560	592	84	101	115	34
25	64	235	385	6,790		2,080	1,620	485	80	170	230	29
26	64	202	306	7,980	6,000	3,740	3,570	423	101	144	224	42
27	56	170	246	6,790	16,100	6,220	4,880	363	115	430	175	51
28	84	125	235		17,200	4,880	2,890	370	72	1,840	120	40
29	72	120	230	2,400	-	2,080	2,000	363	96	1,250	110	42
30	56	130	224		-	1,320	1,540	407	144	825	60	29
31	56	-	202		-	935	-	407	-	534	40	-

Note.- Stage-discharge relation affected by ice Dec. 8-13, Jan. 1 to 7, Jan. 28 to Feb. 26.

1929-30

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	469		9,530		2,560	1,770	349	92	144	26	29
2	40	1,700		12,800		1,540	1,320	334	64	130	26	34
3	45	2,890		13,800		1,120	1,180	313	80	96	26	29
4	51	2,400		10,500		935	1,120	286	101	53	22	26
5	96	1,320	350	7,080	450	775	880	356	68	64	22	26
6	64	935		2,890		775	725	300	110	45	24	24
7	42	680		2,890		725	592	313	415	27	22	29
8	45	542		16,500		995	592	320	320	76	29	29
9	42	461	2,890	18,600		2,000	592	313	191	40	27	27
10	45	407	3,230	16,800		1,920	550	300	170	32	29	29
11	48	680	2,560	15,100	500	1,320	501	246	115	24	26	29
12	48	1,620	1,120	11,400	1,500	935	461	218	96	26	22	27
13	45	1,770	935	18,900	7,000	775	423	218	110	27	26	27
14	45	1,770	8,290	21,400	11,400	635	392	125	56	42	22	27
15	42	3,400	6,790	25,400	9,530	534	392	120	60	40	19	26
16	45	3,400	5,940	15,500	5,670	469	526	160	88	76	24	29
17	40	2,400	4,380	7,380	3,060	454	2,240	154	84	106	24	48
18	42	1,840	9,850	2,560	1,840	1,060	3,400	160	313	56	22	96
19	48	3,740	6,500	2,000	1,180	1,320	2,560	191	356	60	22	76
20	32	3,570	5,940	1,000	995	1,120	1,620	207	241	64	27	34
21	37	2,240			1,390	775	995	196	186	32	40	40
22	125	1,470			1,540	680	825	165	130	34	29	34
23	6,220	995	1,700	600	2,080	592	313	149	120	34	22	56
24	7,380	775			4,380	592	635	160	115	34	26	53
25	6,500	592			3,740	5,140	518	115	320	34	24	48
26	4,880	518			5,140	7,680	438	125	246	29	22	76
27	2,240	461			5,400	5,940	363	139	550	27	24	48
28	1,250	461	700	400	4,630	3,400	378	160	423	26	20	56
29	825	378			-	2,890	342	149	252	26	20	64
30	680	350			-	2,890	349	125	180	29	19	56
31	526	-	6,500		-	2,240	-	115	-	26	24	-

Note.- Stage-discharge relation affected by ice Nov. 30 to Dec. 8, Dec. 21-30, Jan. 19 to Feb. 13.

Discharge, in second-feet, of Sandusky River near Fremont, Ohio, 1923-30, 1948-49--Continued

1948-49

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	64	2,080	2,080	1,600	1,040	2,510	905	231	200	231	263
2	48	60	1,490	1,230	1,260	815	2,360	1,640	200	331	172	815
3	39	60	934	866	1,020	664	1,600	1,890	178	391	117	586
4	31	67	698	731	754	605	1,050	1,080	151	237	86	304
5	39	71	586	1,830	789	566	815	698	131	203	71	225
6	45	948	522	6,230	698	566	765	513	122	686	56	162
7	42	3,080	454	*5,430	644	540	1,100	422	112	576	53	108
8	45	2,610	398	4,280	675	487	1,470	361	99	566	60	94
9	39	1,610	354	2,680	675	454	1,080	317	90	406	64	90
10	31	879	297	2,200	*698	462	754	283	86	720	53	83
11	34	664	270	1,990	615	478	615	263	86	398	48	79
12	53	644	225	1,720	586	504	531	244	83	231	71	71
13	60	605	317	1,360	522	576	487	225	86	237	79	64
14	60	654	1,530	1,050	742	709	487	219	122	183	71	56
15	67	802	2,200	879	5,150	948	644	200	445	126	60	56
16	71	675	7,040	853	9,600	1,080	1,840	194	3,080	99	64	48
17	71	513	7,040	1,660	6,770	1,010	2,010	200	2,960	83	83	48
18	79	438	5,170	3,190	4,780	853	2,180	194	2,470	86	83	50
19	103	478	3,540	7,880	2,280	828	2,400	194	2,060	178	86	48
20	200	1,900	1,890	6,230	1,470	776	1,990	304	1,310	140	90	53
21	194	2,700	1,190	4,520	1,100	776	1,330	430	675	320	71	50
22	145	2,020	1,160	2,550	1,100	1,010	1,010	2,010	446	297	56	42
23	135	1,260	1,150	1,690	2,960	1,300	1,260	5,040	317	151	50	42
24	117	742	948	2,280	2,960	1,510	1,600	2,470	244	103	42	42
25	103	566	675	3,900	2,960	1,360	1,470	1,650	213	83	42	34
26	90	462	b550	4,780	2,740	978	1,040	1,020	194	71	39	34
27	83	874	b480	7,320	2,160	3,010	1,320	644	178	60	34	45
28	79	1,930	b430	9,020	1,450	5,430	3,190	496	183	56	34	64
29	71	1,970	b1,100	8,160	-	4,650	2,740	398	167	53	34	64
30	67	2,160	3,780	5,690	-	2,850	1,400	331	135	56	36	112
31	64	-	3,190	3,080	-	1,690	-	276	-	140	86	-

Peak discharge (base, 7,000 sec.-ft.).- Dec. 16 (5 p.m.) 8,440 sec.-ft.; Jan. 19 (2 p.m.) 8,440 sec.-ft.; Jan. 28 (8 p.m.) 10,200 sec.-ft.; Feb. 16 (4 a.m.) 11,100 sec.-ft.

* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Monthly discharge, in second-feet, 1923-30, 1948-49

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	-	-	-	-	-	-
November 8-30, 1923	2,823	263	90	123	0.099	0.08
December	98,945	8,600	184	3,192	2.56	2.95
Calendar year	-	-	-	-	-	-
January 1924	76,060	11,400	-	2,454	1.97	2.27
February	35,721	-	-	1,232	.987	1.06
March	107,298	13,400	522	3,461	2.77	3.19
April	35,259	8,290	360	1,175	.942	1.05
May	27,869	1,770	474	899	.720	.83
June	72,449	9,530	348	2,415	1.94	2.16
July	12,906	2,000	83	416	.333	.38
August	1,912	126	21	61.7	.049	.06
September	4,178	415	63	139	.111	.12
Water year	-	-	-	-	-	-
October 1924	1,939	112	34	62.5	.050	.06
November	1,591	76	31	53.0	.042	.05
December	24,249	6,500	-	782	.627	.72
Calendar year	-	-	-	-	-	-
January 1925	9,169	-	-	296	.237	.27
February	71,531	9,530	-	2,555	2.05	2.14
March	57,123	7,080	429	1,843	1.48	1.71
April	5,681	387	76	189	.151	.17
May	4,588	334	63	148	.119	.14
June	3,825	830	28	128	.103	.11
July	10,668	1,620	66	344	.276	.32
August	4,607	602	24	149	.119	.14
September	10,864	1,920	15	362	.290	.32
Water year 1924-25	205,835	9,530	15	564	.452	6.15
October 1925	11,507	1,470	104	371	.297	.34
November	47,893	5,940	270	1,596	1.28	1.43
December	14,868	1,400	-	480	.385	.44
Calendar year	-	-	-	-	-	-
January 1926	27,300	-	-	881	.706	.81
February	88,200	9,310	-	3,150	2.52	2.62
March	45,386	7,680	250	1,464	1.17	1.35
April	79,868	12,100	302	2,662	2.13	2.38
May	8,399	611	168	271	.217	.25
June	6,639	890	59	221	.177	.20
July	2,560	443	19	82.6	.066	.08
August	9,726	830	76	314	.252	.29
September	73,665	8,910	90	2,456	1.97	2.20
Water year 1925-26	416,011	12,100	19	1,140	.913	12.39

Monthly discharge, in second-feet, of Sandusky River near Fremont, Ohio, 1923-30, 1948-49--Continued

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October 1926	78,158	8,910	348	2,521	2.02	2.33
November	32,669	3,740	385	1,090	.873	.97
December	19,159	2,890	-	618	.495	.57
Calendar year	-	-	-	-	-	-
January 1927	94,670	13,400	-	3,054	2.45	2.82
February	96,150	8,910	775	3,434	2.75	2.86
March	122,640	19,600	825	3,956	3.17	3.66
April	40,409	5,400	362	1,347	1.08	1.20
May	50,438	7,980	325	1,627	1.30	1.50
June	16,640	2,240	173	555	.445	.50
July	5,545	775	43	179	.143	.16
August	4,399	592	37	142	.114	.13
September	4,349	518	29	145	.116	.13
Water year 1926-27	565,226	19,600	29	1,549	1.24	16.83
October 1927	1,831	140	31	59.1	.047	.05
November	15,652	4,630	33	522	.418	.47
December	107,687	13,800	-	3,474	2.78	3.20
Calendar year	-	-	-	-	-	-
January 1928	37,105	-	-	1,197	.959	1.11
February	70,355	-	-	2,426	1.94	2.09
March	53,354	10,800	430	1,721	1.38	1.59
April	55,451	8,290	304	1,848	1.48	1.65
May	11,126	592	190	359	.288	.33
June	46,736	8,600	156	1,558	1.25	1.40
July	17,432	2,890	61	562	.450	.52
August	1,896	129	33	61.2	.049	.06
September	1,290	162	23	43.0	.034	.04
Water year 1927-28	419,915	-	23	1,147	.919	12.51
October 1928	1,246	84	22	40.2	.032	.04
November	3,907	327	45	130	.104	.12
December	19,563	3,740	-	631	.506	.58
Calendar year	-	-	-	-	-	-
January 1929	94,970	15,500	-	3,064	2.46	2.84
February	49,300	17,200	-	1,761	1.41	1.47
March	82,617	12,800	469	2,665	2.14	2.47
April	70,812	5,940	592	2,360	1.89	2.11
May	39,671	3,570	363	1,280	1.03	1.19
June	5,487	334	72	183	.147	.16
July	29,473	3,740	101	951	.762	.88
August	4,276	423	37	138	.111	.13
September	1,213	64	27	40.4	.032	.04
Water year 1928-29	402,535	17,200	22	1,103	.884	12.03
October 1929	31,597	7,380	29	1,019	.817	.94
November	44,234	3,740	-	1,470	1.18	1.32
December	79,725	9,850	-	2,572	2.06	2.38
Calendar year	-	-	-	-	-	-
January 1930	237,430	25,400	-	7,659	6.14	7.08
February	75,475	11,400	-	2,696	2.16	2.25
March	54,786	7,680	454	1,767	1.42	1.64
April	26,992	3,400	313	900	.721	.80
May	6,581	356	115	212	.170	.20
June	5,652	550	56	188	.151	.17
July	1,559	144	24	50.3	.040	.05
August	757	40	19	24.4	.020	.02
September	1,232	96	24	41.1	.033	.04
Water year 1929-30	566,020	25,400	19	1,551	1.24	16.89
October 1948	2,350	200	31	75.8	.061	.07
November	31,506	3,080	60	1,050	.841	.94
December	51,688	7,040	225	1,667	1.34	1.54
Calendar year 1948	429,914	16,100	21	1,175	.942	12.81
January 1949	107,339	9,020	731	3,463	2.77	3.19
February	58,758	9,600	522	2,098	1.68	1.75
March	38,525	5,430	454	1,243	.996	1.15
April	43,048	3,190	487	1,435	1.15	1.28
May	25,111	5,040	194	810	.649	.75
June	16,854	3,080	83	562	.450	.50
July	7,467	720	53	241	.193	.22
August	2,222	231	34	71.7	.057	.07
September	3,832	815	34	128	.103	.11
Water year 1948-49	388,700	9,600	31	1,065	.853	11.57

Havens Creek at Havens, Ohio

Location.- Water-stage recorder, lat. 41°17'40", long. 83°11'55", in sec. 24, T. 4 N., R. 14 E., at bridge on State Highway 12, three-quarters of a mile southwest of Havens, Sandusky County, and 1¾ mile above mouth.

Drainage area.- 5.00 square miles.

Records available.- August 1946 to September 1948 (fragmentary), October 1948 to September 1949.

Extremes.- Maximum discharge during year, 98 second-feet Feb. 15 (gage height, 3.89 feet); no flow on many days.
1946-49: Maximum discharge, 208 second-feet Mar. 21, 1948 (gage height, 5.12 feet); no flow for long periods.

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

Rating tables, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Nov. 6 to Dec. 1)

Oct. 1 to Mar. 26

0.45	0	0.9	1.0	1.8	11
.5	.05	1.0	1.6	2.1	17
.6	.2	1.2	3.3	2.4	25
.7	.4	1.4	5.2	2.6	31
.8	.7	1.6	7.6	3.1	52

Mar. 27 to Sept. 30

0.45	0	1.0	1.3	1.7	8.2
.5	.06	1.1	1.8	1.9	12
.6	.2	1.2	2.4	2.1	17
.7	.4	1.3	3.2	2.7	36
.8	.6	1.4	4.1		
.9	.9	1.5	5.2		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	1.0	5.0	2.0	2.7	5.3	1.6	0.4	0		0
2		0	a.7	3.2	1.5	1.8	3.6	22	.3	0		0
3		0	a.5	1.7	1.6	1.4	2.5	6.3	.2	0		0
4		0	a.4	1.4	2.3	1.4	1.7	3.2	.2	0		0
5		.3	a.3	16	2.6	2.3	1.6	1.8	.1	.9		.1
6		9.8	a.2	9.8	2.4	1.8	3.4	1.1	.1	22		0
7		3.2	a.2	6.1	3.9	1.0	3.3	.8	.1	16		0
8		1.0	a.1	6.7	2.4	1.1	2.3	.5	0	3.4		0
9		.5	a.1	7.0	1.9	1.2	1.6	.4	0	1.3		0
10		.9	a.1	*7.1	*2.0	3.5	1.3	.3	0	.7		0
11		.6	a.1	5.8	1.5	4.2	1.2	.2	0	.3		0
12		.4	a1.5	4.5	1.4	2.8	1.1	.2	0	.2		0
13		.4	a6	3.5	2.4	2.6	1.1	.2	0	.1		0
14		.3	a4	2.9	5.4	4.1	1.0	.1	.2	.1		0
15		.1	a10	2.9	49	3.9	3.3	.1	9.4	0		0
16		.1	19	5.8	15	2.8	4.5	.1	26	0		0
17		.4	9.1	9.1	8.4	2.1	3.4	.1	13	0		0
18		.3	5.4	24	6.2	2.3	5.0	.1	7.6	0		0
19		6.1	4.3	26	5.5	1.8	3.4	.1	2.9	0		0
20		16	3.6	7.6	4.2	1.8	2.3	1.0	1.2	.1		0
21		4.9	4.9	5.0	3.2	3.0	1.6	.7	.7	0		0
22		2.6	5.8	5.2	7.2	3.3	3.5	33	.6	0		0
23		1.4	3.5	4.9	7.1	2.7	6.0	27	.3	0		0
24		.9	2.4	11	5.8	2.0	3.5	12	.2	0		0
25		.6	1.8	9.3	8.4	1.9	2.2	5.9	.2	0		0
26		.6	1.0	20	5.2	2.1	1.9	3.4	.3	0		0
27		5.3	b.7	17	4.2	8.7	7.2	2.1	.4	0		.1
28		2.9	1.3	32	3.8	3.9	3.4	1.9	.2	0		.1
29		3.4	16	10	-	2.4	2.0	1.2	.1	0		0
30		2.1	10	8.7	-	1.7	1.4	.8	.1	0		0
31		-	6.3	3.4	-	5.8	-	.6	-	0		-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	0	0	0	0	0	0
November	65.1	16	0	2.17	.434	.48
December	120.3	19	.1	3.88	.776	.89
Calendar year	-	-	-	-	-	-
January	282.6	32	1.4	9.12	1.82	2.10
February	166.5	49	1.4	5.95	1.19	1.24
March	84.1	8.7	1.0	2.71	.542	.62
April	85.6	7.2	1.0	2.85	.570	.64
May	128.8	33	.1	4.15	.830	.96
June	64.8	26	0	2.16	.432	.48
July	45.1	22	0	1.45	.290	.33
August	0	0	0	0	0	0
September	.3	.1	0	.01	.0020	.002
Water year 1948-49	1,043.2	49	0	2.86	.572	7.74

Peak discharge (base, 50 sec.-ft.).- Jan. 18 (7 p.m.) 60 sec.-ft.; Feb. 15 (8:30 a.m.) 98 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records (including rain gage records at station) and records for Eagle Creek near Findlay.
b Stage-discharge relation affected by ice.

Black River at Elyria, Ohio

Location.- Water-stage recorder, lat. 41°22'50", long. 82°06'15", in T. 6 N., R. 17 W., at Elyria, Lorain County, three-quarters of a mile below confluence of East and West Branches.

Drainage area.- 392 square miles.

Records available.- October 1944 to September 1949. May 1903 to July 1906 at site about 5½ miles downstream, published as Black River near Elyria.

Extremes.- Maximum discharge during year, 4,500 second-feet Dec. 16 (gage height, 9.91 feet); minimum, 4.0 second-feet Sept. 25-27.
1944-49: Maximum discharge, 8,930 second-feet June 3, 1947, Mar. 22. 1948; maximum gage height, 14.30 feet Mar. 22, 1948; minimum discharge, 0.4 second-foot)Oct. 5, 1945.

Remarks.-Records good except those below 10 second-feet or those for periods of ice effect or no gage-height record, which are fair.

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Nov. 27, June 1 to Sept. 30)

0.6	2.5	1.1	28	2.1	164	4.5	880
.7	5.0	1.3	44	2.5	247	5.5	1,250
.8	9.0	1.4	54	3.0	367	7.0	2,280
.9	14	1.7	94	3.7	577	9.2	3,930

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	14	560	306	267	227	1,520	154	41	72	323	48
2	7.0	10	278	234	180	174	681	132	35	56	92	94
3	6.2	11	170	188	196	188	341	122	31	32	46	79
4	7.0	12	122	143	143	196	238	100	27	20	31	27
5	7.0	13	100	606	138	341	182	78	23	16	34	25
6	7.4	30	85	1,760	141	367	184	64	23	33	51	18
7	8.2	35	75	783	162	285	508	53	21	241	36	19
8	12	79	65	422	153	202	466	45	20	327	30	24
9	8.2	67	55	436	190	166	271	43	20	124	20	17
10	8.6	58	47	408	162	236	184	40	18	1,020	16	12
11	17	41	39	341	166	367	140	37	16	873	14	13
12	9.0	37	58	283	115	528	113	35	15	241	14	15
13	13	44	494	210	149	496	108	32	18	91	11	14
14	11	49	680	162	328	700	176	31	20	49	11	13
15	14	50	*836	136	2,450	880	528	30	19	33	28	11
16	14	45	3,930	143	3,130	528	820	30	20	24	22	11
17	30	39	2,850	475	957	306	970	31	42	20	19	8.2
18	30	33	811	1,010	408	394	800	30	59	20	24	21
19	50	41	367	*2,700	283	354	577	47	51	18	25	12
20	36	112	262	1,490	236	306	367	94	43	16	61	23
21	26	271	247	466	200	380	245	104	30	18	37	21
22	20	204	408	422	260	560	188	312	26	31	25	12
23	18	115	380	466	908	1,020	358	902	20	71	20	11
24	15	78	212	1,100	700	840	860	646	18	44	16	7.4
25	16	58	112	1,940	820	408	700	265	16	29	13	4.5
26	14	53	b100	1,800	840	287	394	156	18	21	11	5.0
27	15	178	b90	2,980	408	1,710	764	108	22	a25	8.6	11
28	16	394	84	3,370	285	2,110	1,070	85	25	14	9.5	33
29	15	451	266	2,430	-	584	380	67	54	12	20	24
30	13	860	1,250	627	-	294	212	58	260	11	36	22
31	11	-	718	316	-	586	-	49	-	320	46	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	484.6	50	6.2	15.6	0.040	0.05
November	3,480	860	10	116	.296	.33
December	15,751	3,930	39	508	1.30	1.50
Calendar year 1948	117,467.5	7,360	4.8	321	.819	11.15
January	28,153	3,370	136	908	2.32	2.68
February	14,375	3,130	115	513	1.31	1.36
March	16,020	2,110	166	517	1.32	1.52
April	14,345	1,520	108	478	1.22	1.36
May	3,980	902	30	128	.327	.38
June	1,051	260	15	35.0	.089	.10
July	3,922	1,020	11	127	.324	.37
August	1,150.1	323	8.6	37.1	.095	.11
September	665.1	94	4.5	22.2	.057	.06
Water year 1948-49	103,376.8	3,930	4.5	283	.722	9.82

Peak discharge (base, 3,200 sec.-ft.).- Dec. 16 (4 p.m.) 4,500 sec.-ft.; Jan. 28 (8:30 p.m.) 3,810 sec.-ft.; Feb. 16 (3 a.m.) 3,930 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of recorded range in stage, observer's reading, and weather records.

b Stage-discharge relation affected by ice.

Rocky River near Berea, Ohio

Location.- Water-stage recorder, lat. 41°24'22", long. 81°53'13", in T. 6 N., R. 15 W., at highway bridge just below confluence of East and West Branches and 3 miles northwest of Berea, Cuyahoga County. Datum of gage is 649.9 feet above mean sea level, datum of 1929 (Cuyahoga County bench mark).

Drainage area.- 269 square miles.

Records available.- November 1923 to September 1935, September 1943 to September 1949.

Average discharge.- 18 years, 247 second-feet.

Extremes.- Maximum discharge during year, 4,010 second-feet Dec. 16 (gage height, 5.18 feet); minimum, 1.5 second-feet Aug. 24, 25.

1923-35, 1943-49: Maximum discharge observed, 17,000 second-feet Aug. 7, 1935, from rating curve extended above 8,000 second-feet; maximum stage observed, 18.6 feet June 29, 1924 (backwater caused by tornado); minimum discharge, 0.2 second-foot Sept. 2, 1932, Aug. 18, 19, 22, 27, 28, 30, 31, 1933.

Maximum stage known, 20.9 feet in March 1913.

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

Revisions (water year).- W 1054: 1935(M).

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	22	313	208	245	166	1,080	110	38	14	10	36
2	17	19	166	183	195	151	407	90	32	29	8.6	29
3	13	22	113	119	147	170	255	85	28	15	8.6	16
4	10	27	94	97	136	178	199	70	24	9.7	8.0	12
5	8.6	28	81	1,030	158	486	158	55	19	8.0	8.6	9.7
6	7.4	49	74	1,450	166	407	170	45	17	13	10	6.9
7	6.9	119	64	398	222	255	492	35	13	41	9.7	6.4
8	9.1	86	55	291	199	174	420	30	10	40	10	16
9	8.0	58	47	276	213	154	245	30	9.7	30	8.0	15
10	7.4	58	44	245	174	318	174	25	8.6	415	7.4	8.6
11	15	74	53	204	133	517	136	25	8.0	268	6.9	6.4
12	16	86	230	154	103	389	113	25	8.0	71	15	6.0
13	23	78	1,130	116	150	315	110	20	8.0	38	18	5.5
14	24	86	468	97	413	603	174	20	6.9	24	8.6	5.0
15	19	76	*925	88	2,640	495	236	20	6.0	15	6.4	4.2
16	17	62	3,110	106	1,470	276	487	20	6.0	12	6.4	3.8
17	78	56	1,080	427	433	208	547	20	9.1	13	6.0	3.4
18	208	55	370	723	250	296	510	20	8.6	13	4.6	19
19	110	64	227	*1,660	191	222	426	30	27	10	4.2	20
20	55	261	183	486	166	187	281	65	16	10	3.4	16
21	38	286	187	236	151	236	191	70	10	9.7	3.0	12
22	29	144	395	364	347	424	162	210	9.1	29	2.1	8.6
23	27	97	236	313	1,090	1,600	250	600	9.1	25	2.7	8.6
24	27	74	129	1,170	426	636	590	450	8.0	17	2.7	7.4
25	31	62	b110	1,410	725	341	480	200	10	13	2.4	5.5
26	34	58	b105	1,520	503	286	270	130	16	12	3.4	6.0
27	29	393	b100	1,800	255	2,150	520	100	14	10	3.0	6.0
28	25	437	97	2,580	208	917	730	86	13	8.0	17	45
29	24	535	422	958	-	358	260	74	10	6.9	35	35
30	19	716	1,440	318	-	236	150	56	12	6.9	12	31
31	19	-	441	276	-	832	-	46	-	7.4	34	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	973.4	208	6.9	31.4	0.117	0.13
November	4,188	716	19	140	.520	.58
December	12,489	3,110	44	403	1.50	1.73
Calendar year 1948	101,491.2	5,200	3.8	277	1.03	14.01
January	19,303	2,580	88	623	2.32	2.68
February	11,509	2,640	103	411	1.53	1.59
March	13,983	2,150	151	451	1.68	1.94
April	10,223	1,080	110	341	1.27	1.42
May	2,862	600	20	92.3	.343	.40
June	414.1	38	6.0	13.8	.051	.06
July	1,233.6	415	6.9	39.8	.148	.17
August	285.7	35	2.1	9.22	.034	.04
September	410.0	45	3.4	13.7	.051	.06
Water year 1948-49	77,873.8	3,110	2.1	213	.792	10.80

Peak discharge (base, 4,000 sec.-ft.).- Dec. 16 (9 a.m.) 4,010 sec.-ft.

* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.- No gage-height record Apr. 23 to May 26; discharge computed on basis of weather records and records for Black River at Elyria.

Cuyahoga River at Hiram Rapids, Ohio

Location.- Water-stage recorder, lat. 41°20'27", long. 81°10'01", in T. 5 N., R. 7 W., at Hiram Rapids, Portage County, 0.6 mile downstream from Black Brook.

Drainage area.- 147 square miles.

Records available.- October 1944 to September 1949. August 1927 to December 1935 at site 2½ miles downstream, published as Cuyahoga River near Hiram.

Average discharge.- 13 years (1927-35; 1944-49), 176 second-feet (unadjusted).

Extremes.- Maximum discharge during year, 790 second-feet Jan. 29 (gage height, 3.74 feet); minimum, 16 second-feet Aug. 24, 25 (gage height, 1.00 foot).
1927-35, 1944-49: Maximum discharge, 2,760 second-feet Mar. 23, 1948 (gage height, 7.00 feet); minimum, 5.1 second-feet Sept. 2, 1933.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by East Branch Reservoir (usable capacity, 4,140 acre-feet). Records of chemical analyses and water temperatures for the water year 1949 are given in Water-Supply Paper 1102.

Revisions (water year).- W 1054: 1945.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	36	207	b280	b450	244	352	241	123	39	99	96
2	42	42	204	b250	376	210	349	196	99	32	96	104
3	37	44	189	b220	b280	186	345	159	g72	30	81	107
4	32	49	163	196	223	172	297	132	g57	28	65	106
5	26	51	136	250	186	191	235	109	g50	26	49	99
6	24	55	114	333	b170	226	207	90	g46	32	39	90
7	22	69	96	372	168	276	212	73	g42	42	32	77
8	24	73	81	413	174	322	226	64	g39	50	29	76
9	28	67	72	400	194	311	241	57	36	50	26	76
10	34	62	a60	341	210	279	226	52	35	60	24	72
11	36	65	a85	286	204	256	199	48	34	71	23	68
12	37	65	a110	235	201	238	165	46	34	71	24	66
13	42	66	150	194	215	229	146	42	32	65	24	61
14	42	72	182	163	263	226	132	41	32	57	24	59
15	42	74	218	140	472	218	121	39	32	54	22	58
16	39	71	341	128	644	207	121	37	31	52	21	56
17	50	65	352	140	740	194	123	36	30	50	20	55
18	81	61	356	161	*667	191	134	34	29	51	20	55
19	92	61	333	215	538	184	144	36	28	51	21	58
20	94	112	286	*247	408	174	159	81	34	59	21	64
21	87	128	*241	266	308	165	161	116	43	101	19	58
22	72	144	210	273	256	191	161	292	36	116	17	57
23	59	148	182	260	270	388	184	498	38	114	17	54
24	48	142	159	283	279	583	210	476	43	107	16	51
25	43	125	130	352	318	644	229	494	52	90	18	45
26	41	104	a100	434	337	574	241	451	62	66	24	38
27	39	119	a75	570	318	574	266	372	71	49	32	32
28	36	142	67	715	300	538	293	297	72	41	37	31
29	36	165	124	765	-	494	318	235	65	38	54	34
30	34	199	232	715	-	421	297	186	49	104	66	34
31	34	-	263	615	-	368	-	154	-	80	76	-

Month	Observed				Change in contents (equivalent, second-feet)†	Adjusted for change in reservoir contents		
	Second-foot-days	Maximum	Minimum	Mean		Mean	Per square mile	Runoff in inches
October	1,398	94	22	45.1	+4.8	49.9	0.339	0.39
November	2,676	199	36	89.2	+14.1	103	.701	.78
December	5,518	356	60	178	+22.5	200	1.36	1.57
Calendar year 1948	64,421	2,610	18	176	+2.7	179	1.22	16.54
January	10,212	765	128	329	+2.4	331	2.25	2.59
February	9,169	740	168	327	-1.0	326	2.22	2.31
March	9,474	644	165	306	+.9	307	2.09	2.41
April	6,494	352	121	216	-1.0	215	1.46	1.63
May	5,184	498	34	167	-.4	167	1.14	1.31
June	1,446	123	28	48.2	-4.0	44.2	.301	.34
July	1,876	116	26	60.5	-16.3	44.2	.301	.35
August	1,136	99	16	36.6	-7.2	29.4	.200	.23
September	1,937	107	31	64.6	-26.6	38.0	.259	.29
Water year 1948-49	56,520	765	16	155	-1.0	154	1.05	14.20

† Change in contents in East Branch Reservoir.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records and records for station at Old Portage.
b Stage-discharge relation affected by ice.
g Computed from graph based on gage readings.

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Cuyahoga River at Old Portage, Ohio

Location.- Water-stage recorder. lat. 41°08'04", long. 81°32'49", at Old Portage, Summit County, at highway bridge 1¼ miles downstream from Little Cuyahoga River and 4 miles northwest of Akron.

Drainage area.- 405 square miles.

Records available.- September 1921 to December 1935, March 1939 to September 1949.

Average discharge.- 24 years, 410 second-feet.

Extremes.- Maximum discharge during year, 2,320 second-feet July 30 (gage height, 7.34 feet); minimum, 35 second-feet Oct. 10, 11 (gage height, 0.58 foot).
1921-35, 1939-49: Maximum discharge, 3,820 second-feet Apr. 5, 1929; maximum gage height, 10.8 feet June 28, 1924; minimum discharge, 14 second-feet Aug. 27, 1944 (gage height, 0.47 foot).

Remarks.- Records good. Diurnal fluctuation caused by power plants above station. Flow regulated by reservoirs and lakes above station. At Lake Rockwell, about 16 miles above gage, an average of 55 second-feet was diverted for municipal supply of city of Akron. Sewage from city enters river below station.

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Aug. 1 to Sept. 30)

Oct. 1 to Jan. 27				Jan. 28 to Sept. 30			
0.6	37	1.5	195	0.6	47	3.2	619
.7	49	2.4	400	.7	59	4.5	1,040
.8	64	3.6	738	1.0	104	5.5	1,420
1.0	99	4.9	1,180	1.4	178	6.1	1,700
				2.2	356		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95	91	366	426	898	562	784	495	256	112	218	90
2	83	120	325	426	738	456	663	443	234	85	174	80
3	54	134	303	413	576	418	619	392	106	62	220	67
4	55	130	302	400	508	405	590	344	102	63	197	63
5	90	122	152	576	482	405	535	309	87	80	145	59
6	104	171	175	800	430	430	535	290	84	139	114	62
7	97	123	175	678	430	443	562	138	92	101	106	69
8	97	161	163	634	418	443	532	112	107	91	107	134
9	86	160	140	648	407	469	482	122	112	80	109	102
10	43	169	122	648	417	535	456	111	95	354	102	94
11	107	177	137	562	379	535	443	105	101	118	230	88
12	104	163	207	475	356	495	392	114	100	121	143	85
13	100	160	246	412	409	456	368	111	184	116	79	82
14	126	160	273	342	492	443	344	98	174	111	66	84
15	100	166	432	319	1,040	430	320	98	134	101	79	88
16	107	167	765	214	1,210	405	344	106	94	88	79	84
17	278	152	738	317	1,100	376	332	116	101	74	57	80
18	144	148	604	437	1,100	381	356	103	101	96	76	86
19	301	170	576	492	1,040	361	260	181	85	155	67	99
20	284	253	576	452	832	337	380	278	84	353	59	91
21	298	191	506	452	648	347	356	153	88	482	55	90
22	238	212	439	466	663	420	392	296	107	295	59	96
23	122	228	388	479	754	829	443	590	104	282	63	98
24	102	237	299	708	678	708	495	693	89	260	70	104
25	108	188	254	864	708	769	535	648	166	201	67	94
26	126	210	211	966	708	864	532	576	160	160	67	88
27	118	283	183	1,180	648	932	723	535	156	141	72	79
28	104	254	176	1,700	634	898	693	482	118	126	90	99
29	108	287	367	1,600	-	784	576	405	106	161	102	82
30	106	327	492	1,250	-	693	535	314	129	547	80	74
31	92	-	506	1,100	-	769	-	288	-	298	141	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,977	301	43	128		
November	5,514	327	91	184		
December	10,598	765	122	342		
Calendar year 1948	126,896	2,640	39	347		
January	20,436	1,700	214	659		
February	18,703	1,210	356	668		
March	16,598	932	337	535		
April	14,577	784	260	486		
May	8,956	693	98	289		
June	3,666	256	84	122		
July	5,453	547	62	176		
August	3,293	230	55	106		
September	2,591	134	59	86.4		
Water year 1948-49	114,362	1,700	43	313		

Peak discharge (base, 2,000 sec.-ft.).- July 30 (3 p.m.) 2,320 sec.-ft.

Cuyahoga River at Independence, Ohio

Location.- Water-stage recorder, lat. 41°23'44", long. 81°37'54", in T. 6 N., R. 12 W., at highway bridge 1 mile northeast of Independence. Datum of gage is 584.14 feet above mean sea level (levels by city of Cleveland).
Drainage area.- 709 square miles.
Records available.- September 1903 to July 1906, September 1921 to May 1923, September 1927 to December 1935, March 1940 to September 1949.
Average discharge.- 18 years (1921-22, 1927-35, 1940-49), 681 second-feet.
Extremes.- Maximum discharge during year, 5,450 second-feet Jan. 28 (gage height, 12.76 feet); minimum, 76 second-feet Aug. 22; minimum gage height, 2.45 feet Oct. 5.
1921-23, 1927-35, 1940-49: Maximum discharge, 11,000 second-feet June 2, 1947 (gage height, 19.07 feet); minimum, 14 second-feet Nov. 30, 1930; minimum combined discharge of river and canal, 48 second-feet Aug. 29, 1933.
Remarks.- Records good except those for period of no gage-height record, which are fair. Diurnal fluctuation caused by power plants above station. Flow slightly regulated by reservoirs and lakes above station. A small amount of water from Tuscarawas River is diverted into this basin at Portage Lakes. Water diverted into Ohio Canal at Brecksville, 6 miles above station, bypasses station; measurements of canal during water year 1948-49 are as follows:

Date	Second-feet	Date	Second-feet
Oct. 5	49.4	Apr. 21	54.8
Nov. 6	56.7	May 26	55.7
Dec. 14	58.0	June 22	51.2
Jan. 19	58.6	July 27	43.9
Feb. 17	53.7	Aug. 23	50.3
Mar. 23	61.1	Sept.13	49.6

Records of chemical analyses and water temperatures for the water year 1949 are given in Water-Supply Paper 1162.

Revisions (water years).- W 894: 1929(M).

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	168	150	666	812	1,500	975	1,950	812	378	252	385	283
2	148	178	549	686	1,220	812	1,500	726	357	203	299	163
3	120	186	494	606	950	747	1,220	606	264	144	252	137
4	91	225	476	587	856	706	1,100	530	197	107	374	113
5	102	197	354	1,800	834	1,250	1,000	458	178	111	267	104
6	141	280	292	2,150	706	1,180	1,120	430	144	156	211	93
7	141	305	299	1,500	790	926	1,350	344	153	261	173	118
8	144	246	277	1,220	768	790	1,200	234	153	176	186	240
9	153	255	234	1,120	790	768	1,020	217	160	156	170	206
10	118	274	228	1,100	686	1,100	879	220	158	649	178	158
11	104	308	217	950	626	1,300	812	203	158	295	168	146
12	203	270	498	790	530	1,050	768	203	153	206	536	122
13	166	270	1,200	666	706	926	726	197	137	186	255	133
14	208	292	686	587	a1,200	1,080	747	189	211	173	148	128
15	184	249	1,210	476	a2,500	926	726	173	166	160	111	128
16	153	267	3,080	458	a4,000	768	834	163	160	153	135	126
17	640	252	1,950	646	a2,000	706	834	192	156	126	124	124
18	642	240	1,400	1,020	1,800	790	950	189	173	122	113	160
19	409	255	1,080	1,700	1,650	686	834	200	153	158	124	168
20	398	768	950	1,080	1,400	606	812	843	133	249	109	150
21	385	512	902	834	1,120	626	768	434	153	693	94	135
22	361	371	975	1,050	1,400	1,020	812	1,100	166	549	83	135
23	277	385	706	856	1,900	2,530	1,200	2,200	158	368	99	144
24	203	381	568	1,900	1,500	1,750	1,550	1,500	160	351	104	153
25	170	334	423	2,310	1,700	1,500	1,350	1,300	231	302	111	141
26	200	299	347	2,750	1,450	1,450	1,120	950	203	261	113	124
27	186	940	305	2,860	1,200	2,970	2,200	834	283	222	113	124
28	178	646	315	4,610	1,120	2,100	1,600	726	237	200	139	217
29	166	834	1,310	2,970	-	1,650	1,150	606	195	184	237	160
30	160	768	1,850	2,200	-	1,350	902	476	186	411	181	133
31	148	-	1,220	1,800	-	1,900	-	406	-	800	305	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	6,867	642	91	222		
November	10,937	940	150	365		
December	25,061	3,080	217	808		
Calendar year 1948	266,921	6,020	83	729		
January	44,094	4,610	458	1,422		
February	36,902	4,000	530	1,318		
March	36,938	2,970	606	1,192		
April	33,034	2,200	726	1,101		
May	17,661	2,200	163	570		
June	5,714	378	133	190		
July	8,384	800	107	270		
August	5,897	536	83	190		
September	4,466	283	93	149		
Water year 1948-49	235,955	4,610	83	646		

Peak discharge (base, 4,400 sec.-ft.).- Jan. 28 (11 a.m.) 5,450 sec.-ft.; Feb. 16 (time unknown) 5,160 sec.-ft.
a No gage-height record; discharge computed on basis of weather records and records for station at Old Portage.

Little Cuyahoga River at Mogadore, Ohio

Location.- Water-stage recorder and concrete control, lat. 41°03'45", long. 81°23'40", in T. 1 N., R. 10 W., 0.8 mile north of Mogadore, Summit County, and three-quarters of a mile upstream from Fritch Lake Outlet.

Drainage area.- 12.3 square miles.

Records available.- February 1946 to September 1949.

Extremes.- Maximum discharge during year, 97 second-feet July 20 (gage height, 1.99 feet); minimum, 0.5 second-foot Apr. 15 (gage height, 0.26 foot).
1946-49: Maximum discharge, 143 second-feet June 7, 1947; minimum, that of Apr. 15, 1949.

Remarks.- Records good except those for period of no gage-height record, which are fair. Flow regulated by Mogadore Reservoir.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used May 13-24, Sept. 4-14)

0.25	0.4	0.60	4.0	0.95	13
.30	.7	.70	5.9	1.0	15
.35	1.0	.75	7.0	1.1	20
.40	1.4	.80	8.4	1.2	26
.45	1.9	.85	9.9	1.3	36
.50	2.5	.90	12	1.4	48

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.7	14	11	11	22	23	22	14	2.4	4.8	4.5	10
2	7.0	14	12	11	21	4.4	21	14	2.5	6.4	5.7	6.0
3	6.6	a10	11	11	21	3.5	21	15	2.3	2.9	9.0	1.7
4	5.3	a6	11	11	25	5.5	20	12	2.4	2.1	8.6	1.0
5	5.1	a4	11	19	28	11	19	11	2.0	2.0	7.2	1.1
6	5.1	a3	10	22	28	11	22	9.3	2.3	5.2	6.3	1.2
7	5.1	a2.5	9.9	22	27	11	22	8.4	2.9	6.1	3.8	1.6
8	5.3	a2.2	9.6	21	26	11	14	6.1	2.3	5.1	4.6	1.8
9	4.7	a2.1	9.3	21	26	9.6	13	3.0	1.9	6.1	6.8	1.7
10	4.2	2.1	9.3	21	18	5.5	12	1.1	2.4	7.8	5.9	1.6
11	4.2	2.1	9.0	21	4.2	6.4	11	.9	4.0	5.9	6.8	1.7
12	3.8	2.1	10	20	4.0	12	7.4	.9	4.1	5.9	7.0	1.8
13	4.0	2.3	10	19	3.8	12	.7	1.2	2.6	5.5	4.9	4.4
14	9.4	2.3	10	15	4.8	13	.7	1.6	2.4	5.3	2.4	13
15	16	2.5	12	11	18	12	.5	1.7	2.4	5.9	1.4	8.4
16	14	3.4	11	12	31	12	13	2.4	1.2	5.5	1.9	6.6
17	16	4.5	9.0	12	28	12	13	2.9	1.3	5.7	6.0	5.9
18	15	7.8	9.0	13	26	11	16	2.3	1.9	6.6	4.4	6.1
19	14	11	9.6	13	24	11	19	1.7	2.2	7.6	3.1	6.1
20	14	16	9.3	13	20	11	16	2.5	2.3	32	2.1	5.9
21	14	12	9.3	13	18	9.9	18	3.4	2.8	32	1.4	5.9
22	14	11	9.6	13	32	7.8	18	2.9	3.1	11	1.6	5.9
23	15	11	9.0	13	45	12	22	3.8	3.1	6.3	2.0	5.3
24	15	11	9.0	21	45	19	24	4.4	2.3	4.4	2.7	2.8
25	14	11	8.7	26	45	20	22	4.2	5.2	6.6	3.5	1.6
26	14	11	8.4	28	45	22	21	4.0	4.9	9.9	1.7	1.2
27	14	12	7.8	34	44	24	21	4.5	3.7	8.7	1.2	1.2
28	14	12	7.8	36	44	21	15	3.8	3.2	7.8	2.0	1.2
29	13	12	11	32	-	24	13	2.8	2.6	9.6	4.4	1.2
30	13	12	12	31	-	26	13	2.4	3.6	10	2.9	1.2
31	13	-	12	26	-	22	-	2.3	-	5.3	3.7	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	317.5	16	3.8	10.2		
November	228.9	16	2.1	7.63		
December	307.6	12	7.8	9.92		
Calendar year 1948	4,122.8	42	2.1	11.3		
January	592	36	11	19.1		
February	723.8	45	3.8	25.8		
March	415.6	26	3.5	13.4		
April	470.3	24	.5	15.7		
May	150.5	15	.9	4.85		
June	82.3	5.2	1.2	2.74		
July	246.0	32	2.0	7.94		
August	129.5	9.0	1.2	4.18		
September	115.1	13	1.0	3.84		
Water year 1948-49	3,779.1	45	.5	10.4		

a No gage-height record; discharge computed on basis of weather records and records for station at Massillon Road, Akron.

Little Cuyahoga River at Massillon Road, Akron, Ohio

Location.- Water-stage recorder and concrete control, lat. 41°03'35", long. 81°27'45", in T. 1 N., R. 10 W., at bridge on Massillon Road in Akron, Summit County, and 250 feet upstream from Springfield Lake Outlet.

Drainage area.- 31.0 square miles.

Records available.- February 1946 to September 1949.

Extremes.- Maximum daily discharge during year, 180 second-feet July 21; minimum, 5.5 second-feet July 5 (gage height, 0.37 foot).
1946-49: Maximum discharge, 521 second-feet Aug. 25, 1947 (gage height, 2.81 feet); minimum, 3.8 second-feet Sept. 18, 1946 (gage height, 0.30 foot).

Remarks.- Records good except those for periods of no gage-height record, which are fair. Flow regulated by Fritch Lake and Mogadore Reservoir. Records of chemical analyses for the water year 1949 are given in Water-Supply Paper 1162.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Sept. 3-28)

0.3	3.8	0.8	24	1.3	80
.4	6.3	.9	31	1.4	102
.5	9.6	1.0	38	1.5	128
.6	14	1.1	48	1.6	157
.7	19	1.2	62	1.7	188

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.9	24	22	23	36	42	47	29	9.6	9.2	a12	17
2	11	23	20	21	34	19	38	27	9.2	12	a15	19
3	11	24	20	20	33	18	37	29	9.2	8.5	a20	8.2
4	9.2	17	20	22	38	19	33	24	8.9	7.2	a17	7.5
5	8.9	13	20	66	43	27	33	23	8.9	6.0	a14	7.5
6	9.2	15	19	54	41	26	46	21	8.2	9.7	a11	6.6
7	8.9	12	17	39	45	23	48	20	8.5	12	a8	8.6
8	10	11	17	36	40	23	33	17	8.5	10	10	13
9	9.2	10	16	35	40	23	28	12	7.9	11	13	7.9
10	8.5	12	16	34	34	29	26	9.9	8.5	43	12	7.2
11	11	11	16	32	18	25	24	9.2	9.2	13	27	6.6
12	8.9	10	26	31	16	26	22	9.2	9.9	12	21	6.6
13	13	11	27	29	23	26	15	9.6	11	12	15	7.5
14	17	11	22	27	29	26	14	9.9	8.5	11	10	16
15	24	10	46	21	94	26	14	10	8.5	11	8.2	16
16	23	11	59	23	64	23	18	10	6.9	11	7.9	12
17	43	12	32	29	46	24	28	10	6.9	12	9.6	11
18	31	15	23	34	42	25	34	9.9	7.2	13	13	12
19	26	20	23	38	38	23	39	15	7.2	34	8.5	12
20	26	34	21	28	34	21	36	25	7.5	a130	7.9	10
21	24	23	23	27	31	22	29	14	7.9	a180	6.9	11
22	23	20	24	31	60	35	40	27	8.2	29	6.3	11
23	25	20	21	31	75	46	49	25	7.5	17	6.9	11
24	24	19	19	66	64	37	52	17	6.9	a10	6.9	8.9
25	24	18	17	58	69	36	42	15	18	a15	8.9	6.9
26	24	20	17	79	59	37	38	13	18	a25	7.5	6.0
27	25	31	16	81	58	46	58	14	12	a18	9.4	5.7
28	23	23	18	123	55	36	36	13	9.2	a16	11	8.5
29	23	28	45	59	-	37	29	12	7.9	a25	18	6.6
30	23	26	42	60	-	39	27	10	7.9	a35	11	6.0
31	23	-	27	44	-	56	-	9.6	-	a16	23	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	579.7	43	8.5	18.7		
November	534	34	10	17.8		
December	751	59	16	24.2		
Calendar year 1948	9,799.2	183	7.0	26.8		
January	1,301	123	20	42.0		
February	1,259	94	16	45.0		
March	921	56	18	29.7		
April	1,013	58	14	33.8		
May	499.3	29	9.2	16.1		
June	273.7	18	6.9	9.12		
July	773.6	180	6.0	25.0		
August	375.9	27	6.3	12.1		
September	293.8	19	5.7	9.79		
Water year 1948-49	8,575.0	180	5.7	23.5		

a No gage-height record; discharge computed on basis of weather records and records for Little Cuyahoga River at Mogadore and Springfield Lake Outlet at Akron.

Springfield Lake Outlet at Akron, Ohio

Location.- Water-stage recorder and concrete control, lat. 41°03'20", long. 81°27'50", in T. 1 N., R. 10 W., in Akron, Summit County, 0.3 mile upstream from mouth and 3 miles downstream from Springfield Lake.

Drainage area.- 8.40 square miles.

Records available.- May 1946 to September 1949.

Extremes.- Maximum discharge during year, 82 second-feet July 30 (gage height, 2.12 feet); minimum, 0.3 second-foot Aug. 20 (gage height, 0.37 foot).
1946-49: Maximum discharge, 139 second-feet Aug. 17, 1947; maximum gage height, 2.72 feet Feb. 14, 1948 (backwater from ice); minimum discharge, 0.3 second-foot Sept. 17-19, 1948, Aug. 20, 1949; minimum gage height, 0.36 foot Sept. 19, 1948.

Remarks.- Records fair except those for periods of ice effect, which are poor. Flow regulated by Springfield Lake. Records of chemical analyses for the water year 1949 are given in Water-Supply Paper 1162.

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Dec. 30, 31, Jan. 2-4, Feb. 20 to Mar. 1, Apr. 22-26, May 19-23, June 15-25, Aug. 15-17, 28-30, Sept. 9-18)

0.35	0.3	0.9	2.0	1.5	13
.4	.4	1.0	2.7	1.6	17
.5	.6	1.1	3.5	1.7	23
.6	.8	1.2	4.7	1.8	32
.7	1.2	1.3	6.4	1.9	46
.8	1.6	1.4	9.2		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	0.8	3.0	b5	b10	8.0	13	7.1	2.5	1.1	1.9	2.1
2	.6	.7	2.6	4.2	b9	9.9	10	6.4	2.1	1.0	1.5	1.3
3	.6	.8	2.5	3.8	b10	9.2	8.9	6.0	2.1	1.1	1.9	1.1
4	.5	.9	2.3	*4.6	b12	9.2	8.3	5.6	2.1	.9	1.5	1.2
5	.6	.8	2.2	16	b11	10	7.6	5.4	2.1	.9	1.3	1.1
6	.6	1.4	2.0	14	b10	11	12	5.3	2.0	1.6	1.1	1.1
7	.5	1.0	1.9	8.9	9.5	9.9	14	5.0	1.9	1.3	1.1	1.2
8	.6	.8	1.9	7.6	9.2	8.3	11	4.7	1.7	1.1	1.0	2.2
9	.6	.9	1.6	6.9	8.6	8.3	9.5	4.6	1.7	1.1	.9	1.0
10	.4	1.6	1.7	6.6	8.3	12	8.6	4.2	1.8	7.9	1.0	.9
11	.9	1.6	1.6	6.4	7.4	12	8.3	4.1	1.7	1.8	2.2	.8
12	.6	1.5	3.1	5.8	6.9	9.9	8.0	3.8	1.6	1.4	2.1	.7
13	.5	1.7	3.6	5.4	8.9	9.9	7.6	3.7	2.0	1.3	1.4	.7
14	.8	1.5	2.6	5.4	*11	8.6	7.6	3.6	1.7	1.1	1.0	.7
15	.5	1.5	7.2	5.1	35	8.3	7.1	3.4	1.4	1.0	1.2	.7
16	.5	1.4	16	5.4	23	7.6	8.0	3.3	1.3	.9	1.2	.7
17	4.0	1.5	9.9	6.9	14	8.3	8.0	3.2	1.3	1.2	.8	.7
18	6.3	1.5	5.6	9.3	12	7.6	9.5	3.0	1.3	1.2	.9	1.4
19	1.3	1.8	5.0	10	10	7.0	9.9	3.1	1.2	1.3	.7	1.2
20	1.1	3.3	4.6	6.9	11	8.8	7.6	4.0	1.2	4.4	.7	.8
21	.9	2.2	5.0	6.0	11	6.9	9.4	3.6	1.1	2.4	.6	.7
22	.9	1.9	5.3	7.6	15	11	9.4	3.7	1.1	1.4	.6	.7
23	.8	1.9	4.8	7.4	16	19	12	4.7	1.0	1.1	.6	.9
24	.8	1.8	4.2	19	12	12	11	4.3	.9	.9	.5	.8
25	.8	1.8	3.4	16	13	10	9.9	4.0	3.1	.8	.4	.7
26	.7	1.9	3.8	22	11	9.9	8.7	3.8	2.2	.9	.4	.8
27	.7	4.2	3.4	24	8.9	12	14	3.5	1.7	.7	2.3	.8
28	.7	2.9	3.4	38	8.3	9.9	10	3.3	1.3	.6	1.2	1.2
29	.7	4.0	9.4	18	-	6.9	8.3	3.0	1.3	1.1	1.4	.7
30	.7	3.6	9.5	b15	-	8.3	7.1	2.7	1.2	15	1.2	.6
31	.7	-	7.6	b11	-	14	-	2.5	-	4.5	3.9	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	30.6	6.3	0.4	0.99		
November	53.2	4.2	.7	1.77		
December	140.7	16	1.6	4.54		
Calendar year 1948	2,029.3	67	.3	5.54		
January	328.2	38	3.8	10.6		
February	332.0	35	6.9	11.9		
March	305.7	19	6.9	9.86		
April	283.5	14	7.1	9.45		
May	128.4	7.1	2.5	4.14		
June	49.6	3.1	.9	1.65		
July	63.0	15	.6	2.03		
August	38.5	3.9	.4	1.24		
September	29.5	2.2	.6	.98		
Water year 1948-49	1,782.9	38	.4	4.88		

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

Low-flow investigation of Tinkers Creek near Bedford, Ohio

An investigation of the low-flow characteristics of Tinkers Creek was made on Oct. 3, 1948, for the purpose of determining the water-supply possibilities in this area. A number of current-meter measurements were made at selected points on the stream and its tributaries after a period of dry weather. The discharges measured are therefore essentially from ground-water sources. This investigation, together with records of nearby gaging stations and other miscellaneous measurements on Tinkers Creek, makes possible a preliminary or reconnaissance estimate of the probable sustained flows that are available.

The measurements on each stream are listed in order proceeding downstream and each measured tributary is inserted in the order in which it enters the main stream. Drainage area shown is total drainage above the measuring point.

Discharge measurements of Tinkers Creek and tributaries near Bedford, Ohio, Oct. 3, 1948

Stream	Location	Drainage area in square miles	Discharge in second-feet	Second-feet per square mile
Tinkers Creek.	0.5 mile below Pond Brook and 400 feet below bridge on State Highway 14, 2½ miles southeast of Twinsburg.	42.4	4.57	0.108
Do.....	200 feet below bridge on Glenwood Road and 2 miles northwest of Twinsburg.	56.2	6.07	.108
Unnamed tributary of Tinkers Creek.	0.2 mile above mouth at bridge on Cochran Road and 4 miles northwest of Twinsburg.	6.53	.26	.040
Tinkers Creek.	500 feet above bridge on Richmond Road and 2½ miles east of Bedford.	69.7	6.90	.099
Unnamed tributary of Tinkers Creek.	0.7 mile above mouth and 100 feet above bridge on Richmond Road, 2½ miles east of Bedford.	6.25	.16	.026
Do.....	0.3 mile above mouth and 200 feet below bridge 1 mile east of Bedford.	5.10	.04	.0078
Tinkers Creek.	500 feet above Pennsylvania R. R. bridge at Bedford.	86.0	7.06	.082
Do.....	2.4 miles above mouth and 1/3 mile above Dunham Road, 2½ miles west of Bedford.	91.6	7.94	.087
Unnamed tributary of Tinkers Creek.	0.1 mile above mouth and ¼ mile above Dunham Road, 2½ miles west of Bedford.	2.68	1.25	.466
Tinkers Creek.	1.8 miles above mouth and ¼ mile below Dunham Road, 2¾ miles west of Bedford.	94.6	8.71	.092
Do.....	0.2 mile above mouth and 500 feet above Canal Road bridge, near Independence.	96.5	8.79	.091

Chagrin River at Willoughby, Ohio

Location.- Water-stage recorder, lat. 41°37'51", long. 81°24'13", at city waterworks, 800 feet downstream from East Branch, 1 mile southeast of Willoughby, Lake County, and 5 miles upstream from mouth.

Drainage area.- 251 square miles.

Records available.- July 1925 to November 1935, October 1939 to September 1949.

Average discharge.- 20 years, 289 second-feet (not including diversion).

Extremes.- Maximum discharge during year, 5,060 second-feet May 22 (gage height, 8.29 feet); minimum daily, 16 second-feet Aug. 26, 27.
1925-35, 1939-49: Maximum discharge, 28,000 second-feet Mar. 22, 1948 (gage height, 17.95 feet, from high-water mark in well), by contracted-opening method; minimum daily, 3.0 second-feet July 25, 26, 1934.

Remarks.- Records good except those for periods of ice effect, which are poor. Water diverted at dam just above station for municipal supply of city of Willoughby.

Revisions (water years).- W 1084: 1929(M), 1931(M).

Rating table, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 20 to Nov. 19, Aug. 3 to Sept. 30)

1.7	9	2.4	102	3.8	670
1.8	17	2.6	147	4.8	1,470
1.9	27	2.9	236	6.3	2,840
2.0	39	3.1	310		
2.2	68	3.5	490		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47	56	294	287	254	201	831	233	88	136	106	66
2	40	66	201	210	254	226	461	220	81	64	60	54
3	37	68	160	135	207	236	318	177	73	43	43	37
4	33	66	140	160	223	223	243	150	64	34	35	32
5	29	70	130	1,210	243	671	204	133	60	31	32	31
6	29	109	121	1,300	220	726	407	121	54	32	29	26
7	31	183	110	475	364	451	575	121	52	64	27	25
8	45	117	98	339	355	302	456	106	47	45	26	47
9	98	88	89	268	523	254	306	98	46	38	25	43
10	68	89	84	226	314	369	223	89	45	78	24	38
11	62	130	79	189	223	451	195	86	45	81	22	29
12	79	102	415	163	192	347	174	82	104	47	28	25
13	68	154	976	140	398	287	189	81	64	37	33	23
14	93	214	*432	128	650	427	233	79	50	33	28	25
15	81	145	459	121	2,750	335	226	78	47	31	23	24
16	62	117	1,470	142	1,320	250	343	78	46	28	22	25
17	354	104	792	287	540	226	364	76	39	29	21	25
18	571	97	373	*397	355	322	475	73	39	31	33	40
19	220	100	268	847	283	298	456	175	39	31	25	78
20	133	919	220	382	243	240	377	1,010	38	32	20	58
21	100	461	207	236	207	570	279	373	35	40	20	49
22	81	260	302	395	587	1,230	268	1,700	45	88	18	45
23	74	195	226	310	919	1,900	501	1,720	38	71	18	46
24	70	163	160	914	461	740	879	800	34	50	18	42
25	66	135	119	1,060	618	456	605	382	40	97	17	40
26	60	123	b110	1,260	485	373	398	275	54	58	16	33
27	58	843	b108	1,240	318	1,070	1,900	207	78	40	16	31
28	54	489	108	2,230	279	624	670	186	56	37	21	66
29	53	480	795	921	-	351	373	158	45	33	74	71
30	52	490	1,140	369	-	257	271	121	46	98	70	47
31	49	-	466	302	-	738	-	102	-	249	64	-

Month	Observed				Diversion (mean second-feet)†	Adjusted for diversion		
	Second-foot-days	Maximum	Minimum	Mean		Mean	Per square mile	Runoff in inches
October	2,897	571	29	93.5	2.08	95.6	0.381	0.44
November	6,633	919	56	221	1.99	223	.888	.99
December	10,652	1,470	79	344	2.01	346	1.38	1.59
Calendar year 1948	118,151	12,300	23	323	2.09	325	1.29	17.64
January	16,643	2,230	121	537	2.07	539	2.15	2.48
February	13,785	2,750	192	492	2.15	494	1.97	2.05
March	15,151	1,900	201	489	2.17	491	1.96	2.26
April	13,200	1,900	174	440	2.05	442	1.76	1.96
May	9,290	1,720	73	300	2.10	302	1.20	1.38
June	1,592	104	34	53.1	2.43	55.5	.221	.25
July	1,806	249	28	58.3	2.32	60.6	.241	.28
August	1,014	106	16	32.7	2.32	35.0	.139	.16
September	1,221	78	23	40.7	1.97	42.7	.170	.19
Water year 1948-49	93,884	2,750	16	257	2.14	259	1.03	14.03

Peak discharge (base, 4,000 sec.-ft.).- Feb. 15 (11:30 a.m.) 4,700 sec.-ft.; May 22 (8 p.m.) 5,060 sec.-ft.

* Winter discharge measurement made on this day.
† Diversion for municipal supply of city of Willoughby.
b Stage-discharge relation affected by ice.

Grand River near Madison, Ohio

Location.- Water-stage recorder, lat. 41°44'26", long. 81°02'48", at highway bridge half a mile upstream from Griswold Creek and 2 miles south of Madison, Lake County. Datum of gage is 674.47 feet above mean sea level, adjustment of 1912.

Drainage area.- 587 square miles.

Records available.- July 1922 to December 1935, February 1938 to September 1949.

Average discharge.- 24 years, 624 second-feet.

Extremes.- Maximum discharge during year, 5,070 second-feet May 23 (gage height, 7.66 feet); minimum, 6.8 second-feet Aug. 28 (gage height, 0.78 foot).
1922-35, 1938-49: Maximum discharge, 16,600 second-feet Mar. 22, 1948 (gage height, 12.48 feet); practically no flow July 31, Aug. 1-2, 1934.

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

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Sept. 23-30)

Oct. 1 to May 23						May 24 to Sept. 30					
0.9	8.0	1.8	104	4.2	1,050	0.8	7.4	2.0	137	5.0	1,640
1.0	13	2.1	155	5.2	1,770	.9	12	2.3	197	5.8	2,350
1.1	20	2.4	222	6.0	2,590	1.0	19	2.6	281	6.6	3,310
1.2	29	2.7	315	6.8	3,600	1.2	36	3.0	430	7.1	4,060
1.3	39	3.0	430	7.2	4,220	1.4	55	3.6	714		
1.5	62	3.6	714			1.7	91	4.2	1,060		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	25	740	1,020	1,180	486	2,820	351	92	63	182	81
2	11	23	527	820	a650	374	1,650	228	78	66	137	127
3	12	22	378	658	a450	322	1,110	169	65	58	82	169
4	13	25	256	443	355	288	848	139	54	37	62	98
5	14	30	188	793	329	438	570	115	46	26	49	56
6	14	41	155	3,000	295	1,730	491	94	40	20	41	36
7	14	52	130	1,960	447	1,390	848	86	35	20	35	26
8	15	82	115	1,420	793	793	1,020	82	32	18	25	27
9	16	79	100	1,280	1,320	504	930	76	30	16	19	23
10	14	76	89	990	1,140	456	648	70	29	33	15	25
11	14	74	79	688	766	688	443	35	28	43	12	26
12	17	81	155	504	688	740	298	29	28	81	22	26
13	26	100	632	370	688	628	222	26	27	52	47	21
14	36	109	1,050	269	1,500	714	210	24	27	34	66	17
15	32	122	820	217	3,230	766	207	24	24	24	45	13
16	30	123	1,280	197	3,820	599	236	23	24	18	30	12
17	60	115	1,820	320	2,110	473	315	20	23	15	21	10
18	134	104	1,320	740	1,530	460	410	20	21	14	16	15
19	222	96	1,020	1,390	1,110	496	452	26	19	12	14	16
20	175	265	875	1,460	663	426	426	518	17	12	23	11
21	150	848	648	960	434	537	333	1,690	16	11	21	9.8
22	107	623	688	875	628	1,380	253	1,390	16	33	16	9.8
23	72	401	663	848	1,820	3,750	278	3,670	19	56	13	12
24	54	291	473	1,300	1,360	2,880	532	3,980	29	79	11	14
25	44	197	344	2,420	1,390	1,650	902	1,920	29	64	9.8	14
26	39	150	193	2,110	1,460	1,280	866	1,120	28	49	8.3	13
27	44	334	190	2,880	990	1,110	3,130	688	38	33	7.4	11
28	46	1,080	169	4,220	714	1,420	2,520	401	40	24	8.3	19
29	56	875	279	4,220	-	1,180	990	233	214	19	64	16
30	48	930	1,410	2,420	-	875	551	157	116	17	42	15
31	30	-	1,610	1,690	-	1,270	-	122	-	42	60	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,570	222	11	50.6	0.086	0.10
November	7,373	1,080	22	246	.419	.47
December	18,394	1,820	79	593	1.01	1.16
Calendar year 1948	214,060.5	13,000	7.1	585	.997	13.57
January	42,482	4,220	197	1,370	2.33	2.69
February	31,880	3,820	295	1,138	1.94	2.02
March	30,103	3,750	288	971	1.65	1.90
April	24,509	3,130	207	817	1.39	1.55
May	17,526	3,980	20	565	.963	1.11
June	1,284	214	16	42.8	.073	.08
July	1,089	81	11	35.1	.060	.07
August	1,203.8	182	7.4	38.8	.066	.08
September	968.6	169	9.8	32.3	.055	.06
Water year 1948-49	178,362.4	4,220	7.4	489	.833	11.29

Peak discharge (base, 5,500 sec.-ft.).- No peak above base.
a No gage-height record; discharge interpolated.

Phelps Creek near Windsor, Ohio

Location.- Water-stage recorder, lat. 41°30'55", long. 80°56'05", in T. 8 N., R. 5 W., at bridge on State Highway 534, 1.4 miles south of Windsor, Ashtabula County, and 1½ miles upstream from mouth.

Drainage area.- 26.4 square miles.

Records available.- March 1942 to September 1949.

Extremes.- Maximum discharge during year, 635 second-feet Feb. 15 (gage height, 4.46 feet); minimum, 0.4 second-foot July 16 (gage height, -0.18 foot).
1942-49: Maximum discharge, 2,020 second-feet Mar. 22, 1948 (gage height, 8.97 feet), from rating curve extended above 1,000 second-feet; no flow Aug. 20, 21, 1943, and parts of days Oct. 24, 25, 1946.

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

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used July 23-26, Sept. 4-30)

-0.20	0.2	0.10	4.7	0.7	44
-.15	.6	.15	6.5	1.0	75
-.10	1.1	.2	8.7	1.6	147
-.05	1.7	.3	14	2.4	260
0.00	2.4	.4	19	3.1	373
.05	3.4	.5	26		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.7	2.4	26	19	15	15	90	12	3.0	1.7	13	90
2	1.7	2.6	16	13	12	14	44	9.2	2.6	1.2	6.9	20
3	1.6	3.2	12	6.9	10	17	26	6.9	2.3	.9	8.3	8.7
4	1.7	3.7	11	5.4	8.7	16	19	5.1	2.0	.6	17	4.7
5	1.7	3.7	8.7	141	11	102	14	3.7	1.7	.5	7.8	3.2
6	1.7	5.1	8.3	144	12	100	52	3.2	1.6	.6	3.4	2.3
7	1.8	8.5	6.5	44	20	38	63	2.8	1.5	.6	2.3	2.1
8	1.8	7.4	5.4	36	36	24	46	2.4	1.2	.5	1.8	3.7
9	2.1	5.8	4.4	37	b50	19	26	2.0	1.1	.6	1.7	4.7
10	1.8	4.7	3.9	36	b30	32	18	1.7	.9	.8	1.6	3.2
11	2.3	4.4	3.4	25	15	40	14	1.5	1.0	.7	1.6	2.3
12	2.3	5.1	33	16	11	32	11	1.2	1.0	.6	2.4	2.0
13	2.6	a7	108	9.8	b50	28	9.7	1.1	1.0	.6	2.6	1.8
14	3.2	a8	39	8.3	102	42	10	1.1	.9	.5	2.1	1.6
15	3.2	6.1	54	6.1	*363	32	10	1.1	.8	.5	1.8	1.3
16	2.8	6.5	164	14	95	23	12	1.1	.8	.4	1.7	1.2
17	10	6.1	65	*60	38	22	18	1.0	.8	.5	2.9	1.0
18	21	5.1	26	66	24	33	19	1.0	.9	.5	4.4	1.0
19	9.7	6.1	16	122	21	24	23	14	.8	.5	4.2	1.1
20	5.1	49	13	38	19	16	21	243	.7	.6	2.4	1.0
21	3.9	31	15	18	16	38	14	48	.8	.6	2.0	1.2
22	3.4	17	43	52	45	201	13	116	.9	.7	1.7	1.1
23	3.0	12	20	31	88	302	32	212	.8	1.7	1.3	1.5
24	2.6	11	11	154	39	58	58	45	.7	2.3	1.1	1.1
25	2.4	8.7	5.8	126	83	35	37	26	.9	1.8	.9	1.2
26	2.3	7.4	3.9	150	49	31	22	16	1.0	1.7	.8	1.2
27	2.3	67	2.8	120	26	100	145	12	6.1	2.3	.8	1.1
28	2.3	37	2.4	285	23	54	42	8.7	16	1.7	1.0	1.3
29	2.1	52	17	194	-	26	20	6.5	3.4	1.2	23	1.3
30	2.1	54	54	28	-	18	14	4.7	2.3	92	17	1.6
31	2.1	-	45	19	-	81	-	3.9	-	38	26	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	108.3	21	1.6	3.49	0.132	0.15
November	447.6	67	2.4	14.9	.564	.63
December	843.5	164	2.4	27.2	1.03	1.19
Calendar year 1948	11,316.7	998	.8	30.9	1.17	15.94
January	2,024.5	285	5.4	65.3	2.47	2.85
February	1,311.7	363	8.7	46.8	1.77	1.84
March	1,613	302	14	52.0	1.97	2.27
April	942.7	145	9.7	31.4	1.19	1.33
May	813.9	243	1.0	26.3	.996	1.15
June	59.5	16	.7	1.98	.075	.08
July	157.4	92	.4	5.08	.192	.22
August	165.5	26	.8	5.34	.202	.23
September	169.5	90	1.0	5.65	.214	.24
Water year 1948-49	8,657.1	363	.4	23.7	.89e	12.18

Peak discharge (base, 900 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
a No gage-height record; discharge interpolated.
b Stage-discharge relation affected by ice.

Rock Creek near Rock Creek, Ohio

Location.- Water-stage recorder, lat. 41°39'05", long. 80°50'10", in T. 10 N., R. 4 W., at highway bridge 0.4 mile downstream from Plum Creek, 1.4 miles southeast of village of Rock Creek, Ashtabula County, 1½ miles downstream from Sugar Creek, and 3 miles upstream from mouth.
Drainage area.- 56.6 square miles.
Records available.- March 1942 to September 1949.
Extremes.- Maximum discharge during year, 2,070 second-feet May 23 (gage height, 5.71 feet); no flow Aug. 25-28.
1942-49: Maximum discharge, 5,730 second-feet Mar. 22, 1948 (gage height, 8.82 feet), from rating curve extended above 2,300 second-feet on basis of velocity-area studies; no flow at times.
Remarks.- Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Aug. 7 to Sept. 30)

Oct. 1 to Feb. 15

0.60	2.2	1.0	24	2.5	221
.65	4.0	1.2	40	2.8	303
.7	6.2	1.4	59	3.1	422
.8	11	1.7	93	4.0	895
.9	18	2.1	148		

Feb. 16 to Sept. 30

0.30	0	0.7	8.2	2.8	302
.35	.1	.8	15	3.1	419
.40	.4	1.1	36	4.0	895
.45	.9	1.4	62	4.6	1,240
.50	1.6	1.8	106	5.0	1,520
.55	2.6	2.2	164		
.6	3.9	2.5	221		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.8	6.2	69	100	b50	38	277	23	8.2	49	21	17
2	5.8	7.2	40	b50	b40	b35	112	18	6.9	35	6.0	6.9
3	4.9	10	29	b30	36	38	65	13	5.6	11	3.1	3.1
4	3.6	9.8	24	b25	30	45	45	9.5	4.8	5.6	2.0	1.6
5	3.3	11	21	394	40	177	34	7.8	3.6	3.6	1.3	1.2
6	3.3	16	20	551	b45	202	70	6.5	3.4	2.9	.9	.7
7	3.6	36	17	158	b75	94	99	5.2	2.9	2.4	.7	.5
8	5.3	23	14	110	b120	54	99	3.9	2.4	13	.5	2.0
9	6.7	14	11	86	b150	43	61	3.6	2.2	8.8	.4	1.8
10	6.7	11	10	67	100	69	38	3.1	2.0	34	.3	1.5
11	8.3	22	9.3	48	46	126	28	2.9	2.0	67	.3	1.0
12	8.8	22	26	37	b40	86	22	2.6	1.8	22	2.3	.7
13	9.3	20	*221	29	100	70	20	2.6	1.6	8.8	2.4	.4
14	11	31	114	25	200	107	27	2.4	1.5	4.8	2.4	.3
15	9.3	25	92	22	*710	83	26	2.4	1.2	3.1	1.3	.3
16	9.3	18	400	27	402	53	29	2.2	.9	2.4	.8	.3
17	34	15	266	*77	130	49	30	2.4	.9	1.8	.6	.3
18	123	13	100	118	73	75	28	2.2	.9	2.0	1.0	.8
19	45	12	60	300	55	50	31	9.4	.9	1.8	.8	1.5
20	20	228	48	128	44	34	29	562	a2.0	3.6	.9	.8
21	11	147	60	59	38	*62	22	260	4.7	2.4	.7	1.2
22	8.3	55	129	103	108	252	23	550	6.0	5.4	.3	1.0
23	6.7	34	70	87	281	703	54	1,480	4.8	14	.2	.8
24	5.8	25	40	358	125	190	94	298	2.6	7.8	.1	.7
25	4.9	20	b25	317	186	92	83	115	2.0	5.6	0	.6
26	4.9	16	b17	358	136	71	71	65	2.0	2.6	0	.5
27	4.9	285	b13	434	68	228	470	41	2.2	2.0	0	.7
28	4.4	169	11	868	54	190	117	30	91	1.3	0	1.3
29	4.4	184	280	348	-	81	50	22	46	1.3	2.2	1.3
30	5.3	151	572	114	-	50	31	15	15	13	2.4	.7
31	5.3	-	172	82	-	228	-	11	-	105	5.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	392.9	123	3.3	12.7	0.224	0.26
November	1,636.2	285	6.2	54.5	.963	1.07
December	2,980.3	572	9.3	96.1	1.70	1.96
Calendar year 1948	28,153.4	3,390	0	76.9	1.36	18.49
January	5,510	868	22	178	3.14	3.62
February	3,482	710	30	124	2.19	2.28
March	3,675	703	34	119	2.10	2.42
April	2,185	470	20	72.8	1.29	1.44
May	3,571.7	1,480	2.2	115	2.03	2.34
June	232.0	91	.9	7.73	.137	.15
July	443.0	105	1.3	14.3	.253	.29
August	60.1	21	0	1.94	.034	.04
September	51.5	17	.3	1.72	.030	.03
Water year 1948-49	24,219.7	1,480	0	66.4	1.17	15.90

Peak discharge (base, 1,200 sec.-ft.).- May 23 (2 a.m.) 2,070 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge interpolated.
b Stage-discharge relation affected by ice.

Mill Creek near Jefferson, Ohio

Location.- Water-stage recorder, lat. 41°45'10", long. 80°48'00", in T. 11 N., R. 3 W., at bridge on State Highway 307, 1¾ miles northwest of Jefferson, Ashtabula County, and 3½ miles downstream from Griggs Creek.

Drainage area.- 78.3 square miles.

Records available.- March 1942 to September 1949.

Extremes.- Maximum discharge during year, 1,640 second-feet Apr. 27 (gage height, 6.65 feet); no flow at times.
1942-49: Maximum discharge, 7,010 second-feet Mar. 22, 1948 (gage height, 9.95 feet); no flow at times.

Remarks.- Records good except those below 10 second-feet, which are fair.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 1 to Nov. 20, June 27 to Sept. 30)

0.7	0	1.3	12	3.1	201
.8	.5	1.5	22	3.6	312
.9	1.4	1.8	41	4.2	484
1.0	2.7	2.1	63	4.8	700
1.1	4.5	2.4	93	5.6	1,040
1.2	7.5	2.7	132		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	3.4	80	70	61	37	608	29	11	6.4	0.3	0.1
2	0	2.9	48	55	47	30	192	22	8.3	4.5	.2	0
3	0	2.6	33	40	34	30	85	15	6.3	3.8	.2	0
4	0	2.3	25	29	33	30	49	11	5.7	2.2	.1	0
5	0	2.0	21	265	38	133	34	9.2	5.4	1.0	0	0
6	0	2.0	17	736	49	422	51	7.5	4.8	.4	0	0
7	0	2.0	15	193	92	178	134	6.3	3.6	.2	0	0
8	0	2.0	13	108	173	83	125	5.1	2.9	.1	0	.1
9	0	3.6	11	86	287	61	84	4.3	2.3	.1	0	0
10	0	8.2	8.8	69	188	88	48	3.8	1.4	.3	0	0
11	0	7.9	6.6	50	71	134	31	2.9	1.0	.1	0	0
12	0	16	11	38	56	95	22	2.6	.8	0	0	0
13	0	21	151	29	104	68	22	2.7	.6	0	0	0
14	.1	17	147	23	312	82	25	2.9	.4	0	0	0
15	0	28	75	20	794	81	27	3.2	.3	0	0	0
16	0	30	224	21	606	58	36	3.2	.1	0	0	0
17	.8	26	246	68	134	48	52	3.6	0	0	0	0
18	.3	20	97	93	64	57	73	3.6	0	0	0	0
19	24	17	52	297	49	61	80	4.0	0	0	0	0
20	36	146	42	200	41	43	69	16	0	0	0	0
21	20	307	40	64	33	95	43	156	0	0	0	0
22	13	100	91	78	121	422	33	124	0	2.2	0	0
23	8.3	52	78	80	437	928	49	1,020	0	.2	0	0
24	6.3	36	44	288	173	308	112	530	0	1.0	0	0
25	5.4	28	30	437	169	99	138	180	0	1.7	0	0
26	5.4	23	20	282	164	69	67	74	0	1.3	0	0
27	5.4	174	13	468	70	104	980	44	.1	1.2	0	0
28	5.1	300	7.2	846	51	136	384	33	.1	1.1	0	0
29	4.5	144	26	470	-	68	77	25	2.4	1.0	.5	0
30	4.1	152	322	93	-	40	42	20	13	.6	.1	0
31	3.8	-	180	75	-	323	-	15	-	.3	.1	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	142.5	36	0	4.60	0.059	0.07
November	1,675.9	307	2.0	55.9	.714	.80
December	2,174.6	322	6.6	70.1	.895	1.03
Calendar year 1948	33,440.7	4,760	0	91.4	1.17	15.89
January	5,671	846	20	183	2.34	2.70
February	4,451	794	33	159	2.03	2.11
March	4,411	928	30	142	1.81	2.09
April	3,772	980	22	126	1.61	1.80
May	2,378.9	1,020	2.6	76.7	.980	1.13
June	70.5	13	0	2.35	.030	.03
July	29.7	6.4	0	.96	.012	.01
August	1.5	.5	0	.05	.00064	.0007
September	.2	.1	0	.01	.00013	.0001
Water year 1948-49	24,778.8	1,020	0	67.9	.867	11.77

Peak discharge (base, 1,500 sec-ft.).- Apr. 27 (5 p.m.) 1,640 sec.-ft.; May 23 (11 a.m.) 1,540 sec.-ft.

Cattaraugus Creek at Gowanda, N. Y.

Location.- Water-stage recorder, lat. 42°27'50", long. 78°56'10" at Gowanda, Erie County, 380 feet downstream from highway bridge, 600 feet downstream from powerhouse of Niagara, Lockport, & Ontario Power Co., and 4.2 miles downstream from South Branch.

Drainage area.- 428 square miles.

Records available.- November 1939 to September 1949.

Extremes.- Maximum discharge during year, 8,820 second-feet Jan. 5; maximum gage height, 8.77 feet Feb. 2 (ice jam); minimum discharge, 12 second-feet Sept. 11 (gage height, 1.11 feet); minimum daily, 56 second-feet Aug. 28.
1939-49: Maximum discharge, 35,900 second-feet Mar. 17, 1942 (gage height, 13.73 feet), from rating curve extended above 6,500 second-feet by logarithmic plotting; minimum, about 6 second-feet Aug. 21 1941 (gage height, 1.01 feet); minimum daily, 52 second-feet Sept. 13, 1945.

Remarks.- Records good except those for periods of ice effect or backwater from debris, which are fair. Flow regulated by municipal power plant and several industrial plants above station. Diurnal fluctuation at low and medium flow.

Dischsrge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	197	371	b600	b560	b390	2,180	548	214	154	c230	239
2	119	178	331	b640	b500	b430	1,270	515	192	134	c150	157
3	118	180	302	743	b490	b480	928	458	180	115	c145	135
4	104	172	296	602	b470	497	757	404	184	106	c150	121
5	101	169	274	2,680	b440	1,190	638	375	167	104	c114	127
6	96	195	276	4,720	b400	2,660	765	348	167	101	c98	111
7	95	300	265	1,770	b420	1,180	1,410	321	162	96	c90	98
8	169	253	252	1,280	b390	846	2,160	304	149	87	c86	120
9	272	208	242	1,350	b580	782	1,490	302	154	89	c78	129
10	179	209	241	1,450	*b520	716	945	281	161	124	c74	112
11	129	417	226	1,010	b440	*710	755	262	150	112	c72	97
12	139	351	313	b720	b410	575	649	259	149	97	c84	97
13	419	323	895	b580	b2,400	537	679	258	138	94	c145	92
14	580	536	548	*b540	2,810	617	1,920	246	139	85	93	91
15	323	484	426	458	3,910	609	1,750	257	139	88	93	96
16	235	515	487	953	2,320	534	1,820	244	130	78	79	85
17	1,770	390	585	1,860	1,180	527	1,180	236	129	72	80	89
18	2,220	330	*419	1,240	b820	b500	1,160	228	125	96	128	166
19	887	323	343	1,680	884	b380	1,750	304	134	109	155	240
20	663	1,320	332	1,000	740	b370	1,110	570	144	154	101	210
21	583	902	326	631	639	1,010	828	394	141	475	94	193
22	433	569	343	668	677	3,380	723	463	131	204	90	164
23	356	525	319	548	1,160	4,140	936	1,140	127	218	83	155
24	304	489	b260	710	787	1 800	848	636	113	136	77	198
25	286	405	b230	1,120	807	1,140	722	437	125	323	79	194
26	249	369	b205	727	b720	929	704	348	163	285	77	160
27	234	526	b200	624	b520	884	2,100	307	147	171	70	141
28	214	480	b270	2,160	b480	879	963	297	123	130	56	131
29	205	416	1,000	b1,600	-	675	704	266	115	116	208	140
30	178	418	2,460	b740	-	582	596	254	171	157	246	130
31	184	-	1,100	b660	-	2,010	-	241	-	c540	138	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	11,960	2,220	95	386	0.902	1.04
November	12,149	1,320	169	405	.946	1.06
December	14,137	2,460	200	456	1.07	1.23
Calendar year 1948	240,944	10,800	95	658	1.54	20.95
January	36,064	4,720	458	1,163	2.72	3.13
February	26,474	3,910	390	946	2.21	2.30
March	31,959	4,140	370	1,031	2.41	2.78
April	34,440	2,180	596	1,148	2.68	2.99
May	11,503	1,140	228	371	.867	1.00
June	4,463	214	113	149	.348	.39
July	4,850	540	72	156	.364	.42
August	3,463	246	56	112	.262	.30
September	4,218	240	85	141	.329	.37
Water year 1948-49	195,680	4,720	56	536	1.25	17.01

Peak discharge (base, 15,000 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.
c Blackwater from debris.

Buffalo Creek at Gardenville, N. Y.

Location.- Water-stage recorder, lat. 42°51'15", long. 78°45'30", in Gardenville, Erie County, 700 feet downstream from bridge on Union Road and 2 miles upstream from Cayuga Creek. Datum of gage is 604.04 feet above mean sea level, unadjusted.
Drainage area.- 145 square miles.
Records available.- October 1938 to September 1949.
Average discharge.- 11 years, 191 second-feet.
Extremes. Maximum discharge during year, 5,130 second-feet Jan. 5; maximum gage height, 5.68 feet Jan. 5 (backwater from ice); minimum discharge, 3.2 second-feet Aug. 17 (gage height, 0.935 foot).
1938-49: Maximum discharge, 14,000 second-feet Mar. 17, 1942, from rating curve extended above 4,000 second-feet by logarithmic plotting; maximum gage height, 11.90 feet Mar. 9, 1942 (ice jam); minimum discharge, 0.7 second-foot Aug. 22, 24, 25, 1941; minimum gage height observed, 0.695 foot Aug. 28, 31, Sept. 3, 1939 (backwater from leaves and debris).
Remarks.- Records good except those for periods of ice effect, which are fair. Diurnal fluctuation at low flow caused by mill 3.2 miles above station.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Backwater from debris Nov. 17-19, Sept. 2-30)

Oct. 1 to Jan. 5

1.0	7.0	1.3	50	1.7	171
1.1	17	1.4	73	1.9	257
1.2	31	1.5	101	2.2	416

Note.- Same as following table above 2.0 feet.

Jan. 6 to Sept. 30

0.95	4.1	1.5	112	3.0	1,000
1.0	7.4	1.7	177	3.4	1,350
1.1	19	1.9	258	3.8	1,790
1.2	35	2.2	416		
1.3	56	2.6	684		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	39	84	120	112	70	559	92	32	62	40	28
2	16	40	68	125	96	100	335	89	28	34	23	30
3	16	41	63	125	88	130	185	78	26	22	17	23
4	16	44	60	114	88	124	143	70	24	16	13	15
5	16	41	57	1,400	82	667	118	67	22	14	10	16
6	15	70	57	1,720	74	988	222	61	21	12	9.1	14
7	14	104	55	419	78	250	590	56	20	10	8.2	13
8	22	72	44	388	70	150	465	54	19	8.6	7.8	15
9	56	52	48	399	160	185	341	52	19	8.2	6.7	15
10	54	69	42	386	*170	167	185	49	18	14	6.0	17
11	37	98	50	215	100	145	150	47	17	14	5.6	14
12	31	81	150	130	80	116	121	46	17	12	5.6	11
13	53	134	421	135	780	106	109	44	17	11	5.6	9.2
14	113	273	162	*124	749	*125	364	44	17	8.6	5.6	9.6
15	67	145	108	94	1,590	122	385	47	15	7.4	5.6	8.6
16	44	108	217	195	566	106	525	43	12	6.7	5.3	8.2
17	509	*90	*336	445	260	96	302	41	11	7.0	4.5	9.0
18	621	68	104	268	150	88	345	38	11	7.0	19	19
19	196	170	82	629	211	70	498	43	12	11	39	38
20	272	1,050	70	210	174	78	226	112	25	11	20	31
21	180	322	76	88	140	600	153	94	19	10	14	23
22	99	159	110	84	175	1,280	131	72	15	14	11	19
23	71	124	100	74	364	1,340	185	198	12	14	7.8	21
24	57	104	64	270	192	378	206	129	10	18	7.0	22
25	52	90	39	500	257	224	157	75	9.6	65	6.0	21
26	48	76	33	135	200	185	149	56	22	66	5.0	19
27	45	191	29	125	112	192	459	47	38	29	4.4	15
28	43	155	28	1,020	122	215	187	41	21	19	6.7	14
29	41	104	50	480	-	140	124	39	16	14	19	15
30	38	93	991	145	-	112	103	46	173	11	46	15
31	37	-	200	125	-	186	-	39	-	53	28	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,894	621	14	93.4	0.644	0.74
November	4,207	1,050	39	140	.966	1.08
December	3,998	991	28	129	.890	1.03
Calendar year 1948	64,591.8	3,040	4.8	176	1.21	16.58
January	10,687	1,720	74	345	2.38	2.74
February	7,242	1,590	70	259	1.79	1.86
March	8,735	1,340	70	282	1.94	2.24
April	8,022	590	103	267	1.84	2.06
May	2,009	198	38	64.8	.447	.52
June	718.6	173	9.6	24.0	.166	.18
July	609.5	66	6.7	19.7	.136	.16
August	411.5	46	4.4	13.3	.092	.11
September	527.6	38	8.2	17.6	.121	.14
Water year 1948-49	50,061.2	1,720	4.4	137	.945	12.86

Peak discharge (base, 7,500 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 8-12, 18-29, Dec. 31 to Jan. 5, Jan. 11-16, 20-24, Jan. 26 to Feb. 15, Feb. 17, 18, Feb. 26 to Mar. 3, Mar. 7, 8, 11-21.

Cayuga Creek near Lancaster, N. Y.

Location.- Water-stage recorder, lat. 42°53'20", long. 78°38'40", just upstream from low flat-crested dam in Como Lake Part, 700 feet downstream from bridge on Bowen Road, 800 feet downstream from Little Buffalo Creek, and 2 miles southeast of Lancaster, Erie County. Datum of gage is 672.80 feet above mean sea level, unadjusted.

Drainage area.- 93.3 square miles.

Records available.- September 1938 to September 1949.

Average discharge.- 11 years, 126 second-feet.

Extremes.- Maximum discharge during year, 4,140 second-feet Jan. 5; maximum gage height, 10.39 feet Jan. 5 (ice jam); minimum daily discharge, 0.2 second-foot Aug. 16; minimum gage height, 2.68 feet Aug. 16, 17.
1938-49: Maximum discharge, 7,480 second-feet Mar. 17, 1942; maximum gage height, 12.36 feet Mar. 9, 1942 (ice jam); practically no flow Aug. 8, 9, 1939, when permanent stop logs were installed in dam.

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.5	14	f54	82	74	43	340	64	13	13	2.6	10
2	4.7	15	44	84	70	78	323	56	12	7.8	1.9	8.0
3	4.5	14	41	86	68	92	170	44	10	5.4	1.6	5.1
4	4.1	15	37	84	64	88	120	37	8.8	3.7	1.6	3.3
5	3.9	15	35	1,250	62	614	94	33	8.0	3.3	1.4	3.5
6	3.8	26	34	1,090	58	723	235	29	6.9	2.5	1.0	3.8
7	3.5	54	30	309	62	180	602	26	6.7	2.3	.7	3.2
8	6.4	42	24	335	54	120	426	23	6.2	1.8	.6	4.4
9	18	27	26	324	*140	133	270	22	6.0	1.3	.5	4.4
10	15	29	23	275	120	130	154	20	5.8	5.2	.4	4.2
11	9.7	62	28	145	70	106	117	19	5.6	5.3	.4	3.1
12	8.8	47	115	68	58	88	98	18	5.2	4.4	.4	2.2
13	13	68	306	*70	660	78	87	17	4.9	2.7	.8	1.9
14	40	142	113	64	460	*88	226	17	4.9	2.2	.6	2.8
15	22	a71	70	44	1,260	84	247	17	4.5	1.6	.4	2.5
16	14	a52	170	150	378	78	332	16	3.2	1.3	.2	2.4
17	156	*a44	*180	317	175	70	216	16	2.3	1.3	.4	2.0
18	194	38	52	198	120	58	260	14	3.5	1.4	22	7.9
19	67	f131	40	408	158	45	315	16	11	3.1	12	19
20	c135	f867	39	125	125	54	165	59	30	5.1	4.2	13
21	c86	212	48	64	93	615	113	37	8.4	3.8	2.7	7.8
22	c47	a104	78	58	144	1,120	94	38	5.2	3.0	1.6	5.9
23	c35	a82	54	50	317	986	145	116	3.7	2.6	1.0	12
24	c26	a68	32	268	154	292	120	75	3.2	2.5	.7	13
25	c23	a58	23	407	235	192	98	38	2.7	36	.6	9.3
26	c20	a48	19	88	140	159	103	28	4.7	20	.5	6.8
27	c18	a175	18	84	88	187	353	23	4.4	7.9	.3	4.9
28	c16	f106	19	900	98	174	137	20	3.2	6.2	.8	4.4
29	15	a70	40	320	-	109	90	21	18	3.7	14	5.3
30	14	a62	428	92	-	88	74	16	34	2.7	16	5.5
31	13	-	130	84	-	123	-	15	-	3.2	7.7	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,040.9	194	3.5	33.6	0.360	0.41
November	2,758	867	14	91.9	.985	1.10
December	2,350	428	18	75.8	.812	.94
Calendar year 1948	39,212.6	1,750	.5	107	1.15	15.62
January	7,925	1,250	44	256	2.74	3.16
February	5,505	1,260	54	197	2.11	2.19
March	6,995	1,120	43	226	2.42	2.79
April	6,124	602	74	204	2.19	2.44
May	990	116	14	31.9	.342	.39
June	246.0	34	2.3	8.20	.088	.10
July	166.3	36	1.3	5.36	.057	.07
August	99.6	22	.2	3.21	.034	.04
September	181.6	19	1.9	6.05	.065	.07
Water year 1948-49	34,381.4	1,260	.2	94.2	1.01	13.70

Peak discharge (base, 3,300 sec.-ft.).- Jan. 5 (9:30 p.m.) 4,140 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of recorded range in stage, weather records, and records for nearby stations.
c Backwater from leaves (fragmentary gage-height record Oct. 20, 21).
f Fragmentary gage-height record; discharge computed on basis of partial gage-height record, weather records, and records for nearby stations.
Note.- Stage-discharge relation affected by ice Dec. 8-11, 15-20, 23-29, Dec. 31 to Jan. 5, Jan. 11-16, 20-23, Jan. 26 to Feb. 14, Feb. 17, 18, Feb. 26 to Mar. 4, Mar. 7, 8, 10-20 (no gage-height record Dec. 15-17, Jan. 30 to Feb. 9).

Cazenovia Creek at Ebenezer, N. Y.

Location.- Water-stage recorder, lat. 42°49'45", long. 78°46'40", 40 feet upstream from highway bridge on Ridge Road in Ebenezer, Erie County, 4.4 miles upstream from mouth, and 5 miles southeast of Buffalo. Datum of gage is 606.86 feet above mean sea level, unadjusted.

Drainage area.- 136 square miles.

Records available.- June 1940 to September 1949.

Extremes.- Maximum discharge during year, 4,770 second-feet Jan. 5; maximum gage height, 7.87 feet Jan. 5 (ice jam); minimum discharge, 3.3 second-feet Aug. 17 (gage height, 0.50 foot).

1940-49: Maximum discharge, 11,200 second-feet Mar. 17, 1942 (gage height, 13.11 feet), from rating curve extended above 5,200 second-feet by logarithmic plotting; minimum, that of Aug. 17, 1949; minimum gage height, 0.42 foot Aug. 25, 1941.

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

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	41	105	145	125	80	735	115	36	33	33	24
2	15	42	90	150	110	125	335	110	33	17	21	22
3	17	39	82	145	100	140	224	92	30	9.6	8.2	14
4	15	39	77	135	100	140	178	79	28	10	9.3	10
5	13	38	73	1,600	92	852	147	74	27	8.3	7.6	15
6	12	55	72	1,690	86	1,100	248	66	26	7.2	6.9	12
7	11	100	66	491	92	310	611	59	24	6.5	5.9	9.6
8	21	73	54	409	82	210	748	54	23	5.8	5.1	11
9	79	58	58	425	200	231	425	51	21	5.3	4.9	14
10	55	69	52	426	*175	207	231	48	20	12	4.7	14
11	37	105	60	255	110	170	178	45	20	14	4.7	11
12	33	87	360	140	88	*135	147	43	19	12	4.5	9.3
13	68	233	590	145	1,200	125	133	42	16	8.9	4.7	7.9
14	162	353	201	*135	952	145	433	40	14	7.0	4.5	9.0
15	78	170	144	102	1,810	140	417	43	12	6.2	4.2	8.7
16	50	138	309	379	633	122	578	40	10	5.8	3.8	9.0
17	750	117	*330	566	300	110	402	39	9.2	6.0	4.0	8.7
18	773	*94	125	331	185	100	442	36	9.5	6.8	19	21
19	211	203	94	725	239	80	570	42	11	9.2	32	46
20	296	1,240	84	230	187	90	274	117	12	9.2	18	27
21	178	346	92	120	150	660	190	92	20	12	11	20
22	107	187	135	116	204	1,530	165	81	13	15	7.9	18
23	81	150	110	104	422	1,680	277	358	9.8	34	6.6	25
24	70	126	64	360	217	502	257	166	8.9	24	5.9	28
25	63	107	46	561	332	302	193	94	8.9	109	5.1	24
26	57	94	38	170	225	246	196	70	35	62	4.4	20
27	52	376	35	155	140	252	576	56	33	25	3.8	16
28	48	214	35	1,220	160	309	225	50	19	16	5.5	14
29	45	144	270	490	-	187	159	48	14	15	18	16
30	42	124	1,230	160	-	159	128	48	74	6.0	54	18
31	41	-	270	140	-	401	-	42	-	51	25	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,493	773	11	113	0.831	0.96
November	5,162	1,240	38	172	1.26	1.41
December	5,351	1,230	35	173	1.27	1.46
Calendar year 1948	72,182.5	2,940	4.2	197	1.45	19.73
January	12,220	1,690	102	394	2.90	3.34
February	8,716	1,810	82	311	2.29	2.38
March	10,840	1,680	80	350	2.57	2.96
April	9,822	748	128	327	2.40	2.69
May	2,340	358	36	75.5	.555	.64
June	636.3	74	8.9	21.2	.156	.17
July	568.8	109	5.3	18.3	.135	.16
August	353.2	54	3.8	11.4	.084	.10
September	502.2	46	7.9	16.7	.123	.14
Water year 1948-49	60,004.5	1,810	3.8	164	1.21	16.41

Peak discharge (base, 5,300 sec.-ft.).- No peak above base.

* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Dec. 8-12, 17-29, Dec. 31 to Jan. 5, Jan. 12-15, 20-24, Jan. 26 to Feb. 13, Feb. 17, 18, Feb. 26 to Mar. 4, Mar. 7, 8, 11-21.

Tonawanda Creek at Batavia, N. Y.

Location.- Water-stage recorder and concrete control, lat. 42°59'55", long. 78°11'20", 150 feet downstream from municipal dam and 500 feet above Walnut Street Bridge in Batavia, Genesee County. Datum of gage is 876.01 feet above mean sea level (city of Batavia bench mark).
Drainage area.- 172 square miles.
Records available.- July 1944 to September 1949.
Extremes.- Maximum discharge during year, 1,670 second-feet Mar. 23 (gage height, 7.08 feet); minimum, 1.0 second-foot Aug. 17 (gage height, 1.065 feet).
1944-49: Maximum discharge, 4,840 second-feet Apr. 6, 1947 (gage height, 13.85 feet); minimum, that of Aug. 17, 1949; minimum gage height, 0.59 foot July 26, 27, 1948.
Maximum stage known, 14.5 feet in March 1942, from records of city of Batavia.
Remarks.- Records excellent except those for periods of ice effect or backwater from debris, which are good. Slight regulation at low flow by plants above station.

Rating table, water year 1948-49, except periods of ice effect or backwater from debris
(gage height, in feet, and discharge, in second-feet)

1.1	1.5	1.5	24	2.4	219
1.15	2.6	1.6	34	2.9	399
1.2	4.1	1.7	46	3.5	589
1.25	6.2	1.8	61	4.5	860
1.3	8.7	1.9	80	5.6	1,180
1.4	16	2.1	129	6.7	1,540

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	20	55	116	166	b106	298	137	39	100	23	23
2	12	22	50	87	135	b122	474	129	34	42	12	25
3	13	22	45	121	b130	160	361	111	33	26	9.9	17
4	12	21	42	111	137	143	256	96	28	25	9.0	c9.6
5	10	21	42	161	132	244	200	89	26	25	7.4	c14
6	8.7	22	41	892	103	842	220	82	23	20	6.1	c16
7	8.2	38	40	1,050	b125	461	553	76	22	15	5.3	c11
8	11	39	36	702	b108	251	509	72	21	12	4.1	c12
9	21	30	35	679	*166	243	411	67	21	11	4.1	c14
10	33	29	38	570	206	216	256	61	20	16	3.5	c15
11	20	49	34	322	157	190	203	55	18	16	2.9	c10
12	16	60	36	183	111	157	175	54	17	14	3.1	c8.4
13	17	45	151	*151	338	b130	157	50	20	11	3.4	c8.2
14	31	109	108	160	1,140	b170	316	49	17	9.0	3.8	7.0
15	36	79	67	99	958	*b180	315	52	14	8.0	2.6	9.3
16	22	60	*58	177	1,230	b145	546	46	12	6.7	1.6	9.0
17	30	49	130	500	483	b150	332	44	10	6.7	3.4	9.8
18	180	42	b70	327	260	b155	295	41	10	8.5	10	15
19	94	45	b52	567	313	b118	583	44	15	13	34	c33
20	c62	223	b54	338	246	b118	328	111	43	16	18	c30
21	c54	217	58	b150	200	227	226	117	22	11	10	c20
22	44	107	63	178	190	1,060	187	72	14	14	7.2	c18
23	34	82	63	147	352	1,530	221	161	11	11	5.7	c22
24	31	70	b41	217	246	954	222	166	9.9	12	4.5	c21
25	28	61	b35	552	244	406	190	95	10	34	4.0	c21
26	25	54	b32	b205	252	320	178	72	20	63	3.2	c16
27	24	57	b31	b145	b150	295	372	60	29	24	2.5	c11
28	22	74	b32	396	b180	295	252	54	16	15	4.3	c11
29	21	60	b42	735	-	216	178	50	49	11	22	c13
30	20	56	390	322	-	178	151	49	163	9.0	46	c17
31	20	-	282	200	-	175	-	44	-	12	27	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per squsre mile	Runoff in inches
October	972.9	180	8.2	31.4	0.183	0.21
November	1,864	223	20	62.1	.361	.40
December	2,251	390	30	72.6	.422	.49
Calendar year 1948	59,526.4	2,270	6.8	163	.948	12.88
January	10,560	1,050	87	341	1.98	2.28
February	8,458	1,230	103	302	1.76	1.83
March	9,957	1,530	106	321	1.87	2.15
April	8,985	583	151	299	1.74	1.94
May	2,406	166	41	77.6	.451	.52
June	786.9	163	9.9	26.2	.152	.17
July	616.9	100	6.7	19.9	.116	.13
August	303.6	46	1.6	9.79	.057	.07
September	466.3	33	7.0	15.5	.090	.10
Water yesr 1948-49	47,807.6	1,530	1.6	130	.756	10.29

Peak discharge (base, 1,800 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.
c Backwater from debris.

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Little Tonawanda Creek at Linden, N. Y.

Location.- Water-stage recorder and concrete control, lat. 42°52'35", long. 78°09'45", at highway bridge in Linden, Genesee County, and 7 miles upstream from mouth.

Drainage area.- 22.0 square miles.

Records available.- July 1912 to September 1949.

Average discharge.- 36 years (1912-19, 1920-49), 27.4 second-feet.

Extremes.- Maximum discharge during year, 370 second-feet Feb. 13 (gage height, 4.57 feet); minimum, 0.36 second-foot Aug. 15; minimum gage height, 0.215 foot Oct. 4.
1912-49: Maximum discharge, 2,400 second-feet Apr. 22, 1916 (gage height, 14.6 feet, from floodmarks), from rating curve extended above 1,500 second-feet by logarithmic plotting; minimum observed, 0.1 second-foot Sept. 5-7, 1934, and several times during Aug. 4-28, 1936.

Remarks.- Records excellent except those for periods of ice effect or those below 2 second-feet, which are good.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug	Sept.
1	0.6	1.3	4.5	b14	b23	b13	48	20	5.0	3.3	0.9	0.9
2	.6	1.2	4.2	16	b22	b18	72	18	4.6	2.4	.8	.8
3	.6	1.2	4.1	b15	b21	21	62	15	4.0	2.1	.8	.7
4	.5	1.2	3.9	b13	23	21	43	13	3.5	2.5	.8	.7
5	.5	1.2	3.8	87	b20	68	34	12	3.3	2.7	.8	.7
6	.5	1.6	3.8	176	b17	109	57	11	3.0	2.1	.7	.7
7	.5	2.1	3.6	66	b17	b42	86	10	2.8	1.9	.7	.7
8	.8	2.0	3.6	57	b16	b30	74	9.4	2.7	1.7	.6	.8
9	1.0	1.8	3.4	71	*31	32	54	8.8	2.5	1.6	.6	.8
10	.7	2.0	3.3	71	b28	30	38	8.3	2.4	2.0	.5	.8
11	.7	3.1	b3.2	44	b18	27	32	7.7	2.3	1.6	.5	.7
12	.7	3.0	3.9	b27	b17	b22	27	7.4	2.2	1.5	.5	.7
13	1.0	4.1	10	*b23	156	b21	25	7.1	2.1	1.4	.6	.7
14	1.1	7.7	7.3	b22	131	*b25	42	7.1	1.9	1.3	.5	.7
15	1.0	5.1	5.7	b15	191	b23	55	6.9	1.8	1.2	.4	.7
16	.8	4.2	*5.9	50	92	b21	62	6.4	1.6	1.1	.4	.7
17	3.0	3.7	*b10	73	b50	b20	44	6.1	1.6	1.1	.5	.6
18	3.5	3.2	b5.4	53	b38	b21	60	5.6	1.7	1.3	1.6	.9
19	1.9	3.8	b4.7	99	42	b16	76	6.0	9.8	1.4	1.3	1.1
20	2.5	21	b5.2	39	34	b17	44	14	4.6	1.2	.8	.9
21	2.0	13	b5.6	b24	28	66	33	9.4	2.5	1.1	.7	.8
22	1.6	8.8	6.9	26	33	202	30	8.9	2.1	1.1	.7	1.1
23	1.5	7.4	b6.8	21	46	207	34	32	1.8	1.0	.6	1.0
24	1.4	6.2	b5.2	49	33	78	30	19	1.7	.9	.6	1.0
25	1.4	5.4	b4.6	65	39	54	26	13	1.9	2.5	.6	.9
26	1.3	4.9	b4.2	b28	b29	46	27	10	2.0	1.3	.5	.8
27	1.3	5.0	b4.0	b24	b21	47	55	8.5	1.8	1.1	.5	.8
28	1.3	4.9	b4.1	99	23	41	32	7.7	1.5	1.0	.5	.9
29	1.2	4.7	11	b68	-	30	25	7.4	7.8	.9	1.8	1.0
30	1.2	4.6	55	b35	-	27	21	6.9	6.6	.9	1.1	.8
31	1.2	-	b22	b27	-	32	-	5.7	-	1.0	.9	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	37.9	3.5	0.5	1.22	0.055	0.06
November	139.4	21	1.2	4.65	.211	.24
December	228.9	55	3.2	7.38	.335	.39
Calendar year 1948	8,863.7	457	0.5	24.2	1.10	14.98
January	1,497	176	13	48.3	2.20	2.53
February	1,239	191	16	44.2	2.01	2.09
March	1,427	207	13	46.0	2.09	2.41
April	1,348	86	21	44.9	2.04	2.28
May	328.3	32	5.8	10.6	.482	.55
June	93.1	9.8	1.5	3.10	.141	.16
July	48.2	3.3	.9	1.55	.070	.08
August	22.8	1.8	.4	.74	.034	.04
September	24.4	1.1	.6	.81	.037	.04
Water year 1948-49	6,434.0	207	.4	17.6	.800	10.87

Peak discharge (base, 530 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Genesee River at Scio, N. Y.

Location.- Water-stage recorder, lat. 42°09'50", long. 77°58'50", at site of former highway bridge, 0.4 mile upstream from Vandermark Creek and three-quarters of a mile upstream from Scio, Allegany County.

Drainage area.- 309 square miles.

Records available.- June 1916 to September 1949.

Average discharge.- 33 years, 383 second-feet.

Extremes.- Maximum discharge during year, 2,690 second-feet Jan. 6 (gage height, 5.81 feet); minimum, 9.0 second-feet Aug. 28 (gage height, 0.18 foot, backwater from weeds). 1916-49: Maximum discharge, 12,000 second-feet May 28, 1946 (gage height, 10.63 feet); minimum, 5.8 second-feet Sept. 4, 1939; minimum gage height, that of Aug. 28, 1949.

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

Revisions.- W 759: Drainage area.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	37	203	727	b480	b300	1,100	360	225	94	37	27
2	20	38	183	626	b380	b310	807	340	205	80	27	24
3	19	38	171	538	b330	316	686	290	185	72	24	19
4	17	40	164	b410	b360	279	589	260	165	66	23	16
5	15	44	152	858	313	398	507	235	150	66	23	16
6	19	91	225	2,010	b245	1,180	615	220	145	58	22	16
7	23	269	241	1,020	b250	671	742	205	125	70	22	15
8	28	135	197	862	b210	532	915	190	120	66	23	22
9	73	104	180	827	b235	511	741	180	102	52	21	36
10	48	147	164	812	b200	*486	601	170	94	56	20	27
11	36	366	152	682	b170	468	541	155	92	64	21	23
12	37	201	191	561	*b140	391	486	150	84	54	22	20
13	42	171	385	482	315	356	510	145	74	49	23	20
14	47	169	272	430	532	341	1,030	135	62	44	17	27
15	49	159	230	363	1,170	328	886	145	54	48	12	29
16	38	164	284	398	973	268	882	135	47	41	13	29
17	52	156	420	*626	601	269	714	160	38	34	14	27
18	193	146	b270	515	463	255	688	135	38	42	42	29
19	112	136	b230	658	468	b195	847	145	42	48	52	49
20	78	326	b235	b520	447	b180	643	660	47	41	22	50
21	66	281	*b230	b370	391	b235	538	400	40	36	13	40
22	56	240	b220	b380	424	362	504	980	44	37	12	37
23	51	357	205	b350	649	743	597	1,700	42	45	11	35
24	49	279	171	444	440	489	610	1,020	37	29	11	34
25	47	237	b155	612	519	433	482	900	38	48	11	36
26	45	210	b110	490	450	454	433	640	58	54	11	34
27	42	254	b114	567	360	794	676	520	54	31	10	31
28	41	228	b110	1,190	375	614	479	440	52	25	10	32
29	40	212	b210	1,120	-	500	424	380	50	29	145	36
30	38	212	1,690	b620	-	454	388	330	54	31	108	37
31	36	-	1,060	b520	-	865	-	270	-	62	40	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,477	193	15	47.6	0.154	0.18
November	5,447	366	37	182	.589	.66
December	8,824	1,690	110	285	.922	1.06
Calendar year 1948	143,471	7,880	15	392	1.27	17.26
January	20,588	2,010	350	664	2.15	2.48
February	11,890	1,170	140	425	1.38	1.43
March	13,977	1,180	180	451	1.46	1.68
April	19,661	1,100	388	655	2.12	2.37
May	11,995	1,700	135	387	1.25	1.44
June	2,563	225	37	85.4	.276	.31
July	1,572	94	25	50.7	.164	.19
August	862	145	10	27.8	.090	.10
September	873	50	15	29.1	.094	.11
Water year 1948-49	99,729	2,010	10	273	.883	12.01

Peak discharge (base, 3,800 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.- Backwater from weeds May 1 to Sept. 30.

Genesee River at Portageville, N. Y.

Location.- Water-stage recorder, lat. 42°34'10", long. 78°02'45", in Portageville, Wyoming County, 300 feet downstream from unnamed tributary, 350 feet downstream from Pennsylvania Railroad bridge, and 0.7 mile upstream from Upper Falls.

Drainage area.- 982 square miles.

Records available.- December 1945 to September 1949.

Extremes.- Maximum discharge during year, 9,660 second-feet Jan. 6 (gage height, 9.55 feet); minimum, 63 second-feet Oct. 7; minimum gage height, 2.26 feet July 20.
1945-49: Maximum discharge, 28,300 second-feet Apr. 6, 1947 (gage height, 17.39 feet); minimum, that of Oct. 7, 1948; minimum gage height, that of July 20, 1949.

Remarks.- Records good except those for periods of ice effect, which are fair. Some diurnal fluctuation during low flow caused by power plants. Slight seasonal regulation by Canadea Reservoir (capacity, 1,106,000,000 cubic feet).

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Jan. 28

2.4	66	4.2	777	6.8	3,980
2.6	100	4.6	1,110	7.4	5,060
2.8	142	5.0	1,510	8.0	6,280
3.0	193	5.4	1,980	8.8	7,980
3.4	334	5.8	2,500		
3.8	525	6.2	3,060		

Jan. 29 to Sept. 30

2.3	71	3.0	203
2.4	82	3.4	340
2.6	112	3.8	532
2.8	153	4.2	777

Note.- Same as preceding table above 4.2 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	83	470	626	1,860	b1,200	b800	3,850	797	539	181	135	216
2	84	477	563	1,490	b940	b780	2,500	840	463	138	134	182
3	85	473	497	1,330	b800	b840	1,960	759	400	132	116	145
4	82	246	791	b1,040	970	b780	1,930	685	367	121	104	125
5	85	162	780	b1,950	b1,250	1,020	1,680	537	332	109	97	127
6	83	375	807	7,870	b1,100	3,680	1,750	542	303	109	296	112
7	77	706	650	3,340	b1,160	2,340	2,200	506	276	102	390	100
8	99	834	570	2,400	b1,000	1,440	2,780	429	249	100	403	111
9	430	662	483	2,280	b1,080	*1,290	2,160	461	248	88	396	106
10	524	652	439	2,450	b820	1,170	1,610	417	228	93	386	240
11	540	1,060	648	1,930	b660	1,190	1,340	388	215	98	175	325
12	511	854	641	*b1,450	b860	1,020	1,180	354	196	90	86	327
13	541	812	1,290	b1,180	1,940	850	1,120	322	204	85	279	319
14	318	888	*1,250	b1,040	*3,650	b840	2,580	323	183	86	390	322
15	223	900	1,030	b860	5,970	b820	2,650	292	175	89	395	195
16	397	880	708	944	5,000	b740	2,990	329	155	82	386	100
17	629	823	1,200	2,250	2,400	758	1,980	314	148	73	396	223
18	1,160	527	1,240	2,010	1,520	716	1,700	314	137	91	247	407
19	706	450	b940	2,070	1,910	b620	2,530	327	130	92	132	435
20	443	1,380	b900	1,840	f1,690	b490	1,940	1,320	149	85	300	436
21	392	1,480	b880	b1,120	1,560	b660	1,440	1,600	141	92	428	367
22	324	928	668	b1,000	1,440	2,640	1,230	963	142	101	420	204
23	460	1,060	562	b940	2,110	4,330	1,580	6,040	129	90	403	154
24	497	983	b490	b1,000	1,420	2,460	1,420	2,810	130	91	403	128
25	510	780	b540	1,760	1,320	1,590	1,270	2,240	150	134	188	134
26	497	643	b450	b1,300	1,470	1,400	1,100	1,470	168	193	86	124
27	489	592	b450	b1,220	b1,000	1,430	1,530	1,160	150	168	288	121
28	254	770	b460	b2,500	b1,000	1,690	1,450	945	138	144	442	124
29	171	652	b560	3,980	-	1,280	1,100	798	126	127	589	126
30	376	617	b4,400	b1,800	-	1,060	966	738	131	141	398	120
31	449	-	3,380	b1,300	-	1,370	-	685	-	203	296	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	11,519	1,160	77	372	-	-
November	22,136	1,480	162	738	-	-
December	28,893	4,400	439	932	-	-
Calendar year 1948	445,237	21,800	77	1,216	1.24	16.86
January	59,504	7,870	860	1,919	-	-
February	47,240	5,970	660	1,687	-	-
March	42,094	4,330	490	1,358	-	-
April	55,306	3,850	966	1,844	-	-
May	29,705	6,040	292	958	-	-
June	6,502	539	126	217	-	-
July	3,528	203	73	114	-	-
August	9,184	589	86	296	-	-
September	6,155	436	100	205	-	-
Water year 1948-49	321,766	7,870	73	882	.898	12.17

Peak discharge (base, 15,000 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.
f Fragmentary gage-height record; discharge computed on basis of partial gage-height record and records for station at St. Helena.

Genesee River at St. Helena, N. Y.

Location.- Water-stage recorder, lat. 42°37'20", long. 77°59'20", at highway bridge in St. Helena, Wyoming County, 1½ miles downstream from Wolf Creek and 3 miles east of Castile.
Drainage area.- 1,017 square miles.
Records available.- August 1908 to September 1949.
Average discharge.- 41 years, 1,225 second-feet.
Extremes.- Maximum discharge during year, 9,120 second-feet Jan. 6 (gage height, 7.97 feet); minimum recorded, 75 second-feet July 16 (gage height, 2.28 feet), but may have been less during period of no gage-height record.
1908-49: Maximum discharge, 44,400 second-feet May 17, 1916, from rating curve extended above 29,000 second-feet by logarithmic plotting; maximum gage height, 16.3 feet Feb. 23, 1945 (ice jam); minimum discharge, 18 second-feet Oct. 5, 17, 1913 (gage height, 1.70 feet).
Remarks.- Records good except those for periods of ice effect or doubtful or no gage-height record, which are fair. Some diurnal fluctuation during low flow caused by power plants. Slight seasonal regulation by Caneadea Reservoir (capacity, 1,106,000,000 cubic feet).
Revisions (water years).- W 264: 1908. W 564: 1916(M). W 759 Drainage area.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to May 23

2.3	75	3.3	634	5.5	3,430
2.4	100	3.6	1,000	6.0	4,200
2.6	168	4.0	1,500	6.5	5,120
2.8	260	4.5	2,080	7.0	6,270
3.0	380	5.0	2,720	7.5	7,620

May 24 to Sept. 30

2.3	79	2.8	269
2.4	107	3.0	385
2.6	178	3.3	634

Note.- Same as preceding table above 3.3 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95	490	681	2,000	1,240	820	3,910	774	624	a178	143	225
2	98	503	625	1,600	980	800	2,680	816	507	a146	137	194
3	101	495	550	1,400	840	826	2,100	744	432	a136	123	152
4	90	315	760	1,140	977	784	2,080	712	382	a122	109	130
5	98	176	786	1,800	1,300	1,010	1,830	600	345	a110	102	130
6	100	326	798	7,570	1,140	3,590	1,850	592	311	105	249	115
7	98	664	723	3,600	1,200	2,600	2,300	559	284	102	391	108
8	107	846	631	2,540	1,060	1,500	2,860	468	257	99	411	114
9	394	721	530	2,380	1,160	*1,350	2,300	493	257	95	405	114
10	560	684	471	2,550	860	1,250	1,730	438	235	96	392	211
11	586	1,090	653	2,060	700	1,250	1,450	398	224	97	228	323
12	546	892	702	*1,550	880	1,070	1,310	360	204	96	96	329
13	576	814	1,300	1,320	1,800	858	1,210	334	209	93	234	319
14	380	874	*1,350	1,170	3,760	840	2,550	314	192	94	393	321
15	227	915	1,070	900	*5,520	820	2,600	304	173	93	398	227
16	385	859	747	934	5,120	772	3,180	325	159	79	385	109
17	644	825	1,190	2,290	2,510	758	2,100	314	147	87	398	195
18	1,270	576	1,360	2,150	1,550	720	1,780	317	140	a90	295	391
19	750	488	1,000	2,180	1,960	640	2,620	330	133	a92	152	437
20	510	1,280	940	1,950	1,770	520	2,070	1,130	148	a86	256	451
21	410	1,610	939	1,250	1,640	680	1,580	1,740	141	a94	430	364
22	348	952	732	1,060	1,520	2,630	1,370	831	149	a104	423	244
23	466	1,050	636	1,000	2,140	4,390	1,490	5,520	133	a92	403	166
24	537	1,000	540	1,050	1,570	2,710	1,540	2,930	133	a92	407	132
25	542	783	580	1,840	1,390	1,790	1,390	2,400	153	a134	233	144
26	535	687	470	1,350	1,550	1,590	1,240	1,610	181	194	96	120
27	516	650	470	1,300	1,040	1,580	1,610	1,270	154	173	236	124
28	322	754	470	2,300	1,040	1,840	1,580	1,000	a140	150	439	130
29	184	712	580	4,140	-	1,450	1,200	814	a128	125	689	130
30	338	672	4,100	1,900	-	1,180	1,000	732	a132	151	402	121
31	476	-	d3,430	1,350	-	1,430	-	720	-	216	322	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	12,289	1,270	90	396	-	-
November	22,703	1,610	176	757	-	-
December	29,814	4,100	470	962	-	-
Calendar year 1948	462,773	21,300	90	1,264	1.24	16.92
January	61,624	7,570	900	1,988	-	-
February	48,217	5,520	700	1,722	-	-
March	44,048	4,390	520	1,421	-	-
April	58,510	3,910	1,000	1,950	-	-
May	29,889	5,520	304	964	-	-
June	6,807	624	128	227	-	-
July	3,621	216	79	117	-	-
August	9,377	689	96	302	-	-
September	6,270	451	108	209	-	-
Water year 1948-49	333,169	7,570	79	913	.898	12.17

Peak discharge (base, 16,000 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of notes by engineer and observer, weather records, and records for station at Portageville.
d Doubtful gage-height record; discharge computed on basis of records for station at Portageville.
Note.- Stage-discharge relation affected by ice Dec. 19, 20, 24-30, Jan. 1-5, 12, 15, 20-23, 26-28, Jan. 30 to Feb. 3, Feb. 5-13, 18, 26, 27, Mar. 1, 2, 8-11, 14, 15, 18-21 (doubtful gage-height record Dec. 30, Jan. 1, Mar. 18-21).

Genesee River at Jones Bridge, near Mount Morris, N. Y.

Location.- Water-stage recorder, lat. 42°45'55", long. 77°50'25", at Jones Bridge, 3½ miles northeast of Mount Morris, Livingston County. Datum of gage is 540.00 feet above mean sea level (levels by New York State Conservation Commission).

Drainage area.- 1,419 square miles.

Records available.- May 1903 to April 1906, August 1908 to April 1914, July 1915 to September 1949.

Average discharge.- 39 years (1908-13, 1915-49), 1,586 second-feet.

Extremes.- Maximum daily discharge during year, 9,800 second-feet Jan. 6; maximum gage height, 20.04 feet Jan. 6 (backwater from ice); minimum discharge, 37 second-feet July 17 (gage height, 0.71 foot); minimum daily, 56 second-feet Sept. 28.
1903-6, 1908-14, 1915-49: Maximum discharge, 55,100 second-feet May 17, 1916 (gage height, 25.44 feet); minimum, 18 second-feet Aug. 29, 1909; minimum daily, 30 second-feet Aug. 8, 1909.

Remarks.- Records good except those for periods of ice effect, partly obstructed intake, or doubtful gage-height record, which are fair. Diurnal fluctuation at low flow caused by power plants. Slight seasonal regulation by Caneadea Reservoir (capacity, 1,106,000,000 cubic feet).

Revisions.- W 759: Drainage area.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	134	457	661	b2,600	b1,350	1,260	3,890	1,040	764	211	193	319
2	121	493	645	b2,150	b1,160	1,070	3,380	1,080	645	230	176	257
3	127	493	579	b1,850	b1,000	1,210	2,700	960	574	154	178	238
4	147	457	697	b1,550	b1,220	1,160	2,480	920	498	179	151	171
5	120	281	850	b2,700	b1,500	1,300	2,220	760	453	151	128	155
6	142	262	827	b9,800	b1,350	3,570	2,190	740	423	151	134	186
7	127	496	764	b5,400	b1,450	3,360	2,820	680	381	121	353	176
8	142	873	661	3,510	b1,400	2,170	3,230	620	357	137	369	131
9	280	720	579	2,980	b1,450	1,860	2,960	580	323	131	397	d156
10	498	666	522	3,080	b1,350	1,720	2,290	520	320	108	393	d199
11	540	943	564	2,610	1,020	1,700	1,940	500	247	139	369	298
12	540	1,050	709	*b2,000	922	1,560	1,680	480	251	126	168	317
13	531	821	1,040	b1,650	1,580	1,280	1,510	460	308	131	137	349
14	506	867	*1,420	b1,400	4,920	1,260	2,470	430	221	102	342	342
15	360	943	1,140	b1,100	*5,410	1,320	2,950	410	247	129	349	327
16	369	896	890	b1,140	7,020	*1,170	3,730	420	226	117	357	220
17	464	890	1,060	2,250	3,640	1,090	2,720	410	243	92	377	118
18	1,180	693	1,380	2,700	2,430	1,050	2,210	420	154	120	526	338
19	943	521	1,100	2,450	2,470	b900	2,880	440	212	108	323	453
20	594	900	955	2,470	2,340	b800	2,640	940	269	124	229	480
21	457	1,830	b1,000	1,630	2,130	926	2,070	2,100	208	113	361	418
22	449	1,090	861	b1,300	1,920	2,590	1,800	1,140	195	115	373	381
23	399	985	698	b1,250	2,460	4,820	1,720	5,000	129	141	410	241
24	535	1,120	574	1,260	2,220	3,560	1,840	3,430	163	117	402	212
25	516	884	598	1,980	1,740	2,330	1,770	2,750	192	173	397	155
26	531	742	b520	b1,500	1,980	2,000	1,580	1,960	270	213	204	266
27	516	650	b500	b1,300	1,530	1,890	1,720	1,460	238	214	158	224
28	471	753	b500	b2,400	1,400	2,160	2,000	1,210	200	195	338	56
29	264	764	b580	4,890	-	1,830	1,600	1,020	228	162	667	121
30	275	671	b3,700	b2,350	-	1,510	1,350	920	221	190	580	178
31	423	-	b4,200	b1,650	-	1,420	-	861	-	434	457	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	12,701	1,180	120	410	-	-
November	23,211	1,830	262	774	-	-
December	30,774	4,200	500	993	-	-
Calendar year 1948	576,248	22,700	94	1,574	1.11	15.10
January	76,880	9,800	1,100	2,480	-	-
February	60,362	7,020	922	2,156	-	-
March	55,846	4,820	800	1,801	-	-
April	70,340	3,890	1,350	2,345	-	-
May	34,661	5,000	410	1,118	-	-
June	9,160	764	129	305	-	-
July	4,828	434	92	156	-	-
August	9,996	667	128	322	-	-
September	7,482	480	56	249	-	-
Water year 1948-49	396,241	9,800	56	1,086	.765	10.39

Peak discharge (base, 15,000 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.
d Doubtful gage-height record; discharge computed on basis of reconstructed gage-height graph.
Note.- Intake partly obstructed Apr. 28 to May 23; discharge computed on basis of available gage-height record, discharge measurements and records for stations upstream.

Genesee River at Driving Park Avenue, Rochester, N. Y.

Location.- Water-stage recorder, lat. 43°11'05", long. 77°37'40", in Rochester, Monroe County, 40 feet downstream from plant 5 of Rochester Gas & Electric Corp. and 100 feet upstream from Driving Park Avenue Bridge.

Drainage area.- 2,467 square miles.

Records available.- December 1919 to September 1949.

Average discharge.- 29 years (1920-49), 2,762 second-feet.

Extremes.- Maximum discharge during year, 16,400 second-feet Feb. 16 (gage height, 8.63 feet); minimum, 53 second-feet Oct. 1 (gage height, -0.59 foot); minimum daily, 383 second-feet Dec. 26.
1919-49: Maximum discharge, 33,500 second-feet Apr. 2, 1940 (gage height, 14.08 feet); minimum, less than 10 second-feet, occurred during low-water periods in some years when power plant was shut down; minimum daily, 219 second-feet Aug. 14, 1927.
Maximum discharge known, about 54,000 second-feet sometime in March 1865.

Remarks.- Records good except those between 3,500 and 5,500 second-feet, and those for periods of fragmentary or no gage-height record, which are fair. Excessive diurnal fluctuation caused by power plants above station. New York State Barge Canal crosses river near southern boundary of Rochester. Water diverted by the canal from Lake Erie is discharged into river from the west, the canal again diverting a smaller amount of water from river to the east. Additional regulation is provided by Caneadea Reservoir.

Revisions.- W 759: Drainage area.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	748	1,130	1,460	4,100	2,640	2,700	3,050	2,450	1,600	852	950	1,230
2	692	1,090	1,430	2,180	2,590	2,220	5,340	2,310	1,520	920	837	866
3	560	1,090	1,440	2,400	2,100	2,450	a4,600	2,150	1,390	820	798	890
4	672	1,090	1,360	1,800	2,270	2,460	a4,300	2,020	1,320	1,040	777	831
5	679	1,080	1,420	1,930	2,230	2,560	a3,500	2,100	1,240	938	852	773
6	673	910	1,730	3,530	2,250	3,590	a3,800	2,150	1,180	859	725	777
7	682	920	1,690	10,800	f2,450	6,900	a4,300	1,920	1,060	760	605	728
8	952	1,190	1,730	7,900	f2,300	5,300	a4,600	1,740	1,040	776	968	858
9	707	1,530	1,830	5,170	2,580	4,200	a4,900	1,650	998	762	994	794
10	858	1,530	1,600	4,760	2,740	3,770	a4,100	1,440	937	806	1,030	753
11	1,100	1,450	1,390	4,170	2,710	3,580	a3,500	1,350	1,050	802	1,000	683
12	1,210	1,720	828	3,840	2,120	3,230	3,130	1,390	794	760	970	777
13	1,160	1,870	1,160	2,370	2,340	3,150	2,910	1,300	1,000	774	729	969
14	1,170	1,650	1,050	2,380	5,060	2,420	3,170	1,370	942	741	644	910
15	1,130	1,660	1,100	1,830	9,070	2,780	4,650	1,190	937	743	911	919
16	877	1,680	1,520	1,150	12,400	2,710	5,610	1,270	858	694	903	916
17	1,240	1,760	1,480	1,850	10,200	2,580	5,690	1,230	858	646	939	509
18	1,290	1,670	832	3,610	5,970	2,550	4,500	1,220	872	766	1,040	664
19	1,920	1,530	951	3,800	4,500	2,380	4,020	1,270	788	781	1,080	781
20	1,770	1,560	1,550	3,350	4,290	1,980	4,910	1,250	842	762	936	910
21	1,370	1,980	1,340	3,460	4,160	2,050	4,340	1,970	922	732	753	966
22	1,100	2,610	1,290	2,290	3,700	3,350	3,530	2,800	885	758	993	904
23	1,030	2,160	1,380	2,290	3,810	6,730	3,080	2,640	830	736	785	882
24	1,040	1,900	653	2,590	4,210	6,900	3,190	6,500	811	636	967	702
25	1,280	1,980	426	2,630	4,260	6,140	3,210	4,690	767	792	980	683
26	1,160	1,720	383	3,480	3,680	4,650	3,130	3,700	818	722	1,050	578
27	1,160	1,640	547	2,790	3,220	3,950	2,940	2,890	884	731	738	474
28	1,150	1,490	512	2,820	2,900	3,780	3,650	2,300	811	900	789	730
29	1,140	1,480	886	5,830	-	3,720	3,250	1,930	914	852	1,320	650
30	830	1,550	1,260	7,110	-	3,210	2,800	1,870	886	744	1,370	502
31	780	-	3,140	3,770	-	2,330	-	1,650	-	705	1,330	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	32,130	1,920	560	1,036	-	-
November	46,580	2,610	910	1,553	-	-
December	39,350	3,140	383	1,269	-	-
Calendar year 1948	971,918	20,700	383	2,656	1.08	14.63
January	111,980	10,800	1,150	3,612	-	-
February	112,750	12,400	2,100	4,027	-	-
March	112,380	8,900	1,980	3,625	-	-
April	117,700	5,690	2,800	3,923	-	-
May	65,710	6,500	1,190	2,120	-	-
June	29,754	1,600	767	992	-	-
July	24,310	1,040	636	784	-	-
August	28,743	1,370	605	927	-	-
September	23,609	1,230	474	787	-	-
Water year 1948-49	744,996	12,400	383	2,041	.827	11.22

a No gage-height record; discharge computed on basis of power-plant records.
f Fragmentary gage-height record; discharge computed on basis of power-plant records.

Caneadea Creek at Caneadea, N. Y.

Location.- Water-stage recorder, lat. 42°23'10", long. 78°09'45", in Caneadea, Allegany County, 800 feet upstream from unnamed tributary and 0.6 mile upstream from mouth.

Drainage area.- 61.5 square miles.

Records available.- July to September 1949.

Extremes.- Maximum discharge during period, 438 second-feet Aug. 5 (gage height, 3.21 feet); minimum, 1.0 second-foot July 16 (gage height, 1.635 feet); minimum daily, 1.1 second-feet July 9, 15, 16.

Remarks.- Records good except those for periods of no gage-height record, which are fair. Extensive regulation by Caneadea Reservoir (capacity, 1,106,000,000 cubic feet) 2 miles above station.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)

1.65	1.1	1.85	6.4	2.2	38	2.6	139
1.70	1.7	1.9	9.0	2.3	55	2.8	223
1.75	2.8	2.0	16	2.4	77	3.0	320
1.80	4.4	2.1	25	2.5	105	3.2	432

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										f1.4	11	1.9
2										1.4	9.6	1.8
3										1.3	8.2	1.7
4										1.6	7.4	1.7
5										1.3	122	1.7
6										1.3	315	1.6
7										1.2	300	1.6
8										1.2	290	1.6
9										a1.1	300	66
10										a1.2	202	219
11										1.2	2.8	219
12										1.3	117	228
13										1.2	310	232
14										1.2	320	168
15										1.1	331	2.0
16										1.1	320	a94
17										f1.2	206	a223
18										1.3	a3.0	a223
19										1.7	a126	223
20										1.6	a363	223
21										2.0	a352	151
22										3.6	a336	3.7
23										3.4	320	1.5
24										2.9	216	1.4
25										f9.4	2.8	1.3
26										10	103	1.3
27										9.6	391	1.2
28										9.0	380	1.5
29										8.4	148	1.3
30										8.7	2.2	37
31										13	2.0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October						
November						
December						
Calendar year						
January	-	-	-	-		
February	-	-	-	-		
March	-	-	-	-		
April	-	-	-	-		
May	-	-	-	-		
June	-	-	-	-		
July	105.9	13	1.1	3.42		
August	5,917.0	391	2.0	191		
September	2,334.8	232	1.2	77.8		
Water year	-	-	-	-		

a No gage-height record; discharge computed on basis of records of operation of Caneadea Reservoir.
f Fragmentary gage-height record; discharge computed from reconstructed gage-height graph.

Canaseraga Creek near Dansville, N. Y.

Location.- Water-stage recorder, lat. 42°33'40", long. 77°42'55", just downstream from Ossian Street Bridge, half a mile downstream from Mill Creek, and 1 mile west of Dansville, Livingston County. Datum of gage is 640.00 feet above mean sea level (levels by New York State Conservation Commission).

Drainage area.- 153 square miles.

Records available.- July 1910 to December 1912, July 1915 to June 1917, March 1919 to September 1949. October 1917 to September 1919 at Cumminsville, 1½ miles downstream, published as Canaseraga Creek at Cumminsville.

Average discharge.- 29 years (1920-49), 148 second-feet.

Extremes.- Maximum discharge during year, 1,680 second-feet Feb. 15 (gage height, 9.09 feet); minimum, 13 second-feet Aug. 17 (gage height, 6.375 feet).
1910-12, 1915-49: Maximum discharge at present site, 8,830 second-feet July 23, 1940 (gage height, 13.1 feet, from floodmark), by contracted-opening method; maximum at former site, 9,110 second-feet July 23, 1940 (gage height, 9.93 feet), by slope-area method; minimum, 10 second-feet Aug. 9, 1934, Sept. 27, 28, 1941.

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

Revisions (water years).- W 604: 1923, 1924. W 759: Drainage area. W 894: 1935.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	30	46	127	b140	b116	238	118	72	a26	24	28
2	24	30	43	130	b122	b140	245	113	66	a24	22	24
3	24	30	42	b96	b118	130	212	100	62	a23	20	23
4	24	30	39	b82	119	122	178	93	54	a22	22	22
5	24	30	38	342	b106	188	153	84	48	a22	21	23
6	24	42	42	807	b100	528	210	82	47	22	20	22
7	24	51	43	326	96	272	284	77	45	21	18	22
8	36	42	42	261	b92	*202	292	70	43	20	18	31
9	34	36	39	278	108	182	245	66	42	21	16	28
10	30	53	38	276	b106	175	191	62	42	22	16	24
11	28	85	35	209	b82	178	168	60	40	21	16	23
12	26	57	35	150	b92	153	150	60	40	20	20	22
13	28	50	50	132	337	144	147	60	38	24	22	21
14	32	48	50	119	460	138	209	58	35	19	18	23
15	30	44	44	b94	963	135	222	56	33	17	18	22
16	28	43	48	128	*532	124	252	54	33	18	16	23
17	50	40	62	303	318	122	201	50	33	18	28	21
18	71	38	48	*223	242	108	185	48	33	22	64	54
19	46	39	39	261	227	b90	231	57	33	20	26	45
20	42	59	44	b185	202	b86	188	116	35	18	23	34
21	40	66	*44	b124	168	115	163	86	33	18	20	28
22	36	54	44	127	168	280	151	270	32	20	18	27
23	32	61	42	101	238	216	169	500	30	18	18	28
24	32	56	37	124	195	240	154	224	30	18	20	31
25	30	50	32	165	175	185	142	201	51	43	18	27
26	30	44	27	b110	162	172	140	148	36	23	18	25
27	30	46	28	b116	144	165	181	123	30	22	16	24
28	28	46	34	287	144	156	148	110	25	20	21	25
29	28	46	45	302	-	132	129	100	24	24	138	28
30	28	46	290	b165	-	122	121	98	a25	48	53	25
31	28	-	184	b145	-	162	-	82	-	48	31	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	991	71	24	32.0	0.209	0.24
November	1,392	85	30	46.4	.303	.34
December	1,675	290	27	54.0	.353	.41
Calendar year 1948	48,990	2,240	19	134	.878	11.90
January	6,295	807	82	203	1.33	1.53
February	5,956	963	82	213	1.39	1.45
March	5,278	528	86	170	1.11	1.28
April	5,699	292	121	190	1.24	1.39
May	3,428	500	48	111	.725	.83
June	1,190	72	24	39.7	.259	.29
July	722	48	17	23.3	.152	.18
August	819	138	16	26.4	.173	.20
September	803	54	21	26.8	.175	.20
Water year 1948-49	34,246	963	16	93.8	.613	8.34

Peak discharge (base, 2,000 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of recorded range in stage, weather records, and records for other stations in Genesee River Basin.
b Stage-discharge relation affected by ice.
Note.- Backwater from ice and/or debris Dec. 24-30. Backwater from debris Dec. 7-23, Mar. 24, July 13-15, Sept. 19-30 (fragmentary gage-height record Sept. 21).

Honeoye Creek at Honeoye Falls, N. Y.

Location.- Water-stage recorder, lat. 42°57'25", long. 77°35'20", 25 feet downstream from highway bridge in Honeoye Falls, Monroe County, and 13 miles upstream from mouth.
Drainage area.- 197 square miles.
Records available.- October 1945 to September 1949.
Extremes.- Maximum discharge during year, 1,200 second-feet Jan. 6 (gage height, 4.04 feet), release from ice jam upstream; minimum, 0.06 second-foot Aug. 28 (gage height, 0.35 foot).
1946-49: Maximum discharge, 1,740 second-feet June 3, 1947 (gage height, 4.71 feet); minimum, that of Aug. 28, 1949.
Remarks.- Records good except those for periods of ice effect or backwater from debris or leaves, which are fair. Flow affected by regulation on and diversion from Hemlock and Canadice Lakes for water supply of city of Rochester. Diurnal fluctuation at low flow caused by mills above station.

Rating tables, water year 1948-49, except periods of ice effect or backwater from debris or leaves
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Jan. 5						Jan. 6 to Sept. 30					
0.62	0.7	0.9	4.8	1.6	47	0.4	0.1	1.0	7.4	2.4	211
.65	1.0	1.0	7.4	1.9	89	.5	.4	1.3	22	2.6	282
.7	1.5	1.2	16	2.2	153	.6	.9	1.6	47	2.8	365
.8	2.9	1.4	29	2.6	297	.8	2.9	2.0	107	3.0	480
						.9	4.8	2.2	152	3.3	628

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.7	3.2	12	270	90	60	126	94	33	3.5	2.0	2.6
2	1.6	3.0	12	235	84	72	183	98	31	3.2	1.7	1.7
3	1.3	3.0	11	180	82	80	158	87	29	3.5	1.5	1.4
4	1.0	3.5	9.8	150	103	80	138	78	27	6.6	1.4	1.2
5	.7	3.7	9.4	175	94	170	118	75	25	8.0	1.5	1.0
6	.8	4.3	8.8	600	86	502	124	234	22	4.8	1.4	.9
7	.7	5.2	9.0	500	*86	310	225	206	19	5.3	1.2	.5
8	1.0	7.8	10	314	82	175	208	127	17	4.4	.6	.8
9	1.1	9.2	11	215	140	189	172	100	16	3.0	.5	.7
10	1.3	9.2	9.4	*180	192	172	140	81	15	2.9	.4	.7
11	1.7	18	8.4	125	165	166	122	72	14	3.1	.4	.7
12	1.7	32	8.6	98	124	145	111	66	13	2.2	.3	.6
13	1.6	24	*9.0	130	180	110	111	62	11	1.9	.4	.5
14	1.6	21	10	102	460	130	243	59	10	1.6	.6	.5
15	3.4	18	9.8	92	598	125	197	58	9.0	1.2	.4	.5
16	5.6	16	12	96	571	112	278	57	7.5	1.0	.2	.6
17	4.2	14	11	128	279	*112	186	52	6.7	.9	.2	.6
18	8.0	13	16	133	160	114	145	48	5.2	1.4	.3	1.1
19	12	12	21	177	189	84	142	45	5.7	1.6	.2	.8
20	14	18	20	150	160	96	135	52	9.6	1.3	.2	.9
21	13	33	15	54	142	118	115	60	8.5	1.1	.2	.9
22	11	28	15	58	135	298	103	54	5.6	1.7	.2	1.0
23	9.0	23	21	45	190	302	105	58	3.9	1.6	.2	.8
24	7.2	21	31	66	169	205	120	63	2.3	1.3	.1	.7
25	6.6	20	35	129	150	163	107	53	2.0	4.5	.1	.6
26	6.2	17	26	74	108	142	102	45	2.2	3.6	.1	.6
27	5.6	15	20	80	80	135	161	41	4.7	2.8	.1	.5
28	5.2	14	17	180	86	128	157	38	4.5	2.7	.1	1.2
29	4.7	13	18	443	-	113	118	37	3.1	2.0	1.7	1.9
30	4.3	12	90	230	-	105	107	38	4.2	1.8	3.1	1.6
31	3.8	-	245	130	-	103	-	35	-	1.9	2.0	-

Month	Observed				Adjusted†		
	Second-foot-days	Maximum	Minimum	Mean	Mean	Per square mile	Runoff in inches
October	141.6	14	0.7	4.57	7.91	0.040	0.05
November	434.1	33	3.0	14.5	31.7	.161	.18
December	761.2	245	8.4	24.6	29.4	.149	.17
Calendar year 1948	33,598.5	949	.7	91.8	145	.736	9.99
January	5,519	600	45	178	270	1.37	1.58
February	4,983	598	80	178	264	1.34	1.40
March	4,816	502	60	155	240	1.22	1.40
April	4,457	278	102	149	228	1.16	1.29
May	2,273	234	35	73.3	103	.523	.60
June	366.7	33	2.0	12.2	15.9	.081	.09
July	86.4	8.0	.9	2.79	-.80	-.004	-.00
August	23.3	3.1	.1	.75	-3.73	-.019	-.02
September	28.1	2.6	.5	.94	-3.02	-.015	-.02
Water year 1948-49	23,889.4	600	.1	65.5	97.5	.495	6.72

* Winter discharge measurement made on this day.
† Adjusted for diversions from and change in contents in Hemlock and Canadice Lakes; outlet of Honeoye Lake is not controlled. Negative figures indicate that natural losses from Hemlock, Canadice, and Honeoye Lakes exceeded inflow.
Note.- Stage-discharge relation affected by ice Dec. 31 to Jan. 7, Jan. 9-16, 20-23, 26-28, Jan. 30 to Feb. 3, Feb. 6-9, 11-14, 18, Feb. 26 to Mar. 4, Mar. 7, 8, 12-20. Backwater from ice and/or debris Dec. 9-30. Backwater from debris Oct. 5 to Dec. 8, and from leaves Sept. 19-30.

Canadice Lake Outlet near Hemlock, N. Y.

Location.- Hook gage, lat. 42°44'25", long. 77°34'15", upstream from weir at outlet of Canadice Lake, Ontario County, 4 miles southeast of Hemlock, Livingston County. Datum of gage is 1,093.00 feet above mean sea level (furnished by city of Rochester). Gage readings have been reduced to elevations above mean sea level.

Drainage area.- 12.6 square miles.

Records available.- April 1903 to September 1949.

Average discharge.- 46 years, 11.7 second-feet (unadjusted).

Cooperation.- Records furnished by Department of Public Works, city of Rochester.

Monthly discharge, water year October 1948 to September 1949

Month	Mean elevation of lake (feet)	Observed discharge in second-feet	Adjusted†		
			Discharge in second-feet		Runoff in inches
			Mean	Per square mile	
October	1,092.55	8.994	-1.298	-0.103	-0.119
November	1,092.28	4.665	4.232	.336	.375
December	1,091.81	2.447	-3.585	-.285	-.328
Calendar year 1948.	1,094.73	10.504	9.771	.775	10.553
January	1,092.25	8.341	16.468	1.307	1.507
February	1,092.41	11.384	11.036	.876	.912
March	1,092.46	12.743	13.372	1.061	1.224
April	1,092.61	16.212	18.147	1.440	1.607
May	1,092.43	9.377	6.024	.478	.551
June	1,092.04	6.228	-.930	-.074	-.082
July	1,091.03	9.238	-1.439	-.114	-.132
August	1,089.94	9.451	-1.600	-.127	-.146
September	1,089.22	3.916	-1.739	-.138	-.154
Water year 1948-49.	1,091.75	8.569	4.840	.384	5.215

† Adjusted for change in contents in Canadice Lake. Negative figures indicate that natural losses from Canadice Lake exceeded inflow.

Note.- Elevation of Canadice Lake: 1,093.23 feet at 12 p.m. Sept. 30, 1948, and 1,088.97 feet at 12 p.m. Sept. 30, 1949; 1,092.46 feet at 12 p.m. Dec. 31, 1947, and 1,091.63 feet at 12 p.m. Dec. 31, 1948.

Oatka Creek at Garbutt, N. Y.

Location.- Water-stage recorder, lat. 43°00'30", long. 77°47'25", 40 feet downstream from highway bridge at Garbutt, Genesee County, and 3½ miles upstream from mouth.
Drainage area.- 208 square miles.
Records available.- October 1945 to September 1949.
Extremes.- Maximum discharge during year, 1,030 second-feet Feb. 15 (gage height, 4.42 feet); minimum, 21 second-feet Sept. 11, 12, 13; minimum gage height, 2.095 feet Aug. 27, 28, Sept. 11, 12, 13.
1945-49: Maximum discharge, 3,680 second-feet Apr. 6, 1947 (gage height, 6.80 feet); minimum, 19 second-feet Oct. 12, 17, 1946; minimum gage height, that of Aug. 27, 28, Sept. 11, 12, 13, 1949.
Remarks.- Records good except those for periods of ice effect or backwater from debris, which are fair.

Rating tables, water year 1948-49, except periods of ice effect or backwater from debris)
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Jan. 7				Jan. 8 to Sept. 30					
2.1	25	2.5	82	2.0	17	2.4	65	3.0	237
2.2	36	2.6	103	2.1	25	2.5	85	3.3	381
2.3	48	2.8	158	2.2	36	2.6	108	3.8	655
2.4	64	3.0	235	2.3	48	2.8	165	4.3	950

Note.- Same as following table above 3.1 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jnly	Aug.	Sept.
1	28	29	c42	120	b170	b125	271	185	65	37	32	28
2	28	29	c42	77	b150	b130	419	175	62	37	31	25
3	28	29	c41	64	b135	159	446	165	58	36	31	24
4	27	30	c39	b62	b155	b155	360	153	55	39	30	23
5	26	31	c39	77	b145	175	271	144	52	38	29	23
6	26	32	39	258	b135	436	267	138	50	37	29	22
7	26	33	38	435	b130	b460	468	132	48	37	28	22
8	28	33	37	523	*127	b290	490	127	47	36	28	23
9	29	32	c36	413	141	241	408	124	46	34	27	23
10	29	33	c34	371	185	233	314	119	45	38	26	22
11	28	34	c34	339	b170	b215	250	116	45	34	27	21
12	27	36	c62	205	b145	b190	222	111	45	33	28	21
13	28	38	c47	*147	204	b165	207	106	45	33	27	21
14	28	42	c37	b135	666	b170	297	101	45	33	25	22
15	28	41	*c46	b102	927	*189	556	99	43	32	25	22
16	28	39	43	134	870	b180	550	94	43	31	26	22
17	29	39	47	179	760	b175	474	92	43	32	27	22
18	31	39	42	285	450	b180	350	87	43	33	38	25
19	30	42	b42	290	360	b155	484	83	43	34	30	24
20	34	58	38	371	329	159	474	92	43	33	27	23
21	38	64	b38	b200	276	165	324	140	42	33	27	23
22	36	77	42	165	246	591	254	127	41	38	27	25
23	34	56	43	156	295	942	246	111	39	34	25	25
24	33	48	b41	153	324	912	263	157	39	32	24	26
25	32	47	b36	267	258	576	241	120	41	46	24	25
26	31	45	b33	297	b235	392	222	96	39	37	23	24
27	30	45	b32	140	b200	345	263	83	37	34	23	23
28	29	43	b31	b200	b180	324	334	79	37	34	23	23
29	29	43	37	b460	-	276	233	75	45	33	31	25
30	29	42	47	b370	-	233	199	73	41	32	26	22
31	29	-	81	b250	-	222	-	69	-	32	27	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	916	38	26	29.5	0.142	0.16
November	1,229	77	29	41.0	.197	.22
December	1,286	81	31	41.5	.200	.23
Calendar year 1948	66,038	1,860	26	180	.865	11.79
Jannary	7,245	523	62	234	1.12	1.30
February	8,368	927	127	299	1.44	1.50
March	9,160	942	125	295	1.42	1.64
April	10,157	556	199	339	1.63	1.82
May	3,573	185	69	115	.553	.64
June	1,367	65	37	45.6	.219	.24
Jnly	1,082	46	31	34.9	.168	.19
Angust	851	38	23	27.5	.132	.15
September	699	28	21	23.3	.112	.12
Water year 1948-49	45,933	942	21	126	.606	8.21

Peak discharge (base, 1,500 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.
c Backwater from ice and/or debris.
Note.- Backwater from debris Oct. 1 to Nov. 13, Nov. 30, June 26 to July 24, July 26 to Sept. 30.

Black Creek at Churchville, N. Y.

Location.- Water-stage recorder, lat. 43°06'00", long. 77°53'00", at east end of Carrol Street, in Churchville, Monroe County, 60 feet downstream from main line tracks of New York Central Railroad, and 1 mile upstream from unnamed tributary.

Drainage area.- 123 square miles.

Records available.- October 1945 to September 1949.

Extremes.- Maximum discharge during year, 800 second-feet Feb. 16 (gage height, 4.35 feet); minimum, 2.15 second-feet Aug. 17; minimum gage height, 1.04 feet Aug. 11, 17. 1945-49: Maximum discharge, 1,940 second-feet Apr. 6, 1947 (gage height, 6.76 feet); minimum, that of Aug. 17, 1949; minimum gage height, 1.005 feet July 23, 1946.

Remarks.- Records good except those for periods of ice effect or backwater from weeds and debris, which are fair. New York Central System diverted approximately 10,500,000 gallons each month from a point just above station for use by locomotives, equivalent to a mean discharge of 0.5 second-foot at station. Slight regulation by pumping operations above station.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	8.8	21	34	88	60	142	78	20	98	3.7	7.4
2	4.6	8.8	18	30	60	62	171	72	19	37	3.7	5.4
3	4.6	9.0	17	29	52	88	176	64	17	18	3.6	4.8
4	4.5	11	16	27	56	72	142	58	16	29	3.4	4.6
5	4.5	12	16	46	54	132	111	54	14	70	3.3	5.8
6	4.4	14	16	110	50	260	129	52	13	56	3.2	5.8
7	4.4	17	14	161	48	290	208	45	12	27	3.1	5.6
8	5.4	14	14	263	*48	243	232	40	11	17	3.0	6.0
9	7.2	13	12	286	61	171	177	36	11	13	3.0	5.6
10	7.6	16	10	238	84	153	124	34	10	22	2.7	5.2
11	6.6	19	9.2	*166	100	135	100	31	10	36	2.4	4.8
12	6.2	21	12	74	90	110	87	30	9.2	20	2.6	4.5
13	6.4	29	15	73	155	74	82	28	8.6	14	2.6	4.4
14	6.4	31	16	68	363	98	82	28	9.0	10	2.6	4.5
15	6.4	28	*14	39	644	*116	95	28	9.4	8.4	2.7	4.5
16	6.4	22	15	58	772	102	148	27	7.4	7.4	2.8	4.9
17	13	24	21	77	520	108	164	24	6.2	6.8	2.4	4.9
18	28	19	16	93	260	104	132	23	6.0	8.8	4.1	6.0
19	27	23	20	127	249	76	184	20	6.4	11	5.6	8.4
20	30	68	17	100	206	70	221	32	6.8	8.8	5.4	9.0
21	34	92	17	58	157	116	152	37	6.6	7.2	4.6	7.4
22	24	68	24	62	142	318	106	35	5.6	6.6	4.1	7.2
23	19	48	27	54	195	660	103	49	4.6	5.8	3.6	7.0
24	16	36	19	63	211	623	110	46	4.4	5.4	3.2	7.2
25	14	30	17	90	188	365	100	42	4.6	5.6	3.0	7.4
26	12	25	14	78	171	249	93	37	6.0	7.0	2.9	7.2
27	11	26	12	54	116	221	126	31	5.2	6.8	2.8	6.6
28	10	23	11	96	106	224	171	28	4.5	5.6	3.0	6.8
29	9.4	22	18	157	-	188	122	25	6.4	5.0	5.6	7.4
30	9.0	21	42	185	-	144	92	24	52	4.4	9.6	8.8
31	8.8	-	38	170	-	126	-	22	-	4.1	8.0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	355.2	34	4.4	11.5	0.093	0.11
November	796.6	92	8.8	26.6	.216	.24
December	548.2	42	9.2	17.7	.144	.17
Calendar year 1948	34,286.7	1,450	3.1	93.7	.762	10.38
January	3,166	286	27	102	.829	.96
February	5,246	772	48	187	1.52	1.59
March	5,758	660	60	186	1.51	1.74
April	4,082	232	82	136	1.11	1.23
May	1,180	78	20	38.1	.310	.36
June	321.9	52	4.4	10.7	.087	.10
July	581.5	98	4.1	18.8	.153	.18
August	116.1	9.6	2.4	3.75	.030	.04
September	185.1	9.0	4.4	6.17	.050	.06
Water year 1948-49	22,336.6	772	2.4	61.2	.498	6.78

Peak discharge (base, 1,000 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Jan. 15, 20-23, 28, Jan. 30 to Feb. 3, Feb. 5-8, 11-13, 17, 18, Feb. 27 to Mar. 4, Mar. 6, 7, 11-21 (no gage-height record Jan. 20-23). Backwater from ice and/or weeds and debris Dec. 10 to Jan. 6. Backwater from weeds and debris Oct. 1 to Dec. 9, May 1 to Sept. 30 (no gage-height record Aug. 4-8).

Oswego River at lock 7, Oswego, N. Y.

Location.- Water-stage recorders, lat. 43°27'00", long. 76°30'25", at lock 7 in Oswego, Oswego County, three-quarters of a mile upstream from mouth. Datum of gage is 246.00 feet above mean sea level (New York State Barge Canal datum).
Drainage area.- 5,121 square miles.
Records available.- November 1933 to September 1949. April 1897 to December 1901 and, of doubtful accuracy, October 1927 to September 1928 at High Dam, about three-quarters of a mile upstream.
Average discharge.- 15 years (1934-49), 6,450 second-feet.
Extremes.- Maximum discharge during year, 16,300 second-feet Feb. 17 (gage height, 8.42 feet), includes mean daily discharge of canals; minimum gage height, 1.27 feet Sept. 4; minimum daily discharge, 353 second-feet Aug. 14.
1933-49: Maximum discharge, 37,500 second-feet Mar. 28, 1936, includes mean daily discharge of canals; maximum gage height, 13.46 feet Apr. 10, 1940; minimum discharge (river only), 30 second-feet Nov. 6, 1944; minimum gage height, 0.97 foot Aug. 24, 1934; minimum daily discharge, that of Aug. 14, 1949.
Remarks.- Records excellent except those for periods of backwater from Lake Ontario and/or partly obstructed intake, which are good. This record represents total discharge at Oswego and included flow in Hydraulic and Barge Canals. A large amount of natural storage and some artificial regulation is afforded by the many large lakes and the Barge Canal system in river basin. Large diurnal fluctuations at low and medium flow by power plants above station. Oswego River Basin receives water from Erie division of Barge Canal through lock 32 near Pittsford. Water may be diverted into or received from Mohawk River Basin through summit level of Barge Canal at New London. During a part of year entire flow from 45 square miles of drainage area of Mud Creek may be diverted from Chemung River Basin into Lake Keuka in Oswego River Basin. Nearly all of flow from 15.7 square miles of the Tioughnioga River Basin may be diverted into DeRuyter Reservoir, in Oswego River Basin.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,500	1,220	5,400	6,690	10,400	10,600	4,910	6,000	5,000	1,800	2,100	1,820
2	2,340	1,300	4,860	6,990	9,450	10,000	4,480	6,400	4,100	780	2,000	1,640
3	1,600	1,300	4,580	7,740	9,910	9,200	4,440	6,000	3,900	660	1,900	1,200
4	2,700	1,400	4,450	7,880	10,400	9,560	4,440	6,000	3,400	1,000	1,750	798
5	2,250	1,250	3,500	8,120	9,940	9,640	4,180	5,600	2,300	2,250	1,600	686
6	2,700	1,220	4,210	10,000	9,820	9,930	4,170	5,800	3,500	1,750	680	1,770
7	2,500	840	4,410	12,300	9,570	10,800	5,550	5,800	2,600	1,650	660	2,050
8	2,900	2,500	4,410	13,200	9,850	11,000	6,020	5,200	1,900	1,650	1,850	1,880
9	2,400	2,600	4,140	13,700	9,790	10,700	5,670	6,200	2,300	1,400	2,100	1,830
10	1,600	2,300	4,320	13,600	9,850	10,500	5,520	6,400	1,850	960	1,550	1,640
11	2,700	2,200	4,490	13,500	9,710	9,950	6,720	5,600	1,550	1,850	1,560	1,150
12	2,800	2,800	5,070	12,100	9,230	10,000	7,280	5,400	1,450	2,250	1,440	1,930
13	2,700	2,400	6,530	10,900	9,540	9,810	6,880	4,800	2,900	1,650	474	2,020
14	2,450	1,900	6,780	10,400	9,540	9,180	5,910	3,100	2,500	1,240	353	2,050
15	2,500	3,040	6,390	10,500	11,700	8,810	6,440	2,500	2,250	960	996	2,050
16	2,070	3,060	6,170	10,300	13,600	8,670	6,990	3,600	1,950	720	1,320	2,070
17	1,250	3,040	5,890	10,300	14,700	8,440	7,040	3,200	1,650	600	1,150	1,950
18	2,500	2,660	4,270	10,800	14,000	8,010	7,710	3,300	860	1,450	1,320	2,370
19	3,130	3,290	3,620	11,300	12,800	7,540	8,380	3,200	1,080	1,750	1,320	2,870
20	2,640	3,910	5,140	11,500	9,600	7,090	7,880	2,800	3,000	1,650	758	2,620
21	2,310	4,010	4,710	12,300	9,070	6,450	7,470	2,600	2,600	2,050	582	2,720
22	2,110	5,070	4,920	12,300	9,430	6,970	6,980	3,200	2,000	1,950	1,140	3,070
23	1,120	5,900	3,900	11,400	10,500	7,660	6,740	4,600	1,600	600	1,330	3,250
24	980	5,650	4,330	11,600	10,700	7,340	5,800	4,000	1,500	1,040	1,340	2,930
25	1,020	5,300	3,260	11,200	10,800	5,450	6,600	4,300	520	2,400	1,430	2,630
26	1,120	5,440	3,800	10,400	11,000	3,900	6,400	4,200	600	1,900	1,570	3,230
27	1,300	5,260	4,650	10,500	10,500	3,820	6,400	4,100	2,150	1,650	519	4,730
28	1,250	4,850	4,550	11,100	10,300	4,530	6,600	4,000	2,350	1,800	623	4,640
29	1,500	5,080	4,910	11,300	-	4,800	6,600	3,200	2,300	1,650	1,620	4,090
30	1,080	5,650	5,590	11,000	-	4,970	6,200	4,000	2,250	900	2,060	2,590
31	800	-	6,170	10,400	-	5,260	-	5,600	-	660	1,950	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	62,820	3,130	800	2,026	0.396	0.46
November	96,440	5,900	840	3,215	.628	.70
December	149,420	6,780	3,260	4,820	.941	1.08
Calendar year 1948	1,948,140	16,800	800	5,323	1.04	14.14
January	335,320	13,700	6,690	10,820	2.11	2.43
February	295,700	14,700	9,070	10,560	2.06	2.15
March	250,580	11,000	3,820	8,083	1.58	1.82
April	186,400	8,380	4,170	6,213	1.21	1.35
May	140,700	6,400	2,500	4,539	.886	1.02
June	67,890	5,000	520	2,263	.442	.49
July	44,620	2,400	600	1,439	.281	.32
August	41,045	2,100	353	1,324	.259	.30
September	70,274	4,730	686	2,342	.457	.51
Water year 1948-49	1,741,209	14,700	353	4,770	.931	12.63

Note.- Backwater form Lake Ontario and/or effect or partly obstructed intake Oct. 4-15, 17, 18, Oct. 23 to Nov. 14, Apr. 24 to Aug. 10.

Fall Creek near Ithaca, N. Y.

Location.- Water-stage recorder and concrete control, lat. 42°27'20", long. 76°28'30", in Forest Home, Tompkins County, half a mile upstream from Cornell University Dam, 1½ miles northeast of Ithaca, and 2 miles upstream from mouth. Datum of gage is 794.81 feet above mean sea level, adjustment of 1912 (levels by Corps of Engineers).
Drainage area.- 124 square miles.
Records available.- February 1925 to September 1949. July 1908 to June 1909 at site 1½ miles downstream.
Average discharge.- 24 years, 186 second-feet.
Extremes.- Maximum discharge during year, 2,220 second-feet Nov. 20 (gage height, 3.91 feet); minimum, 10 second-feet Aug. 24, 28 (gage height, 0.28 foot).
1925-49: Maximum discharge, 15,500 second-feet July 8, 1935 (gage height, 9.52 feet), from average of computed flow over each of four dams; minimum, about 3 second-feet Aug. 25, 1927 (gage height, 0.18 foot).
Remarks.- Records excellent except those for periods of ice effect, which are good. Cornell University diverted 68,633,067 cubic feet during year from a point about 1 mile above station for water supply, equivalent to a mean discharge at station of 2.18 second-feet.
Revisions (water years).- W 759: Drainage area, W 874: 1935-38.

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

0.3	11	1.0	71	2.1	487
.4	17	1.2	106	2.5	757
.5	24	1.4	159	3.0	1,200
.6	32	1.6	232	3.5	1,710
.8	50	1.8	322		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	27	133	258	195	195	201	147	64	41	76	30
2	24	24	113	258	160	205	197	150	58	36	43	23
3	22	23	102	258	145	200	156	169	52	33	33	21
4	20	24	96	210	155	175	136	128	47	34	34	20
5	19	25	90	380	150	250	118	120	44	73	25	18
6	18	42	96	1,660	140	856	474	275	41	53	22	18
7	18	338	*120	803	145	479	662	204	39	38	21	18
8	20	122	98	575	122	279	426	139	38	35	18	19
9	25	74	84	440	165	266	308	118	36	30	16	23
10	26	67	72	406	150	262	241	104	35	33	16	22
11	24	182	62	308	122	249	201	92	34	50	17	17
12	21	111	58	220	94	210	176	86	32	33	29	17
13	22	78	90	205	175	160	162	80	30	29	30	16
14	34	70	86	195	450	210	205	77	28	25	22	26
15	30	63	62	145	928	228	183	74	26	25	18	57
16	24	56	70	170	785	174	228	71	25	26	16	35
17	28	52	90	*275	383	179	193	69	24	24	17	27
18	88	53	78	289	230	159	180	65	24	25	16	27
19	68	48	46	472	258	122	431	67	26	26	15	127
20	45	989	66	385	249	104	262	294	32	25	18	101
21	44	444	78	195	201	*145	179	213	45	25	17	58
22	36	222	*88	220	240	318	159	119	54	28	16	49
23	32	393	82	209	640	*378	201	276	43	27	13	58
24	30	228	58	285	*400	271	220	187	30	22	11	78
25	29	173	37	401	499	212	176	169	99	45	12	99
26	27	142	35	225	451	197	153	120	340	84	14	56
27	26	176	32	185	256	205	469	104	129	39	13	43
28	25	176	50	364	284	209	266	92	69	34	11	46
29	25	147	90	482	-	159	188	94	52	36	109	144
30	24	188	1,000	220	-	144	182	80	35	50	112	108
31	29	-	822	195	-	147	-	70	-	133	44	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	926	88	16	29.9	0.241	0.28
November	4,759	989	23	158	1.27	1.42
December	3,884	1,000	32	125	1.01	1.17
Calendar year 1948	61,474	2,500	18	168	1.35	18.44
January	10,893	1,660	145	351	2.83	3.27
February	8,152	928	94	291	2.35	2.44
March	7,347	856	104	237	1.91	2.20
April	7,315	662	118	244	1.97	2.19
May	4,053	294	65	131	1.06	1.22
June	1,631	340	24	54.4	.439	.49
July	1,219	133	22	39.3	.317	.37
August	874	112	11	28.2	.227	.28
September	1,393	144	16	46.4	.374	.42
Water year 1948-49	52,426	1,660	11	144	1.16	15.73

Peak discharge (base, 1,900 sec.-ft.).- Nov. 20 (1:45 p.m.) 2,220 sec.-ft.; Jan. 6 (8 a.m.) 1,960 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation effected by ice Dec. 11, 12, 15-30, Jan. 4, 5, 13-16, 21, 22, 27, Jan. 30 to Feb. 14, Feb. 18, Mar. 1-5, 12, 13, 19-21.

Cayuga Inlet near Ithaca, N. Y.

Location.- Water-stage recorder and concrete control, lat. 42°23'35", long. 76°32'40", half a mile upstream from Butternut Creek and 5 miles south of Ithaca, Tompkins County. Datum of gage is 437.16 feet above mean sea level (levels by Corps of Engineers).
Drainage area.- 36.7 square miles.
Records available.- March 1937 to September 1949.
Average discharge.- 12 years, 38.7 second-feet.
Extremes.- Maximum discharge during year, 461 second-feet Nov. 20 (gage height, 2.52 feet); minimum, 2.4 second-feet Aug. 27 (gage height, 0.425 foot).
1937-49: Maximum discharge, 4,110 second-feet Aug. 13, 1942 (gage height, 7.58 feet), from rating curve extended above 650 second-feet on basis of slope-area determinations at gage heights 5.5 and 7.58 feet; minimum, 1.8 second-feet Aug. 30, 31, Sept. 1, 2, 1939 (gage height, 0.42 foot).
Remarks.- Records good except those for periods of ice effect, no gage-height record, or shifting control, which are fair.

Rating tables, water year 1948-49, except periods of ice effect or shifting control
(gage height, in feet, and discharge, in second-feet)
(Backwater from aquatic vegetation May 13-17)

Oct. 1 to Nov. 20				Nov. 20 to Sept. 30					
0.5	3.8	0.9	31	0.44	2.7	0.8	16	1.3	72
.55	5.7	1.1	54	.5	3.9	.9	22	1.4	90
.6	8.2	1.3	82	.55	5.3	1.0	32	1.6	135
.7	14	1.5	118	.6	6.8	1.1	44	1.8	189
.8	22	1.7	163	.7	11	1.2	57	2.0	253

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.4	7.4	26	79	b35	b52	38	27	16	5.4	5.4	5.6
2	6.0	7.2	23	64	b31	b50	31	28	14	5.0	4.7	4.8
3	5.5	7.2	22	52	b29	b45	28	29	13	4.7	4.6	4.4
4	5.3	8.7	21	b48	b32	b43	25	23	12	4.6	4.6	4.2
5	5.5	8.2	20	128	b31	68	23	22	11	5.3	4.1	4.4
6	5.7	27	26	241	b29	147	81	47	11	6.5	3.8	4.4
7	5.5	46	23	121	b30	81	75	30	10	5.0	4.0	4.6
8	10	23	21	94	b27	b66	63	24	10	4.4	3.6	5.4
9	11	16	19	79	b33	b60	53	22	9.6	4.1	3.2	5.0
10	9.2	19	18	72	b31	57	47	20	9.0	5.2	3.0	4.4
11	7.7	30	16	57	b24	58	42	19	8.8	4.7	4.9	4.1
12	7.4	20	18	b48	b22	50	38	18	8.6	4.2	7.3	4.0
13	8.5	17	20	b46	b47	b48	38	16	7.8	3.9	6.2	4.9
14	10	15	20	43	84	b45	64	17	7.4	3.8	4.8	8.7
15	8.4	14	17	b36	176	44	49	16	7.0	4.1	4.0	6.6
16	7.4	13	20	37	113	b39	47	16	6.6	4.0	3.8	5.9
17	13	13	22	*51	76	b38	40	15	6.6	4.1	3.8	5.2
18	26	12	20	45	b64	b30	46	15	6.8	4.8	5.2	11
19	15	14	b17	53	56	b30	58	17	6.6	4.2	4.2	13
20	11	a136	18	40	53	b29	47	72	6.6	3.9	3.7	8.8
21	10	a57	b18	b33	45	31	39	36	6.4	3.8	3.5	6.8
22	9.0	a51	*18	39	67	38	43	36	9.2	3.8	3.3	7.4
23	8.7	a59	18	34	107	*40	54	52	6.5	3.6	3.3	7.0
24	9.0	36	15	46	*72	32	44	39	5.9	3.3	3.2	7.0
25	8.7	30	b13	46	98	29	38	36	15	8.1	3.1	6.5
26	8.4	26	b13	b32	72	29	37	30	11	5.4	2.9	5.9
27	8.4	34	b15	b38	b60	30	42	29	6.8	4.6	2.8	5.6
28	8.2	27	b20	67	57	27	33	23	6.0	4.2	3.0	9.5
29	8.0	30	b28	64	-	23	29	22	5.8	5.2	51	13
30	7.7	29	b225	b42	-	22	27	21	5.6	9.1	15	10
31	7.4	-	109	b37	-	32	-	18	-	9.3	7.6	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	278.0	26	5.3	8.97	0.244	0.28
November	832.7	136	7.2	27.8	.757	.84
December	899	225	13	29.0	.790	.91
Calendar year 1948	12,792.9	546	4.2	35.0	.954	12.95
January	1,912	241	32	61.7	1.68	1.94
February	1,601	176	22	57.2	1.56	1.62
March	1,413	147	22	45.6	1.24	1.43
April	1,319	81	23	44.0	1.20	1.34
May	835	72	15	26.9	.733	.85
June	266.6	16	5.6	8.89	.242	.27
July	152.3	9.3	3.3	4.91	.134	.15
August	187.4	51	2.8	6.05	.165	.19
September	198.1	13	4.0	6.60	.180	.20
Water year 1948-49	9,894.1	241	2.8	27.1	.738	10.02

Peak discharge (base, 1,100 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of recorded range in stage and records for Owego Creek near Owego.
b Stage-discharge relation affected by ice.
Note.- Shifting-control method used Nov. 21-26.

Canandaigua Lake at Canandaigua, N. Y.

Location.- Water-stage recorder, lat. 42°52'20", long. 77°16'20", at south end of City Pier at northern end of Canandaigua Lake, 1 mile southeast of Canandaigua, Ontario County. Datum of gage is 680.76 feet above mean sea level (levels by Corps of Engineers).

Drainage area.- 189 square miles.

Records available.- November 1939 to September 1949. Records previously collected at site on west outlet on west side of E. T. Waldorf's boathouse by Oswego River Watershed Corp. of Fulton, N. Y.

Extremes.- Maximum gage height during year, 7.16 feet May 5; minimum, 5.34 feet Dec. 25. 1939-49: Maximum gage height observed, 9.09 feet Apr. 12, 13, 1940; minimum observed, 4.45 feet Jan. 30, 1942.

Remarks.- Elevation of lake surface regulated by stop logs on east and west outlets. West outlet, which usually carries most of lake outflow, is an artificial canal 1¼ miles long which discharges into Canandaigua Lake Outlet; spillway consists of permanent stop log 9.8 feet long with top at elevation 683.96 feet extending across a masonry arch opening under roadway. East outlet is at head of natural outlet channel from lake; spillway consists of 40 feet of detachable stop logs mounted in six courses on concrete footing. The city engineer, Canandaigua, N. Y., regulates storage in lake for Oswego River Watershed Corp., Fulton, N. Y., by operation of stop logs on both spillways. Capacity of lake not determined. Area of water surface is about 16.57 square miles at elevation 686 feet.

Gage height, in feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.99	5.66	5.62	5.54	6.31	6.25	6.13	6.71	6.89	6.68	6.54	6.30
2	5.95	5.67	5.62	5.56	6.28	6.24	6.14	6.72	6.89	6.67	6.54	6.24
3	5.91	5.69	5.60	5.57	6.26	6.22	6.16	6.71	6.90	6.65	6.51	6.22
4	5.90	5.67	5.59	5.59	6.23	6.22	6.17	6.72	6.90	6.65	6.49	6.21
5	5.88	5.68	5.63	5.65	6.21	6.21	6.18	6.72	6.85	6.66	6.47	6.21
6	5.85	5.72	5.62	5.78	6.23	6.22	6.22	6.88	6.85	6.64	6.45	6.14
7	5.84	5.72	5.57	5.87	6.22	6.24	6.28	6.89	6.82	6.61	6.44	6.13
8	5.87	5.69	5.53	5.92	6.18	6.24	6.30	6.91	6.78	6.61	6.43	6.12
9	5.94	5.73	5.52	5.97	6.13	6.23	6.32	6.91	6.78	6.67	6.40	6.09
10	5.89	5.73	5.51	5.99	6.12	6.22	6.33	6.88	6.77	6.59	6.39	a6.06
11	5.87	5.74	5.50	6.02	6.10	6.24	6.33	6.88	6.75	6.55	6.38	a6.04
12	5.85	5.74	5.49	6.03	a6.12	6.22	6.33	6.88	6.75	6.53	6.40	a6.06
13	5.83	5.73	5.49	6.05	a6.24	6.21	6.34	6.88	6.77	6.52	6.38	a6.04
14	5.79	5.71	5.48	6.04	a6.27	6.19	6.37	6.88	6.78	6.50	6.37	a6.04
15	5.78	5.70	5.49	a6.04	a6.35	6.17	6.42	6.87	6.82	6.48	6.34	a6.01
16	5.81	5.72	5.55	a6.06	6.39	6.15	6.43	6.86	6.77	6.47	6.34	6.01
17	5.79	5.73	5.49	a6.08	6.42	6.14	6.45	6.86	6.74	6.47	6.35	5.99
18	5.80	5.67	5.48	a6.12	6.43	6.10	6.48	6.87	6.72	6.47	6.33	6.02
19	5.78	5.69	5.48	a6.09	6.40	6.07	6.49	6.87	6.70	6.49	6.29	6.02
20	5.77	5.70	5.48	a6.15	6.38	6.06	6.51	6.87	6.70	6.47	6.26	5.98
21	5.77	5.69	5.50	a6.25	6.36	6.08	6.52	6.91	6.70	6.46	6.24	5.98
22	5.78	5.69	5.48	6.18	6.37	6.10	6.53	6.97	6.67	6.47	6.23	5.96
23	5.76	5.68	5.45	6.16	6.37	6.09	6.56	6.97	6.66	6.43	6.21	5.95
24	5.71	5.66	5.44	6.16	6.38	6.10	6.56	6.97	6.66	6.41	6.17	5.93
25	5.69	5.66	5.42	6.15	6.37	6.13	6.57	6.97	6.68	6.46	6.16	5.92
26	5.69	5.68	5.43	6.18	6.32	6.10	6.59	6.97	6.73	6.46	6.16	5.93
27	5.68	5.66	5.43	6.19	6.31	6.12	6.64	6.94	6.71	6.47	6.15	5.97
28	5.69	5.63	5.43	6.28	6.28	6.12	6.65	6.93	6.71	6.46	6.15	5.89
29	5.68	5.63	5.49	6.29	-	6.11	6.67	6.93	6.71	6.45	6.27	5.88
30	5.67	5.63	5.45	6.31	-	6.09	6.68	6.93	6.70	6.46	6.32	5.88
31	5.66	-	5.51	6.31	-	6.11	-	6.91	-	6.54	6.29	-

a No gage-height record; mean daily gage heights estimated on basis of records for Canandaigua Lake Outlet at Chapin, or interpolated.

Monthly gage height, in feet, water year October 1948 to September 1949

Month	Maximum	Minimum	Mean	Change in contents during month (equivalent, second-feet)
October	5.99	5.66	5.80	-58.6
November	5.74	5.63	5.69	-7.13
December	5.63	5.42	5.51	-17.3
Calendar year 1948	7.73	5.09	6.27	-1.46
January	6.31	5.54	6.02	+135
February	6.43	6.10	6.29	-5.71
March	6.25	6.06	6.16	-22.4
April	6.68	6.13	6.41	+99.8
May	6.97	6.71	6.88	+34.5
June	6.90	6.66	6.76	-37.4
July	6.68	6.41	6.53	-24.2
August	6.54	6.15	6.34	-44.8
September	6.30	5.88	6.04	-76.6
Water year 1948-49	6.97	5.42	6.20	-2.05

Canandaigua Lake Outlet at Chapin, N. Y.

Location.- Water-stage recorder, lat. 42°55'00", long. 77°14'00", in Chapin, Ontario County, 500 feet upstream from highway bridge and 3 miles downstream from Canandaigua Lake. Datum of gage is 673.6 feet above mean sea level (levels by Corps of Engineers).

Drainage area.- 199 square miles.

Records available.- November 1939 to September 1949.

Extremes.- Maximum discharge during year, 335 second-feet Feb. 15 (gage height, 2.62 feet); minimum, 16 second-feet Sept. 30; minimum gage height, 1.46 feet Dec. 25.
1939-49: Maximum discharge, 1,100 second-feet Mar. 17, 1942 (gage height, 4.64 feet); minimum, 4.6 second-feet Sept. 17, 1948; minimum gage height, 1.22 feet Feb. 1, 1942.

Remarks.- Records excellent except those for periods of ice effect, no gage-height record, or backwater from weeds, which are good. Flow regulated by Canandaigua Lake (see preceding page).

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	56	36	46	52	170	241	a155	76	80	39	28	32
2	56	36	46	49	195	200	a150	76	80	36	28	31
3	54	39	43	35	210	238	a125	76	76	34	27	30
4	52	38	43	35	202	229	a122	78	80	39	27	29
5	52	36	43	68	199	226	a140	80	64	46	27	29
6	52	42	44	106	195	265	a145	155	60	34	26	27
7	52	41	42	68	*200	253	a135	92	66	31	27	26
8	58	39	41	68	190	247	130	88	74	28	26	26
9	56	39	40	60	214	244	127	86	76	31	26	24
10	54	43	39	*58	214	241	127	86	76	32	26	23
11	52	46	38	54	195	247	125	86	66	27	25	22
12	52	54	39	50	200	244	125	86	44	25	27	23
13	52	54	*39	47	242	235	130	86	43	24	25	22
14	50	54	38	50	250	238	154	86	43	24	24	22
15	50	54	38	49	299	232	140	86	43	23	24	21
16	50	52	39	52	287	220	123	86	42	23	24	21
17	54	54	40	56	277	*200	77	86	36	22	24	21
18	52	52	39	60	274	211	75	84	38	23	23	22
19	50	52	39	74	280	200	75	82	38	25	27	22
20	49	56	39	58	274	195	73	86	37	27	37	22
21	47	52	39	88	268	170	73	84	37	26	34	22
22	46	52	39	196	277	182	73	90	37	25	34	21
23	46	52	39	196	290	214	75	90	36	25	33	20
24	42	50	35	193	277	208	73	88	36	24	32	20
25	41	49	29	190	280	211	73	86	37	30	31	19
26	40	50	28	185	268	188	77	86	40	25	31	19
27	40	50	36	154	259	154	88	86	37	25	30	20
28	40	47	35	180	256	151	78	86	37	25	32	19
29	39	46	36	190	-	145	76	84	39	25	47	18
30	38	46	38	170	-	143	76	82	43	25	37	16
31	36	-	39	170	-	145	-	80	-	29	32	-

Month	Observed				Adjusted†		
	Second-foot-days	Maximum	Minimum	Mean	Mean	Per square mile	Runoff in inches
October	1,508	58	36	48.6	-10.0	-0.050	-0.06
November	1,411	56	36	47.0	39.9	.201	.22
December	1,208	46	28	39.0	21.7	.109	.13
Calendar year 1948	48,448.8	513	5.2	132	131	.658	8.96
January	3,061	196	35	98.7	233	1.17	1.35
February	6,742	299	170	241	235	1.18	1.23
March	6,517	265	143	210	188	.945	1.09
April	3,215	155	73	107	207	1.04	1.16
May	2,689	155	76	86.7	121	.608	.70
June	1,541	80	36	51.4	13.9	.070	.08
July	877	46	22	28.3	4.13	.021	.02
August	901	47	23	29.1	-15.8	-.079	-.09
September	689	32	16	23.0	-53.7	-.270	-.30
Water year 1948-49	30,359	299	16	83.2	81.1	.408	5.53

* Winter discharge measurement made on this day.
† Adjusted for change in contents in Canandaigua Lake. Negative figures indicate that natural losses from Canandaigua Lake exceeded inflow.
a No gage-height record; discharge computed on basis of recorded range in stage, observer's tape-gage reading, weather records, and records for Canandaigua Lake at Canandaigua.
Note.- Stage-discharge relation affected by ice Jan. 28 to Feb. 3, Feb. 6-8, 11, 12, Mar. 2, 13, 16, 17, 19-21. Backwater from ice and/or weeds Dec. 15 to Jan. 21. Backwater from weeds Oct. 1-19, Oct. 22 to Dec. 14, Apr. 27 to Sept. 30.

Owasco Lake Outlet near Auburn, N. Y.

Location.- Water-stage recorder and concrete control, lat. 42°56'45", long. 76°36'05", 2½ miles downstream from center of Auburn, Cayuga County, and 4 miles downstream from State dam at outlet of Owasco Lake.
Drainage area.- 208 square miles.
Records available.- November 1912 to September 1949.
Average discharge.- 36 years (1913-49), 284 second-feet.
Extremes.- Maximum discharge during year, 732 second-feet Feb. 16, 24 (gage height, 3.04 feet); minimum 9.8 second-feet Nov. 25 (gage height, 1.42 feet); minimum daily, 13 second-feet Nov. 25.

1912-49: Maximum discharge, 2,090 second-feet Mar. 19, 1936, Apr. 9, 1940 (gage height, 4.88 feet); minimum, about 2 second-feet Dec. 5, 1936 (gage height, 1.36 feet); minimum daily, 5 second-feet Nov. 11, 1934.

Remarks.- Records good. Diurnal fluctuation caused by mills in Auburn; seasonal regulation at State dam. Water supply for Auburn taken from Owasco Lake, part of which returns as sewage to outlet above gaging staion.
Revisions (water years).- W 759: Drainage area. W 804: 1913(M). W 824: 1913-14, 1916, 1920(M, m), 1922(M, m), 1928(M, m), 1929, 1932 (M, m).

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)
(Backwater from weeds July 15 to Sept. 10)

Oct. 1 to Dec. 7				Dec. 8 to Sept. 30			
1.45	13	1.7	51	1.9	94	2.4	278
1.5	19	1.8	71	2.0	121	2.6	393
1.55	26	2.0	120	2.1	152	3.0	698
1.6	33	2.2	184	2.2	188		

Note.- Same as preceding table below 1.9 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	22	161	174	379	537	448	298	350	53	65	43
2	46	21	161	170	418	545	448	318	344	53	78	42
3	46	18	105	177	436	530	448	300	203	55	78	40
4	45	19	35	184	184	467	383	310	26	62	78	40
5	42	19	35	218	364	481	332	348	55	48	80	38
6	42	35	36	285	398	434	350	336	80	50	76	45
7	39	25	80	328	325	448	332	321	32	51	78	37
8	45	21	161	332	309	448	396	300	55	54	78	41
9	38	18	159	344	387	448	448	316	58	55	71	42
10	32	29	160	338	352	441	448	316	50	57	57	30
11	33	22	159	338	349	455	455	316	54	53	55	32
12	31	17	159	332	335	455	404	305	51	75	55	37
13	31	15	155	330	428	408	332	310	58	55	55	38
14	28	15	157	321	367	462	332	321	55	55	55	51
15	28	18	153	327	468	462	353	300	51	61	55	32
16	26	41	156	321	544	462	332	321	50	80	53	30
17	37	99	152	332	632	462	310	327	49	78	49	31
18	33	42	153	327	632	470	321	327	48	82	63	38
19	28	31	159	369	624	470	310	332	50	82	49	37
20	30	28	151	455	613	470	305	344	73	78	47	32
21	27	16	170	470	608	462	310	332	54	71	47	67
22	25	17	170	455	605	448	316	332	58	69	49	161
23	22	19	166	470	608	448	326	338	52	59	47	76
24	21	18	166	477	641	448	300	347	63	57	49	169
25	24	13	166	484	657	455	310	338	79	82	49	177
26	22	18	163	484	649	448	323	332	53	61	53	178
27	22	22	163	477	637	448	323	332	54	61	44	172
28	21	18	163	484	541	455	304	327	52	63	49	195
29	22	21	177	462	-	448	305	310	52	65	92	184
30	18	74	184	438	-	448	294	310	51	67	42	180
31	18	-	177	444	-	455	-	344	-	63	45	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	972	50	18	31.4	-	-
November	791	99	13	26.4	-	-
December	4,512	184	35	146	-	-
Calendar year 1948	82,693	1,310	13	226	1.09	14.77
January	11,147	484	170	360	-	-
February	13,733	657	309	490	-	-
March	14,318	545	408	462	-	-
April	10,598	455	294	353	-	-
May	10,008	348	298	323	-	-
June	2,360	350	26	78.7	-	-
July	1,955	82	48	63.1	-	-
August	1,841	92	42	59.4	-	-
September	2,315	195	30	77.2	-	-
Water year 1948-49	74,550	657	13	204	.981	13.32

Note.- Increase in contents in Owasco Lake during calendar year 1948, 195,300,000 cubic feet (equivalent mean discharge, 6.17 second-feet; runoff, 0.40 inch); increase in elevation, 0.68 foot. Increase in contents during water year 1948-49, 379,000,000 cubic feet (equivalent mean discharge, 12.0 second-feet; runoff, 0.78 inch); increase in elvetion, 1.32 foot.

Onondaga Creek at Syracuse, N. Y.

Location.- Water-stage recorder and steel plate weir, lat. 43°00'35", long. 76°09'00", 75 feet upstream from end of channel improvement, 300 feet upstream from Ballantyne Road bridge, and 2 miles south of center of Syracuse, Onondaga County. Datum of gage is 401.25 feet above mean sea level, datum of 1929.

Drainage area.- 98.2 square miles.

Records available.- November 1939 to July 1949 (discontinued).

Extremes.- Maximum discharge during period October 1948 to July 1949, 670 second-feet Jan. 6 (gage height, 4.80 feet); minimum, 6.0 second-feet sometime during period Oct. 11-15, computed from recorded range in stage; minimum gage height, 2.02 feet June 23; minimum daily discharge, 16 second-feet Oct. 5-7.
1939-49: Maximum discharge, 3,980 second-feet Dec. 30, 1942 (gage height, 9.58 feet); minimum, 1.2 second-feet Sept. 12, 1941 (gage height, 1.85 feet); minimum daily, 8.5 second-feet Sept. 6, 1942.

Remarks.- Records excellent except those for periods of ice effect, backwater from debris, or no gage-height record, which are fair. Diurnal fluctuation at low and medium flow caused by mills.

Revisions.- W 974: Drainage area.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a18	21	59	181	b145	148	128	136	58	27		
2	a19	20	54	158	b125	136	118	130	58	24		
3	a18	21	51	147	b125	b135	105	125	60	24		
4	a17	20	47	117	121	128	100	109	52	23		
5	a16	20	47	167	117	163	91	107	44	27		
6	a16	34	47	579	b102	334	211	254	41	25		
7	a16	160	57	604	b106	253	416	184	39	-		
8	a19	72	48	383	b98	163	254	133	38	-		
9	a20	42	43	254	120	164	192	112	37	-		
10	a21	37	39	242	b124	159	162	100	37	-		
11	a21	80	38	191	b104	159	147	92	35	-		
12	a21	58	41	139	83	151	134	85	35	-		
13	a22	46	65	143	123	129	128	80	31	-		
14	a24	52	56	134	244	146	159	76	28	-		
15	a24	51	44	b96	326	157	151	85	28	-		
16	23	43	43	*129	398	133	203	77	27	-		
17	31	38	52	180	222	135	183	74	24	-		
18	c64	38	44	172	174	124	150	65	24	-		
19	43	35	*39	204	213	b106	176	62	26	-		
20	27	132	40	176	196	97	158	97	31	-		
21	23	122	50	117	*157	*121	132	93	35	-		
22	20	71	46	141	151	249	122	76	31	-		
23	20	84	49	142	333	266	152	116	26	-		
24	20	27	42	143	229	191	170	97	23	-		
25	21	60	b41	181	219	156	141	140	40	-		
26	21	52	b40	128	b210	146	128	105	162	-		
27	19	67	b43	120	b155	146	303	86	61	-		
28	19	73	48	218	b170	146	214	77	44	-		
29	19	62	b64	b320	-	125	160	72	31	-		
30	20	62	b340	b175	-	116	147	71	28	-		
31	20	-	386	b155	-	113	-	64	-			

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	702	64	16	22.6	0.230	0.27
November	1,745	160	20	58.2	.593	.66
December	2,103	386	38	67.8	.690	.80
Calendar year 1948	35,147	917	15	96.0	.978	13.31
January	6,236	604	96	201	2.05	2.36
February	4,890	398	83	175	1.78	1.85
March	4,895	334	97	158	1.61	1.85
April	5,035	416	91	168	1.71	1.91
May	3,180	254	62	103	1.05	1.20
June	1,234	162	23	41.1	.419	.47
July 1-6	150	27	23	25.0	.255	.06
August	-	-	-	-	-	-
September	-	-	-	-	-	-
Water year	-	-	-	-	-	-

Peak discharge (base, 1,400 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of observer's readings, weather records, and records for Limestone Creek at Fayetteville.
b Stage-discharge relation affected by ice.
c Backwater from debris.

Onondaga Creek at Temple Street, Syracuse, N. Y.

Location.- Water-stage recorder, lat. 43°02'25", long. 76°09'20", 150 feet upstream from Temple Street Bridge in Syracuse, Onondaga County. Datum of gage is 353.4 feet above mean sea level (levels by city of Syracuse).

Records available.- June to September 1949. November 1939 to July 1949 at site 2¾ miles upstream, published as Onondaga Creek at Syracuse; records not equivalent.

Extremes.- Maximum discharge during period June to September 1949, 787 second-feet June 20 (gage height, 7.21 feet); minimum, 18 second-feet July 21; minimum gage height, 1.87 feet July 9.

Remarks.- Records good except those for periods of no gage-height record, which are fair. Extensive diurnal fluctuation caused by gristmill. Since June 1949, high flows controlled by Onondaga Flood Control Reservoir.

Rating tables, June 8 to Sept. 30, 1949 (gage height, in feet, and discharge, in second-feet)
(Shifting-control method used July 19)

June 8 to July 19				July 19 to Sept. 30			
2.1	28	3.0	75	2.1	22	2.9	54
2.4	40	3.4	107	2.3	28	3.2	71
2.7	56	3.8	147	2.6	40	3.5	94

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									-	40	30	29
2									-	38	33	27
3									-	38	26	26
4									-	37	26	26
5									-	41	26	27
6									-	38	25	29
7									-	37	25	29
8									54	33	24	31
9									51	33	24	32
10									50	40	24	32
11									49	40	24	28
12									48	34	32	29
13									47	34	33	29
14									a45	32	27	91
15									a44	31	26	53
16									a43	30	26	38
17									42	31	26	32
18									41	38	29	33
19									67	48	25	45
20									a72	29	25	38
21									a56	27	25	35
22									a52	27	24	38
23									a43	28	25	34
24									a40	26	24	41
25									88	40	25	40
26									147	35	25	36
27									58	28	25	33
28									44	26	34	45
29									41	29	94	57
30									40	30	53	49
31									-	34	34	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October						
November						
December						
Calendar year						
January	-	-	-	-		
February	-	-	-	-		
March	-	-	-	-		
April	-	-	-	-		
May	-	-	-	-		
June 8-30	1,262	147	40	54.9		
July	1,052	48	26	33.9		
August	924	94	24	29.8		
September	1,112	91	26	37.1		
Water year	-	-	-	-		

a No gage-height record; discharge computed from records for station at Syracuse, 2¾ miles upstream.

East Branch Fish Creek at Taberg, N. Y.

Location.- Water-stage recorder, lat. 43°18'05", long. 75°37'10", at highway bridge in Taberg, Oneida County, just downstream from Furnace Creek. Datum of gage is 491.12 feet above mean sea level, datum of 1929.
Drainage area.- 189 square miles.
Records available.- April 1923 to September 1949.
Average discharge.- 26 years, 542 second-feet (unadjusted).
Extremes.- Maximum discharge during year, 5,340 second-feet Mar. 28 (gage height, 5.66 feet); minimum, 4.9 second-feet Aug. 15, 16 (gage height, -0.20 foot).
1923-49: Maximum discharge, 13,600 second-feet Oct. 2, 1945 (gage height, 10.90 feet); minimum, that of Aug. 15, 16, 1949.
Remarks.- Records good except those for periods of ice effect, which are fair. Diversion above station for water supply by city of Rome as shown in monthly table. Additional diversion from a reservoir (capacity, 214 million gallons; drainage area, 16.4 square miles) on Florence Creek above station for water supply for city of Oneida amounted to 156,750,000 cubic feet during water year 1949, equivalent to a mean discharge of 5.0 second-feet. Figures of mean annual diversion, in second-feet, from Florence Creek for water years 1927-48 are published herein. Diurnal fluctuation at low flow caused by diversion and small power operations upstream.
Revisions (water years).- W 604: 1924. W 759: Drainage area. W 1034: 1944. W 1054: 1923-45.

Mean annual diversion, in second-feet, by city of Oneida, 1926-48

Water year	Diversion (second-feet)	Water year	Diversion (second-feet)	Water year	Diversion (second-feet)
Oct. 26, 1926 to Sept. 30, 1927	3.3	1934-35	3.6	1941-42	4.2
1927-28	3.3	1935-36	3.8	1942-43	4.4
1928-29	2.6	1936-37	3.8	1943-44	4.5
1929-30	2.4	1937-38	3.7	1944-45	4.6
1930-31	2.3	1938-39	3.9	1945-46	4.6
1931-32	2.6	1939-40	4.1	1946-47	4.7
1932-33	2.9	1940-41	4.2	1947-48	4.5
1933-34	3.5				

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	45	408	1,170	350	396	1,190	453	106	42	53	245
2	26	43	375	978	310	334	1,220	582	95	44	17	155
3	28	42	324	794	300	329	1,230	737	85	35	15	100
4	22	52	297	652	310	320	1,040	489	76	30	35	72
5	32	63	275	667	290	378	1,120	396	70	25	11	83
6	35	193	766	1,420	250	853	2,020	547	64	18	11	129
7	14	1,660	1,060	1,190	260	769	2,420	465	60	20	10	95
8	32	858	623	924	270	595	1,880	360	58	20	35	95
9	157	453	*453	769	300	534	1,270	297	57	18	9.8	117
10	121	508	375	668	270	521	924	254	57	68	8.0	95
11	76	560	324	502	240	483	828	218	56	63	7.4	76
12	74	408	337	390	280	396	844	203	50	40	8.4	71
13	89	378	819	441	330	354	933	189	44	28	7.0	43
14	116	675	630	408	520	396	1,120	189	37	20	5.6	1,650
15	93	465	354	310	1,190	360	1,330	222	31	16	5.2	1,050
16	76	453	360	380	2,040	315	1,960	193	28	16	5.2	452
17	87	528	370	*514	1,520	315	1,240	166	26	16	5.2	258
18	283	569	297	616	1,120	292	870	173	32	28	182	267
19	214	531	230	998	933	260	1,450	214	39	43	249	477
20	139	3,780	220	916	810	260	1,550	233	183	90	98	637
21	109	2,220	220	581	638	315	1,140	183	77	59	56	652
22	87	1,030	245	528	595	678	951	210	44	41	37	508
23	82	1,180	220	459	705	3,670	2,100	402	32	50	23	430
24	78	1,000	200	424	588	3,480	1,530	375	29	38	19	360
25	68	705	180	447	761	2,810	987	306	32	50	20	279
26	58	521	160	360	645	3,230	847	233	74	62	18	207
27	53	932	170	350	477	3,740	*1,300	200	87	53	16	189
28	50	870	210	400	459	4,860	810	172	72	56	22	294
29	49	595	440	460	-	3,160	595	157	46	40	1,090	713
30	49	453	2,700	410	-	2,020	508	142	40	46	757	514
31	47	-	1,930	340	-	1,580	-	126	-	48	298	-

Month	Observed				Diversion (second-feet)†	Adjusted for diversion		
	Second-foot-days	Maximum	Minimum	Mean		Mean	Per square mile	Runoff in inches
October	2,464	283	14	79.5	22.3	-	-	-
November	21,761	3,780	42	725	20.6	-	-	-
December	15,572	2,700	160	502	20.8	-	-	-
Calendar year 1948	178,327	7,360	14	487	23.0	510	2.70	36.74
January	19,466	1,420	310	628	21.1	-	-	-
February	16,761	2,040	250	599	21.7	-	-	-
March	38,003	4,860	260	1,226	21.4	-	-	-
April	37,207	2,420	508	1,240	20.1	-	-	-
May	9,086	737	126	293	18.9	-	-	-
June	1,787	183	26	59.6	24.5	-	-	-
July	1,221	90	16	39.4	23.4	-	-	-
August	3,133.8	1,090	5.2	101	23.2	-	-	-
September	10,293	1,650	43	343	23.4	-	-	-
Water year 1948-49	176,754.8	4,860	5.2	484	21.8	506	2.68	36.34

Peak discharge (base, 4,900 sec.-ft.).- Nov. 20 (12 m.) 4,950 sec.-ft.; Mar. 28 (9 a.m.) 5,340 sec.-ft.
* Winter discharge measurement made on this day.
† Diversion by city of Rome for water supply (figures furnished by city of Rome). For diversion by city of Oneida see "Remarks."
Note.- Stage-discharge relation affected by ice Dec. 19-30, Jan. 12, 15, Jan. 26 to Feb. 9, Feb. 11-14, Mar. 19, 20.

Oneida River at Caughdenoy, N. Y.

Location.- Water-stage recorder, lat. 43°16'20", long. 76°12'15", 40 feet upstream from navigation dam of New York State Barge Canal system, 700 feet upstream from highway bridge in Caughdenoy, Oswego County, 0.5 mile downstream from Caughdenoy Creek, and 5 miles downstream from Oneida Lake. Datum of gage is 362.00 feet above mean sea level (New York State Barge Canal bench mark).
Drainage area.- 1,377 square miles.
Records available.- January 1910 to December 1913, October 1947 to September 1949. September 1902 to December 1909 at Oak Orchard State Dam, about 6 miles downstream, published as Oneida River near Euclid. September 1902 to December 1909 and January 1910 to September 1925 in reports of State engineer and surveyor.
Extremes.- Maximum daily discharge during year, 5,760 second-feet Jan. 21; maximum gage height, 9.20 feet Apr. 23; minimum daily discharge, 160 second-feet Aug. 17.
1948-49: Maximum daily discharge, 7,740 second-feet Mar. 29, 31, 1948; maximum gage height, 9.49 feet Apr. 14, 1948; minimum daily discharge, that of Aug. 17, 1949.
Remarks.- Records good except those for periods of shifting control or no gage-height record, which are fair. This record represents total discharge at Caughdenoy and includes flow in Oneida and Barge Canals. A large amount of natural storage by Oneida Lake. Considerable seasonal regulation by operation of gates in Oneida and Barge Canals. Occasional large diurnal fluctuation caused by seiche in Oneida Lake. Water may be diverted into or received from Mohawk River Basin through summit level of Barge Canal at New London. Nearly all of flow from 16 square miles of the Tioughnioga River Basin may be diverted into DeRuyter Reservoir, in Oswego River Basin.
Cooperation.- Records of gate openings, lockages, and elevations of water surface in Barge Canal above and below lock 23 furnished by New York State Department of Public Works.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	308	250	3,350	3,600	4,610	4,070	2,420	3,750	1,540	775	420	480
2	303	380	3,400	3,780	4,410	4,060	2,480	3,640	1,540	719	480	660
3	281	560	3,310	3,880	4,380	4,340	2,490	3,590	1,490	649	420	680
4	299	380	3,160	4,350	4,320	5,160	2,220	3,600	1,420	604	330	640
5	332	300	3,240	4,600	4,230	5,180	1,710	3,480	1,230	573	310	500
6	285	a400	2,910	4,700	4,190	5,020	1,740	3,550	1,210	592	300	500
7	377	a330	2,960	5,060	4,120	5,030	2,050	3,410	1,040	519	300	680
8	562	a800	2,780	5,390	4,080	4,990	2,340	3,490	1,090	582	290	780
9	309	920	2,760	5,610	3,980	4,990	2,450	3,370	1,130	516	250	660
10	269	820	3,660	5,540	3,970	4,930	2,630	3,160	1,100	459	225	720
11	350	1,140	4,320	5,560	3,930	4,880	2,920	3,160	1,050	497	200	740
12	264	1,330	4,240	5,490	3,900	4,790	3,260	3,050	1,050	513	235	780
13	267	1,030	4,060	5,340	3,820	4,830	3,240	2,960	1,020	419	290	1,000
14	280	1,300	3,900	5,030	3,730	4,870	3,140	2,360	1,010	434	250	680
15	175	1,260	4,320	4,960	3,680	4,800	3,270	1,990	1,020	440	225	840
16	230	1,430	4,300	4,820	4,010	4,750	3,170	1,960	957	410	270	880
17	185	1,320	3,380	4,680	4,370	4,670	3,290	1,860	980	459	160	1,220
18	200	1,370	3,510	4,700	4,560	4,660	3,840	1,840	905	370	210	1,440
19	250	1,720	3,600	4,680	3,280	4,630	3,450	1,670	824	170	215	1,400
20	225	2,250	3,250	5,230	1,360	4,550	3,400	1,800	795	205	170	1,320
21	250	3,310	a3,340	5,760	2,400	4,450	3,490	1,830	719	245	195	1,530
22	320	3,630	a3,170	5,560	3,320	4,250	3,520	1,990	595	210	220	1,520
23	330	3,550	3,000	5,500	3,740	4,240	3,430	1,670	686	205	200	1,430
24	210	3,680	a3,080	5,370	3,870	2,280	3,490	1,800	714	260	175	1,390
25	175	3,650	a2,980	5,220	3,930	1,120	3,670	1,600	741	240	185	c1,500
26	195	3,740	a2,920	5,190	4,030	1,240	3,650	1,780	679	350	205	c1,550
27	260	3,330	a2,870	4,930	4,140	1,340	3,760	1,710	735	300	175	c1,500
28	260	3,580	a2,880	4,870	4,190	1,530	3,730	1,640	881	280	195	c1,400
29	240	3,640	2,890	4,720	-	2,050	3,840	1,560	829	340	410	c1,350
30	250	3,600	2,960	4,710	-	2,370	3,790	1,530	763	340	660	c1,350
31	270	-	3,290	4,690	-	2,420	-	1,590	-	320	760	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	8,511	562	175	275	0.200	0.23
November	55,000	3,740	250	1,833	1.33	1.49
December	103,790	4,320	2,760	3,348	2.43	2.80
Calendar year 1948	802,952	7,740	175	2,194	1.59	21.70
January	153,520	5,760	3,600	4,952	3.60	4.15
February	108,550	4,610	1,360	3,877	2.82	2.93
March	122,490	5,180	1,120	3,951	2.87	3.31
April	91,880	3,840	1,710	3,063	2.22	2.48
May	76,390	3,750	1,530	2,464	1.79	2.06
June	29,743	1,540	595	991	.720	.80
July	12,995	775	170	419	.304	.35
August	8,930	760	160	288	.209	.24
September	31,120	1,550	480	1,037	.753	.84
Water year 1948-49	802,919	5,760	160	2,200	1.60	21.68

a Nc gage-height record; discharge computed on basis of record of stage obtained by State of New York at same site and at lock 23, Barge Canal.
c Backwater from debris.
Note.- River stage below crest of dam Feb. 7-18, Mar. 12-25; mean daily discharge of 6 second-feet used to take account of seepage and leakage thrcugh dam, on basis of 2 discharge measurements. Shifting-control method used Oct. 14 to Nov. 11, July 18 to Sept. 17.

Limestone Creek at Fayetteville, N. Y.

Location.- Water-stage recorder, lat. 43°01'45", long. 76°00'50", 100 feet downstream from Genesee Street Bridge in Fayetteville, Onondaga County, and 8 miles upstream from mouth. Datum of gage is 427.62 feet above mean sea level (levels by Corps of Engineers).

Drainage area.- 85.7 square miles, not including 15.7 square miles of Middle Branch Tioughnioga Creek Basin, flow from which may be completely diverted into Limestone Creek Basin through DeRuyter Reservoir.

Records available.- November 1939 to September 1949.

Extremes.- Maximum discharge during year, 1,420 second-feet Jan. 6 (gage height, 4.53 feet); minimum, 18 second-feet Aug. 20 (gage height, 1.23 feet).
1939-49: Maximum discharge, 6,260 second-feet Dec. 30, 1942 (gage height, 7.18 feet), from rating curve extended above 5,000 second-feet by logarithmic plotting; minimum, 14 second-feet Aug. 10, 1940, Aug. 17, 1941; minimum gage height, that of Aug. 20, 1949.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Canal diverts from Limestone Creek about 3 miles above station and returns water to creek about 400 feet above station. Flow regulated by DeRuyter Reservoir.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	30	104	211	b160	b165	158	146	72	40	39	a29
2	26	35	96	217	b140	b155	142	146	68	39	33	a28
3	27	40	90	211	b130	b150	129	198	64	37	32	a29
4	26	41	97	b180	142	b150	122	138	59	36	31	a31
5	24	41	83	357	137	b230	110	133	56	37	31	a33
6	24	52	89	1,250	b120	499	296	469	54	37	29	36
7	23	169	117	588	b120	b270	314	226	51	36	28	34
8	24	78	92	379	b110	b170	235	168	51	34	27	36
9	26	56	81	343	133	189	197	140	48	33	26	37
10	27	54	74	b330	b130	191	170	122	47	36	26	36
11	27	101	73	b230	b112	189	151	110	46	39	25	34
12	27	74	76	b175	b90	157	140	104	43	35	26	32
13	32	62	124	b185	175	b135	135	99	40	34	36	32
14	35	66	94	b175	336	b165	176	99	40	33	29	62
15	39	66	76	*b135	579	b170	168	106	39	33	28	57
16	39	61	78	b185	518	b150	208	97	39	34	26	43
17	41	56	90	315	b240	b150	166	93	38	34	25	38
18	65	56	76	260	b210	b135	150	83	37	34	26	38
19	60	54	*b56	389	292	b116	250	80	37	38	26	142
20	47	401	b62	254	279	b110	186	120	40	38	25	73
21	43	291	b60	b160	*194	*b175	149	100	56	34	f24	61
22	40	146	80	b185	227	482	137	89	43	34	f24	52
23	39	203	76	b170	556	432	184	148	40	32	24	52
24	39	144	b60	b200	288	266	183	114	37	32	24	67
25	39	118	b56	245	317	214	149	205	87	40	24	75
26	39	104	b54	b145	b260	203	145	120	241	40	23	53
27	40	162	b52	b140	b205	203	408	104	66	34	22	43
28	40	133	b66	336	b215	191	221	92	49	31	25	50
29	40	116	b118	332	-	156	173	86	43	32	130	112
30	35	116	786	b180	-	146	160	83	42*	33	a98	90
31	29	-	523	b165	-	144	-	76	-	42	a40	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,088	65	23	35.1	-	-
November	3,126	401	30	104	-	-
December	3,649	786	52	118	-	-
Calendar year 1948	46,074	1,500	23	126	1.47	19.98
January	8,627	1,250	135	278	-	-
February	6,415	579	90	229	-	-
March	6,258	499	110	202	-	-
April	5,514	408	110	184	-	-
May	4,094	469	76	132	-	-
June	1,673	241	37	55.8	-	-
July	1,101	42	31	35.5	-	-
August	1,030	130	22	33.2	-	-
September	1,535	142	28	51.2	-	-
Water year 1948-49	44,110	1,250	22	121	1.41	19.15

Peak discharge (base, 2,000 sec.-ft.).- No peak above base.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of recorded range in stage, weather records, and records for Onondaga Creek at Syracuse.
b Stage-discharge relation affected by ice.
f Fragmentary gage-height record; discharge computed on basis of reconstructed gage-height graph.

Black River near Boonville, N. Y.

Location.- Water-stage recorder, lat. 43°30'35", long. 75°18'25", at highway bridge three-quarters of a mile upstream from Sugar River and 2 miles northeast of Boonville, Oneida County.
Drainage area.- 295 square miles.
Records available.- February 1911 to September 1949.
Average discharge.- 38 years, 676 second-feet (unadjusted).
Extremes.- Maximum discharge during year, 5,290 second-feet Mar. 28 (gage height, 9.29 feet); minimum, 32 second-feet Oct. 8 (gage height, 3.18 feet); minimum daily, 56 second-feet Oct. 2.
1911-49: Maximum discharge, 12,400 second-feet Mar. 28, 1913 (gage height, about 12.5 feet, former site, from floodmarks); minimum, about 5 second-feet Aug. 26, 1918 (gage height, 2.40 feet); minimum daily, 7 second-feet Aug. 26, 1918.
Remarks.- Records excellent except those for periods of ice effect or no gage-height record, which are good. Flow partly regulated by several headwater reservoirs. Forestport feeder diverts water from State Pond at Forestport. That portion of diverted water which does not pass down Black River Canal (flowing south) returns to Black River below station through Mill Creek Sluiceway.
Revisions (water years).- W 784: 1934. W 1084: 1912(M), 1913, 1917-19(M), 1924(M), 1926(M), 1928(M), 1930(M), 1933(M).

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Dec. 30						Dec. 31 to Sept. 30					
3.4	54	4.5	295	7.0	1,970	3.5	66	5.0	460	7.4	2,310
3.6	80	5.0	491	7.7	2,790	3.8	112	5.5	700	8.2	3,360
3.8	112	5.6	810	8.3	3,660	4.1	172	6.1	1,100	9.1	4,910
4.1	176	6.3	1,320			4.5	280	6.7	1,590		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	69	97	655	3220	520	600	2280	800	319	109	140	582
2	56	97	613	2290	500	520	2040	819	283	107	116	348
3	65	97	558	1540	480	500	1980	2110	256	102	228	
4	72	107	a500	1170	460	500	1830	1800	230	105	104	179
5	61	116	a480	1060	460	565	1640	1260	217	101	100	170
6	65	177	a580	2010	440	801	1920	1310	199	97	97	173
7	59	1380	*a1500	2550	440	894	2570	1080	181	97	90	163
8	65	1140	1230	1860	440	761	2310	869	174	93	85	170
9	212	565	927	1380	460	709	1900	723	173	89	82	213
10	185	510	768	1170	*460	695	1500	631	172	128	78	226
11	107	528	682	935	440	673	1270	581	166	135	73	196
12	151	440	587	*700	430	654	1230	538	164	110	104	165
13	115	393	671	703	477	625	1230	511	160	99	98	154
14	116	451	666	677	542	615	1400	481	151	93	86	582
15	115	446	529	520	1010	615	1590	485	139	91	79	805
16	a116	387	529	580	2220	550	1890	464	128	89	74	528
17	a116	421	524	639	2180	525	1690	456	123	87	70	427
18	a310	470	482	654	1470	453	1320	412	118	108	276	334
19	a300	516	386	864	1180	410	1190	393	118	120	478	379
20	a200	2180	380	1050	944	390	1200	412	119	146	401	480
21	160	3590	380	762	764	467	1060	393	118	130	253	446
22	135	2000	470	719	737	594	1010	375	113	115	176	409
23	118	1530	506	698	752	2240	1760	576	108	117	136	376
24	110	1250	429	* 646	704	3860	2020	631	104	109	126	387
25	108	927	340	611	802	3340	1620	538	111	117	120	354
26	110	739	330	541	865	3180	1200	440	140	128	110	392
27	107	901	330	500	660	3950	1310	386	141	114	105	607
28	110	1200	430	600	620	*4830	1260	364	133	110	116	687
29	107	934	663	717	-	4470	1020	368	119	109	843	919
30	101	750	2470	596	-	3240	876	378	114	102	2100	905
31	102	-	4480	515	-	2830	-	353	-	132	973	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,823	310	56	123	0.417	0.48
November	24,339	3,590	97	811	2.75	3.07
December	24,055	4,480	330	776	2.63	3.03
Calendar year 1948	258,545	6,440	56	706	2.39	32.57
January	32,477	3,220	500	1,048	3.55	4.09
February	21,457	2,220	430	766	2.60	2.71
March	45,056	4,830	390	1,453	4.93	5.68
April	47,116	2,570	876	1,571	5.33	5.94
May	20,937	2,110	353	675	2.29	2.64
June	4,790	319	104	160	.542	.60
July	3,393	146	87	109	.369	.43
August	7,791	2,100	70	251	.851	.98
September	11,984	919	154	399	1.35	1.51
Water year 1948-49	247,218	4,830	56	677	2.29	31.16

Peak discharge (base, 3,900 second-feet).- Nov. 21 (7 a.m.) 3,960 sec.-ft.; Dec. 31 (10:30 a.m.) 5,090 sec.-ft.; Mar. 28 (5:45 p.m.) 5,290 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of gage-height record at Forestport feeder dam and weather records.
Note.- Stage-discharge relation affected by ice Dec. 20-22, 25-28, Jan. 15, 16, 27, 28, Feb. 1-12, Feb. 27 to Mar. 4, Mar. 19, 20 (doubtful gage-height record Dec. 26, 27). Variable draw-down conditions Nov. 20, 21; discharge computed on basis of adjusted gage heights.

Black River at Watertown, N. Y.

Location.- Water-stage recorder, lat. 43°59'05", long. 75°55'30", at Vanduzee Street Bridge, in Watertown, Jefferson County, and 3½ miles upstream from Philomel Creek.
Drainage area.- 1,876 square miles.
Records available.- July 1920 to September 1949.
Average discharge.- 29 years, 3,911 second-feet.
Extremes.- Maximum discharge during year, 20,800 second-feet Mar. 30 (gage height, 7.99 feet); minimum, 75 second-feet July 10 (gage height, 0.07 foot); minimum daily, 336 second-feet July 10.

1920-49: Maximum discharge, 33,900 second-feet Apr. 9, 1928 (gage height, 10.6 second-feet); minimum, 10 second-feet Sept. 2, 1934 (gage height, -0.19 foot); minimum daily, 137 second-feet Sept. 4, 1939.

Maximum discharge known, about 39,700 second-feet in April 1869 (from New York State Museum Bulletin 85).

Remarks.- Records excellent except those for periods of ice effect or fragmentary gage-height record, which are good. Flow partly regulated by Stillwater Reservoir, Fulton Chain of Lakes, and other reservoirs. During canal season water is diverted out of basin through Forestport feeder and Black River Canal (flowing south). Extensive diurnal fluctuation at low and medium flow caused by mills and power plants in and above Watertown.
Revisions.- W 759: Drainage area.

Rating tables, water year 1948-49, except period of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Jan. 2				Jan. 3 to Sept. 30					
1.0	643	3.0	3,760	0.6	322	2.0	1,770	5.0	8,690
1.3	948	3.5	4,810	.8	460	2.5	2,570	6.0	12,000
1.6	1,300	4.0	5,930	1.0	622	3.0	3,510	7.0	16,200
2.0	1,860	5.0	8,880	1.3	910	3.5	4,580	7.9	20,400
2.5	2,740			1.6	1,250	4.0	5,800		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,480	1,000	3,720	6,470	2,920	4,180	13,600	5,070	1,970	1,240	974	4,510
2	1,440	1,230	3,020	7,800	2,630	3,700	11,400	4,150	1,750	1,150	1,000	3,430
3	1,170	1,250	3,020	f8,690	2,900	3,340	9,460	4,600	1,660	1,100	1,120	2,240
4	908	1,150	2,580	8,880	2,610	2,990	7,890	5,090	1,440	998	1,270	1,520
5	1,070	1,150	1,850	8,040	2,640	2,900	7,210	5,350	1,100	982	1,290	982
6	1,300	1,370	2,190	7,740	2,510	3,600	7,060	5,420	1,070	1,230	1,120	1,340
7	1,510	1,570	3,300	7,800	2,000	4,100	8,190	5,240	1,070	1,270	738	1,480
8	1,450	4,420	*4,680	8,260	2,540	4,500	9,620	5,140	1,340	1,210	876	1,440
9	1,350	6,000	4,770	8,850	2,620	4,460	10,300	4,830	1,540	1,250	823	1,610
10	1,250	4,140	4,160	f8,690	2,690	4,350	9,880	4,260	1,450	336	898	1,840
11	1,250	3,330	3,710	7,740	2,690	4,310	8,600	3,520	1,330	952	991	914
12	1,550	2,780	2,380	6,670	*2,760	3,980	7,590	3,020	942	962	1,110	1,330
13	1,610	2,470	3,150	*5,290	2,970	2,920	6,720	2,670	946	1,040	1,330	1,390
14	1,790	2,210	4,310	4,510	3,140	2,960	6,140	2,160	1,090	1,130	727	1,840
15	1,840	2,390	3,690	3,890	5,200	3,210	6,030	1,870	1,080	1,040	878	3,050
16	1,700	2,410	3,140	3,080	9,460	3,210	6,830	2,040	1,160	1,070	923	3,570
17	1,320	2,540	2,900	3,580	8,910	3,080	7,090	2,100	1,290	848	1,070	3,120
18	1,180	2,600	2,620	4,490	9,230	2,870	7,300	1,960	1,080	827	1,800	1,930
19	1,810	2,810	1,570	5,570	9,620	2,410	7,500	1,950	1,020	830	1,140	1,810
20	2,200	3,720	1,660	6,980	8,660	2,070	7,530	1,880	868	972	2,280	2,200
21	2,160	6,930	2,120	6,170	7,180	2,270	7,060	1,910	940	1,180	1,450	2,970
22	2,060	7,800	2,460	5,310	6,300	3,440	6,530	1,890	977	1,230	1,310	2,950
23	1,680	8,610	2,740	4,690	5,470	9,920	6,170	1,750	952	936	1,210	2,850
24	1,390	8,240	2,530	4,180	5,070	11,900	6,670	2,330	998	1,140	1,120	2,700
25	726	7,110	1,890	3,940	5,310	14,200	7,320	2,610	1,040	1,080	994	2,240
26	1,360	5,910	b1,300	3,600	5,500	*16,100	7,530	2,640	956	856	970	1,910
27	1,530	4,830	b1,500	3,080	5,030	16,300	7,210	2,400	973	1,050	970	1,910
28	1,600	4,560	1,760	2,990	4,440	17,400	6,670	2,210	1,130	1,340	656	2,000
29	1,590	4,470	2,160	3,330	-	*19,800	6,390	1,650	1,360	1,090	1,050	2,760
30	1,290	4,350	4,020	3,390	-	20,200	5,850	1,230	1,320	1,190	2,360	3,560
31	1,080	-	5,930	2,900	-	17,100	-	2,030	-	926	4,300	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	45,644	2,200	726	1,472	-	-
November	112,350	8,610	1,000	3,745	-	-
December	90,830	5,930	1,300	2,930	-	-
Calendar year 1948	1,349,220	32,000	500	3,686	1.96	26.74
January	176,600	8,880	2,900	5,697	-	-
February	133,000	9,620	2,000	4,750	-	-
March	217,770	20,200	2,070	7,025	-	-
April	233,340	13,600	5,850	7,778	-	-
May	94,970	5,420	1,230	3,064	-	-
June	35,842	1,970	868	1,195	-	-
July	32,455	1,340	336	1,047	-	-
August	38,748	4,300	656	1,250	-	-
September	67,396	4,510	914	2,247	-	-
Water year 1948-49	1,278,945	20,200	336	3,504	1.87	25.35

Peak discharge (base, 17,000 sec.-ft.).- Mar. 30 (1:30 a.m.) 20,800 sec.-ft.
* Winter discharge measurement made on this day.
b Stage-discharge relation affected by ice.
f Fragmentary gage-height record; discharge computed on basis of reconstructed gage-height record.

Black River Canal (flowing south) near Boonville, N. Y.

Location.- Two water-stage recorders and concrete controls, lat. 43°27'20", long. 75°19'25", gage 1 at lock 69, 2 miles south of Boonville, Oneida County, and gage 2 on Lansingkill spillway, 100 feet downstream from spillway head gates, 600 feet upstream from lock 70, and half a mile upstream from lock 69. Datum of gage 1 is 1,105.56 feet above mean sea level, datum of 1929.

Records available.- September 1915 to September 1942 (canal seasons only), October 1942 to September 1949.

Extremes.- Maximum daily discharge during year, 131 second-feet Nov. 20; minimum daily, 1.0 second-foot Dec. 28.
1915-49: Maximum daily discharge recorded, 323 second-feet Nov. 30, 1915; practically no flow at times when no water is being diverted.

Remarks.- Records good except those for periods of ice effect or no gage-height record at gage 1, which are fair. Record shows combined flow at gages 1 and 2 and represents total diversion from Black River at Forestport, through Forestport feeder, into Mohawk River Basin. Discharge during period Nov. 23 to May 17, when no water was diverted, made up of leakage through head gates and runoff from area draining into canal above station.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	65	1.8	2.9	1.4	1.5	1.9	1.5	63	65	65	82
2	66	64	1.7	2.3	1.3	1.5	1.9	1.6	61	65	65	77
3	67	64	1.7	1.9	1.3	1.5	1.8	1.7	61	64	64	73
4	67	64	1.7	1.8	1.3	1.5	1.7	1.7	62	63	62	70
5	69	65	1.6	1.9	1.2	1.7	1.7	1.7	61	63	63	69
6	70	72	1.9	4.1	1.3	2.8	1.9	3.5	60	62	62	72
7	70	78	*2.1	3.0	1.3	2.3	1.8	9.8	62	63	62	69
8	73	30	1.5	2.1	1.4	1.9	1.7	6.4	63	63	63	73
9	57	54	1.4	1.7	*1.3	1.8	1.7	4.6	64	62	63	75
10	20	72	1.4	1.6	1.3	1.7	1.6	3.3	59	62	62	76
11	48	73	1.4	1.4	1.3	1.7	1.5	2.7	58	47	61	74
12	54	66	1.5	1.5	1.4	1.5	1.5	2.5	58	61	62	73
13	55	86	1.7	1.5	1.5	1.5	1.5	2.2	57	61	61	72
14	70	71	1.5	1.3	1.7	1.5	1.7	2.2	60	62	60	78
15	72	67	1.5	*1.3	3.3	1.5	1.8	2.3	65	61	60	66
16	70	64	1.5	1.4	4.0	1.5	1.9	2.3	64	61	59	86
17	73	68	1.5	1.4	3.2	1.4	1.7	2.2	63	61	59	82
18	77	69	1.5	1.4	2.8	1.4	1.5	26	63	63	64	79
19	37	72	1.4	2.4	2.6	1.3	1.5	44	64	63	36	86
20	59	131	1.3	1.9	2.6	1.3	1.5	52	64	64	54	66
21	73	70	1.3	1.3	2.1	1.5	1.5	53	65	64	67	70
22	72	30	1.3	1.3	1.9	2.3	1.5	53	65	64	66	84
23	70	15	1.4	1.4	2.5	4.3	1.7	53	65	65	64	86
24	70	3.8	1.2	1.4	2.3	2.7	1.6	50	65	63	64	88
25	68	3.1	1.2	1.4	2.7	2.2	1.5	65	64	64	64	88
26	65	2.7	1.2	1.2	2.8	2.2	1.5	66	69	63	63	83
27	64	2.9	1.1	1.2	2.0	2.1	1.5	65	70	63	63	83
28	64	2.7	1.0	1.4	1.7	2.1	1.5	64	67	64	64	94
29	64	2.3	1.3	1.5	-	1.9	1.6	65	66	64	86	58
30	65	1.9	4.7	1.4	-	1.9	1.6	65	65	63	48	56
31	65	-	4.0	1.4	-	*1.9	-	64	-	65	73	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,980	77	20	63.9		
November	1,509.4	131	1.9	50.3		
December	51.3	4.7	1.0	1.65		
Calendar year 1948	11,574.9	131	.6	31.6		
January	53.7	4.1	1.2	1.73		
February	55.5	4.0	1.2	1.98		
March	57.9	4.3	1.3	1.87		
April	49.3	1.9	1.5	1.64		
May	837.2	66	1.5	27.0		
June	1,893	70	57	63.1		
July	1,938	65	47	62.5		
August	1,929	86	36	62.2		
September	2,288	94	56	76.3		
Water year 1948-49	12,642.3	131	1.0	34.6		

* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice at gage Dec. 19-27, Jan. 10-18, 20-22, 26, 27, Jan. 29 to Feb. 13, Feb. 17, 18, Feb. 26 to Mar. 4, Mar. 16-21. No gage-height record at gage 1 Dec. 8-12; discharge computed on basis of weather records and adjacent gage-height record. Backwater from leaves at gage 2 Aug. 14-18, Aug. 21 to Sept. 11, Sept. 17-22, 24-30.

Moose River at McKeever, N. Y.

Location.- Water-stage recorder, lat. 43°36'40", long. 75°06'35", half a mile west of McKeever, Herkimer County, and 2 miles downstream from South Branch. Datum of gage is 1,479.92 feet above mean sea level, datum of 1929.
Drainage area.- 365 square miles.
Records available.- May 1922 to September 1949. June 1900 to December 1922 at site at Moose River, 2½ miles downstream.
Average discharge.- 41 years (1907-13, 1914-49), 837 second-feet (unadjusted).
Extremes.- Maximum discharge during year, 6,600 second-feet Dec. 31; maximum gage height, 10.60 feet Dec. 30 (backwater from ice); minimum discharge, 104 second-feet Aug. 10-12, (gage height, 1.71 feet).
1900-1949: Maximum discharge, 18,700 second-feet June 3, 1947 (gage height, 17.45 feet, from floodmark), result of failure of dam, minimum, about 42 second-feet July 21, 23, 25-27, 1913.
Remarks.- Records good except those for periods of ice effect, which are fair. Flow regulated to some extent by Fulton Chain of Lakes since about 1880.
Revisions (water years).- W 624: 1922(M). W 729: Drainage area. W 874: 1928.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Mar. 28

2.3	220	4.6	1,310
2.6	311	5.3	1,790
3.0	459	6.0	2,350
3.5	686	7.0	3,260
4.0	950	8.5	4,840

Mar. 29 to Sept. 30

1.7	102	2.8	404	4.5	1,280
1.9	143	3.2	568	5.0	1,600
2.1	189	3.6	760	6.0	2,350
2.4	270	4.0	981		

Note.- Same as preceding table above 6.0 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	318	237	701	4,760	540	800	2,190	1,090	331	170	253	894
2	318	234	623	2,530	540	760	1,900	1,020	311	156	217	550
3	314	229	541	1,790	520	740	1,740	1,570	304	145	175	412
4	311	229	476	1,450	500	740	1,610	1,490	292	135	152	361
5	308	229	427	1,280	480	762	1,490	1,130	270	126	137	361
6	308	270	515	2,160	460	851	1,580	1,200	256	122	128	390
7	301	1,230	*1,550	2,630	450	1,000	2,130	1,300	230	120	122	450
8	325	1,400	1,230	1,920	470	960	2,090	1,150	214	116	118	454
9	431	863	868	1,490	560	868	1,840	993	206	114	110	462
10	488	637	696	1,220	540	814	1,560	845	199	130	106	577
11	411	599	600	*1,020	520	782	1,420	734	192	145	104	550
12	392	514	580	840	520	746	1,360	608	182	139	130	470
13	408	459	609	740	560	720	1,410	528	175	135	167	427
14	411	541	599	600	620	700	1,730	490	167	126	154	695
15	411	568	580	520	840	680	2,080	495	161	118	132	1,090
16	389	514	510	480	1,950	660	2,370	446	154	116	116	771
17	385	493	472	560	2,200	640	1,830	321	150	114	112	582
18	447	572	443	660	1,750	620	1,410	318	145	126	347	503
19	463	554	420	740	1,550	600	1,320	368	143	137	976	520
20	427	2,160	400	980	1,400	580	1,320	400	143	139	547	714
21	385	3,640	410	940	1,250	580	1,360	450	147	147	319	923
22	352	1,860	420	780	1,180	647	1,450	438	152	150	230	906
23	328	1,520	400	720	1,100	1,750	1,950	478	139	147	184	835
24	314	1,480	370	660	1,000	3,000	2,220	546	132	135	163	665
25	308	1,210	280	620	980	2,600	1,840	537	132	150	152	516
26	295	998	290	580	960	2,800	1,490	542	150	161	143	431
27	285	950	270	560	900	3,600	1,740	474	194	179	135	372
28	279	1,150	280	560	840	5,200	1,700	431	192	202	135	395
29	270	998	340	620	-	4,100	1,390	390	167	172	879	1,050
30	261	819	1,240	580	-	*3,090	1,220	365	154	165	2,740	1,290
31	246	-	4,800	560	-	2,660	-	358	-	196	1,420	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inchss
October	10,889	488	246	351	-	-
November	27,157	3,640	229	905	-	-
December	21,940	4,800	270	708	-	-
Calendar year 1948	281,563	7,320	146	769	2.11	28.70
January	35,550	4,760	480	1,147	-	-
February	25,180	2,200	450	899	-	-
March	45,050	5,200	580	1,453	-	-
April	50,740	2,370	1,220	1,691	-	-
May	21,505	1,570	318	694	-	-
June	5,784	331	132	193	-	-
July	4,433	202	114	143	-	-
August	10,803	2,740	104	348	-	-
September	18,616	1,290	361	621	-	-
Water year 1948-49	277,647	5,200	104	761	2.08	28.30

Peak discharge (base, 5,500 sec.-ft.).- Dec. 31 (10:30 p.m.) 6,600 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 11, 12, 15, 19-31, Jan. 10 to Mar. 4, Mar. 7, 8, 13-21, 23-29.

Middle Branch Moose River at Old Forge, N. Y.

Location.- Staff gage, lat. 43°42'50", long. 74°58'10", at Old Forge, Herkimer County, 400 feet downstream from State dam. Datum of gage is 1,690.63 feet above mean sea level, datum of 1929.
Drainage area.- 52 square miles.
Records available.- November 1911 to September 1949.
Average discharge.- 37 years (1912-49), 105 second-feet (unadjusted).
Extremes.- Maximum discharge observed during year, 282 second-feet Aug. 29, 30 (gage height, 3.3 feet); minimum observed, 3.9 second-feet Nov. 9 (gage height, 1.60 feet); minimum daily, 4.3 second-feet Nov. 9.
1911-49: Maximum daily discharge, 862 second-feet Mar. 23, 1921, from rating curve extended above 450 second-feet by logarithmic plotting; minimum daily, about 0.1 second-foot many times during 1938-39, 1944, 1945, when gates in dam were closed.
Remarks.- Records good except those for periods of backwater from debris or North Branch Moose River, or doubtful gage-height record, which are fair. On days when gate openings are changed, discharge is computed from gage readings and record of gate operations. Gage read twice daily. Flow regulated by Fulton Chain of Lakes.

Rating tables, water year 1948-49, except periods of backwater from debris or North Branch Moose River
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Apr. 9				Apr. 10 to Sept. 30			
1.6	3.9	2.0	33	1.6	4.9	2.4	87
1.7	8.3	2.2	56	1.7	10	2.7	140
1.8	15	2.4	86	1.8	17	3.0	204
Note.- Same as following table above 2.5 feet.				2.0	35	3.3	282
				2.2	58		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	255	132	6.1	8.0	80	204	64	122	31	21	21	95
2	242	127	6.1	8.2	83	204	64	122	64	21	21	26
3	242	121	6.1	8.2	83	248	64	122	64	21	21	20
4	242	117	6.1	8.2	83	268	80	123	63	21	21	20
5	242	114	6.1	8.2	83	255	119	123	61	21	21	80
6	242	110	6.5	8.4	80	255	119	160	32	21	21	204
7	242	129	6.1	8.4	78	255	119	181	20	21	21	204
8	242	100	6.5	8.4	106	255	121	170	20	21	21	204
9	242	4.3	6.5	8.4	204	255	134	d160	21	21	20	204
10	229	5.7	6.5	8.6	192	255	170	d160	21	21	20	204
11	229	6.1	6.5	8.6	181	255	170	102	21	21	20	204
12	229	6.5	6.5	8.9	192	255	170	17	21	21	20	204
13	216	6.5	6.5	12	170	255	170	17	21	21	20	244
14	216	6.5	6.5	15	170	255	140	17	21	21	20	176
15	216	6.5	6.5	17	181	255	83	19	21	21	20	64
16	204	6.5	6.5	20	181	255	25	51	21	21	20	65
17	204	6.5	6.5	22	181	255	5.9	64	21	21	20	65
18	192	6.1	6.5	25	181	242	5.4	64	21	21	22	65
19	192	6.5	6.5	28	181	242	4.9	64	21	21	20	68
20	192	6.5	6.5	32	181	242	5.4	110	21	21	20	109
21	192	6.6	6.5	37	181	242	5.9	123	21	21	20	187
22	181	6.6	7.0	42	170	242	5.9	119	21	21	20	242
23	181	6.6	7.0	46	170	242	6.5	82	21	21	20	165
24	170	6.6	7.0	47	170	205	d47	69	21	21	20	53
25	170	6.6	7.0	48	170	116	106	65	21	21	20	20
26	170	6.5	7.0	51	170	117	122	65	21	21	20	20
27	160	6.1	7.4	54	170	119	122	65	21	21	20	20
28	150	6.1	7.4	56	176	104	124	35	21	21	20	21
29	150	6.1	7.4	56	-	62	124	17	21	21	151	91
30	150	6.1	7.9	67	-	62	124	17	21	21	268	123
31	134	-	7.9	78	-	64	-	17	-	21	255	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	6,318	255	134	204	-	-
November	1,088.1	132	4.3	36.3	-	-
December	207.1	7.9	6.1	6.68	-	-
Calendar year 1948	30,482.2	340	3.4	83.3	1.60	21.80
January	853.5	78	8.0	27.5	-	-
February	4,248	204	78	152	-	-
March	6,540	268	62	211	-	-
April	2,620.9	170	4.9	87.4	-	-
May	2,642	181	17	85.2	-	-
June	817	64	20	27.2	-	-
July	651	21	21	21.0	-	-
August	1,244	268	20	40.1	-	-
September	3,467	244	20	116	-	-
Water year 1948-49	30,696.6	268	4.3	84.1	1.62	21.96

d Doubtful gage-height record; discharge computed on basis of records for adjacent days, reservoir elevations, and record of gate operation at Old Forge Dam.
Note.- Backwater from debris Apr. 25 to May 3 (doubtful gage-height record May 3). Backwater from North Branch Moose River Nov. 21-25, Jan. 1-11, Mar. 28 to Apr. 4. Increase on combined storage in Old Forge and Sixth Lake Reservoirs during calendar year 1948, about 429,400,000 cubic feet (equivalent mean discharge, 13.6 sec.-ft.; runoff, 3.54 inches); increase during water year 1948-49, about 363,900,000 cubic feet (equivalent mean discharge, 11.5 sec.-ft.; runoff, 3.00 inches).

Middle Branch Moose River near McKeever, N. Y.

Location.- Water-stage recorder, lat. 43°37'45", long. 75°04'55", half a mile upstream from confluence with South Branch and 1½ miles northeast of McKeever, Herkimer County. Datum of gage is 1,530.29 feet above mean sea level, datum of 1929.

Drainage area.- 148 square miles.

Records available.- October 1925 to September 1949.

Average discharge.- 24 years, 330 second-feet (unadjusted).

Extremes.- Maximum discharge during year, 1,270 second-feet Mar. 30; maximum gage height, 5.46 feet Jan. 3 (backwater from ice); minimum discharge, 47 second-feet Aug. 10, 11, 17 (gage height, 2.06 feet).
1925-49: Maximum discharge, 2,100 second-feet Apr. 27, 1926; maximum gage height, 7.15 feet Jan. 18, 1938 (ice jam); minimum discharge, 27 second-feet Aug. 18, 1946 (gage height, 1.73 feet).

Remarks.- Records good except those for periods of ice effect, which are fair. Flow partly regulated by Fulton Chain of Lakes since about 1880.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Mar. 30				Mar. 31 to Sept. 30					
2.8	154	4.4	700	2.0	42	2.9	164	4.4	660
3.0	195	4.9	953	2.2	60	3.2	233	4.9	915
3.4	301	5.5	1,320	2.4	82	3.6	347	5.3	1,160
3.9	480			2.6	110	4.0	489		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	301	176	301	720	270	400	1,030	481	123	76	74	398
2	298	170	274	740	260	400	910	433	128	75	67	236
3	295	166	240	660	245	400	802	422	142	71	63	196
4	292	166	204	600	240	420	717	401	140	64	59	203
5	289	164	174	560	235	445	669	387	135	61	56	228
6	286	178	184	580	230	468	665	401	131	59	54	262
7	280	304	*223	540	225	464	684	447	107	58	51	322
8	295	323	226	520	245	453	693	451	94	55	49	325
9	317	286	220	500	340	449	698	433	88	53	48	322
10	304	a226	218	480	330	437	688	384	85	63	47	313
11	295	a211	240	430	*310	437	674	350	81	69	47	302
12	292	a206	254	*370	310	430	638	276	78	65	55	293
13	286	200	257	310	300	418	602	230	77	62	58	296
14	283	202	257	240	340	430	584	210	74	58	56	408
15	271	193	235	210	420	422	558	206	71	56	52	290
16	257	189	220	200	568	400	571	167	68	54	49	246
17	260	184	209	230	540	399	529	67	67	53	48	251
18	280	187	185	270	600	390	529	96	65	58	108	265
19	271	187	170	290	622	380	529	150	65	61	146	296
20	263	351	160	350	564	380	501	170	65	61	135	332
21	249	430	165	380	540	374	462	230	64	62	98	380
22	238	492	170	330	509	399	429	233	61	62	77	459
23	228	538	160	310	480	633	444	236	59	62	67	451
24	223	500	150	290	464	719	440	203	58	60	63	338
25	220	472	116	280	457	667	513	192	60	67	60	228
26	218	441	112	270	441	719	546	187	65	69	59	185
27	211	462	110	260	410	822	567	181	80	76	58	166
28	204	396	116	260	403	1,030	533	177	68	85	57	172
29	200	364	175	290	-	1,180	533	140	62	76	154	206
30	195	333	350	280	-	1,260	513	126	65	74	382	296
31	184	-	700	270	-	*1,150	-	128	-	75	444	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	8,085	317	184	261	-	-
November	8,661	538	164	289	-	-
December	6,775	700	110	219	-	-
Calendar year 1948	111,061	1,590	64	303	2.05	27.92
January	12,020	740	200	388	-	-
February	10,898	622	225	389	-	-
March	17,375	1,260	374	560	-	-
April	18,251	1,030	429	608	-	-
May	8,195	481	67	264	-	-
June	2,526	142	58	84.2	-	-
July	2,000	85	53	64.5	-	-
August	2,841	444	47	91.6	-	-
September	8,665	459	166	289	-	-
Water year 1948-49	106,292	1,260	47	291	1.97	26.71

Peak discharge (base, 1,200 sec.-ft.).- Mar. 30 (5:30 a.m.) 1,270 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of records of gate operation at Old Forge and records for Middle Branch Moose River at Old Forge and Moose River at McKeever.
Note.- Stage-discharge relation affected by ice Dec. 15, Dec. 18 to Feb. 15, Feb. 17, 18, 21, 27, Mar. 1-4, 14, 16, 18-20.

Independence River at Donnattsburg, N. Y.

Location.- Water-stage recorder, lat. 43°44'50", long. 75°20'05", at highway bridge at Donnattsburge, Lewis County, 1¼ miles downstream from Chase Lake Outlet and 5 miles upstream from mouth. Prior to Sept. 16, wire-weight gage at same site and datum.
Drainage area.- 91.7 square miles.
Records available.- July 1942 to September 1949. December 1927 to June 1942 at site 3½ miles upstream, published as Independence River Sperryville.
Extremes.- Maximum discharge during year, 2,210 second-feet Mar. 29 (gage height, 7.6 feet, from graph based on gage readings); minimum observed, 18 second-feet Aug. 4, 5 (gage height, 2.85 feet).
1942-49: Maximum discharge, 3,410 second-feet Oct. 2, 1945 (gage height, 8.8 feet, from graph based on gage readings); minimum observed, 18 second-feet Sept. 17, 1948, Aug. 4, 5, 1949 (gage height, 2.85 feet).
Remarks.- Records good Sept. 16-30; others fair. Wire-weight gage read twice daily October, November, and March; once daily at other times.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Sept. 14

2.8	15	3.8	143	5.5	775
3.0	28	4.1	215	6.0	1,050
3.2	48	4.5	339	6.5	1,390
3.5	89	5.0	536	7.2	1,890

Sept. 15-30

3.4	77	4.1	233
3.5	94	4.5	361
3.8	156	4.8	474

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	d38	d140	676	b114	d185	514	d185	83	40	31	165
2	22	d36	d124	536	b106	d155	394	d195	a72	42	28	139
3	24	d38	d104	472	b102	d130	322	d230	a62	38	29	95
4	30	d38	d94	413	b98	d116	243	d225	a60	32	18	73
5	36	d37	d88	357	b92	d124	273	d210	a54	28	18	66
6	42	d52	189	d600	b90	d330	432	d230	a52	26	22	76
7	47	394	165	d500	b92	d300	639	d230	a48	23	21	71
8	50	165	143	d420	b88	d230	676	d210	49	20	20	60
9	55	154	105	d390	b94	d190	558	d185	a44	22	20	80
10	44	165	95	d500	b88	154	452	d160	a44	28	20	74
11	40	165	84	d380	b82	139	322	d135	a44	32	23	80
12	40	165	82	d290	b78	131	305	d120	41	31	25	63
13	42	165	*119	d230	*97	121	322	d110	39	28	36	49
14	43	154	82	*165	120	116	339	d104	37	27	26	195
15	46	154	70	d135	d298	b114	375	d110	34	22	20	474
16	d41	143	67	d140	d676	b104	472	d112	33	24	21	265
17	d42	143	60	d190	d581	b100	452	d102	31	28	24	156
18	d74	165	63	d230	d413	b96	432	d94	28	28	85	115
19	d90	243	60	d540	d305	b88	375	d100	32	32	177	119
20	d68	512	63	d540	243	b86	339	d112	31	32	100	188
21	d58	775	b60	d380	202	b98	322	d102	30	28	73	284
22	d52	775	b66	d320	189	b122	273	83	25	29	47	220
23	d48	725	b64	d250	d290	154	273	97	27	27	35	166
24	d46	676	b60	d210	d245	325	289	116	28	24	31	147
25	d44	d400	b58	d180	d330	827	305	135	30	30	28	124
26	d40	d270	b58	d135	d320	990	305	116	30	31	26	102
27	d40	d440	b62	d120	d270	1,220	305	103	29	32	26	86
28	d40	d380	b74	d135	d240	1,870	289	89	28	28	30	86
29	d38	d235	137	d180	-	1,560	289	91	30	25	127	272
30	d38	d175	369	b150	-	*775	243	94	28	28	289	326
31	d36	-	759	b124	-	676	-	92	-	32	177	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,377	90	21	44.4	0.484	0.56
November	7,975	775	36	266	2.90	3.23
December	3,764	759	58	121	1.32	1.53
Calendar year 1948	63,576	2,210	19	174	1.90	25.78
January	9,888	676	120	319	3.48	4.01
February	5,943	676	78	212	2.31	2.41
March	11,626	1,870	86	375	4.09	4.72
April	11,129	676	243	371	4.05	4.51
May	4,277	230	83	138	1.50	1.73
June	1,203	83	25	40.1	.437	.49
July	897	42	20	28.9	.315	.36
August	1,653	289	18	53.3	.581	.67
September	4,416	474	49	147	1.60	1.79
Water year 1948-49	64,148	1,870	18	176	1.92	26.01

* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records, engineer's gage reading, and records for nearby streams.
b Stage-discharge relation affected by ice.
d Doubtful gage-height record; discharge computed on basis of weather records and records for nearby streams.

Stillwater Reservoir near Beaver River, N. Y.

Location.- Float-tape gage, lat. 43°53'50", long. 75°03'05", at Stillwater Dam, 7½ miles west of Beaver River post office, Herkimer County. Datum of gage is at mean sea level, adjustment of 1912.
Drainage area.- 172 square miles.
Records available.- February 1925 to September 1949.
Extremes.- Maximum elevation during year, 1,679.48 feet Apr. 24 (contents, 4,675,000,000 cubic feet); minimum, 1,659.45 feet Nov. 6 (contents, 668,000,000 cubic feet).
1925-49: Maximum elevation, 1,679.73 feet June 3, 1947 (contents, 4,748,000,000 cubic feet); minimum since first filling, 1,644.80 feet Mar. 25-27, 1940 (reservoir empty).
Remarks.- Records good. Reservoir originally formed about 1885; enlarged at various times and in 1924 enlarged to a usable capacity of 4,623,000,000 cubic feet between elevations 1,650.3 and 1,679.3 feet above mean sea level. Elevation of gate sill of lowest outlet, 1,642.3 feet. Capacity below elevation 1,650.3 feet, about 90,000,000 cubic feet. Reservoir is used to regulate flow of Beaver and Black Rivers for control of floods, for power development, and for general welfare of the public. Records of contents given herein represent those above elevation 1,650.3 feet. Daily observations made about 8 a.m.
Cooperation.- Records furnished by Board of Black River Regulation District.

Elevation, in feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67.81	60.79	64.72	66.24	69.40	69.50	74.66	79.34	79.13	75.80	70.41	66.64
2	67.56	60.53	64.80	66.59	69.37	69.50	75.01	79.34	79.10	75.61	70.21	66.72
3	67.34	60.28	64.84	66.83	69.31	69.47	75.32	79.37	79.07	75.44	69.99	66.73
4	67.09	60.03	64.89	67.00	69.26	69.44	75.61	79.37	79.04	75.24	69.79	66.73
5	66.85	59.77	64.91	67.13	69.21	69.43	75.88	79.35	79.01	75.06	69.59	66.72
6	66.61	59.52	64.97	67.45	69.14	69.47	76.17	79.41	78.97	74.87	69.38	66.76
7	66.36	59.76	65.04	67.97	69.07	69.49	76.58	79.39	78.89	74.68	69.16	66.77
8	66.11	59.97	65.30	68.35	68.97	69.49	76.95	79.36	78.79	74.49	68.94	66.73
9	66.02	60.18	65.41	68.61	68.76	69.47	77.27	79.31	78.71	74.31	68.73	66.70
10	65.79	60.37	65.50	68.79	68.58	69.46	77.51	79.30	78.62	74.17	68.52	66.72
11	65.58	60.57	65.54	68.94	68.40	69.46	77.74	79.28	78.52	74.04	68.36	66.76
12	65.37	60.72	65.58	69.02	68.22	69.46	77.95	79.23	78.41	73.87	68.18	66.78
13	65.13	60.76	65.65	69.15	68.07	69.45	78.14	79.20	78.30	73.72	67.98	66.79
14	64.92	60.84	65.72	69.28	67.97	69.43	78.37	79.20	78.20	73.56	67.76	66.83
15	64.68	60.91	65.75	69.35	67.92	69.41	78.62	79.24	78.10	73.38	67.54	67.04
16	64.44	60.96	65.78	69.42	68.19	69.37	78.88	79.24	77.98	73.21	67.31	67.08
17	64.17	61.02	65.81	69.50	68.53	69.34	79.14	79.24	77.88	73.04	67.09	67.04
18	64.07	61.05	65.82	69.51	68.73	69.30	79.34	79.21	77.75	72.94	67.08	67.06
19	63.88	61.08	65.83	69.52	68.90	69.25	79.39	79.21	77.59	72.77	67.13	67.18
20	63.68	61.33	65.83	69.58	69.05	69.19	79.42	79.22	77.50	72.61	67.05	67.17
21	63.46	62.16	65.76	69.62	69.15	69.13	79.40	79.23	77.34	72.43	67.00	67.25
22	63.24	62.72	65.68	69.65	69.24	69.09	79.42	79.20	77.21	72.22	66.96	67.33
23	63.00	63.13	65.58	69.65	69.32	69.24	79.41	79.17	77.07	72.04	66.87	67.39
24	62.76	63.51	65.48	69.64	69.36	69.71	79.46	79.20	76.88	71.84	66.76	67.46
25	62.53	63.82	65.39	69.62	69.40	70.15	79.42	79.19	76.72	71.68	66.67	67.54
26	62.28	64.07	65.28	69.59	69.45	70.60	79.37	79.19	76.54	71.51	66.55	67.62
27	62.03	64.21	65.19	69.58	69.47	71.29	79.37	79.18	76.39	71.31	66.44	67.68
28	61.79	64.39	65.07	69.55	69.48	72.25	79.35	79.16	76.24	71.12	66.34	67.74
29	61.55	64.54	64.91	69.54	-	73.13	79.32	79.14	76.05	70.92	66.35	67.85
30	61.29	64.64	65.06	69.47	-	73.71	79.34	79.13	75.96	70.73	66.52	67.95
31	61.03	-	65.66	69.43	-	74.26	-	79.14	-	70.59	66.55	-

Note.- Add 1,600 feet to obtain elevation above mean sea level.

Monthly elevation and contents, water year October 1948 to September 1949

Date	Elevation (feet)†	Contents (millions of cubic feet)	Change in contents during month (equivalent mean second-feet)
Sept.30	1,667.89	1,930	-
Oct. 31	1,660.87	837	-408
Nov. 30	1,664.69	1,378	+209
Dec. 31	1,666.05	1,602	+83.6
Calendar year 1948	-	-	+5.8
Jan. 31	1,669.41	2,222	+231
Feb. 28	1,669.49	2,238	+6.6
Mar. 31	1,674.53	3,351	+416
Apr. 30	1,679.34	4,635	+495
May 31	1,679.13	4,574	-22.8
June 30	1,675.85	3,680	-345
July 31	1,670.47	2,438	-464
Aug. 31	1,666.61	1,699	-276
Sept.30	1,668.01	1,953	+98.0
Water year 1948-49	-	-	+.7

† Reservoir elevations at 12 p.m. obtained by interpolation.

Beaver River below Stillwater Dam, near Beaver River, N. Y.

Location.- Float-tape gage, lat. 43°53'50", long. 75°03'05", at outlet of Stillwater Reservoir, 7½ miles west of Beaver River post office, Herkimer County.

Drainage area.- 172 square miles.

Records available.- May 1908 to September 1949.

Average discharge.- 41 years, 366 second-feet (unadjusted).

Extremes.- Maximum daily discharge during year, 976 second-feet Apr. 24; minimum daily, 12 second-feet Nov. 9, 10.
1908-49: Maximum discharge, about 3,700 second-feet May 3, 1926; practically no flow at times when gates in dam are closed.

Remarks.- Records good. Flow completely regulated by Stillwater Reservoir (see preceding page). Discharge determined from ratings for gates and spillway of Stillwater Dam. Gage read once daily.

Cooperation.- Records of gate openings and reservoir elevations furnished by Board of Black River Regulating District.

Revisions.- W 714: Drainage area.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	577	482	204	211	412	310	16	397	193	572	520	120
2	575	478	207	214	412	310	16	401	193	569	519	120
3	571	473	207	217	412	309	16	410	193	567	517	120
4	567	468	207	217	410	309	16	410	192	564	517	120
5	567	464	207	217	410	309	16	405	192	564	514	120
6	562	412	207	218	410	309	16	515	258	564	512	151
7	559	305	207	221	536	309	17	548	429	561	511	217
8	554	132	208	222	609	309	17	534	428	542	509	214
9	554	12	208	224	606	309	17	389	425	488	506	214
10	551	12	208	225	605	309	21	314	424	487	506	160
11	549	13	210	225	601	309	25	313	422	485	502	65
12	545	114	210	225	600	309	27	313	419	485	501	172
13	542	221	210	225	597	309	31	242	418	483	499	149
14	541	221	210	226	597	309	33	195	415	483	497	510
15	536	222	210	226	487	309	38	196	413	481	496	512
16	533	222	211	226	324	309	41	196	411	479	492	512
17	530	222	211	346	229	309	45	196	433	479	489	180
18	527	222	211	414	204	309	340	195	522	479	368	14
19	527	222	211	414	205	307	560	195	517	479	258	291
20	523	103	295	414	205	307	615	152	516	495	179	184
21	519	13	402	414	205	307	640	222	512	542	122	137
22	517	13	401	414	272	307	647	236	509	539	201	137
23	514	13	400	414	309	307	647	195	525	539	258	66
24	511	13	398	414	309	132	976	195	581	539	257	14
25	509	13	398	414	309	15	899	195	579	534	255	14
26	505	126	397	414	309	15	716	195	579	534	255	14
27	501	201	396	414	309	15	657	195	574	532	254	14
28	498	204	395	414	309	15	565	194	574	527	254	247
29	495	204	395	414	-	16	449	193	572	527	254	341
30	491	204	287	412	-	16	397	193	572	524	255	200
31	486	-	210	412	-	16	-	193	-	524	176	-

Month	Observed				Adjusted†		
	Second-foot-days	Maximum	Minimum	Mean	Mean	Per aquare mile	Runoff in inches
October	16,536	577	486	533	125	0.727	0.84
November	6,024	482	12	201	410	2.38	2.66
December	8,338	402	204	269	353	2.05	2.36
Calendar year 1948	130,598	1,060	10	357	363	2.11	28.69
January	9,677	414	211	312	544	3.16	3.64
February	11,202	609	204	400	407	2.37	2.46
March	7,339	310	15	237	652	3.79	4.37
April	8,516	976	16	284	779	4.53	5.05
May	8,722	548	152	281	259	1.51	1.73
June	12,990	581	192	433	88.1	.512	.57
July	16,167	572	479	522	57.8	.336	.39
August	11,953	520	122	386	110	.640	.74
September	5,329	512	14	178	276	1.60	1.79
Water year 1948-49	122,793	976	12	336	337	1.96	26.60

† Adjusted for change in contents in Stillwater Reservoir.

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Beaver River at Croghan, N. Y.

Location.- Water-stage recorder, lat. 43°53'50", long. 75°24'15", about 1,000 feet upstream from Black Creek and half a mile west of Croghan, Lewis, County.
Drainage area.- 294 square miles.
Records available.- September 1930 to September 1949.
Average discharge.- 19 years, 575 second-feet.
Extremes.- Maximum discharge during year, 1,950 second-feet Mar. 30 (gage height, 4.58 feet); minimum, 43 second-feet Sept. 5 (gage height, 1.13 feet); minimum daily, 65 second-feet Sept. 5.
1948-49: Maximum discharge, 4,310 second-feet May 13, 1943 (gage height, 6.47 feet); minimum, about 18 second-feet Feb. 24, 1936 (gage height, 0.89 foot); minimum daily, 35 second-feet May 13, 1934.
Remarks.- Records excellent except those for period of no gage-height record, which are good. Flow almost completely regulated by Stillwater Reservoir (see p.264). Between Stillwater Dam and this station flow is further regulated by nine power-plant ponds. Diurnal fluctuation at low and medium flow.
Revisions.- W 759: Drainage area.

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)

Oct. 1 to Mar. 30				Mar. 31 to Sept. 30			
1.4	100	2.6	483	1.2	51	2.3	351
1.6	144	3.0	693	1.4	84	2.6	481
1.8	196	3.5	1,020	1.6	128	3.0	693
2.0	255	4.0	1,400	1.8	180	3.4	950
2.3	357	4.5	1,870	2.0	242	3.8	1,240

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	799	438	367	488	606	496	1,020	366	305	654	463	324
2	711	461	427	328	618	596	658	706	260	655	575	308
3	207	543	343	510	547	553	115	687	257	476	656	273
4	511	566	306	643	604	536	334	565	224	442	671	100
5	643	483	112	681	587	380	353	606	92	518	688	65
6	770	318	334	863	238	186	583	807	203	629	421	239
7	801	520	423	747	542	460	806	794	412	662	120	421
8	672	686	391	566	741	552	763	973	613	663	406	466
9	368	709	334	477	741	627	522	952	668	594	587	415
10	126	543	327	645	768	636	248	786	617	219	642	289
11	496	335	309	642	893	724	573	650	291	516	677	110
12	550	317	118	639	1,020	437	773	605	89	509	695	257
13	774	299	474	633	920	147	748	455	316	600	608	306
14	917	118	500	676	717	454	781	159	553	663	146	395
15	901	207	426	406	1,110	541	675	85	563	674	492	397
16	380	459	448	117	1,120	727	387	349	582	423	529	556
17	138	489	402	559	734	641	141	414	540	121	660	321
18	563	414	330	652	837	502	576	410	342	445	691	120
19	673	634	140	905	684	383	972	417	163	595	668	355
20	846	860	445	746	271	110	874	406	498	690	397	557
21	768	473	741	714	625	388	810	320	505	680	112	326
22	773	950	843	638	449	789	861	148	554	659	245	423
23	a360	725	842	371	481	1,190	957	308	641	480	301	459
24	a145	386	665	542	486	1,060	789	402	681	154	302	300
25	a520	332	239	640	585	1,210	977	471	670	507	324	117
26	a680	304	145	645	481	1,100	963	582	375	600	435	303
27	a800	266	477	588	141	1,140	951	521	528	668	297	340
28	a900	118	601	631	489	1,230	956	329	609	670	116	496
29	a640	326	671	626	-	1,470	1,000	103	629	664	453	560
30	a480	449	728	275	-	1,850	934	291	635	657	413	497
31	127	-	655	579	-	1,200	-	324	-	157	417	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inchss
October	18,039	917	126	582	-	-
November	13,728	950	118	458	-	-
Decomber	13,563	843	112	438	-	-
Calsndar year 1948	208,753	2,090	76	570	1.94	26.41
January	18,172	905	117	586	-	-
February	18,035	1,120	141	644	-	-
March	22,315	1,850	110	720	-	-
April	21,100	1,020	115	703	-	-
May	15,001	973	85	484	-	-
June	13,415	681	89	447	-	-
July	16,644	690	121	537	-	-
August	14,207	695	112	458	-	-
September	10,095	560	65	336	-	-
Water year 1948-49	194,314	1,850	65	532	1.81	24.60

a No gage-height record; discharge computed on basis of power-plant records.

Deer River at Copenhagen, N. Y.

Location.- Water-stage recorder, lat. 43°53'55", long. 75°39'40", at power plant half a mile northeast of Copenhagen, Lewis County. Datum of gage is 963.41 feet above mean sea level, datum of 1929.
Drainage area.- 89 square miles.
Records available.- September 1929 to September 1949.
Average discharge.- 20 years, 219 second-feet.
Extremes.- Maximum discharge during year, 3,060 second-feet Feb. 15; maximum gage height, 6.88 feet Sept. 20 (backwater from silt); minimum discharge, 2.0 second-feet July 26 (gage height, 0.26 foot); minimum daily, 4.2 second-feet July 21.
1929-49: Maximum discharge, 14,400 second-feet Sept. 1, 1941, by computation of flow over dam; maximum gage height, 13.18 feet Jan. 31, 1947 (ice jam); minimum discharge, 0.7 second-foot Aug. 12, 1940 (gage height, 0.17 foot); minimum daily, 0.8 second-foot July 22 to Aug. 2, 1933.
Remarks.- Records good except those for periods of ice effect, backwater from deposits of silt from reservoir, shifting control, or doubtful or no gage-height record, which are fair. Diurnal fluctuation at low and medium flow caused by power plant.
Revisions (water year).- W 784: 1934. W 759: Drainage area.

Rating tables, water year 1948-49, except period of ice effect, backwater from silt, and shifting control
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Nov. 20						Nov. 20 to Sept. 30					
0.4	4.3	1.0	32	2.0	175	0.3	2.6	1.2	56	3.3	659
.5	7.2	1.2	48	2.3	250	.4	4.8	1.4	80	3.8	929
.6	11	1.4	69	2.6	341	.5	7.9	1.7	127	4.4	1,320
.8	20	1.7	114	3.0	492	.6	12	2.0	190	5.0	1,820
						.8	23	2.4	299	5.6	2,400
						1.0	37	2.8	439		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.8	a18	127	412	118	150	318	108	29	12	4.7	a82
2	8.8	a18	115	358	112	121	269	208	25	12	4.4	a58
3	6.6	19	102	296	108	118	252	265	22	12	4.7	33
4	10	17	96	247	107	111	225	152	20	11	4.6	25
5	7.2	18	85	303	100	181	208	135	17	d11	4.7	39
6	5.6	87	197	882	93	390	294	296	19	d7.7	4.8	79
7	7.0	471	272	616	95	264	700	181	19	d7.1	5.6	42
8	11	264	182	479	91	200	977	124	19	d4.8	5.0	33
9	18	147	136	424	99	167	610	94	20	d4.9	5.1	33
10	17	131	135	435	93	148	372	72	19	d4.5	5.1	33
11	13	226	121	278	84	138	338	61	16	d8.8	4.6	27
12	12	162	160	193	84	97	290	54	14	d6.5	24	22
13	12	181	709	183	140	94	269	51	18	d4.7	18	17
14	13	258	366	161	299	114	302	57	17	d4.6	7.2	135
15	14	186	176	142	1,650	104	415	63	17	d5.1	5.1	145
16	13	198	169	220	1,370	95	877	54	16	d5.1	5.0	90
17	21	168	181	737	812	93	501	46	16	5.1	4.9	80
18	62	162	122	530	547	89	345	39	16	4.9	15	84
19	50	199	81	1,240	467	83	517	46	16	4.9	32	100
20	44	977	90	668	388	81	529	45	17	4.3	21	150
21	46	628	77	328	263	108	341	39	15	4.2	14	190
22	37	338	96	233	228	997	261	38	13	4.3	5.0	155
23	31	390	90	181	269	2,350	479	76	13	4.5	6.8	108
24	27	435	71	169	275	1,350	621	112	11	4.7	4.6	110
25	23	296	63	157	470	1,170	388	88	14	5.8	6.8	100
26	21	195	63	134	329	1,460	278	69	12	5.0	4.7	72
27	20	302	68	132	222	1,510	341	55	14	5.0	a4.8	66
28	18	278	78	171	181	1,640	252	47	13	5.0	a5.2	70
29	18	188	b280	218	-	762	185	43	12	5.0	a210	140
30	a18	140	1,390	162	-	583	159	40	12	5.3	a195	110
31	a18	-	622	135	-	431	-	35	-	4.9	a104	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	632.0	62	5.6	20.4	0.229	0.26
November	7,097	977	17	237	2.66	2.97
December	6,520	1,390	63	210	2.36	2.72
Calendar year 1948	72,520.0	3,100	5.5	198	2.22	30.30
January	10,824	1,240	132	349	3.92	4.52
February	9,094	1,650	84	325	3.65	3.80
March	15,199	2,350	81	490	5.51	6.35
April	11,913	977	159	397	4.46	4.98
May	2,793	296	35	90.1	1.01	1.17
June	501	29	11	16.7	.188	.21
July	194.7	12	4.2	6.28	.071	.08
August	746.4	210	4.4	24.1	.271	.31
Septmber	2,428	190	17	80.9	.909	1.01
Water year 1948-49	67,942.1	2,350	4.2	186	2.09	28.38

Peak discharge (base, 2,500 sec.-ft.).- Feb. 15 (2:30 p.m.) 3,060 sec.-ft.; Mar. 23 (7:45 a.m.) 2,720 sec.-ft.
a No gage-height record; discharge computed on basis of weather records and records for nearby streams.
b Stage-discharge relation affected by ice.
d Doubtful gage-height record; discharge computed on basis of fragmentary record, study of power-generation cycle, and weather records.
Note.- Backwater from deposits of silt from reservoir Sept. 14-30. Shifting-control method used Dec. 30 to Jan. 19.

East Branch Oswegatchie River at Cranberry Lake, N. Y.

Location.- Water-stage recorder, lat. 44°13'15", long. 74°51'00", in village of Cranberry Lake, St. Lawrence County, 900 feet downstream from dam at outlet of Cranberry Lake. Datum of gage is 1,458.23 feet above mean sea level, datum of 1929.
Drainage area.- 144 square miles.
Records available.- May 1923 to September 1949.
Average discharge.- 26 years, 295 second-feet (unadjusted).
Extremes.- Maximum discharge during year, 681 second-feet Apr. 27 (gage height, 5.88 feet); minimum, 82 second-feet Sept. 3 (gage height, 3.915 feet); minimum daily, 83 second-feet Sept. 2-5.
1923-49: Maximum discharge 1,940 second-feet May 13, 1943 (gage height, 7.70 feet); minimum daily, about 3 second-feet Apr. 9-16, 1931.
Remarks.- Records excellent. Flow almost completely regulated by Cranberry Lake Dam (total storage, 2,530,000,000 cubic feet).

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)

Oct. 1 to Apr. 27				Apr. 28 to Sept. 30			
4.0	97	5.1	349	3.9	80	5.0	313
4.2	128	5.5	505	4.1	107	5.4	463
4.5	185	5.9	691	4.4	158	5.9	691
4.8	258			4.7	226		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	326	126	114	122	439	162	581	582	204	176	231	84
2	323	160	114	123	439	162	581	510	204	176	231	83
3	323	160	114	125	439	162	581	510	187	176	231	83
4	323	160	114	126	476	162	581	442	168	178	231	83
5	323	160	114	130	523	162	581	369	170	178	231	83
6	323	160	114	135	518	164	581	430	170	178	229	104
7	323	162	114	142	514	164	581	480	172	178	226	153
8	319	208	114	145	523	164	581	480	172	180	226	153
9	319	237	115	149	545	164	586	459	172	196	226	153
10	319	237	115	143	540	164	586	358	172	196	226	153
11	319	237	115	238	536	164	586	285	156	196	226	153
12	319	237	115	304	531	162	515	242	138	196	226	153
13	301	237	115	304	527	162	366	242	138	196	226	153
14	289	237	115	304	527	162	310	242	138	218	226	153
15	289	237	115	307	527	162	310	242	138	242	224	153
16	283	266	115	307	531	162	310	242	138	242	224	153
17	272	307	115	307	531	162	310	242	128	245	221	153
18	266	304	115	360	531	162	377	242	106	245	221	153
19	253	301	115	400	531	162	435	245	106	245	218	153
20	218	301	115	400	531	162	497	245	106	245	216	153
21	192	304	115	400	531	162	558	245	124	245	216	153
22	177	258	115	396	527	231	581	245	176	245	216	153
23	177	172	115	396	420	280	509	245	176	242	216	153
24	177	172	115	396	253	334	463	224	174	242	216	153
25	177	140	115	396	160	374	463	201	174	242	216	153
26	158	114	115	396	160	381	545	201	174	240	216	a153
27	131	114	115	396	160	393	647	201	176	237	216	a153
28	110	114	117	423	160	441	671	201	176	234	216	a153
29	110	114	117	439	-	572	618	201	176	234	216	a153
30	109	114	117	439	-	577	595	201	176	231	170	a153
31	109	-	118	439	-	581	-	204	-	231	84	-

Month	Observed				Adjusted†		
	Second-foot-days	Maximum	Minimum	Mean	Mean	Per square mile	Runoff in inches
October	7,657	326	109	247	136	0.944	1.09
November	6,050	307	114	202	269	1.87	2.09
December	3,566	118	114	115	199	1.38	1.59
Calendar year 1948	97,351	1,300	109	266	278	1.93	26.33
January	9,087	439	122	293	384	2.67	3.08
February	12,630	545	160	451	340	2.36	2.46
March	7,578	581	162	244	561	3.90	4.49
April	15,486	671	310	516	627	4.35	4.86
May	9,458	582	201	305	283	1.97	2.26
June	4,785	204	106	160	60.7	.422	.47
July	6,705	245	176	216	44.2	.307	.35
August	6,714	231	84	217	78.1	.542	.62
September	4,192	153	83	140	127	.882	.98
Water year 1948-49	93,908	671	83	257	258	1.79	24.34

† Adjusted for change in contents in Cranberry Lake Reservoir.
a No gage-height record; discharge computed on basis of daily record of gate openings and reservoir elevations.
Note.- Elevation of surface of Cranberry Lake Reservoir, 1,482.00 feet (corrected) at 12 p.m. Sept. 30, 1948; 1,482.15 feet at 12 p.m. Sept. 30, 1949: 1,480.67 feet (corrected) at 12 p.m. Dec. 31, 1947; 1,482.45 feet at 12 p.m. Dec. 31, 1948.

East Branch Oswegatchie River near Oswegatchie, N. Y.

Location.- Water-stage recorder, lat. 44°13'25", long. 75°04'35", at Flat Rock hydroelectric plant of Niagara-Mohawk Power Corp., 2¾ miles north of Oswegatchie, St. Lawrence County.

Drainage area.- 263 square miles.

Records available.- October 1924 to September 1949.

Average discharge.- 24 years (1925-49), 529 second-feet (unadjusted).

Extremes.- Maximum discharge during year, 2,500 second-feet Mar. 28 (gage height, 5.76 feet); minimum, 5.2 second-feet Oct. 4 (gage height, 0.86 foot); minimum daily, 8.6 second-feet July 4, 10.

1924-49: Maximum discharge, 4,090 second-feet Apr. 12, 1947; maximum gage height, 7.1 feet Apr. 6, 1928; minimum discharge, probably less than 1 second-foot during complete shut-down of power plant; minimum daily, 1 second-foot July 25, 1926.

Remarks.- Records excellent except those for period of no gage-height record, which are fair. Extensive diurnal fluctuation at low and medium flow caused by power plant; seasonal flow partly regulated by Cranberry Lake Reservoir (see preceding page).

Revision.- W 759: Drainage area.

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)

Oct. 1 to Mar. 28				Mar. 29 to Sept. 30					
2.1	125	4.0	885	0.9	8.6	2.0	115	4.0	925
2.4	188	4.5	1,290	1.0	12	2.3	175	4.5	1,290
2.8	300	5.0	1,740	1.2	23	2.6	254	5.3	2,020
3.2	445	5.5	2,220	1.4	38	3.0	390		
3.6	635			1.7	70	3.5	620		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jnne	July	Aug.	Sept.
1	323	190	388	434	539	331	1,550	496	327	391	380	316
2	268	191	341	288	782	290	1,390	940	a350	332	404	394
3	323	182	362	339	708	336	645	930	a320	10	407	10
4	317	200	301	353	678	332	1,010	997	a360	8.6	440	10
5	322	199	270	461	668	328	1,030	1,070	a370	351	392	9.4
6	290	262	333	746	413	320	1,220	1,010	a330	319	9.7	409
7	306	492	313	764	613	319	1,450	1,050	a310	350	90	392
8	436	278	399	424	495	535	1,280	576	a310	384	420	453
9	263	514	340	319	612	443	1,510	739	a270	9.0	410	366
10	261	601	330	359	593	579	1,100	983	a205	8.6	396	10
11	361	404	290	726	584	564	938	793	a210	360	396	111
12	321	414	273	633	621	350	995	852	a240	309	357	370
13	522	430	311	571	577	304	1,010	683	a180	351	9.7	417
14	565	307	261	697	630	342	1,070	481	a135	331	9.7	316
15	368	357	258	302	800	347	743	326	a108	304	418	301
18	351	361	253	320	1,590	371	833	613	a125	9.4	401	370
17	361	467	235	600	1,410	401	783	414	113	9.4	384	10
18	377	509	213	739	1,270	386	807	283	119	427	414	11
19	385	464	185	922	1,240	310	769	315	121	397	403	402
20	510	770	197	1,120	916	319	1,050	334	110	432	9.7	410
21	385	809	203	861	802	283	1,060	360	98	403	112	442
22	333	639	197	855	492	359	892	300	225	424	403	492
23	285	726	214	464	546	1,160	799	263	240	354	461	105
24	265	800	172	521	746	1,590	724	339	236	65	362	137
25	330	530	147	685	945	1,530	763	362	167	413	444	106
26	255	399	149	706	835	1,530	1,020	702	9.4	398	260	335
27	331	410	163	707	512	1,540	1,010	483	335	404	9.4	369
28	230	301	125	694	419	2,140	1,060	354	367	386	9.7	446
29	190	374	132	694	-	1,970	970	265	319	408	409	416
30	195	303	325	298	-	1,750	961	287	319	10	442	297
31	189	-	811	606	-	1,610	-	341	-	9.4	407	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	10,218	565	189	330	-	-
November	12,883	809	182	429	-	-
December	8,491	811	125	274	-	-
Calendar year 1948	182,943	2,830	112	500	1.90	25.87
January	18,208	1,120	288	587	-	-
February	21,036	1,590	413	751	-	-
March	22,969	2,140	283	741	-	-
April	30,442	1,550	645	1,015	-	-
May	17,941	1,070	263	579	-	-
June	6,926.4	370	9.4	231	-	-
July	8,367.4	432	8.6	270	-	-
August	9,469.9	461	9.4	305	-	-
September	8,232.4	492	9.4	274	-	-
Water year 1948-49	175,186.1	2,140	8.6	480	1.83	24.75

a No gage-height record; discharge computed on basis of power-plant records.

Oswegatchie River near Heuvelton, N. Y.

Location.- Water-stage recorder, lat. 44°36'00", long. 75°22'45", 1½ miles downstream from Beaver Creek and 2½ miles upstream from Heuvelton, St. Lawrence County.
Drainage area.- 973 square miles.
Records available.- June 1916 to September 1949.
Average discharge.- 33 years, 1,697 second-feet.
Extremes.- Maximum discharge during year, 8,950 second-feet Mar. 31 (gage height, 6.71 feet); minimum, 130 second-feet Aug. 17 (gage height, 0.47 foot).
1916-49: Maximum discharge, 15,800 second-feet Apr. 9, 1947; maximum gage height, 9.33 feet Apr. 9, 1947 (ice jam); minimum discharge, that of Aug. 17, 1949.
Remarks.- Records excellent except those for periods of ice effect or no gage-height record, which are fair. Seasonal flow slightly regulated by Cranberry Lake Reservoir; slight diurnal fluctuation at low and medium flow caused by power plants. During high stages on Grass River, part of flow of that stream may pass through Upper Lake, Indian Creek, and Lower Lake and enter Oswegatchie River at Rensselaer Falls, 4½ miles above station.
Revisions.- W 759: Drainage area.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Mar. 31						Apr. 1 to Sept. 30					
0.8	267	1.6	823	4.0	3,800	0.5	137	1.3	552	3.0	2,300
.9	319	2.0	1,190	5.0	5,480	.7	204	1.6	780	4.0	3,750
1.1	440	2.5	1,730	6.0	7,420	.9	302	2.0	1,150	5.0	5,450
1.3	581	3.0	2,360	6.7	8,930	1.1	420	2.5	1,680	6.4	8,270

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jnne	July	Aug.	Sept.
1	377	298	1,570	1,600	1,510	2,640	8,230	2,440	780	588	365	662
2	408	303	1,430	2,050	1,490	2,150	6,980	2,210	910	504	224	780
3	460	348	1,270	a2,350	1,440	1,790	5,610	1,880	740	478	230	732
4	396	298	1,270	a2,100	1,400	1,510	4,330	2,090	772	511	420	639
5	402	354	1,180	a1,950	1,450	1,510	3,340	2,260	732	348	439	439
6	421	402	1,030	a2,150	1,400	2,140	3,480	2,540	692	188	446	241
7	396	488	1,140	2,940	1,250	2,330	5,040	2,580	716	196	420	297
8	460	730	*1,310	3,060	1,220	2,150	5,920	2,570	610	365	281	498
9	454	1,310	1,390	3,400	*1,140	1,970	5,650	2,350	581	390	189	552
10	501	1,270	1,360	3,600	1,200	1,980	5,250	1,940	559	465	254	581
11	515	1,390	1,250	3,580	1,240	1,930	4,660	1,860	504	319	420	532
12	488	1,440	1,160	3,160	1,220	1,600	3,910	1,860	465	196	439	359
13	460	1,290	1,060	2,800	1,200	1,690	3,240	1,650	377	211	433	196
14	552	1,150	1,000	2,420	1,550	1,340	2,810	1,590	365	336	420	472
15	698	1,180	1,110	2,090	2,500	1,290	2,680	1,450	359	414	275	595
16	798	1,120	1,120	1,900	5,000	1,380	2,930	1,280	396	439	152	610
17	690	1,130	1,000	1,980	6,000	1,280	2,990	1,080	359	396	241	708
18	612	1,080	960	2,150	6,000	1,240	2,930	1,170	292	266	439	670
19	643	1,200	781	3,310	5,600	1,250	2,840	1,140	196	189	484	465
20	789	1,510	747	5,000	4,700	1,130	2,770	1,030	192	199	504	458
21	919	2,530	715	4,880	4,000	991	2,780	1,010	266	390	458	654
22	875	2,980	707	4,090	3,400	1,180	2,710	1,020	336	471	353	647
23	798	3,260	643	3,410	2,900	3,750	2,580	1,060	308	433	232	639
24	658	3,120	589	2,810	2,670	5,550	2,580	1,000	297	426	446	639
25	643	2,830	552	2,230	3,100	6,800	2,720	974	330	426	498	588
26	559	2,550	474	1,920	3,600	8,000	2,740	901	292	325	471	402
27	515	2,180	494	1,730	3,590	*7,760	2,810	974	232	365	452	378
28	537	1,930	530	1,680	3,180	7,840	2,950	1,180	286	458	433	639
29	501	1,750	596	2,260	-	8,290	2,910	1,040	292	458	308	831
30	415	1,590	1,070	2,130	-	8,820	2,710	865	441	452	193	984
31	336	-	1,490	1,850	-	8,890	-	740	-	439	305	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	17,276	919	336	557	0.572	0.66
November	43,011	3,260	298	1,434	1.47	1.64
December	30,998	1,570	474	1,000	1.03	1.18
Calendar year 1948	586,666	14,300	239	1,603	1.65	22.42
January	82,580	5,000	1,600	2,664	2.74	3.16
February	74,950	6,000	1,140	2,677	2.75	2.86
March	102,371	8,890	991	3,302	3.39	3.91
April	113,080	8,230	2,580	3,769	3.87	4.32
May	47,734	2,580	740	1,540	1.58	1.82
June	13,677	910	192	456	.469	.52
July	11,641	588	188	376	.386	.44
August	11,224	504	152	362	.372	.43
Septsmber	16,887	984	196	563	.579	.65
Water year 1948-49	565,429	8,890	152	1,549	1.59	21.59

Peak discharge (base, 7,100 sec.-ft.).- Feb. 17 (9:30 p.m.) 7,610 sec.-ft.; Mar. 31 (3:30 a.m.) 8,950 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of records for stations upstream.
Note.- Stage-discharge relation affected by ice Dec. 16-18, Feb. 4-22, Mar. 25, 26.

West Branch Oswegatchie River near Harrisville, N. Y.

Location.- Water-stage recorder, lat. 44°11'10", long. 75°19'55", at highway bridge half a mile northeast of Geers Corners and 4 miles downstream from Harrisville, Lewis County. Datum of gage is 738.51 feet above mean sea level, datum of 1929.

Drainage area.- 258 square miles.

Records available.- July 1916 to September 1949.

Average discharge.- 33 years, 516 second-feet.

Extremes.- Maximum discharge during year, 4,070 second-feet Mar. 29 (gage height, 7.23 feet); minimum, 41 second-feet Aug. 17, 18 (gage height, 1.06 feet).
1916-49: Maximum discharge, 6,920 second-feet Jan. 9, 1930 (gage height, 9.6 feet); minimum, 25 second-feet Sept. 1, 1934 (gage height, 0.86 foot).

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Diurnal fluctuations, principally during low flow, caused by pulp mill at Harrisville.

Revisions (water years).- W 759: Drainage area. W 784: 1934.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44	90	462	882	a387	b580	1,710	628	285	96	72	329
2	42	74	415	926	a357	b520	1,360	591	245	95	69	287
3	45	74	363	882	a327	b460	1,140	682	204	65	51	229
4	45	80	323	785	a306	b410	999	839	194	79	53	194
5	44	70	304	716	a313	415	888	815	171	78	82	155
6	44	95	276	926	309	b540	882	815	167	78	74	134
7	44	407	*373	*1,190	308	b600	1,140	876	142	74	47	120
8	46	733	460	1,520	*293	b600	1,550	839	143	69	59	95
9	52	716	447	1,470	293	526	1,680	731	123	48	44	98
10	98	552	398	1,300	292	484	1,490	626	128	51	44	129
11	88	504	355	1,090	282	448	1,270	516	123	74	43	169
12	94	481	289	a876	239	403	1,060	445	99	76	44	161
13	102	435	345	a693	282	376	914	398	114	72	45	127
14	106	439	382	a540	421	407	839	365	97	51	66	137
15	115	466	328	a488	843	379	827	363	104	49	66	298
16	103	435	327	470	1,760	a353	926	399	90	48	66	345
17	100	412	316	536	2,250	a320	1,080	365	84	48	43	298
18	217	369	260	581	1,730	a296	1,080	318	82	54	48	265
19	337	367	217	762	1,480	a280	966	326	74	57	109	256
20	268	624	238	972	1,160	287	907	374	91	56	223	230
21	220	1,180	223	1,030	876	303	870	358	82	52	154	212
22	186	1,460	208	907	718	457	803	276	95	49	140	202
23	157	1,360	210	750	669	1,370	768	302	92	48	106	201
24	144	1,200	180	633	655	2,550	851	337	85	48	77	222
25	132	992	165	540	724	*2,290	1,020	343	64	70	67	240
26	110	769	158	457	b800	2,470	1,060	300	62	72	57	237
27	98	654	158	411	b780	2,980	979	272	103	68	57	174
28	107	658	163	436	716	3,620	882	261	101	49	50	158
29	86	613	194	534	-	3,730	779	265	103	46	68	174
30	84	530	476	a488	-	2,790	699	300	94	47	358	228
31	72	-	795	a427	-	*2,210	-	328	-	50	391	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,430	337	42	111	0.430	0.49
November	16,839	1,460	70	561	2.17	2.43
December	9,808	795	158	316	1.22	1.41
Calendar year 1948	181,480	5,620	42	496	1.92	26.16
January	24,218	1,520	411	781	3.03	3.49
February	19,570	2,250	239	699	2.71	2.82
March	33,454	3,730	280	1,079	4.18	4.82
April	31,419	1,710	699	1,047	4.06	4.53
May	14,653	876	261	473	1.83	2.11
June	3,641	285	62	121	.469	.52
July	1,917	96	46	61.8	.240	.28
August	2,873	391	43	92.7	.359	.41
September	6,104	345	95	203	.787	.88
Water year 1948-49	167,926	3,730	42	460	1.78	24.19

Peak discharge (base, 3,300 sec.-ft.).- Mar. 29 (1 a.m.) 4,070 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of recorded range in stage and weather records.
b Stage-discharge relation affected by ice.

Grass River at Pyrites, N. Y.

Location.- Water-stage recorder, lat. 44°31'30", long. 75°11'50", 1,000 feet downstream from lower bridge in Pyrites, St. Lawrence County, and half a mile upstream from Harrison Creek.
Drainage area.- 335 square miles.
Records available.- August 1924 to September 1949.
Average discharge.- 25 years, 596 second-feet.
Extremes.- Maximum discharge during year, 5,060 second-feet Mar. 29; maximum gage height, 10.29 feet Feb. 15 (backwater from ice); minimum discharge, 8.8 second-feet Aug. 10, 25 (gage height, 0.57 foot, from reconstructed gage-height graph based on power-plant records); minimum daily, 64 second-feet Aug. 16, 17.
1924-49: Maximum discharge, about 8,300 second-feet Nov. 18, 1927 (gage height, 13.0 feet, from outside floodmark); minimum observed, 8.8 second-feet Sept. 21, 1948, Aug. 10, 25, 1949 (gage height, 0.57 foot); minimum daily, 59 second-feet Aug. 29 to Sept. 1, 1934.
Remarks.- Records good except those for periods of ice effect or fragmentary or no gage-height record, which are fair. Diurnal fluctuation at extremely low flow caused by power plant above station.
Revisions.- W 759: Drainage area.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Feb. 16				Feb. 17 to Sept. 30			
1.1	62	2.3	401	3.2	800	7.0	2,950
1.3	102	2.7	566	4.0	1,200	9.3	4,680
1.6	177	3.2	800	5.0	1,740		
1.9	264	4.0	1,230	Note.- Same as preceding table below 3.2 feet.			

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	81	150	413	820	480	520	2,410	800	375	296	118	450
2	96	153	390	920	450	440	1,840	717	329	199	125	400
3	98	142	354	880	430	420	1,520	776	296	158	111	330
4	100	148	329	860	400	400	1,320	820	264	169	123	245
5	104	148	303	820	370	520	1,180	756	243	169	138	230
6	92	172	332	*1,020	340	820	1,360	1,040	220	188	123	250
7	100	521	477	1,220	360	600	2,130	1,250	205	164	109	220
8	109	771	*553	1,180	380	540	2,520	1,100	199	148	98	190
9	235	588	477	1,140	*390	580	2,380	895	199	128	83	165
10	357	444	409	1,100	360	520	1,920	732	191	135	f74	230
11	277	397	340	900	330	490	1,490	615	183	172	81	200
12	234	378	325	700	300	420	1,280	544	174	197	72	155
13	234	336	379	660	460	370	1,160	502	166	172	72	120
14	231	346	394	580	760	410	1,100	489	158	145	77	140
15	208	390	374	540	1,160	420	1,110	527	145	130	66	200
16	188	368	340	600	2,700	340	1,340	498	132	116	64	180
17	189	350	340	1,100	2,000	370	1,520	440	130	114	64	185
18	402	322	270	980	1,600	350	1,320	401	125	111	90	200
19	527	312	240	1,350	1,600	290	1,120	467	123	118	212	240
20	417	634	200	1,300	1,300	270	1,040	875	135	128	267	290
21	319	1,210	220	860	940	330	985	895	164	120	197	330
22	270	1,230	240	900	760	450	905	680	363	107	145	310
23	240	1,080	230	660	700	2,300	885	597	452	96	114	290
24	214	935	230	520	660	2,500	1,120	689	343	96	102	310
25	199	746	210	480	840	2,200	1,250	656	255	100	f85	350
26	191	584	180	460	880	*2,600	1,130	553	217	142	80	350
27	174	532	150	450	620	*3,100	1,040	485	199	153	74	185
28	172	610	220	540	580	4,290	1,060	432	183	128	80	225
29	166	557	350	700	-	4,680	995	409	166	114	135	245
30	161	465	620	640	-	3,740	905	409	196	118	320	320
31	155	-	740	560	-	*3,180	-	409	-	125	450	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	6,540	527	81	211	0.630	0.73
November	15,010	1,230	142	500	1.49	1.67
December	10,629	740	150	343	1.02	1.18
Calendar year 1948	205,714	5,790	79	562	1.68	22.84
January	25,440	1,350	450	821	2.45	2.82
February	22,150	2,700	300	791	2.36	2.46
March	38,460	4,680	270	1,241	3.70	4.27
April	41,335	2,520	885	1,378	4.11	4.59
May	20,458	1,250	401	660	1.97	2.27
June	6,530	452	123	218	.651	.72
July	4,456	296	96	144	.430	.49
August	3,949	450	64	127	.379	.44
Septsmber	7,535	450	120	251	.749	.84
Water year 1948-49	202,492	4,680	64	555	1.66	22.48

Peak discharge (base, 3,600 sec.-ft.).- Mar. 29 (5 a.m.) 5,060 sec.-ft.
* Winter discharge measurement made on this day.
f Fragmentary gage-height record; discharge computed on basis of partly estimated gage-height graph and record of power-plant operation.
Note.- Stage-discharge relation affected by ice Dec. 11, Dec. 16 to Mar. 27 (doubtful gage-height record Feb. 5-8, fragmentary gage-height record Mar. 22, 23). No gage-height record Aug. 26 to Sept. 30; discharge computed on basis of observer's inspections, weather records, and records for St. Regis River at Brasher Center.

Raquette River at Piercefield, N. Y.

Location.- Water-stage recorder, lat. 44°14'05", long. 74°34'20", half a mile downstream from dam of International Paper Co. at Piercefield, St. Lawrence County.

Drainage area.- 722 square miles.

Records available.- August 1908 to September 1949.

Average discharge.- 41 years, 1,288 second-feet.

Extremes.- Maximum discharge during year, 4,220 second-feet Apr. 3 (gage height, 9.36 feet); minimum, 44 second-feet Nov. 3, 6 (gage height, 1.63 feet); minimum daily, 65 second-feet Aug. 11.

1908-49: Maximum discharge, 8,240 second-feet May 16, 1943 (gage height, 12.09 feet); minimum, 4.1 second-feet Oct. 12, 1947 (gage height, 0.61 foot) caused by construction work above station; minimum daily, 4.1 second-feet Oct. 12, 1947.

Remarks.- Records excellent except those for period of doubtful gage-height record, which are fair. Seasonal distribution of flow appreciably modified by natural storage in lakes and ponds above station. Slight regulation at low flow by dam at outlet of Raquette Pond, 2 miles upstream, and by power plant at Piercefield.

Revisions (water year).- W 604: 1924. W 759: Drainage area.

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)

Oct. 1 to Jan. 4				Jan. 5 to Sept. 30					
2.3	110	4.2	525	1.8	57	3.2	255	6.0	1,280
2.5	136	5.0	818	2.1	87	3.6	345	7.0	1,960
2.8	182	6.0	1,300	2.4	123	4.2	512	8.0	2,800
3.2	260	7.0	1,960	2.8	181	5.0	799	9.4	4,270
3.6	354	8.2	2,980						

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	611	158	1,140	1,480	1,100	1,270	3,960	2,460	987	611	365	587
2	614	285	1,130	2,100	1,100	1,230	4,140	2,450	820	601	292	584
3	618	140	1,110	2,360	1,080	1,180	4,200	2,420	618	522	179	567
4	575	139	1,080	2,920	1,060	1,140	4,160	2,380	560	525	162	584
5	625	137	1,050	3,180	1,080	1,17	4,090	2,340	618	522	164	468
6	614	139	1,080	3,200	1,060	1,160	3,980	2,300	611	518	301	653
7	611	155	1,080	3,200	1,040	1,170	3,930	2,280	632	518	360	614
8	611	111	1,090	3,170	1,010	1,170	3,860	2,420	547	493	156	597
9	611	142	1,100	3,100	982	1,220	3,770	2,380	487	472	166	580
10	608	143	1,090	3,020	959	1,380	3,720	2,350	419	454	68	574
11	600	139	1,080	2,940	941	1,360	3,630	2,350	266	496	65	580
12	590	142	1,060	2,840	914	1,330	3,520	2,310	410	490	67	584
13	577	139	1,060	2,710	901	1,290	3,380	2,160	407	393	197	544
14	594	137	1,030	2,610	901	1,250	3,160	1,960	388	350	87	539
15	567	233	1,000	2,480	996	1,220	3,030	1,850	420	276	248	625
16	485	252	988	2,350	1,160	1,190	2,940	1,650	388	255	275	664
17	594	383	965	2,270	1,300	1,150	2,890	1,330	373	175	421	653
18	560	427	938	2,200	1,410	1,110	2,890	1,300	345	200	577	653
19	544	429	907	2,150	1,590	1,040	2,830	1,280	338	200	574	668
20	544	467	860	2,070	1,760	964	2,740	1,250	321	200	587	720
21	531	666	839	1,980	1,680	892	2,690	1,240	319	200	564	795
22	519	737	835	1,840	1,610	943	2,660	1,220	331	151	567	832
23	516	622	814	1,750	1,550	1,200	2,580	1,100	474	247	601	808
24	503	751	785	1,710	1,490	1,270	2,510	1,070	601	90	577	808
25	392	912	761	1,650	1,450	1,380	2,500	945	587	199	577	808
26	358	1,010	737	1,480	1,400	1,560	2,510	760	591	189	574	660
27	359	1,070	718	1,300	1,350	1,810	2,480	429	608	189	570	771
28	266	1,100	698	1,190	1,310	2,300	2,460	683	618	253	472	791
29	339	1,140	691	1,100	-	d2,800	2,490	1,080	618	333	519	632
30	339	1,150	775	1,120	-	d3,300	2,480	1,040	614	411	451	671
31	133	-	1,010	1,110	-	d3,700	-	992	-	92	457	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	16,008	625	133	516	0.715	0.82
November	13,455	1,150	111	448	.620	.69
December	29,499	1,140	691	952	1.32	1.52
Calendar year 1948	433,494	5,910	111	1,184	1.64	22.33
January	68,580	3,200	1,100	2,212	3.06	3.53
February	34,184	1,760	901	1,221	1.69	1.76
March	45,109	3,700	892	1,455	2.02	2.32
April	96,180	4,200	2,460	3,206	4.44	4.95
May	51,779	2,460	429	1,670	2.31	2.67
June	15,316	987	266	511	.708	.79
July	10,625	611	90	343	.475	.55
August	11,240	601	65	363	.503	.58
September	18,814	795	468	627	.868	.97
Water year 1948-49	410,789	4,200	65	1,125	1.56	21.15

d Doubtful gage-height record; discharge computed from reconstructed gage-height graph.

Raquette River at Raymondville, N. Y.

Location.- Water-stage recorder, lat. 44°50'20", long. 74°58'45", 250 feet upstream from old highway bridge at Raymondville, St. Lawrence County, 0.3 mile downstream from Trout Brook, 0.4 mile downstream from power plant of Niagara-Mohawk Power Corp., and 18 miles upstream from mouth. Datum of gage is 183.33 feet above mean sea level, datum of 1929.
Drainage area.- 1,131 square miles.
Records available.- November 1943 to September 1949.
September to October 1903 and April 1904 to November 1916 at site at Massena Springs, 8 miles downstream (drainage area, 1,197 square miles), published as Raquette River at Massena Springs; records not comparable.
Extremes.- Maximum discharge during year, 7,590 second-feet Mar. 30; maximum gage height, 6.57 feet Feb. 16 (backwater from ice); minimum discharge, 10 second-feet Sept. 6, 25 (gage height, 0.50 foot); minimum daily, 21 second-feet Aug. 21.
1943-49: Maximum discharge, 10,300 second-feet June 8, 1947 (gage height, 7.57 feet); minimum, that of Sept. 6, 25, 1949; minimum daily, that of Aug. 21, 1949.
Remarks.- Records excellent except those for periods of ice effect or no gage-height record, which are fair. Extensive diurnal fluctuation caused by power and industrial operations. Seasonal distribution of flow appreciably modified by natural storage in lakes and ponds above station.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Mar. 29

0.7	32	1.4	218	3.5	2,080
.8	48	1.7	356	4.0	2,820
.9	67	2.0	535	5.0	4,600
1.0	90	2.5	935	6.3	7,410
1.2	146	3.0	1,450		

Mar. 30 to Sept. 30

0.6	18	0.9	66
.7	30	1.0	89
.8	46	1.2	146

Note.- Same as preceding table above 1.2 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	684	736	1,540	1,760	1,550	1,950	6,050	3,520	1,650	1,040	245	1,170
2	828	672	1,650	1,730	1,450	1,800	5,850	3,360	1,630	1,030	305	1,380
3	366	546	1,670	1,730	1,500	1,550	5,780	3,290	1,530	350	306	860
4	769	553	1,560	1,760	1,550	1,600	5,760	3,410	1,200	302	295	1,040
5	622	548	1,570	2,540	1,550	1,750	5,630	3,430	741	678	518	457
6	772	296	1,670	4,900	1,450	1,800	5,850	3,460	850	854	436	900
7	806	300	1,560	4,760	1,350	1,350	6,240	3,400	786	900	163	682
8	879	558	1,680	4,820	1,200	1,450	5,760	3,500	977	925	300	664
9	812	773	*1,560	4,500	1,300	1,700	6,200	3,290	834	306	232	714
10	445	736	1,600	4,400	*960	1,790	6,070	3,220	678	316	376	668
11	896	744	1,560	4,600	1,400	1,780	5,370	3,210	744	841	414	301
12	988	762	1,620	*4,580	1,450	1,770	5,070	3,140	338	694	508	728
13	1,000	566	1,570	4,360	1,610	1,750	4,990	2,690	746	786	362	690
14	1,130	333	1,630	3,860	1,860	1,450	4,800	2,630	666	818	254	1,030
15	920	773	1,670	3,700	2,500	1,400	4,620	2,660	708	896	289	1,360
16	944	771	1,530	3,300	5,600	1,500	4,780	2,660	705	330	292	1,320
17	390	723	1,670	3,700	3,930	1,690	4,880	2,440	694	300	763	1,240
18	950	750	1,500	3,400	3,500	1,680	4,580	2,070	422	765	707	330
19	1,050	666	350	4,290	3,140	1,400	4,380	1,630	411	718	93	1,160
20	1,490	432	1,060	4,100	2,700	1,300	4,190	1,620	668	596	88	1,080
21	1,500	966	1,360	3,300	2,500	1,450	4,120	1,940	670	352	21	1,200
22	1,470	1,690	1,060	3,100	2,600	1,640	3,910	2,090	706	336	283	1,190
23	263	1,780	1,160	2,700	2,450	3,390	3,660	1,960	676	210	284	1,120
24	50	1,790	1,040	2,800	2,400	3,430	3,680	1,810	708	280	198	1,200
25	646	1,740	840	2,700	2,300	3,290	4,000	1,820	486	315	615	174
26	805	1,610	200	2,300	2,350	4,100	4,020	1,830	304	305	a680	1,040
27	798	1,620	1,180	2,250	2,300	5,030	3,910	1,650	734	294	a580	1,040
28	737	1,700	1,140	1,900	2,100	*6,160	3,890	1,080	806	277	a270	1,000
29	906	1,610	1,180	1,700	-	7,230	3,880	932	998	310	698	1,020
30	180	1,580	1,520	1,550	-	7,210	3,730	1,040	1,030	322	622	950
31	47	-	1,700	1,450	-	6,570	-	1,530	-	307	1,140	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile.	Runoff in inches
October	24,143	1,500	47	779	0.689	0.79
November	28,324	1,790	296	944	.835	.93
December	42,600	1,700	200	1,374	1.21	1.40
Calendar year 1948	657,604	8,340	37	1,797	1.59	21.62
January	98,540	4,900	1,450	3,179	2.81	3.24
February	60,550	5,600	960	2,162	1.91	1.99
March	81,960	7,230	1,300	2,644	2.34	2.69
April	145,650	6,240	3,660	4,855	4.29	4.79
May	76,322	3,520	932	2,462	2.18	2.51
June	24,096	1,650	304	803	.710	.79
July	16,753	1,040	210	540	.477	.55
August	12,337	1,140	21	398	.352	.41
September	27,708	1,380	174	924	.817	.91
Water year 1948-49	638,983	7,230	21	1,751	1.55	21.00

* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of power-plant records.
Note.- Stage-discharge relation affected by ice Dec. 18-20, 24-28, Jan. 15, 16, Jan. 20 to Feb. 12, Feb. 15, 16, 18, Feb. 20 to Mar. 8, Mar. 13-16, 19-21.

St. Regis River at Brasher Center, N. Y.

Location.- Water-stage recorder, lat. 44°51'50", long. 74°46'45", 600 feet upstream from highway bridge at Brasher Center, St. Lawrence County, and 6½ miles downstream from confluence of East and West Branches at Winthrop. Datum of gage is 217.23 feet above mean sea level, datum of 1929.
Drainage area.- 616 square miles.
Records available.- August 1910 to November 1917, January 1919 to September 1949.
Average discharge.- 36 years (1910-13, 1914-17, 1919-49), 1,065 second-feet.
Extremes.- Maximum discharge during year, 7,780 second-feet Mar. 28; maximum gage height, 11.51 feet Mar. 23 (backwater from ice); minimum discharge, 137 second-feet July 30 (gage height, 5.71 feet); minimum daily, 174 second-feet July 30, 31, Aug. 27.
1910-17, 1919-49: Maximum discharge, 16,800 second-feet Apr. 6, 1937, from rating curve extended above 8,300 second-feet by logarithmic plotting; maximum gage height recorded, about 15.3 feet Apr. 6, 1937 (ice jam); minimum discharge observed, about 34 second-feet Aug. 8, 1917 (gage height, 5.25 feet); minimum daily, 37 second-feet Aug. 8, 1917.
Remarks.- Records good except those for periods of ice effect, fragmentary or no gage-height record, or shifting control, which are fair. Slight diurnal fluctuation caused by power operations above station.
Revisions (water years).- W 1114: 1910.

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

5.7	132	6.4	650	8.0	2,910
5.8	184	6.6	857	8.5	3,900
6.0	312	7.0	1,340	9.0	5,000
6.2	468	7.5	2,050	9.9	7,230

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	179	298	814	a1,350	b780	868	3,940	1,740	a680	244	179	660
2	190	292	740	a1,500	b740	690.	3,200	1,570	a600	232	179	603
3	196	278	f603	a1,450	b720	650	2,750	1,510	a538	232	184	521
4	226	278	584	a1,400	b680	612	2,430	1,610	494	226	251	411
5	220	292	547	a1,350	b640	804	2,240	1,480	444	244	278	395
6	208	292	565	1,790	b620	1,290	2,480	1,600	411	278	251	419
7	202	554	690	2,020	b680	970	3,690	1,620	387	196	226	380
8	226	891	814	2,000	b720	880	4,050	1,550	372	214	202	342
9	364	982	*782	1,960	750	925	3,670	1,350	372	214	190	305
10	452	814	700	1,930	*680	814	3,060	1,150	364	251	208	395
11	403	700	b540	1,570	594	771	2,520	1,030	364	285	264	350
12	357	584	b560	1,210	460	670	2,240	970	342	298	251	292
13	342	530	603	*1,190	740	584	2,110	902	327	292	251	244
14	342	594	680	1,030	1,280	660	2,110	902	320	264	226	271
15	320	690	b470	836	b1,900	670	2,210	891	292	251	196	357
16	312	740	b490	1,050	4,300	b540	2,690	868	271	238	179	327
17	342	631	497	1,990	3,290	b600	2,660	804	271	232	190	334
18	512	594	411	1,510	2,460	b560	2,310	730	258	238	214	350
19	670	584	b370	2,270	2,430	b470	2,100	750	251	251	334	403
20	700	1,130	b310	2,240	1,980	b430	2,070	1,010	251	232	285	468
21	594	2,000	334	1,430	1,540	b540	2,040	1,150	258	238	264	521
22	428	2,050	387	1,470	1,330	670	2,100	1,050	298	214	244	494
23	436	1,920	364	1,130	1,170	b4,000	1,990	970	395	220	220	468
24	468	1,760	b360	880	1,040	b4,300	2,180	959	452	202	202	494
25	411	1,480	b340	b800	1,340	b4,100	2,360	936	395	214	190	547
26	395	1,220	b290	b760	1,390	b4,300	2,180	868	380	220	179	547
27	387	1,090	b240	b740	925	b5,000	2,280	825	334	202	174	334
28	350	1,090	b360	b860	947	*b6,800	2,500	761	305	208	179	387
29	327	1,030	494	1,110	-	7,100	2,210	710	298	184	263	411
30	305	914	987	b1,020	-	6,060	1,990	a700	264	174	503	503
31	298	-	880	b900	-	5,000	-	a720	-	174	660	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	11,162	700	179	360	0.584	0.67
November	26,302	2,050	278	877	1.42	1.59
December	16,806	987	240	542	.880	1.01
Calendar year 1948	337,541	7,340	174	922	1.50	20.38
January	42,746	2,270	740	1,379	2.24	2.58
February	36,126	4,300	460	1,290	2.09	2.18
March	62,328	7,100	430	2,011	3.26	3.76
April	76,360	4,050	1,990	2,545	4.13	4.61
May	33,686	1,740	700	1,087	1.76	2.03
June	10,988	680	251	366	.594	.66
July	7,162	298	174	231	.375	.43
August	7,616	660	174	246	.399	.46
September	12,533	660	244	418	.679	.76
Water year 1948-49	343,815	7,100	174	942	1.53	20.74

Peak discharge (base, 5,600 sec.-ft.).- Mar. 28 (11:15 p.m.) 7,780 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of weather records and records for Grass River at Pyrites and West Branch Oswegatchie River near Harrisville.
b Stage-discharge relation affected by ice.
f Fragmentary gage-height record; discharge computed on basis of partly estimated gage-height graph.

Salmon River at Chasm Falls, N. Y.

Location.- Water-stage recorder, lat. 44°45'20", long. 74°13'10", at Chasm Falls, Franklin County, a quarter of a mile downstream from power plant of Niagara Mohawk Power Corp.

Drainage area.- 132 square miles.

Records available.- July 1925 to September 1949.

Average discharge.- 24 years, 229 second-feet.

Extremes.- Maximum discharge during year, 1,790 second-feet Mar. 28 (gage height, 4.00 feet); minimum, 27 second-feet Dec. 17 (gage height, 0.68 foot); minimum daily, 72 second-feet Aug. 16.
1925-49: Maximum discharge, 2,890 second-feet Apr. 25, 1926 (gage height, 5.0 feet); minimum, 14 second-feet Feb. 12, 1943 (gage height, 0.44 foot); minimum daily, 28 second-feet Sept. 4, 1934.

Remarks.- Records excellent except those for periods of no gage-height record, which are fair. Diurnal fluctuation at low and medium flow caused by power plant. A small diversion from tributary stream above station is used as water supply for village of Malone.

Revisions (water years).- W 729: 1931(m). W 759: Drainage area.

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)

Oct. 1 to Nov. 20				Nov. 21 to Sept. 30					
1.2	92	1.8	256	1.0	60	1.5	162	2.5	605
1.4	135	2.1	376	1.1	74	1.8	264	3.1	1,000
1.6	190			1.3	112	2.1	393	3.8	1,590

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95	106	216	393	210	220	640	334	164	102	108	159
2	108	104	214	379	225	212	499	317	140	88	92	139
3	104	101	206	294	233	217	432	343	144	85	103	116
4	95	109	211	245	235	214	403	292	135	85	145	102
5	93	109	209	193	230	235	379	276	119	85	111	117
6	92	138	229	246	203	251	437	330	121	88	102	133
7	94	298	260	292	209	165	594	384	114	80	91	83
8	111	212	242	317	203	209	611	343	121	80	88	100
9	181	177	212	304	202	220	505	280	117	73	79	107
10	143	177	212	280	214	203	413	249	114	110	84	110
11	130	175	212	239	189	196	384	227	124	117	95	99
12	112	171	195	216	148	173	375	211	111	103	92	91
13	117	173	194	224	200	156	403	202	101	101	85	91
14	109	118	202	216	208	199	429	206	98	91	79	159
15	105	138	151	188	322	207	490	213	92	87	74	139
16	110	98	191	227	533	148	559	195	94	86	72	123
17	121	101	138	265	a460	162	489	178	90	85	108	106
18	184	100	136	254	a320	158	403	168	92	89	149	106
19	140	127	114	304	a290	124	379	197	88	101	151	182
20	133	375	147	384	a200	140	408	257	90	93	110	169
21	120	452	137	272	a195	162	437	217	99	87	94	213
22	115	292	133	276	a260	200	478	183	118	81	86	208
23	113	326	152	241	a260	539	432	212	143	82	84	200
24	120	321	155	225	a245	642	509	213	123	81	82	206
25	113	280	136	196	252	487	505	210	132	90	82	192
26	114	246	133	183	237	630	432	191	117	100	79	193
27	109	246	121	213	207	887	468	193	147	88	78	203
28	113	249	130	237	237	1,520	534	181	112	118	79	225
29	109	227	152	231	-	1,460	452	184	104	98	238	211
30	105	217	161	192	-	1,090	384	182	103	84	374	195
31	105	-	250	196	-	866	-	172	-	111	223	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,613	184	92	117	0.886	1.02
November	5,963	452	98	199	1.51	1.68
December	5,551	260	114	179	1.36	1.56
Calendar year 1948	79,938	1,790	92	218	1.65	22.51
January	7,922	393	183	256	1.94	2.23
February	6,927	533	148	247	1.87	1.95
March	12,292	1,520	124	397	3.01	3.46
April	13,863	640	375	462	3.50	3.91
May	7,340	384	168	237	1.80	2.07
June	3,467	164	88	116	.879	.98
July	2,849	118	73	91.9	.696	.80
August	3,517	374	72	113	.856	.99
September	4,477	225	83	149	1.13	1.26
Water year 1948-49	77,781	1,520	72	213	1.61	21.91

a No gage-height record; discharge computed on basis of power-plant records.

Chateaugay River near Chateaugay, N. Y.

Location.- Water-stage recorder, lat. 44°54'35", long. 74°05'10", 150 feet downstream from dam of International Hydroelectric Corp., 1 mile south of Chateaugay, Franklin County, and 5 miles upstream from Marble River.
Drainage area.- 112 square miles.
Records available.- September to December 1908, October 1926 to September 1949.
Average discharge.- 23 years (1926-49), 177 second-feet.
Extremes.- Maximum discharge during year, 794 second-feet Feb. 15; maximum gage height, 4.42 feet (backwater from ice) Feb. 15; minimum discharge, 68 second-feet June 18; minimum gage height, 1.36 feet Oct. 26, Nov. 12; minimum daily discharge, 80 second-feet July 22, 23, 28, 30, Aug. 4, 6, 12, 26.
1908, 1926-49: Maximum discharge, 2,060 second-feet Apr. 8, 1928 (gage height, 7.3 feet), from rating curve extended above 970 second-feet by logarithmic plotting; minimum, 6 second-feet Nov. 20, 1928 (gage height, 0.23 foot); minimum daily, 26 second-feet July 8, 1934.
Remarks.- Records good except those for periods of ice effect, which are fair. Flow regulated by Upper and Lower Chateaugay Lakes. Considerable diurnal fluctuation at all stages caused by power operations.
Revisions.- W 759: Drainage area.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Feb. 15				Feb. 16 to Sept. 30			
1.4	75	2.3	205	1.4	72	2.3	200
1.6	98	2.8	300	1.6	95	2.8	300
1.9	140			1.9	134	3.6	510

Discharge, in second-foot, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	93	83	115	155	280	213	476	419	117	84	82	90
2	86	84	114	160	280	205	455	354	117	84	81	85
3	86	84	114	160	270	210	435	344	116	85	81	86
4	86	85	110	155	270	200	418	315	116	87	80	84
5	86	83	102	180	270	236	397	227	115	85	81	87
6	86	89	125	225	260	221	369	229	109	84	80	85
7	87	92	124	255	240	200	408	230	108	85	81	85
8	90	87	121	255	235	200	432	224	107	83	82	85
9	88	84	119	250	225	195	455	198	106	82	82	88
10	85	85	*119	240	225	200	441	188	106	89	84	82
11	86	84	117	230	*225	200	429	127	103	83	87	84
12	87	84	122	220	215	198	443	127	100	83	80	83
13	86	86	125	215	225	204	438	125	100	82	81	83
14	86	86	121	*210	230	204	432	123	97	82	82	87
15	85	86	118	210	350	196	443	121	98	82	82	84
16	85	86	124	215	271	190	443	120	87	82	82	83
17	88	85	124	220	245	190	435	120	84	82	86	83
18	91	84	113	235	240	185	435	117	83	81	95	83
19	88	92	112	300	244	185	438	121	85	82	86	85
20	88	130	110	290	240	195	429	118	85	81	83	83
21	88	98	120	280	235	200	455	117	86	81	83	89
22	86	105	120	287	230	215	470	120	88	80	85	95
23	86	132	112	280	226	420	467	123	83	80	84	93
24	86	119	100	270	223	248	485	122	86	81	83	92
25	86	116	90	260	230	243	473	124	87	82	82	93
26	86	115	84	250	225	294	473	124	86	82	80	92
27	85	123	90	245	220	301	470	122	87	81	82	93
28	85	118	92	250	220	352	476	119	86	80	82	94
29	85	115	98	250	-	378	464	119	86	81	110	96
30	86	114	104	280	-	*498	452	119	86	80	90	92
31	85	-	155	290	-	494	-	119	-	83	88	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,687	93	85	86.7	-	-
November	2,913	132	83	97.1	-	-
December	3,514	155	84	113	-	-
Calendar year 1948	56,684	719	83	155	1.38	18.82
January	7,322	300	155	236	-	-
February	6,849	350	215	245	-	-
March	7,670	498	185	247	-	-
April	13,336	485	369	445	-	-
May	5,275	419	117	170	-	-
June	2,900	117	83	96.7	-	-
July	2,559	89	80	82.5	-	-
August	2,607	110	80	84.1	-	-
September	2,624	98	82	87.5	-	-
Water year 1948-49	60,256	498	80	165	1.47	20.01

* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 19 to Jan. 6, Jan. 10-21, Jan. 23 to Feb. 15, Feb. 18, 20, 21, 25-27, Mar. 2-4, 7-9, 16-23. Increase in storage in Chateaugay Lakes during calendar year 1948, about 109,900,000 cubic feet (equivalent mean discharge, 3.48 second-feet; runoff, 0.42 inch); increase in elevation, 0.83 foot. Increase in storage during water year 1948-49, about 66,200,000 cubic feet (equivalent mean discharge, 2.10 second-feet; runoff, 0.25 inch); increase in elevation, 0.50 foot.

Richelieu River (Lake Champlain) at Rouses Point, N. Y.

Location.- Water-stage recorder, lat. 44°59'45", long. 73°21'40", in Rouses Point, Clinton County, at outlet of Lake Champlain, 90 feet north of Rutland Railroad bridge and 1 mile south of Fort Montgomery. Datum of gage is 93.00 feet above mean sea level, datum of 1929.

Drainage area.- 8,277 square miles.

Records available.- October 1863 to December 1870 (maximum and minimum monthly gage heights at St. Johns, Quebec, published in Water-Supply Paper 97) and March 1871 to September 1949 (daily gage heights; those for 1871-1907, published in Water-Supply Paper 894). January 1875 to September 1916 (monthly discharge) at Chambly, Quebec, published in Water-Supply Paper 424. Gage heights prior to Oct. 1, 1925, published as Richelieu River at Fort Montgomery, Rouses Point.

Extremes.- Maximum gage height during year, 5.26 feet Jan. 19; minimum, 0.06 foot Nov. 6. 1871-1949: Maximum gage height observed, 8.80 feet Mar. 30, 1903; minimum observed, -0.83 foot Oct. 23, 1941.

Observations at St. Johns, Quebec, indicate a maximum gage height of 8.83 feet (computed) during April 1869.

Gage height, in feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.66	0.40	2.16	2.95	3.62	3.27	4.71	4.73	2.98	1.72	0.86	0.84
2	.60	.50	2.15	3.43	3.53	3.29	4.75	4.70	2.93	1.69	.93	.75
3	.53	.52	2.16	3.59	3.50	3.25	4.74	4.60	2.92	1.59	.91	.74
4	.55	.49	2.05	3.73	3.44	3.27	4.70	4.60	2.87	1.56	.84	.78
5	.55	.46	2.13	3.86	3.41	3.23	4.74	4.50	2.76	1.44	.79	.79
6	.54	.58	2.24	3.95	3.37	3.16	4.74	4.51	2.72	1.43	.82	.57
7	.55	.67	2.14	4.19	3.38	3.19	4.80	4.39	2.58	1.34	.83	.56
8	.58	.73	2.11	4.30	3.33	3.20	4.84	4.49	2.51	1.35	.81	.56
9	.70	.90	2.11	4.45	3.25	3.17	4.79	4.35	2.49	1.48	.71	.56
10	.65	.91	2.09	4.35	3.15	3.14	4.83	4.24	2.48	1.52	.70	.55
11	.60	.83	2.08	4.35	3.08	3.14	4.84	4.24	2.45	1.30	.70	.62
12	.56	.87	2.25	4.44	3.16	3.15	4.84	4.23	2.35	1.29	.66	.71
13	.57	.88	2.00	4.35	3.00	3.08	4.77	4.16	2.41	1.23	.59	.68
14	.51	.74	1.94	4.25	2.95	3.09	4.66	4.05	2.38	1.19	.60	.63
15	.49	.84	1.93	4.29	3.03	3.01	4.73	3.89	2.39	1.19	.52	.59
16	.75	.88	2.19	4.58	3.20	2.99	4.69	3.90	2.22	1.18	.56	.64
17	.55	1.15	1.94	4.09	3.32	2.97	4.67	3.81	2.15	1.18	.75	.57
18	.52	.82	1.84	4.18	3.51	2.89	4.72	3.79	2.10	1.17	.66	.68
19	.57	.80	1.83	4.47	3.39	2.85	4.69	3.64	1.97	1.17	.47	.59
20	.53	1.04	1.78	3.99	3.39	2.84	4.69	3.54	1.92	1.10	.45	.56
21	.54	1.42	1.88	4.16	3.40	2.83	4.69	3.54	1.95	1.03	.47	.59
22	.61	1.71	1.75	4.13	3.45	2.78	4.73	3.74	1.91	1.13	.53	.63
23	.64	1.82	1.71	3.95	3.40	2.87	4.70	3.38	1.85	.95	.50	.53
24	.47	1.94	1.69	3.91	3.43	3.10	4.62	3.38	1.88	.94	.39	.51
25	.42	1.99	1.64	3.87	3.44	3.41	4.75	3.30	1.91	.96	.42	.50
26	.46	2.24	1.63	3.85	3.38	3.51	4.77	3.34	1.84	1.00	.51	.63
27	.48	2.13	1.75	3.82	3.39	3.76	4.72	3.22	1.75	.99	.48	.81
28	.48	2.03	1.60	3.86	3.36	4.06	4.67	3.18	1.81	.95	.45	.59
29	.46	2.08	1.71	3.71	-	4.33	4.79	3.12	1.80	.90	.51	.48
30	.48	2.20	1.55	3.73	-	4.55	4.71	3.04	1.74	.85	.67	.50
31	.46	-	2.10	3.68	-	4.67	-	3.03	-	.85	.76	-

Monthly gage height, in feet, water year October 1948 to September 1949

Month	Maximum	Minimum	Mean
October	0.75	0.42	0.55
November	2.24	.40	1.15
December	2.25	1.55	1.94
Calendar year 1948	5.81	.40	2.11
January	4.58	2.95	4.01
February	3.62	2.95	3.33
March	4.67	2.78	3.29
April	4.84	4.62	4.74
May	4.73	3.03	3.89
June	2.98	1.74	2.27
July	1.72	.85	1.22
August	.93	.39	.64
September	.84	.48	.62
Water year 1948-49	4.84	.39	2.30

Lake Champlain at Burlington, Vt.

Location.- Water-stage recorder, lat. 44°29'00", long. 73°13'30", in Burlington, Chittenden County, 0.6 mile north of railroad station. Datum of gage is 92.86 feet above mean sea level, datum of 1929.

Records available.- May 1907 to September 1949.

Extremes.- Maximum gage height during year, 5.00 feet Apr. 9, affected by seiche; minimum, 0.41 foot Aug. 27, affected by seiche.
1907-49: Maximum gage height observed, 8.65 feet Mar. 27, 28, 1936; minimum observed, -0.25 foot Dec. 4, 1908.

Gage height, in feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.73	0.55	2.19	3.09	3.60	3.46	4.86	4.73	3.02	1.70	0.97	0.76
2	.73	.52	2.19	3.51	3.60	3.41	4.86	4.66	2.98	1.66	.94	.71
3	.71	.48	2.15	3.70	3.54	3.37	4.85	4.64	2.91	1.63	.89	.72
4	.70	.49	2.15	3.79	3.50	3.31	4.83	4.62	2.85	1.60	.91	.68
5	.68	.50	2.12	3.83	3.50	3.25	4.80	4.60	2.81	1.57	.91	.67
6	.64	.50	2.06	4.02	3.45	3.31	4.81	4.58	2.76	1.54	.88	.67
7	.62	.69	2.13	4.25	3.39	3.32	4.87	4.57	2.70	1.51	.83	.69
8	.52	.77	2.18	4.39	3.35	3.30	4.96	4.51	2.63	1.45	.79	.68
9	.65	.80	2.19	4.44	3.32	3.28	4.99	4.47	2.58	1.39	.78	.70
10	.62	.84	2.20	4.50	3.28	3.28	4.98	4.44	2.53	1.32	.79	.69
11	.61	.88	2.17	4.53	3.17	3.27	4.94	4.36	2.46	1.34	.82	.67
12	.63	.88	2.09	4.49	3.12	3.25	4.88	4.25	2.43	1.34	.80	.61
13	.63	.88	2.09	4.45	3.07	3.23	4.84	4.18	2.35	1.35	.78	.59
14	.61	.88	2.08	4.43	3.05	3.18	4.82	4.06	2.28	1.32	.75	.65
15	.60	.91	2.08	4.36	3.07	3.15	4.80	4.03	2.21	1.30	.72	.66
16	.54	.92	2.00	4.22	3.25	3.11	4.79	3.93	2.17	1.27	.68	.65
17	.51	.83	1.97	4.27	3.42	3.07	4.81	3.86	2.12	1.23	.63	.64
18	.62	.87	1.98	4.23	3.43	3.02	4.78	3.76	2.08	1.22	.62	.61
19	.61	.94	1.94	4.12	3.48	3.00	4.78	3.71	2.05	1.19	.67	.62
20	.64	1.15	1.92	4.16	3.50	2.94	4.76	3.68	2.02	1.18	.66	.62
21	.63	1.49	1.87	4.16	3.50	2.87	4.74	3.61	1.98	1.15	.62	.62
22	.62	1.69	1.86	4.18	3.46	2.86	4.77	3.47	1.98	1.11	.57	.59
23	.58	1.87	1.84	4.09	3.50	2.93	4.76	3.44	1.96	1.06	.55	.61
24	.61	2.00	1.82	4.06	3.47	3.23	4.82	3.41	1.94	1.04	.55	.61
25	.60	2.08	1.78	4.02	3.46	3.43	4.85	3.37	1.92	1.04	.55	.61
26	.58	2.06	1.74	3.97	3.52	3.59	4.81	3.31	1.87	1.00	.49	.57
27	.58	2.11	1.66	3.94	3.50	3.84	4.82	3.27	1.86	.96	.46	.50
28	.57	2.16	1.66	3.86	3.48	4.12	4.85	3.22	1.83	.97	.48	.51
29	.57	2.23	1.60	3.78	-	4.45	4.82	3.16	1.79	.97	.62	.57
30	.54	2.20	1.77	3.70	-	4.68	4.79	3.11	1.74	.96	.72	.59
31	.54	-	2.27	3.65	-	4.81	-	3.07	-	.97	.74	-

Note.- *Gage heights for periods Jan. 21-24, Jan. 29 to Feb. 13 computed on basis of records for* Richelieu River (Lake Champlain) at Rouses Point, N. Y., adjusted for wind direction and velocity when necessary.

Monthly gage height, in feet, water year October 1948 to September 1949

Month	Maximum	Minimum	Mean
October	0.73	0.51	0.62
November	2.23	.48	1.17
December	2.27	1.60	1.99
Calendar year 1948	5.69	.48	2.18
January	4.53	3.09	4.07
February	3.60	3.05	3.39
March	4.81	2.86	3.40
April	4.99	4.74	4.83
May	4.73	3.07	3.94
June	3.02	1.74	2.29
July	1.70	.96	1.27
August	.97	.46	.72
September	.76	.50	.64
Water year 1948-49	4.99	.46	2.35

Great Chazy River at Perry Mills, N. Y.

Location.- Water-stage recorder, lat. 45°00'00", long. 73°30'05", 500 feet upstream from highway bridge at Perry Mills, Clinton County, and 7½ miles upstream from Corbeau Creek.

Drainage area.- 247 square miles.

Records available.- September 1928 to September 1949.

Average discharge.- 21 years, 271 second-feet.

Extremes.- Maximum discharge during year, 2,850 second-feet Mar. 28; maximum gage height, 8.22 feet Feb. 16 (backwater from ice); minimum discharge, 27 second-feet Nov. 3 (gage height, 1.80 feet); minimum daily, 34 second-feet Sept. 8.
1928-49: Maximum discharge, 6,000 second-feet Apr. 7, 1937; maximum gage height, 11.5 feet, from floodmark, Mar. 9, 1946 (ice jam); minimum discharge, about 0.8 second-foot Sept. 18, 1932 (gage height, 1.33 feet); minimum daily, 10 second-feet Sept. 18, 1932.

Remarks.- Records good except those for periods of no gage-height record, which are fair, and those for period of ice effect, which are poor. Diurnal fluctuation at low and medium flow caused by saw mill. Flow partly regulated by Chazy Lake. Clinton Prison at Dannemora obtains water supply from Chazy Lake.

Revisions (water years).- W 714: 1930.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a98	69	124	1,240	260	235	665	414	143	56	58	155
2	a102	92	117	1,200	260	220	537	378	134	55	54	120
3	a110	52	108	820	235	190	482	411	121	55	68	90
4	a96	72	105	720	245	160	450	342	91	54	83	85
5	a92	83	97	580	235	150	430	276	82	51	78	80
6	a86	92	104	980	220	260	545	305	78	63	74	55
7	a82	152	167	940	215	240	1,440	388	78	78	74	38
8	a86	144	154	860	215	180	1,200	384	76	74	74	34
9	a130	109	173	800	210	160	785	306	79	72	74	35
10	a110	76	106	680	210	170	581	254	80	95	84	61
11	a106	79	*89	540	200	160	465	224	77	76	99	88
12	a100	72	*76	410	*150	150	423	202	74	57	96	77
13	a94	73	95	340	210	135	402	194	70	82	82	60
14	a88	65	102	300	300	130	439	177	65	74	82	39
15	a84	73	90	215	400	150	419	184	66	74	69	45
16	a78	83	79	*230	1,240	140	534	174	67	72	70	48
17	a82	78	100	580	1,160	140	469	169	71	74	82	46
18	a108	81	78	560	1,040	135	391	165	69	80	81	43
19	a90	75	66	600	960	120	490	145	49	78	62	56
20	80	656	*58	700	760	114	776	154	43	77	55	69
21	89	785	58	560	680	130	706	131	94	74	44	52
22	a80	384	56	460	440	140	755	118	93	72	36	47
23	a80	470	56	450	350	600	583	162	76	70	42	43
24	a82	426	54	350	300	1,700	640	182	71	69	74	46
25	a82	270	52	320	300	1,300	642	160	78	74	79	51
26	a78	211	52	290	260	1,750	502	162	72	68	78	48
27	a74	251	56	260	235	2,250	638	167	67	72	75	41
28	73	273	62	300	245	2,560	701	151	70	71	79	37
29	a72	212	68	290	-	*1,940	629	141	65	71	117	43
30	a70	157	88	260	-	1,250	497	136	62	69	186	47
31	a70	-	175	270	-	936	-	143	-	72	143	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,752	130	70	88.8	0.360	0.41
November	5,715	785	52	190	.769	.86
December	2,865	175	52	92.4	.374	.43
Calendar year 1948	77,527	3,800	38	212	.858	11.66
January	17,105	1,240	215	552	2.23	2.58
February	11,535	1,240	150	412	1.67	1.74
March	17,995	2,560	114	580	2.35	2.71
April	18,216	1,440	391	607	2.46	2.74
May	6,899	414	118	223	.903	1.04
June	2,361	143	43	78.7	.319	.36
July	2,179	95	51	70.3	.285	.33
August	2,452	186	36	79.1	.320	.37
September	1,779	155	34	59.3	.240	.27
Water year 1948-49	91,853	2,560	34	252	1.02	13.84

Peak discharge (base, 2,500 sec.-ft.).- Mar. 28 (8:15 p.m.) 2,850 sec.-ft.
* Winter discharge measurement made on this day.
a.No gage-height record; discharge computed on basis of partial gage-height record, weather records, and records for nearby stations.
Note.- Stage-discharge relation affected by ice Dec. 18 to Mar. 27.

Saranac River at Plattsburg, N. Y.

Location.- Water-stage recorder, lat. 44°40'50", long. 73°28'20", in Plattsburg, Clinton County, 600 feet downstream from Imperial Paper & Color Corp. dam and 3 miles upstream from mouth.
Drainage area.- 608 square miles.
Records available.- October 1943 to September 1949. March 1903 to September 1930 at site 1.5 miles upstream, published as Saranac River near Plattsburg.
Average discharge.- 31 years (1905-30, 1943-49), 839 second-feet.
Extremes.- Maximum discharge during year, 7,090 second-feet Mar. 28 (gage height, 8.58 feet); minimum, 3.0 second-feet Aug. 8 (gage height, 1.23 feet); minimum daily, 18 second-feet June 19.
1903-30, 1943-49: Maximum discharge, 11,500 second-feet Apr. 8, 1928, from computation of flow over dam, and through waste gates and power plant; minimum daily, 15 second-feet Aug. 4, 1908.
Remarks.- Records excellent except those for period of no gage-height record, which are poor. Flow partly regulated by storage in Lower Saranac Lake. Considerable diurnal fluctuation caused by power and industrial operations. City of Plattsburg diverts about 5 second-feet from Mead and West Brooks, tributaries above station, for municipal supply.

Rating tables, water year 1948-49 (gage height, in feet, and discharge, in second-feet)

Oct. 1 to July 8								July 8 to Sept. 30			
1.5	14	2.2	98	3.4	496	5.0	1,700	2.3	113	3.3	413
1.6	21	2.5	164	3.7	658	6.0	2,850	2.5	155	3.6	547
1.8	40	2.8	251	4.1	920	7.0	4,280	2.7	205	3.9	700
2.0	66	3.1	361	4.5	1,240	7.9	5,800	3.0	299	4.3	935

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	342	353	871	3,050	853	1,070	2,530	1,400	752	391	268	585
2	367	330	753	1,920	865	1,040	2,210	1,390	738	285	325	430
3	434	413	625	1,510	865	1,010	1,970	1,480	720	367	345	363
4	236	376	624	1,520	911	952	1,820	1,150	683	224	348	386
5	353	406	725	1,440	818	970	1,840	1,170	571	693	268	312
6	394	403	833	1,860	646	1,430	1,940	1,430	629	561	335	602
7	431	686	1,010	1,870	650	1,220	2,440	1,510	544	384	289	603
8	359	620	907	1,810	815	1,020	2,340	1,510	595	221	119	541
9	432	552	863	1,500	717	1,090	2,020	1,300	625	212	372	557
10	387	596	827	1,400	755	1,290	1,890	1,260	707	157	225	531
11	617	453	677	1,270	782	1,190	1,750	782	511	344	195	438
12	443	298	553	1,020	634	947	1,690	633	355	272	128	632
13	465	317	701	897	662	719	1,490	551	263	281	130	523
14	418	184	650	887	787	804	1,650	528	419	317	244	658
15	404	162	603	857	905	1,030	1,700	561	319	214	237	903
16	359	365	567	904	2,350	862	2,100	731	261	233	264	649
17	372	348	681	1,210	1,620	864	1,930	710	390	291	318	289
18	360	291	672	1,310	1,400	857	1,780	564	312	178	335	225
19	402	351	530	1,490	1,640	639	1,760	592	18	388	398	a350
20	350	962	551	1,530	1,410	621	1,880	660	178	264	221	a370
21	405	1,330	676	1,040	1,290	681	1,800	444	384	255	295	a840
22	373	889	694	1,100	1,210	858	1,860	507	413	307	342	a860
23	277	848	581	1,080	1,210	1,380	1,610	774	376	242	300	a680
24	309	804	434	1,070	1,370	1,840	1,860	896	360	251	272	a800
25	426	638	469	1,030	1,400	1,830	1,760	871	365	251	288	a720
26	292	756	629	877	1,260	2,290	1,660	802	472	240	263	a760
27	318	826	633	732	1,060	3,340	1,840	797	397	300	196	a760
28	327	867	680	868	1,070	5,650	2,140	802	398	302	284	a760
29	359	953	738	963	-	4,320	1,790	765	435	330	333	a900
30	332	889	771	796	-	3,630	1,570	692	411	307	907	a840
31	349	-	1,500	920	-	3,110	-	797	-	258	562	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	11,690	617	236	377	0.620	0.72
November	17,266	1,330	162	576	.947	1.06
December	22,028	1,500	434	711	1.17	1.35
Calendar year 1948	291,204	4,100	162	796	1.31	17.83
January	39,731	3,050	732	1,282	2.11	2.43
February	29,935	2,350	634	1,069	1.76	1.83
March	48,554	5,650	621	1,566	2.58	2.97
April	56,620	2,530	1,490	1,887	3.10	3.46
May	28,060	1,510	444	905	1.49	1.72
June	13,601	752	18	453	.745	.83
July	9,320	693	157	301	.495	.57
August	9,406	907	.119	303	.498	.58
September	17,867	903	225	596	.980	1.09
Water year 1948-49	304,078	5,650	18	833	1.37	18.61

a No gage-height record; discharge computed on basis of power-plant records at Kents Falls, 7 miles upstream.

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West Branch Ausable River near Newman, N. Y.

Location.- Water-stage recorder, lat. 44°18'40", long. 73°55'00", 4 miles northeast of Newman, Essex County, and 4 miles downstream from Lake Placid Outlet.

Drainage area.- 116 square miles.

Records available.- June 1916 to December 1917, July 1919 to September 1949.

Average discharge.- 30 years (1919-49), 220 second-feet.

Extremes.- Maximum discharge during year, 7,020 second-feet Dec. 31 (gage height, 10.13 feet); minimum, 23 second-feet July 25 (gage height, 2.21 feet); minimum daily, 32 second-feet July 24.
1916-17, 1919-49: Maximum discharge, 10,800 second-feet Sept. 22, 1938 (gage height, 12.20 feet), from rating curve extended above 3,200 second-feet by logarithmic plotting; practically no flow Sept. 13, 1920 (gage height, 1.60 feet), caused by closing gates in logging dam; minimum daily, 7.2 second-feet July 29, 1920.

Remarks.- Records good except those for periods of ice effect, which are fair. Diurnal fluctuation at low and medium flow caused by mills above station.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Dec. 31

2.4	40	3.5	269	5.5	1,360
2.6	63	4.0	476	6.0	1,740
2.8	93	4.5	726	7.0	2,690
3.1	154	5.0	1,020	7.9	3,710

Jan. 1 to Sept. 30

2.3	30	2.9	110
2.5	48	3.2	179
2.7	74	3.5	269

Note.- Same as preceding table above 3.5 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	72	166	2,290	b92	b108	403	364	164	55	90	135
2	50	69	147	869	b86	b100	344	737	138	49	61	105
3	50	66	153	b540	b82	b90	301	721	125	50	51	78
4	55	66	154	b400	b80	b84	280	505	112	42	43	75
5	42	84	154	b330	b76	b108	259	517	102	55	43	68
6	43	98	274	729	b72	161	329	759	89	52	45	72
7	47	1,090	552	579	b84	137	434	720	84	44	40	64
8	59	478	316	408	b90	b100	381	493	84	43	35	69
9	242	252	216	309	b88	b108	317	352	81	40	39	250
10	131	230	b170	262	b82	b100	262	287	76	48	37	335
11	92	218	b165	b220	b76	b96	246	239	71	54	53*	179
12	94	166	b170	b190	b62	b92	239	203	69	46	67	116
13	100	148	*146	b175	b94	b86	312	184	63	80	61	90
14	87	187	120	b160	*b135	b78	612	176	60	62	47	276
15	76	159	95	b140	b400	b86	708	182	62	51	43	234
16	68	140	112	b160	830	b84	932	162	54	48	40	145
17	73	129	109	*258	397	b74	516	152	53	45	53	106
18	201	140	97	228	255	b78	369	142	47	56	106	86
19	157	139	b76	243	218	b70	324	152	48	61	168	81
20	119	1,780	b72	263	179	b62	313	262	53	48	92	87
21	96	964	b82	b170	154	b72	309	201	79	44	65	107
22	86	503	95	b165	136	b102	411	159	108	38	55	150
23	82	420	95	b155	b130	b720	887	189	106	42	48	138
24	86	344	83	b135	b120	772	747	233	91	32	48	169
25	98	276	b72	b114	136	461	537	236	77	50	42	174
26	96	227	b62	b92	127	878	403	209	83	61	42	134
27	91	236	b74	b98	b110	1,240	449	182	84	48	41	104
28	88	283	90	b116	b112	1,830	541	162	67	66	39	108
29	79	224	93	129	-	826	411	154	63	52	348	210
30	83	184	256	106	-	*672	336	162	56	46	480	199
31	75	-	3,620	b96	-	532	-	179	-	75	209	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,791	242	42	90.0	0.776	0.89
November	9,370	1,780	66	312	2.69	3.00
December	8,086	3,620	62	261	2.25	2.59
Calendar year 1948	79,722	3,620	42	218	1.88	25.54
January	10,129	2,290	92	327	2.82	3.25
February	4,503	830	62	161	1.39	1.44
March	10,007	1,830	62	323	2.78	3.21
April	12,912	932	239	430	3.71	4.14
May	9,375	759	142	302	2.60	3.01
June	2,449	164	47	81.6	.703	.79
July	1,583	80	32	51.1	.441	.51
August	2,629	480	35	84.8	.731	.84
September	4,144	335	64	138	1.19	1.33
Water year 1948-49	77,978	3,620	32	214	1.84	25.00

Peak discharge (base, 2,000 sec.-ft.).- Nov. 20 (3:15 p.m.) 2,710 sec.-ft.; Dec. 31 (4:45 p.m.) 7,020 sec.-ft.; Mar. 28 (7 a.m.) 2,310 sec.-ft.

* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Ausable River near Ausable Forks, N. Y.

Location.- Water-stage recorder, lat. 44°27'05", long. 73°38'35", 1¾ miles downstream from confluence of East and West Branches and from village of Ausable Forks, Clinton County. Datum of gage is 505.65 feet above mean sea level, datum of 1929.
Drainage area.- 448 square miles.
Records available.- September 1924 to September 1949. August 1910 to September 1925 at Ausable Forks, 1½ miles upstream.
Average discharge.- 25 years (1924-49), 682 second-feet.
Extremes.- Maximum discharge during year, 23,200 second-feet Dec. 31 (gage height, 1.39 feet from high-water mark in gage house), from rating curve extended above 9,100 second-feet on basis of slope-area determination; minimum, 92 second-feet Aug. 26 (gage height, 1.08 feet); minimum daily, 132 second-feet Aug. 9; minimum gage height, 1.08 feet Aug. 26.
1910-49: Maximum discharge, 24,200 second-feet Sept. 22, 1938, from rating curve extended above 9,100 second-feet by logarithmic plotting; maximum gage height, about 14.0 feet Mar. 27, 1934 (ice jam); practically no flow July 21, 1912, result of unusual regulation.
Remarks.- Records excellent except those for periods of ice effect, which are fair. Flow partly regulated since 1905, principally by Taylor Pond and Fern Lake. Diurnal flucuations at low and medium flow caused by power above station.
Revisions (water years).- W 854: 1925(M), 1934 (maximum gage height).

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

1.2	121	2.5	740	6.0	5,600
1.4	180	3.0	1,140	7.0	7,960
1.6	251	3.5	1,640	8.1	11,200
1.8	334	4.0	2,250		
2.1	486	5.0	3,730		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	164	211	464	8,680	280	340	1,420	1,090	448	161	240	381
2	174	204	427	3,040	260	310	1,180	1,780	391	161	228	283
3	171	200	376	1,770	245	290	1,030	2,360	339	158	177	221
4	164	200	367	1,240	225	260	969	1,580	304	141	168	183
5	164	260	339	1,030	215	350	889	1,440	283	152	158	171
6	155	323	443	2,280	200	500	1,170	2,110	259	158	146	171
7	168	2,040	1,430	2,000	235	420	1,600	2,040	236	161	149	180
8	187	1,270	897	1,400	250	330	1,380	1,590	240	152	141	194
9	557	706	652	1,110	250	350	1,140	1,120	174	149	132	247
10	422	569	521	986	245	330	929	897	218	168	135	684
11	275	606	427	740	220	310	859	769	207	183	152	448
12	244	470	376	580	190	300	851	671	194	183	174	317
13	263	401	*464	480	270	270	1,040	606	190	242	187	251
14	240	448	391	440	*400	260	1,910	575	174	229	171	512
15	218	417	310	*390	1,040	280	2,270	569	171	183	152	752
16	197	372	320	440	2,840	260	3,100	532	161	174	146	443
17	197	334	340	680	1,600	240	1,790	492	155	171	174	321
18	367	330	300	620	1,000	250	1,250	464	149	177	244	251
19	412	348	245	680	880	220	1,260	464	143	204	391	260
20	330	4,360	230	740	700	200	1,260	654	158	190	343	241
21	283	3,130	250	500	540	225	1,250	594	197	168	263	240
22	259	1,570	280	460	470	390	1,570	486	271	161	204	295
23	240	1,230	290	420	430	2,500	2,770	521	279	149	187	321
24	247	1,020	260	380	390	2,820	2,560	632	251	146	183	372
25	259	798	230	340	440	1,740	1,880	619	221	152	183	412
26	267	664	210	280	430	2,930	1,380	600	207	187	174	330
27	259	612	235	290	360	4,260	1,400	544	211	190	171	279
28	247	733	280	330	360	6,520	1,820	492	194	183	164	259
29	244	619	360	370	-	*3,020	1,410	454	171	187	549	504
30	229	515	780	330	-	2,650	1,130	454	171	174	1,300	509
31	221	-	*11,200	300	-	1,950	-	481	-	200	608	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	7,824	557	155	252	0.562	0.65
November	24,960	4,360	200	832	1.86	2.07
December	23,694	11,200	210	764	1.71	1.97
Calendar year 1948	235,034	11,200	135	642	1.43	19.52
January	33,326	8,680	280	1,075	2.40	2.77
February	14,965	2,840	190	534	1.19	1.24
March	35,075	6,520	200	1,131	2.52	2.91
April	44,467	3,100	851	1,482	3.31	3.69
May	27,680	2,360	454	893	1.99	2.30
June	6,767	448	143	226	.504	.56
July	5,394	242	141	174	.388	.45
August	7,794	1,300	132	251	.560	.65
September	10,032	752	171	334	.746	.83
Water year 1948-49	241,978	11,200	132	663	1.48	20.09

Peak discharge (base, 6,200 sec.-ft.).- Nov. 20 (4:30 p.m.) 7,170 sec.-ft.; Dec. 31 (7 p.m.) 23,200 sec.-ft.; Mar. 28 (7 a.m.) 7,960 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 15-31, Jan. 11 to Feb. 15, Feb. 19 to Mar. 23.

Black Brook at Black Brook, N. Y.

Location.- Water-stage recorder, lat. 44°26'50', long. 73°44'45", three-quarters of a mile south of hamlet of Black Brook, Clinton County, and 1½ miles upstream from mouth.

Drainage area.- 49.4 square miles.

Records available.- September 1924 to September 1949.

Average discharge.- 25 years, 50.4 second-feet.

Extremes.- Maximum discharge during year, 628 second-feet Mar. 28 (gage height, 5.35 feet); minimum, 6.6 second-feet Sept. 6; minimum gage height, 1.48 feet June 18.
1924-49: Maximum discharge, 1,050 second-feet Apr. 6, 1937 (gage height, 6.95 feet), from rating curve extended above 450 second-feet by logarithmic plotting; minimum, 0.8 second-foot July 2, Aug. 29, 1931.

Remarks.- Records excellent except those for periods of ice effect or no gage-height record, which are fair. Flow partly regulated by Fern Lake and Taylor Pond.

Revisions.- W 759: Drainage area.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	18	26	303	b38	b54	136	78	41	18	48	19
2	56	17	25	202	b35	b48	110	75	27	28	69	15
3	56	17	22	122	b32	b46	98	78	17	28	46	9.8
4	56	17	22	b92	b29	b45	91	71	16	28	46	7.6
5	55	17	20	b72	b27	b52	87	59	14	30	45	6.8
6	58	19	25	87	b24	74	98	71	13	39	45	7.2
7	63	59	44	94	b26	b64	155	84	12	46	44	20
8	66	48	38	84	b27	b56	156	86	11	46	43	32
9	79	32	a30	75	b28	b60	123	75	10	46	42	39
10	42	26	a27	69	26	56	97	66	9.9	50	42	38
11	19	23	a26	b62	b24	55	88	62	9.7	50	45	35
12	17	20	a27	b58	b22	b54	83	60	9.5	48	43	33
13	18	19	*a25	b54	b23	b50	81	58	9.3	50	42	32
14	24	22	a22	b46	*25	b54	82	57	9.0	47	42	45
15	22	22	a19	b41	b52	b52	84	56	8.6	46	42	33
16	20	21	a36	b47	172	b48	115	56	8.2	45	42	19
17	22	20	a54	*b54	162	b47	107	52	8.0	46	46	20
18	32	18	a48	61	b100	b43	86	50	7.8	50	53	16
19	33	20	a37	69	b98	b41	87	42	8.8	48	48	16
20	29	93	a35	b84	b90	b37	105	42	17	47	45	16
21	31	109	b38	b68	b76	b42	101	34	32	46	42	15
22	37	69	b40	b56	69	b50	92	27	33	46	42	15
23	33	62	b40	b47	67	110	88	27	35	46	41	14
24	32	58	b38	b41	65	163	92	27	34	45	53	15
25	30	46	b34	b39	65	150	90	28	21	48	57	14
26	27	36	b30	b34	b62	172	81	41	15	47	56	15
27	25	35	b32	b36	b58	295	86	48	13	66	56	20
28	23	40	b45	b41	b56	476	105	46	12	50	57	19
29	22	34	b66	b48	-	*276	103	45	10	46	88	21
30	20	28	b90	b44	-	220	88	44	11	45	92	27
31	19	-	b130	b41	-	190	-	45	-	49	27	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,121	79	17	36.2	-	-
November	1,065	109	17	35.5	-	-
December	1,191	130	19	38.4	-	-
Calendar year 1948	15,813	414	13	43.2	0.874	11.90
January	2,271	303	34	73.3	-	-
February	1,578	172	22	56.4	-	-
March	3,178	476	37	103	-	-
April	2,997	158	81	99.9	-	-
May	1,690	86	27	54.5	-	-
June	482.8	41	7.8	16.1	-	-
July	1,370	66	18	44.2	-	-
August	1,529	92	27	49.3	-	-
September	834.4	45	6.8	21.1	-	-
Water year 1948-49	19,107.2	476	6.8	52.3	1.06	14.38

* Winter discharge measurement made on this day.
a Nc gage-height record; discharge computed on basis of engineer's inspection, recorded range in stage, weather records, records for West Branch Ausable River near Newman, records of regulation of Fern Lake and Taylor Pond.
b Stage-discharge relation affected by ice.

East Branch Ausable River at Ausable Forks, N. Y.

Location.- Water-stage recorder, lat. 44°26'20", long. 73°40'55", 700 feet upstream from upper highway bridge in Ausable Forks, Essex County, and half a mile upstream from confluence with West Branch. Datum of gage is 545.37 feet above mean sea level, datum of 1929.
Drainage area.- 198 square miles.
Records available.- September 1924 to September 1949.
Average discharge.- 25 years, 310 second-feet.
Extremes.- Maximum discharge during year, 16,500 second-feet Dec. 31 (gage height, 11.60 feet), from rating curve extended above 5,800 second-feet by logarithmic plotting on basis of velocity-area studies; minimum, 27 second-feet Aug. 10 (gage height, 0.97 foot).
1924-49: Maximum discharge, 20,100 second-feet Sept. 22, 1938 (gage height, 12.91 feet), from rating curve extended above 5,800 second-feet by logarithmic plotting on basis of velocity-area studies; minimum observed, 20 second-feet Aug. 11, 14, 28, 1934.
Remarks.- Records excellent except those for periods of ice effect or no gage-height record, which are fair. Diurnal fluctuation at low flow caused by power plants above station.
Revisions.- W 759: Drainage area.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Dec. 31				Jan. 1 to Sept. 30					
1.0	34	2.5	442	0.9	21	2.1	258	5.0	2,400
1.1	45	3.0	698	1.0	29	2.5	421	5.5	3,020
1.3	73	3.5	1,020	1.1	39	3.0	689	6.0	3,720
1.5	109	4.0	1,410	1.3	64	3.5	1,020	6.5	4,500
1.8	179	4.6	1,970	1.5	97	4.0	1,410		
2.1	275	5.3	2,760	1.8	165	4.5	1,870		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	37	80	199	4,350	106	130	619	505	168	49	66	148
2	46	75	176	1,290	98	120	505	942	152	45	50	101
3	42	73	156	727	92	110	445	1,180	135	42	43	75
4	37	72	151	500	86	102	421	808	119	39	40	61
5	36	144	139	416	82	150	380	738	105	39	37	56
6	37	164	201	1,230	78	220	608	1,030	95	40	35	55
7	37	906	681	937	90	170	726	990	88	38	33	55
8	43	544	415	621	98	130	574	738	88	35	31	53
9	270	317	298	483	96	135	474	510	81	34	28	66
10	161	283	225	420	90	125	385	398	76	38	27	186
11	117	302	185	310	84	120	368	334	75	a46	31	138
12	103	221	150	215	74	112	376	291	69	a43	40	97
13	115	185	*170	200	112	100	548	258	64	a72	43	76
14	94	202	158	180	*185	94	1,090	238	60	55	37	291
15	82	174	120	*160	490	102	1,230	227	59	42	33	347
16	73	163	125	185	1,360	98	1,550	208	55	38	30	208
17	75	144	130	290	707	88	827	193	52	38	39	135
18	139	142	116	280	469	94	569	182	48	43	66	99
19	146	153	92	280	398	84	648	182	47	55	147	85
20	122	2,720	86	310	314	76	619	258	48	50	140	81
21	109	1,420	92	200	245	92	671	231	59	43	97	81
22	98	751	102	190	205	180	948	196	88	38	69	99
23	92	594	104	170	170	1,200	1,600	231	83	36	55	111
24	94	466	96	160	150	1,250	1,350	276	72	34	47	138
25	101	354	86	145	170	808	934	269	67	36	42	152
26	109	283	74	110	160	1,500	671	244	64	47	36	113
27	105	268	88	114	135	2,120	689	215	66	45	34	94
28	98	325	98	130	140	3,080	880	193	59	43	33	83
29	94	268	120	145	-	*1,310	636	179	55	47	245	250
30	90	221	245	130	-	1,260	505	176	55	47	467	231
31	85	-	8,200	116	-	867	-	185	-	59	238	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,887	270	36	93.1	0.470	0.54
November	12,014	2,720	72	400	2.02	2.26
December	13,278	8,200	74	428	2.16	2.49
Calendar year 1948	108,661	8,200	32	297	1.50	20.42
January	14,974	4,350	110	483	2.44	2.61
February	6,484	1,360	74	232	1.17	1.22
March	16,027	3,080	76	517	2.61	3.01
April	21,846	1,600	368	728	3.68	4.10
May	12,605	1,180	176	407	2.06	2.37
June	2,352	168	47	78.4	.396	.44
July	1,356	72	34	43.7	.221	.25
August	2,359	467	27	76.1	.384	.44
September	3,765	347	53	126	.636	.71
Water year 1948-49	109,947	8,200	27	301	1.52	20.64

Peak discharge (base, 3,700 sec.-ft.).- Nov. 20 (3 p.m.) 4,620 sec.-ft.; Dec. 31 (3:45 p.m.) 16,500 sec.-ft.; Mar. 28 (5:30 a.m.) 4,310 sec.-ft.
* Winter discharge measurement made on this day.
a No gage-height record; discharge computed on basis of partial gage-height record and records for other stations in Ausable River Basin.
Note.- Stage-discharge relation affected by ice Dec. 10-15, 15-31, Jan. 10 to Feb. 15, Feb. 21 to Mar. 23.

Bouquet River at Willsboro, N. Y.

Location.- Water-stage recorder, lat. 44°21'30", long. 73°23'50", at Willsboro, Essex County, 2½ miles downstream from North Branch Bouquet River.
Drainage area.- 275 square miles.
Records available.- August and September 1904 (gage heights and discharge measurements only), August to November 1908, July 1923 to September 1949.
Average discharge.- 26 years (1923-49), 301 second-feet.
Extremes.- Maximum discharge during year, 7,790 second-feet Dec. 31 (gage height, 8.86 feet); minimum, 44 second-feet Aug. 10 (gage height, 2.23 feet).
1923-49: Maximum discharge, about 11,800 second-feet Oct. 1, 1924 (gage height, 10.85 feet), from rating curve extended above 4,600 second-feet by logarithmic plotting; minimum, 10 second-feet Nov. 26, 1941 (gage height, 1.87 feet).
Remarks.- Records good except those for periods of ice effect, which are fair. Occasional slight diurnal fluctuation at low flow caused by power plants above station.
Revisions.- W 759: Drainage area.

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

2.2	40	3.1	332	5.0	1,880
2.4	71	3.5	577	5.6	2,530
2.6	118	4.0	957	6.4	3,560
2.8	188	4.5	1,400	7.4	5,110

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	54	88	201	5,070	150	185	780	473	158	66	62	121
2	84	86	192	1,350	135	165	646	511	144	62	59	97
3	79	84	173	787	124	155	577	682	134	61	51	79
4	64	86	165	584	116	140	564	524	124	59	53	75
5	61	92	161	505	110	200	518	448	115	57	53	71
6	61	137	238	1,050	106	270	669	557	108	57	53	71
7	59	528	537	1,040	118	230	932	544	102	54	51	64
8	66	467	400	675	130	170	749	518	100	53	50	64
9	235	255	300	564	130	180	639	412	97	53	47	71
10	207	214	250	537	124	175	557	343	95	62	46	68
11	115	227	205	400	112	165	498	311	95	75	46	71
12	95	197	154	250	100	155	486	290	92	69	47	64
13	90	161	218	235	130	140	518	274	88	64	53	59
14	88	140	180	220	180	130	675	260	84	61	51	61
15	82	150	145	200	*240	140	757	245	79	54	48	146
16	77	137	165	240	1,000	135	1,060	222	77	53	46	118
17	77	131	170	380	1,510	124	727	214	73	50	48	90
18	161	124	160	360	680	130	557	205	71	56	71	71
19	184	137	124	370	520	116	639	192	71	66	102	84
20	137	1,390	118	400	430	106	727	205	69	66	84	59
21	128	1,570	124	270	320	135	697	210	71	61	68	57
22	113	646	140	260	260	245	765	188	66	51	59	62
23	102	591	145	235	230	920	941	197	69	54	56	73
24	97	498	130	210	200	1,540	908	222	68	51	53	88
25	97	382	112	185	240	941	772	245	73	53	51	88
26	105	311	100	150	230	1,130	598	218	82	57	51	79
27	102	279	112	155	190	1,700	570	201	77	61	51	75
28	100	284	135	175	195	2,510	742	188	69	61	48	73
29	95	260	175	195	-	1,500	632	173	68	57	159	77
30	92	222	390	175	-	*1,410	531	161	68	53	466	118
31	90	-	3,000	160	-	1,090	-	165	-	58	182	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	3,197	235	54	103	0.375	0.43
November	9,874	1,570	84	329	1.20	1.34
December	8,819	3,000	100	284	1.03	1.19
Calendar year 1948	102,174	3,000	48	279	1.01	13.81
January	17,387	5,070	150	561	2.04	2.35
February	8,010	1,510	100	286	1.04	1.08
March	16,332	2,510	106	527	1.92	2.21
April	20,431	1,060	486	681	2.48	2.76
May	9,598	682	161	310	1.13	1.30
June	2,687	158	86	89.6	.328	.36
July	1,813	75	50	58.5	.213	.25
August	2,365	466	46	76.3	.277	.32
September	2,374	146	57	79.1	.288	.32
Water year 1948-49	102,887	5,070	46	282	1.03	13.91

Peak discharge (base, 2,800 sec.-ft.).- Dec. 31 (12 p.m.) 7,790 sec.-ft.; Mar. 28 (2:30 p.m.) 2,970 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 15-31, Jan. 11 to Feb. 16, Feb. 18 to Mar. 23.

Lake George at Rogers Rock, N. Y.

Location.- Water-stage recorder, lat. 43°48'10", long. 73°27'25", about 500 feet north of Hooper's dock, on south side of Stones Bay, Rogers Rock, Essex County. Datum of gage is 315.93 feet above mean sea level, adjustment of 1912.

Records available.- July 1913 to September 1949.

Extremes.- Maximum gage height during year, 4.48 feet Jan. 6; minimum, 1.99 feet Nov. 3.
1913-49: Maximum gage height observed, 5.09 feet Apr. 9, 1936; minimum, 0.64 foot Dec. 20, 1941.

Remarks.- Elevation of lake surface regulated by power plant and floodgates at Ticonderoga. Lake George has been controlled by a dam at its outlet for more than 100 years.

Gage height, in feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.48	2.07	2.59	3.96	3.85	3.81	3.73	3.79	3.69	3.30	3.03	3.06
2	2.45	2.08	2.57	4.13	3.82	3.79	3.75	3.82	3.70	3.29	3.01	2.96
3	2.36	2.06	2.57	4.16	3.79	3.75	3.76	3.84	3.72	3.27	3.01	2.94
4	2.37	2.06	2.53	4.20	3.77	3.73	3.80	3.86	3.69	3.27	2.98	2.93
5	2.36	2.07	2.53	4.23	3.77	3.71	3.83	3.86	3.65	3.20	2.97	2.95
6	2.33	2.13	2.60	4.34	3.79	3.69	3.86	3.94	3.66	3.21	2.98	2.91
7	2.32	2.23	2.62	4.35	3.80	3.67	3.93	3.91	3.63	3.14	3.00	2.88
8	2.33	2.24	2.60	4.29	3.79	3.65	3.92	3.98	3.60	3.15	3.01	2.88
9	2.43	2.25	2.59	4.24	3.78	3.64	3.92	3.96	3.57	3.19	2.98	2.91
10	2.40	2.29	2.57	4.20	3.74	3.62	3.90	3.89	3.59	3.20	2.97	2.91
11	2.36	2.26	2.55	4.11	3.70	3.65	3.89	3.88	3.56	3.13	2.94	2.92
12	2.34	2.26	2.58	4.13	3.70	3.67	3.88	3.90	3.51	3.15	2.91	2.90
13	2.33	2.26	2.59	4.06	3.67	3.65	3.85	3.89	3.54	3.13	2.86	2.88
14	2.27	2.21	2.54	3.96	3.64	3.61	3.79	3.89	3.55	3.06	2.86	2.91
15	2.22	2.21	2.51	3.94	3.72	3.56	3.84	3.82	3.55	3.09	2.81	2.89
16	2.27	2.19	2.52	3.93	3.79	3.53	3.90	3.85	3.51	3.07	2.84	2.90
17	2.25	2.22	2.54	3.83	3.80	3.48	3.87	3.82	3.48	3.05	2.84	2.87
18	2.31	2.19	2.51	3.81	3.79	3.43	3.87	3.82	3.48	3.09	2.89	2.88
19	2.31	2.17	2.47	3.87	3.77	3.40	3.95	3.79	3.45	3.11	2.82	2.87
20	2.29	2.39	2.47	3.82	3.75	3.37	3.98	3.70	3.43	3.10	2.85	2.87
21	2.28	2.50	2.50	3.81	3.75	3.35	3.96	3.77	3.47	3.06	2.81	2.83
22	2.27	2.52	2.49	3.88	3.77	3.32	3.93	3.79	3.43	3.09	2.81	2.82
23	2.25	2.57	2.46	3.83	3.81	3.39	3.94	3.79	3.39	3.05	2.81	2.81
24	2.20	2.59	2.44	3.65	3.82	3.47	3.88	3.79	3.39	3.02	2.73	2.79
25	2.15	2.57	2.41	3.78	3.83	3.52	3.86	3.81	3.38	3.02	2.75	2.76
26	2.15	2.60	2.44	3.82	3.84	3.57	3.84	3.79	3.40	3.05	2.76	2.78
27	2.15	2.64	2.47	3.84	3.82	3.62	3.81	3.77	3.33	3.04	2.75	2.77
28	2.16	2.58	2.43	3.88	3.81	3.73	3.80	3.75	3.34	3.06	2.74	2.72
29	2.10	2.55	2.47	3.86	-	3.73	3.80	3.73	3.34	3.05	2.90	2.74
30	2.12	2.58	2.58	3.84	-	3.73	3.78	3.73	3.31	3.03	3.02	2.76
31	2.11	-	3.43	3.84	-	3.73	-	3.71	-	3.03	3.01	-

Monthly gage height, in feet, water year October 1948 to September 1949

Month	Maximum	Minimum	Mean
October	2.48	2.10	2.28
November	2.64	2.06	2.32
December	3.43	2.41	2.55
Calendar year 1948	4.13	1.52	2.86
January	4.35	3.78	3.99
February	3.85	3.64	3.77
March	3.81	3.32	3.60
April	3.98	3.73	3.86
May	3.98	3.70	3.83
June	3.72	3.31	3.51
July	3.30	3.02	3.12
August	3.03	2.73	2.89
September	3.06	2.72	2.87
Water year 1948-49	4.35	2.06	3.21

Lake George Outlet at Ticonderoga, N. Y.

Location.- Water-stage recorder and concrete control on river channel, lat. 43°50'35", long. 73°26'00", at Ticonderoga, Essex County, 250 feet downstream from "C" Mill dam of International Paper Co., 250 feet upstream from Trout Brook, and half a mile downstream from upper dam ("A" Mill dam) of International Paper Co. Turbine gate-opening recorder, 250 feet upstream, on tailrace. Datum of gage on river channel is 190.41 feet above mean sea level, datum of 1929.

Drainage area.- 234 square miles.

Records available.- October 1942 to September 1949. August 1904 to December 1905 at site at "B" Mill, 2,000 feet upstream.

Extremes.- Maximum daily discharge during year, 1,060 second-feet Jan. 12; minimum daily, 24 second-feet July 5, Sept. 12, 19.
1942-49: Maximum daily discharge, 1,290 second-feet June 5, 6, 1947; minimum daily, 7.2 second-feet Dec. 25, 1946.

Remarks.- Records excellent except those for periods of no gate-opening record, which are fair. Discharge in tailrace determined from rating for turbine gates developed from discharge measurements. Records represent total discharge from Lake George and include flow in river channel and in tailrace. Flow regulated by Lake George and three power plants.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	183	147	236	144	425	554	353	175	287	187	25	132
2	185	163	236	98	425	625	355	232	287	190	42	135
3	87	163	237	243	425	618	314	330	287	83	47	135
4	169	168	237	319	420	618	320	330	285	25	47	79
5	193	169	157	381	420	618	351	325	151	24	47	26
6	195	168	193	776	342	617	355	325	160	73	47	115
7	194	97	226	918	379	603	468	322	258	73	36	139
8	189	135	226	1,010	414	474	553	223	290	75	25	139
9	181	171	226	918	414	373	547	321	290	46	42	139
10	97	169	226	960	414	373	545	479	285	25	43	139
11	163	169	226	969	410	456	544	473	272	57	42	61
12	190	166	115	1,060	410	652	545	444	135	96	42	24
13	187	159	190	1,050	316	718	545	481	146	90	42	124
14	191	89	234	1,010	392	714	476	480	237	110	35	151
15	191	63	231	1,010	519	724	360	354	259	110	25	131
16	180	140	232	1,000	633	717	360	429	256	110	46	131
17	92	170	231	950	587	709	370	482	253	54	47	131
18	154	168	233	684	518	652	402	385	245	25	48	53
19	187	168	112	345	507	591	695	337	154	99	46	24
20	189	158	162	354	490	524	941	320	122	99	46	136
21	189	83	226	345	456	562	933	289	214	107	35	172
22	187	162	231	342	404	472	884	184	227	104	26	171
23	161	211	229	189	404	420	805	214	221	101	54	169
24	91	217	153	283	404	420	774	272	221	49	46	168
25	187	230	36	339	453	425	779	340	204	25	46	75
26	182	230	53	349	526	425	753	321	89	100	46	113
27	172	231	171	360	453	278	514	288	73	99	46	184
28	181	110	224	462	500	232	536	287	183	100	35	183
29	170	175	223	542	-	288	645	159	188	93	25	199
30	81	240	208	281	-	411	506	94	185	96	42	252
31	84	-	268	382	-	354	-	243	-	46	85	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	5,082	195	81	164	-	-
November	4,889	240	63	163	-	-
December	6,208	268	36	200	-	-
Calendar year 1948	96,650	881	27	264	1.13	15.36
January	18,073	1,060	98	583	-	-
February	12,460	633	316	445	-	-
March	16,217	724	232	523	-	-
April	16,528	941	314	551	-	-
May	9,938	482	94	321	-	-
June	6,464	290	73	215	-	-
July	2,571	190	24	82.9	-	-
August	1,306	85	25	42.1	-	-
September	3,810	252	24	127	-	-
Water year 1948-49	103,546	1,060	24	284	1.21	16.48

Note.- No gate-opening record Oct. 23-30, Jan. 25-29; discharge computed on basis of power-plant record.

Poultney River below Fair Haven, Vt.

Location.- Water-stage recorder, lat. 43°37'40", long. 73°18'50", a third of a mile downstream from Carver Falls, 1.9 miles upstream from Hubbardton River, and 3¼ miles northwest of Fair Haven, Rutland County.
Drainage area.- 187 square miles.
Records available.- October 1928 to September 1949.
Average discharge.- 21 years, 245 second-feet.
Extremes.- Maximum discharge during year, 6,920 second-feet Dec. 31 (gage height, 17.71 feet), from rating curve extended above 2,400 second-feet on basis of computations of flow over dam at gage heights 16.10, 21.40, and 24.36 feet; minimum, 7.2 second-feet Oct. 22, 24; minimum daily, 16 second-feet July 16, 27, Aug. 26, 27.
1928-49: Maximum discharge, 14,800 second-feet July 20, 1945 (gage height, 24.56 feet, from high-water mark in gage well), from rating curve extended above 1,900 second-feet by method explained above; minimum, 2.3 second-feet July 18, 1937; minimum daily, 2.9 second-feet Oct. 13, 1935.
Remarks.- Records good except those for periods of ice effect, which are fair. Flow regulated by power plant above station and by Lake Bomoseen.
Revisions (water years).- W 1114: 1929(M), 1932-35.

Rating tables, water year 1948-49, except periods of ice effect (gage height, in feet, and discharge, in second-feet)

Oct. 1 to Dec. 30				Dec. 31 to Sept. 30					
2.1	10	2.6	66	2.0	12	3.5	206	11.0	2,400
2.2	20	3.0	122	2.2	30	4.0	311	12.0	2,880
2.3	31	3.5	206	2.4	51	5.5	699	14.0	4,030
				2.7	84	7.0	1,120	16.0	5,480
Note.- Same as following table above 3.5 feet.				3.0	120	9.0	1,700		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	71	50	130	2,430	280	350	297	208	102	20	68	63
2	38	60	119	1,240	310	306	264	186	75	23	40	65
3	22	60	101	827	310	306	247	377	72	22	28	58
4	60	60	100	619	240	284	260	429	72	20	28	23
5	66	52	111	524	160	*306	*245	344	62	20	23	35
6	69	18	123	1,520	125	524	248	751	73	20	31	56
7	71	90	172	1,220	280	490	304	486	53	20	18	38
8	89	118	*108	*789	270	365	262	347	52	19	19	54
9	41	45	138	621	280	372	279	300	43	18	17	69
10	19	76	116	551	240	370	258	264	48	19	20	85
11	69	50	113	557	220	340	245	240	60	19	23	50
12	85	56	75	472	125	330	228	207	22	18	28	55
13	72	54	105	440	100	300	232	199	47	17	21	42
14	71	34	112	401	170	268	223	164	46	18	21	55
15	55	54	91	220	330	238	192	151	44	17	21	40
16	18	36	91	220	1,100	214	275	150	44	16	21	41
17	18	44	78	260	925	245	256	124	38	17	20	36
18	84	41	72	320	604	225	247	134	18	20	20	40
19	56	75	87	350	547	155	269	124	21	20	20	50
20	79	476	99	360	521	130	303	124	50	21	21	54
21	55	405	76	300	420	165	270	120	20	21	20	39
22	71	258	74	300	400	265	251	105	21	21	20	42
23	34	269	59	260	430	824	235	111	22	21	19	68
24	19	275	72	260	410	839	212	121	22	20	18	122
25	64	218	18	270	440	531	243	122	23	22	17	83
26	60	184	60	260	510	542	232	117	24	18	16	99
27	66	202	72	300	400	518	272	106	26	16	16	60
28	72	205	65	270	380	557	269	123	24	16	22	67
29	59	149	80	180	-	448	254	90	21	24	93	57
30	29	156	1,420	130	-	387	200	103	19	27	187	79
31	20	-	5,400	190	-	345	-	115	-	29	85	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,702	89	18	54.9	0.294	0.34
November	3,870	476	18	129	.690	.77
December	9,537	5,400	18	308	1.65	1.90
Calendar year 1948	81,978	5,400	15	224	1.20	16.31
January	16,661	2,430	130	537	2.87	3.31
February	10,527	1,100	100	376	2.01	2.09
March	11,539	839	130	372	1.99	2.29
April	7,572	304	192	252	1.35	1.51
May	6,542	751	90	211	1.13	1.30
June	1,264	102	18	42.1	.225	.25
July	619	29	16	20.0	.107	.12
August	1,021	187	16	32.9	.176	.20
September	1,725	122	23	57.5	.307	.34
Water year 1948-49	72,579	5,400	16	199	1.06	14.42

Peak discharge (base, 2,600 sec.-ft.).- Dec. 31 (9 a.m.) 6,920 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 24-30, Jan. 15 to Feb. 16, Feb. 21 to Mar. 1, Mar. 17-21.

Otter Creek at Center Rutland, Vt.

Location.- Water-stage recorder, lat. 43°36'15", long. 73°00'50", at highway bridge in Center Rutland, Rutland County, 200 feet downstream from dam, 1.2 miles downstream from East Creek, and 1½ miles west of Rutland.

Drainage area.- 307 square miles.

Records available.- May 1928 to September 1949.

Average discharge.- 21 years, 543 second-feet.

Extremes.- Maximum discharge during year, 10,000 second-feet Dec. 31 (gage height, 11.45 feet), from rating curve extended above 2,900 second-feet on basis of computation of flow over dam at gage height 11.51 feet; minimum daily, 57 second-feet Aug. 27, 28. 1928-49: Maximum discharge, 13,700 second-feet Sept. 22, 1938 (gage height, 12.45 feet), by computation of flow over dam; minimum daily, 45 second-feet Sept. 21, 1947.

Remarks.- Records good except those for periods of ice effect, which are fair. Flow regulated by power plants and by Chittenden Reservoir on East Creek.

Revisions (water year).- W 1084: 1929.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Jan. 14						Jan. 15 to Sept. 30					
0.2	53	1.6	340	5.0	2,460	0.2	53	1.2	237	3.0	980
.4	77	2.0	480	6.5	3,840	.3	65	1.6	350	4.0	1,660
.6	106	2.4	660	8.0	5,450	.5	94	2.0	480	5.0	2,460
.9	159	3.0	990	11.0	9,350	.8	147	2.4	650		
1.2	227	4.0	1,660								

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	143	135	242	6,650	382	448	839	597	322	96	270	166
2	92	152	227	3,520	377	405	719	548	274	88	156	146
3	58	143	226	1,940	*320	392	634	1,520	227	70	149	102
4	103	180	213	1,220	348	362	659	1,120	207	71	135	89
5	135	186	153	1,020	325	358	640	781	188	96	139	86
6	141	140	227	2,440	251	550	*731	1,260	170	94	98	139
7	138	316	*357	*2,790	314	956	1,200	992	160	78	82	135
8	153	297	306	1,940	326	623	1,090	811	149	72	104	153
9	136	208	247	1,200	308	*572	1,050	635	144	65	107	343
10	112	247	232	1,020	361	548	827	566	132	73	121	388
11	136	233	173	848	343	480	735	489	135	128	112	234
12	144	263	152	606	294	455	713	429	125	101	146	189
13	147	172	222	620	264	424	693	410	133	105	98	166
14	150	133	263	588	421	391	720	361	113	103	84	130
15	140	173	179	451	1,060	411	704	364	114	95	103	185
16	86	175	222	494	b1,950	366	1,440	325	108	86	101	142
17	68	188	194	549	b1,550	355	1,090	309	103	71	107	114
18	185	188	141	553	860	309	806	288	90	128	180	105
19	202	186	99	571	789	b270	913	286	84	206	141	273
20	190	951	175	638	715	259	1,030	318	123	149	86	368
21	174	1,180	178	416	637	309	1,020	380	200	132	74	256
22	162	602	196	414	540	467	865	298	163	116	92	252
23	108	591	182	425	560	1,460	942	364	133	85	104	503
24	84	516	157	397	556	1,700	979	401	117	66	115	908
25	142	381	89	432	569	1,360	748	433	105	122	81	546
26	160	322	101	335	510	1,430	658	348	206	119	93	357
27	152	293	142	354	380	1,820	1,020	352	144	128	57	284
28	146	338	180	410	440	2,380	1,100	304	116	152	57	238
29	144	276	189	457	-	2,220	863	328	115	237	480	218
30	94	275	1,600	280	-	1,510	697	374	111	146	438	269
31	74	-	9,160	350	-	1,050	-	377	-	328	233	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches	Change in reservoir contents†
October	4,099	202	58	132	0.430	0.50	-43.2
November	9,440	1,180	133	315	1.03	1.14	+2.12
December	16,424	9,160	89	530	1.73	1.99	+10.7
Calendar year 1948	173,374	9,160	58	474	1.54	21.01	+14.5
January	33,928	6,650	280	1,094	3.56	4.11	-10.7
February	15,750	1,950	251	562	1.83	1.91	-50.2
March	24,640	2,380	259	795	2.59	2.98	+42.7
April	26,125	1,440	634	871	2.84	3.16	+47.2
May	16,368	1,520	286	528	1.72	1.98	+32.3
June	4,511	322	84	150	.489	.55	-7.10
July	3,606	328	65	116	.378	.44	-14.0
August	4,343	480	57	140	.456	.53	-14.0
September	7,484	908	86	249	.811	.91	-2.89
Water year 1948-49	166,718	9,160	57	457	1.49	20.20	-.28

Peak discharge (base, 3,400 sec.-ft.).- Dec. 31 (12 m. to 1 p.m.) 10,000 sec.-ft.

* Winter discharge measurement made on this day.

† Change in contents, equivalent in second-feet, in Chittenden Reservoir.

b Stage-discharge relation affected by ice.

Otter Creek at Middlebury, Vt.

Location.- Water-stage recorder, lat. 44°00'45", long. 73°10'05", 150 feet upstream from highway bridge in Middlebury, Addison County, and 3½ miles downstream from Middlebury River.

Drainage area.- 628 square miles.

Records available.- April 1903 to May 1907, October 1910 to January 1920, October 1928 to September 1949.

Average discharge.- 33 years (1903-6, 1910-19, 1928-49), 974 second-feet.

Extremes.- Maximum discharge during year, 6,220 second-feet Jan. 4 (gage height, 7.26 feet); minimum, 139 second-feet July 8.

1903-7, 1910-20, 1928-49: Maximum discharge, 11,000 second-feet Mar. 20, 21, 1936 (gage height, 10.3 feet); minimum, 93 second-feet Mar. 5, 1929.

Maximum discharge known, 13,600 second-feet Nov. 4, 1927 (gage height, 13.3 feet, present datum, at chain-gage site, 1,800 feet upstream), from rating curve extended above 9,000 second-feet by logarithmic plotting.

Remarks.- Records excellent except those for periods of ice effect, shifting control, or backwater from aquatic vegetation or debris, which are good. Some regulation by Chittenden Reservoir on East Creek.

Revisions (water years).- W 434: 1903, 1904. W 684: 1913(M), drainage area. W 1114: 1913.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	178	190	524	2,190	643	878	2,460	1,170	776	192	387	447
2	235	217	461	*3,270	720	870	2,360	1,040	650	183	341	296
3	208	245	405	5,290	700	811	2,160	1,130	559	162	252	235
4	178	259	376	6,140	615	*741	1,990	1,630	442	152	214	197
5	208	323	358	5,880	570	734	1,750	1,650	332	152	203	185
6	235	328	337	*5,560	530	870	1,540	1,590	376	152	187	200
7	245	823	*650	5,060	475	1,310	1,620	1,650	352	146	165	222
8	242	892	671	4,530	560	1,360	1,720	1,580	323	141	158	235
9	323	678	594	4,210	629	1,200	1,690	1,390	323	144	173	296
10	288	538	498	3,980	636	1,090	1,620	1,150	305	165	169	426
11	222	594	419	3,670	615	1,000	1,460	975	275	185	165	496
12	256	489	318	3,440	510	915	1,300	870	245	195	178	376
13	280	475	332	3,120	454	804	1,190	790	249	195	175	284
14	267	364	419	2,780	475	776	1,150	713	271	192	158	249
15	271	296	399	2,400	890	804	1,160	664	259	180	150	259
16	252	337	364	2,000	1,800	776	1,440	643	235	171	169	245
17	225	337	352	1,660	1,860	741	1,640	601	219	156	183	239
18	326	370	332	1,410	1,890	692	1,610	559	208	146	264	211
19	393	364	222	1,270	1,920	566	1,500	468	185	185	405	203
20	393	1,290	171	1,260	1,910	454	1,520	580	180	228	274	274
21	352	2,180	256	1,110	1,850	517	1,570	580	245	219	183	405
22	314	2,090	332	878	1,740	622	1,540	594	275	205	165	364
23	284	1,940	320	850	1,470	1,480	1,480	580	280	183	190	405
24	249	1,720	290	790	1,340	2,010	1,490	664	259	169	175	727
25	203	1,310	235	770	1,250	2,070	1,460	727	235	169	173	1,000
26	239	930	175	720	1,240	2,180	1,310	741	225	195	178	811
27	280	797	175	680	1,050	2,270	1,250	699	245	203	165	580
28	275	769	223	730	922	2,320	1,470	664	256	211	148	440
29	252	699	249	805	-	2,310	1,520	594	219	217	348	358
30	245	587	515	770	-	2,460	1,380	650	197	259	930	364
31	222	-	1,690	590	-	2,480	-	734	-	275	734	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches	Change in reservoir contents†
October	8,140	393	178	263	0.419	0.48	-43.2
November	22,431	2,180	190	748	1.19	1.33	+2.12
December	12,660	1,690	171	408	.650	.75	+10.7
Calendar year 1948	302,723	6,550	128	827	1.32	17.94	+14.5
January	77,793	6,140	590	2,509	4.00	4.61	-10.7
February	29,264	1,920	454	1,045	1.66	1.73	-50.2
March	38,111	2,480	454	1,229	1.96	2.26	+42.7
April	47,350	2,460	1,150	1,578	2.51	2.80	+47.2
May	28,070	1,650	468	905	1.44	1.66	+32.3
June	9,200	776	180	307	.489	.54	-7.10
July	5,727	275	141	185	.295	.34	-14.0
August	7,759	930	148	250	.398	.46	-14.0
September	11,029	1,000	185	368	.586	.65	-2.89
Water year 1948-49	297,534	6,140	141	815	1.30	17.61	-.285

Peak discharge (base, 3,100 sec.-ft.).- Jan. 4 (3 p.m.) 6,220 sec.-ft.

* Winter discharge measurement made on this day.

† Change in contents, equivalent in second-feet, in Chittenden Reservoir.

Note.- Stage-discharge relation affected by ice Dec. 23-27, Jan. 15, 23-31, Feb. 2, 3, 5, 6, 8, 12. Backwater from aquatic vegetation or debris, or shifting-control method used Oct. 1-18, Nov. 21 to Jan. 3, May 12 to June 21, June 25 to Sept. 7, Sept. 11-30.

East Creek at Rutland, Vt.

Location.- Water-stage recorder, lat. 43°37'40", long. 72°59'20", at Rutland, Rutland County, on grounds of Rutland Country Club, 280 feet downstream from Grove Street Bridge and 2 miles upstream from mouth.

Drainage area.- 51.1 square miles.

Records available.- August 1940 to September 1949.

Extremes.- Maximum discharge during year, 1,450 second-feet Dec. 31 (gage height, 4.26 feet); minimum daily, 5.2 second-feet Dec. 5.
1940-49: Maximum discharge, 36,500 second-feet June 3, 1947 (gage height, 20.3 feet, from high-water mark in gage house), mean of two slope-area determinations; minimum daily, 3.1 second-feet Nov. 8, 1947.

Remarks.- Records excellent except those for period of shifting control and those below 60 second-feet, which are good. Diversion above station from Mendon Brook for municipal supply of Rutland. Flow regulated by power plants and by Chittenden Reservoir (capacity, 819,800,000 cubic feet).

Rating tables, water year 1948-49, except period of shifting control (gage height, in feet, and discharge, in second-feet).

Oct. 1 to Jan. 14

0.6	2.9	1.2	36	2.1	241
.7	5.5	1.4	59	2.5	405
.8	9.2	1.5	74	3.0	655
.9	14	1.6	92	3.6	940
1.0	20	1.7	114		
1.1	27	1.8	140		

Jan. 15 to Sept. 30

0.8	7.3	1.2	34
.9	12	1.3	45
1.0	17	1.4	58
1.1	24	1.5	74

Note.- Same as preceding table above 1.5 feet.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	89	77	52	298	113	106	94	57	38	24	24	34
2	22	83	54	142	110	98	76	57	40	20	13	32
3	11	82	56	140	97	90	69	411	21	12	32	10
4	82	95	52	136	112	82	86	158	25	11	24	11
5	93	81	5.2	145	84	37	73	110	24	12	39	12
6	90	28	77	397	38	100	113	139	22	12	11	49
7	87	127	90	204	97	90	138	108	20	12	12	34
8	100	34	64	104	110	85	95	76	23	12	35	47
9	36	56	55	80	90	68	91	66	22	12	42	100
10	13	100	62	134	119	68	76	76	24	12	48	30
11	77	32	27	125	105	50	68	54	12	41	44	22
12	73	65	17	110	89	38	64	55	19	21	49	49
13	84	30	63	133	36	51	75	44	29	31	10	37
14	88	13	83	128	100	28	80	40	19	24	16	14
15	81	72	39	110	221	47	90	48	21	22	41	66
16	25	72	80	91	250	37	127	42	22	16	42	8.8
17	13	81	52	123	148	28	73	32	26	12	48	9.6
18	96	66	11	125	128	26	73	37	13	55	88	9.6
19	84	69	12	139	123	41	84	56	13	54	32	39
20	90	224	78	129	53	20	103	45	41	57	10	52
21	84	96	55	110	123	40	104	35	54	40	11	47
22	80	62	63	119	38	91	74	35	45	42	33	51
23	28	95	57	77	124	282	108	54	20	10	48	69
24	13	61	53	104	126	189	117	58	26	11	57	68
25	86	52	11	120	123	138	59	65	25	49	37	31
26	83	52	12	106	48	176	85	60	20	41	42	30
27	87	39	53	100	49	215	96	61	21	52	11	40
28	74	41	78	125	99	293	80	44	20	54	12	27
29	74	37	92	111	-	136	84	56	35	54	212	25
30	25	64	469	37	-	172	57	47	25	16	40	24
31	8.8	-	930	101	-	102	-	62	-	67	30	-

Month	Observed				Change in contents and diversion (equivalent, second-feet)†	Adjusted		
	Second-foot-days	Maximum	Minimum	Mean		Mean	Per square mile	Runoff in inches
October	1,976.8	100	8.8	63.8	-38.4	25.4	0.497	0.57
November	2,086	224	13	69.5	+6.90	76.4	1.50	1.67
December	2,902.2	930	5.2	93.6	+15.7	109	2.13	2.47
Calendar year 1948	25,968.9	930	4.0	71.0	+19.5	90.5	1.77	24.12
January	4,103	397	37	132	-5.39	127	2.49	2.86
February	2,953	250	36	105	-44.9	60.6	1.19	1.24
March	3,004	293	20	96.9	+47.9	145	2.84	3.27
April	2,612	138	57	87.1	+52.0	139	2.72	3.04
May	2,288	411	32	73.8	+36.9	111	2.17	2.50
June	765	54	12	25.5	-1.89	23.6	.462	.52
July	908	67	10	29.3	-8.81	20.5	.401	.46
August	1,193	212	10	38.5	-9.06	29.4	.575	.66
September	1,078.0	100	8.8	35.9	+1.77	37.7	.738	.82
Water year 1948-49	25,869.0	930	5.2	70.9	+4.70	75.6	1.48	20.08

† Change in contents in Chittenden Reservoir and diversion from Mendon Brook for supply of Rutland.
Note.- Shifting-control method used June 12 to Sept. 30.

Winooski River at Montpelier, Vt.

Location.- Water-stage recorder, lat. 44°15'25", long. 72°35'35", three-eighths of a mile upstream from Dog River and 1 mile downstream from depot in Montpelier, Washington County. Datum of gage is 499.99 feet above mean sea level, datum of 1929.
Drainage area.- 397 square miles.
Records available.- May 1909 to September 1923, August 1928 to September 1949.
Average discharge.- 30 years (1914-23, 1928-49), 589 second-feet (adjusted for change in reservoir contents since October 1938).
Extremes.- Maximum discharge during year, 6,950 second-feet Dec. 31 (gage height, 10.46 feet); minimum daily, 39 second-feet July 10.
1909-23, 1928-49: Maximum discharge, 20,200 second-feet Apr. 7, 1912 (gage height, about 16.7 feet, present datum), from rating curve extended above 6,900 second-feet on basis of slope-area determination at gage height 27.1 feet; minimum, 6 second-feet Sept. 30, 1921 (gage height, 2.58 feet); minimum daily, 17 second-feet Sept. 3, 1933.
Maximum discharge known, 57,000 second-feet Nov. 3, 1927 (gage height, 27.1 feet), by slope-area method.
Remarks.- Records excellent except those for period of backwater from aquatic vegetation, which are good, and those for periods of ice effect or no gage-height record, which are fair. Flow regulated by several small power plants above station, by Peacham Pond and Mollys Falls Reservoir (combined usable capacity, 492,000,000 cubic feet), which regulate runoff from 24 square miles, and by East Barre and Wrightsville Detention Reservoirs (combined usable capacity, 1,379,500,000 cubic feet; see p. 295).
Revisions (water years). W 434: 1915. W 894: Drainage area.

Rating table, water year 1948-49, except periods of ice effect or backwater from aquatic vegetation (gage height, in feet, and discharge, in second-feet)

2.8	35	3.3	110	4.8	830
2.9	45	3.5	162	5.3	1,220
3.0	58	3.7	230	6.0	1,890
3.1	73	4.0	360	7.0	2,990
3.2	90	4.4	570	9.0	5,200

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	113	118	471	2,580	*340	380	1,760	624	282	123	151	128
2	134	116	455	*1,780	340	*360	*1,570	600	228	72	120	122
3	79	130	390	1,490	340	360	1,380	1,640	191	59	106	104
4	84	143	380	1,170	340	330	2,010	1,470	168	51	119	88
5	63	280	296	1,110	350	310	1,600	1,060	131	72	107	55
6	87	221	380	1,850	250	490	1,750	802	146	78	66	80
7	86	737	660	1,540	280	640	2,160	996	160	82	55	103
8	105	779	548	1,120	350	520	1,690	916	135	66	68	100
9	324	494	471	a980	350	520	1,400	718	127	46	72	98
10	248	362	410	a800	340	450	1,200	618	126	39	85	70
11	159	420	351	690	320	420	1,100	526	118	82	112	57
12	139	360	280	470	280	390	1,000	482	76	94	113	88
13	135	263	*312	500	240	290	956	430	89	124	68	71
14	157	391	375	480	280	340	932	395	102	106	42	75
15	145	410	300	450	480	370	982	351	101	108	68	85
16	112	336	330	460	1,100	340	1,470	360	114	75	60	72
17	97	287	310	480	980	360	1,100	327	114	82	64	58
18	327	316	280	500	640	320	940	290	96	106	110	48
19	433	311	210	540	560	310	1,010	299	80	149	123	80
20	223	1,990	250	490	470	270	1,340	363	85	153	88	74
21	158	1,890	270	390	430	290	1,310	283	159	129	55	102
22	191	1,350	250	340	440	500	1,180	240	179	88	82	116
23	162	1,440	250	400	430	2,800	1,100	310	161	52	66	116
24	117	1,170	210	400	410	2,300	1,070	376	134	53	80	218
25	157	1,000	180	370	370	1,840	1,050	357	103	82	82	150
26	154	809	160	340	370	2,350	996	368	179	76	74	127
27	164	795	190	370	300	2,440	1,080	375	148	140	45	141
28	148	781	230	380	330	3,090	1,140	346	124	242	40	131
29	134	624	260	340	-	2,450	940	259	128	128	169	110
30	122	515	1,800	270	-	2,410	753	296	128	68	315	131
31	96	-	5,170	310	-	2,020	-	313	-	98	158	-

Month	Observed				Change in contents (equivalent second-feet)†	Adjusted for change in reservoir contents		
	Second-foot-days	Maximum	Minimum	Mean		Mean	Per square mile	Runoff in inches
October	4,851	433	63	156	-9.71	147	0.370	0.43
November	18,938	1,990	116	631	+20.0	651	1.64	1.83
December	16,429	5,170	160	530	+61.5	591	1.49	1.72
Calendar year 1948	177,086	5,170	63	484	+10.2	494	1.24	16.93
January	23,390	2,580	270	755	-84.2	670	1.69	1.95
February	11,710	1,100	240	418	-41.4	377	.950	.99
March	30,060	3,090	270	970	+95.3	1,065	2.68	3.09
April	37,929	2,160	753	1,264	-41.7	1,223	3.08	3.44
May	16,790	1,640	240	542	+17.1	559	1.41	1.62
June	4,092	282	60	136	-6.77	130	.327	.36
July	2,925	242	39	94.4	-3.94	90.4	.228	.26
August	2,963	315	40	95.6	-15.6	80.0	.202	.23
September	2,998	218	48	99.9	-19.3	80.6	.203	.23
Water year 1948-49	173,075	5,170	39	474	-1.96	472	1.19	16.15

Peak discharge (base, 3,900 sec.-ft.).- Dec. 31 (7 a.m.) 6,950 sec.-ft.
* Winter discharge measurement made on this day.
† Change in contents in Peacham Pond, Mollys Falls Reservoir, and East Barre and Wrightsville Detention Reservoirs.
a No gage-height record; discharge computed on basis of weather and power-plant records.
Note.- Stage-discharge relation affected by ice Dec. 12, 15-30, Jan. 12 to Mar. 23. Backwater from aquatic vegetation July 19 to Sept. 30.

Winooski River near Essex Junction, Vt.

Location.- Water-stage recorder, lat. 44°28'40", long. 73°08'20", half a mile downstream from Muddy Brook and 2 miles southwest of Essex Junction, Chittenden County.
Drainage area.- 1,044 square miles.
Records available.- October 1928 to September 1949.
Average discharge.- 21 years, 1,652 second-feet (adjusted for change in reservoir contents since October 1938).
Extremes.- Maximum discharge during year, 28,500 second-feet Dec. 31 (gage height, 16.09 feet); minimum daily, 82 second-feet Sept. 11.

1928-49: Maximum discharge, 45,300 second-feet Mar. 19, 1936 (gage height, 23.54 feet), from rating curve extended above 25,000 second-feet on basis of slope-area determination and computations of flow over dam at gage heights 18.72, 23.54, and 50.4 feet; minimum daily, 70 second-feet Sept. 25, 1937.

Maximum discharge known, 113,000 second-feet Nov. 4, 1927 (gage height, 50.4 feet, from floodmarks), by slope-area determination and computation of flow over dam.

Remarks.- Records excellent except those for periods of ice effect, which are fair. Flow regulated by power plants above station, by Peacham Pond and Mollys Falls Reservoir (combined usable capacity, 492,000,000 cubic feet), by Waterbury Reservoir (see p. 300), and by East Barre and Wrightsville Detention Reservoirs (see following page).
Revisions (water years).- W 714: 1930(M). W 894: Drainage area.

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

0.2	80	1.0	350	3.0	2,380
.3	101	1.3	515	4.0	4,300
.4	125	1.7	800	6.0	8,400
.6	183	2.1	1,160	9.0	14,000
.8	256	2.5	1,630	12.0	20,000

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	511	456	1,320	20,000	1,050	1,250	3,780	2,490	811	390	494	450
2	316	436	1,460	6,800	1,100	1,500	3,270	1,750	656	138	459	356
3	192	442	1,200	5,000	1,100	1,400	2,870	2,740	718	97	398	132
4	458	562	872	4,100	1,050	1,400	3,350	3,600	544	116	388	128
5	480	480	914	3,400	950	1,400	3,500	2,690	390	211	428	220
6	386	584	1,420	2,900	660	1,500	3,250	2,700	610	150	145	348
7	366	1,680	2,130	5,400	1,000	1,700	5,220	1,840	658	188	87	336
8	440	2,220	2,140	3,600	1,100	1,350	*4,380	2,160	500	210	354	369
9	899	1,460	1,430	2,700	1,100	1,500	3,620	2,240	504	128	350	426
10	633	1,270	1,390	2,400	1,100	1,500	2,970	2,000	502	226	423	179
11	392	1,070	1,300	*2,000	1,050	1,200	3,270	1,300	318	354	378	82
12	348	1,030	791	1,630	950	1,250	3,120	1,390	108	352	398	369
13	362	760	1,180	1,260	700	900	3,120	1,240	438	420	138	376
14	423	905	*1,360	1,280	1,000	1,100	3,370	705	298	396	84	390
15	532	1,070	822	1,050	1,500	1,200	3,220	810	376	390	366	364
16	327	852	1,050	900	3,000	1,150	4,620	1,070	425	274	324	328
17	250	822	1,010	1,300	2,500	1,100	3,860	789	420	124	422	240
18	858	780	778	1,200	1,600	1,100	3,200	625	160	392	354	94
19	910	904	430	1,300	1,400	900	3,180	728	85	428	455	332
20	706	5,370	820	1,400	1,400	900	3,580	737	474	432	340	374
21	481	7,800	810	1,200	1,400	900	4,140	752	463	386	94	453
22	458	4,530	860	850	1,450	1,200	3,900	608	469	396	329	394
23	340	4,120	840	950	1,250	5,800	3,180	706	427	195	313	464
24	337	4,120	850	1,200	1,450	6,980	3,540	852	462	102	354	304
25	406	3,290	500	1,200	1,500	4,760	3,780	974	158	372	324	346
26	576	2,580	320	1,200	1,600	5,900	3,250	1,120	225	338	345	348
27	493	1,900	750	1,100	1,000	7,160	3,440	876	467	514	160	448
28	522	1,980	820	1,200	1,300	9,140	3,880	719	450	852	117	399
29	467	1,710	900	750	-	6,170	3,330	895	334	600	839	428
30	310	1,480	6,000	820	-	5,660	2,840	832	386	284	1,270	458
31	300	-	14,000	1,150	-	4,720	-	978	-	214	589	-

Month	Observed				Change in contents (equivalent, second-foot)†	Adjusted for change in reservoir contents		
	Second-foot-days	Maximum	Minimum	Mean		Mean	Per square mile	Runoff in inches
October	14,479	910	192	467	-16.0	451	0.432	0.50
November	56,643	7,800	436	1,888	+211	2,099	2.01	2.24
December	50,467	14,000	320	1,628	+150	1,778	1.70	1.96
Calendar year 1948	539,303	14,000	112	1,474	+43.1	1,517	1.45	19.77
January	81,240	20,000	750	2,621	-240	2,381	2.28	2.63
February	36,260	3,000	660	1,295	-253	1,042	.998	1.04
March	83,690	9,140	900	2,700	+225	2,925	2.80	3.23
April	106,030	5,220	2,840	3,534	+55.9	3,590	3.44	3.84
May	42,916	3,600	608	1,384	+42.2	1,427	1.37	1.58
June	12,836	811	85	428	-49.7	378	.362	.40
July	9,669	852	97	312	-30.5	281	.269	.31
August	11,519	1,270	84	372	-75.5	296	.284	.33
September	9,935	464	82	331	-30.6	301	.288	.32
Water year 1948-49	515,684	20,000	82	1,413	+.67	1,413	1.35	18.38

Peak discharge (base, 12,500 sec.-ft.).- Dec. 31 (time unknown) 28,500 sec.-ft.
* Winter discharge measurement made on this day.
† Change in contents in Peacham Pond, Mollys Falls Reservoir, East Barre and Wrightsville Detention Reservoirs, and Waterbury Reservoir.
Note.- No gage-height record Dec. 19 to Jan. 11, Jan. 16 to Feb. 13; discharge computed on basis of 1 discharge measurement, weather records, recorded range in stage, power-plant records, and records for other stations in Winooski River Basin. Stage-discharge relation affected by ice Feb. 14 to Mar. 23 and during parts of periods of no gage-height record.

Reservoirs in Winooski River Basin above Montpelier, Vt.

East Barre Detention Reservoir.- Staff gage, lat. 44°09'20", long. 72°26'40", at reservoir on Jail Branch at East Barre, Washington County, 4½ miles upstream from mouth of Jail Branch. Datum of gage is 1,127.9 feet above mean sea level (levels by Corps of Engineers). Drainage area, 38.8 square miles. Records available, March and April 1936, September 1938 to September 1949. Maximum gage height observed during year, 16.1 feet Dec. 31, Mar. 28; minimum observed, 0.3 foot Oct. 1-4. Maximum gage height observed during period 1936, 1938-49, 36.0 feet Mar. 22, 1936; minimum observed, 0.1 foot on several days in August and September 1939.

Reservoir is formed by earth-fill dam completed by Corps of Engineers in 1935 for flood control. Capacity of reservoir, 506,000,000 cubic feet between gage heights 0.0 foot (bottom of outlet opening) and 37.1 feet (crest of spillway). Dam has no gates; below gage height 37.1 feet outflow from reservoir is dependent on capacity of outlet opening, 4 feet square, near base of dam. Gage read once daily by employee of State of Vermont Water Conservation Baord.

Wrightsville Detention Reservoir.- Staff gage, lat. 44°18'35", long. 72°34'30", at reservoir on North Branch Winooski River at Wrightsville, Washington County, a third of a mile downstream from Long Meadow Brook and 4¼ miles upstream from mouth. Datum of gage is 612.75 feet above mean sea level (levels by Corps of Engineers). Drainage area, 66.5 square miles. Records available, March and April 1936, September 1938 to September 1949. Maximum gage height observed during year, 36.2 feet Mar. 30; minimum observed, 0.2 foot Aug. 17. Maximum gage height during period 1936, 1938-49, 63.7 feet Mar. 22, 1936, from graph based on gage readings; minimum observed, that of Aug. 17, 1949.

Reservoir is formed by earth-fill dam completed by Corps of Engineers in 1935 for flood control. Capacity of reservoir, 873,500,000 cubic feet between gage heights 0.0 foot (bottom of outlet opening) and 72.25 feet (crest of spillway). Dam has no gates; below gage height 72.25 feet outflow from reservoir is dependent on capacity of outlet opening, 5¼ feet square, near base of dam. Gage read once daily by employee of State of Vermont Water Conservation Board.

Monthly gage height and contents, water year October 1948 to September 1949

Date	East Barre Detention Reservoir			
	Gage height (feet)†	Contents (millions of cubic feet)	Change in contents during month	
			Millions of cubic feet	Equivalent, second-feet
Sept.30	0.3	0.15	-	-
Oct. 31	2.0	1.11	+0.96	+0.[illegible]
Nov. 30	2.8	1.71	+.60	+.2[illegible]
Dec. 31	15.7	57.1	+55.39	+20.7
Calendar year 1948	-	-	+56.7	+1.79
Jan. 31	1.7	.93	-56.17	-21.0
Feb. 28	1.7	.93	0	0
Mar. 31	13.0	29.9	+28.97	+10.8
Apr. 30	3.4	2.21	-27.69	-10.7
May 31	2.2	1.26	-.95	-.3[illegible]
June 30	.8	.40	-.86	-.33
July 31	1.5	.80	+.40	+.15
Aug. 31	1.2	.62	-.18	-.07
Sept.30	2.1	1.18	+.56	+.22
Water year 1948-49	-	-	+1.03	+.03

Date	Wrightsville Detention Reservoir			
Sept.30	.06	1.35	-	-
Oct. 31	1.0	2.25	+0.90	+0.34
Nov. 30	4.2	11.2	+8.95	+3.45
Dec. 31	30.6	185.4	+174.2	+65.0
Calendar year 1948	-	-	+182.65	+5.78
Jan. 31	1.8	4.25	-181.15	-67.6
Feb. 28	2.0	4.80	+.55	+.23
Mar. 31	33.4	214.6	+209.8	+78.3
Apr. 30	5.0	13.8	-200.8	-77.5
May 31	2.1	5.05	-8.75	-3.27
June 30	.5	1.10	-3.95	-1.52
July 31	1.0	2.25	+1.15	+.43
Aug. 31	2.4	5.90	+3.65	+1.36
Sept.30	1.7	4.00	-1.90	-.73
Water year 1948-49	-	-	+2.65	+.08

† Gage height at 12 p.m. determined from graph based on observer's readings and records for station on river below reservoir.

Jail Branch at East Barre, Vt.

Location.- Water-stage recorder, lat. 44°09'40", long. 72°27'00", at East Barre, Washington County, just downstream from highway bridge, 0.6 mile downstream from East Barre Detention Reservoir and 3.9 miles upstream from mouth. Datum of gage is 1,071.59 feet above mean sea level (levels by Corps of Engineers).

Drainage area.- 40.4 square miles.

Records available.- August 1920 to September 1923, November 1933 to September 1949.

Average discharge.- 19 years, 57.3 second-feet (adjusted).

Extremes.- Maximum discharge during year, 309 second-feet Dec. 31, Jan. 1, Mar. 28; maximum gage height, 2.08 feet Mar. 23 (ice jam); minimum discharge, 0.3 second-foot Aug. 17.

1920-23, 1933-49: Maximum discharge observed, 1,350 second-feet Apr. 10, 1922 (gage height, 8.38 feet, site and datum then in use), from rating curve extended above 900 second-feet; minimum, that of Aug. 17, 1949.

Remarks.- Records good except those below 10 second-feet and those for periods of ice effect, which are fair. Discharge affected by East Barre Detention Reservoir (see p. 295). Diurnal fluctuation at low flow caused by mill above station. Diversion from reservoir on Orange Brook, a tributary above station, for city of Barre.

Revisions.- W 1034: Drainage area.

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.8	6.6	23	297	19	*20	255	57	26	3.4	7.3	6.1
2	3.1	5.6	24	279	*19	19	194	54	15	2.9	3.8	5.5
3	3.3	5.3	21	229	17	18	89	214	13	2.7	2.4	4.8
4	3.3	7.9	20	*60	17	18	186	252	11	2.1	1.6	4.2
5	3.4	30	19	60	18	17	160	177	9.9	2.1	1.4	5.2
6	3.4	16	25	195	17	24	157	86	8.7	2.2	1.2	15
7	3.3	86	44	172	16	35	219	91	7.2	1.4	.7	6.4
8	4.2	49	31	76	16	30	173	70	7.2	1.5	.7	5.4
9	34	22	23	66	18	28	116	54	6.9	.9	.6	8.0
10	8.8	23	18	66	19	27	87	47	6.6	3.0	.8	6.0
11	5.0	31	*19	50	17	26	81	41	6.4	5.0	.7	4.6
12	4.2	*20	17	43	15	25	74	40	5.8	3.3	1.0	4.2
13	4.0	12	18	38	19	24	74	39	5.4	4.5	2.4	3.9
14	3.6	22	18	35	26	23	89	37	4.8	5.0	1.4	3.9
15	3.6	17	13	31	40	22	100	39	4.7	3.1	.7	4.5
16	3.6	15	12	33	80	21	199	33	4.3	2.6	.4	5.8
17	4.2	13	12	35	52	20	127	29	3.7	2.1	.5	5.3
18	25	20	11	31	39	19	89	25	3.6	3.8	2.0	4.5
19	17	19	10	33	33	18	108	29	3.6	5.1	6.3	5.3
20	12	186	9.0	35	31	18	164	47	5.2	3.2	4.7	5.4
21	11	204	8.5	29	28	18	173	29	16	1.8	3.4	6.1
22	9.8	72	8.3	30	26	28	119	25	9.1	1.0	2.3	7.9
23	9.8	85	8.0	26	25	230	132	38	9.3	.8	2.5	15
24	12	66	7.7	24	23	273	119	46	5.2	.6	1.1	41
25	11	43	7.2	22	23	261	86	49	7.9	1.1	.9	16
26	9.8	33	6.8	21	22	273	81	36	24	3.1	.7	9.8
27	8.3	42	6.5	20	21	285	99	61	6.6	2.9	.7	5.8
28	8.0	44	7.0	19	21	303	119	40	5.0	12	1.8	6.2
29	7.3	30	8.0	20	-	303	76	33	4.8	5.8	60	5.6
30	7.0	24	160	19	-	291	64	33	4.2	3.2	29	11
31	7.0	-	303	19	-	*273	-	30	-	6.4	8.3	-

Month	Obaerved				Change in contents (equivalent, second-feet)†	Adjusted for change in reservoir contents		
	Second-foot-days	Maximum	Minimum	Mean		Mean	Per aquare mile	Runoff in inches
October	252.8	34	2.8	8.15	+0.36	8.51	0.211	0.24
November	1,249.4	204	5.3	41.6	+.23	41.9	1.04	1.16
December	918.0	303	6.5	29.6	+20.7	50.3	1.25	1.44
Calendar year 1948	15,838.7	338	2.0	43.3	+1.79	45.1	1.12	15.19
January	2,113	297	19	68.2	-21.0	47.2	1.17	1.35
February	717	80	15	25.6	0	25.6	.634	.66
March	2,990	303	17	96.5	+10.8	107	2.65	3.06
April	3,809	255	64	127	-10.7	116	2.87	3.21
May	1,881	252	25	60.7	-.35	60.3	1.49	1.72
June	251.1	26	3.6	8.37	-.33	8.04	.199	.22
July	98.6	12	.6	3.18	+.15	3.33	.082	.09
August	151.3	60	.4	4.88	-.07	4.81	.119	.14
September	238.4	41	3.9	7.95	+.22	8.16	.202	.23
Water year 1948-49	14,669.6	303	.4	40.2	+.03	40.2	.995	13.52

* Winter discharge measurement made on this day.

† Change in contents in East Barre Detention Reservoir.

Note.- Stage-discharge relation affected by ice Nov. 30 to Dec. 30, Jan. 10-30, Feb. 14-22, 24, 26-28, Mar. 3, 4, 6-23.

North Branch Winooski River at Wrightsville, Vt.

Location.- Water-stage recorder and concrete control, lat. 44°18'00", long. 72°34'45", at Wrightsville, Washington County, three-quarters of a mile downstream from Wrightsville Detention Reservoir and 3½ miles upstream from mouth. Datum of gage is 550.53 feet above mean sea level (levels by Corps of Engineers).
Drainage area.- 69.2 square miles.
Records available.- October 1933 to September 1949.
Average discharge.- 16 years, 132 second-feet (adjusted).
Extremes.- Maximum discharge during year, 663 second-feet Mar. 30 (gage height, 3.47 feet); minimum daily, 2.3 second-feet Aug. 27, 28.
1933-49: Maximum discharge, 2,170 second-feet Apr. 12, 1934 (gage height, 6.53 feet), from rating curve extended above 920 second-feet; minimum daily, 0.2 second-foot Aug. 13, 1941.
Maximum discharge known, 17,200 second-feet Nov. 3, 1927, by computation of flow over dam three-quarters of a mile above gage.
Remarks.- Records excellent except those for periods of ice effect or no gage-height record, which are fair. Discharge affected by Wrightsville Detention Reservoir (see p. 295). Diurnal fluctuation at low flow caused by small mill above station.

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

0.1	2.0	0.7	29	1.9	216
.2	5.1	.8	37	2.3	308
.3	8.7	.9	47	2.7	407
.4	12	1.0	60	3.1	525
.5	17	1.2	90	3.5	675
.6	22	1.5	136		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.3	19	117	627	*38	51	*619	152	43	11	20	30
2	11	20	105	603	37	.*50	588	138	35	7.3	17	19
3	13	17	90	570	37	46	560	225	28	5.5	14	15
4	13	18	80	*528	36	45	532	286	23	5.5	11	13
5	12	38	70	*486	35	43	504	220	20	7.4	8.5	10
6	11	47	76	462	34	57	486	164	18	5.6	7.0	7.3
7	10	209	147	450	34	90	486	191	17	4.9	6.0	5.8
8	10	303	147	407	35	85	468	212	16	2.9	5.5	5.8
9	70	216	123	344	35	76	441	158	16	2.6	5.5	9.5
10	70	145	104	270	33	71	400	123	15	4.6	8.0	11
11	42	138	89	172	32	68	354	100	12	12	7.0	7.6
12	29	112	68	99	31	66	306	86	10	12	6.0	5.1
13	26	93	*72	90	40	64	275	75	9.8	15	5.2	4.3
14	30	159	72	86	48	63	272	63	9.5	23	4.6	4.2
15	28	*158	54	81	66	61	272	60	9.1	18	4.1	9.5
16	23	128	53	76	170	58	313	54	9.8	21	3.7	13
17	21	106	52	76	180	55	296	45	9.5	21	3.3	12
18	73	120	50	76	130	51	225	41	8.3	19	4.8	12
19	96	116	45	74	105	49	189	40	8.0	33	8.7	11
20	69	394	40	74	90	47	243	38	8.0	30	8.7	9.1
21	54	525	38	68	80	48	301	35	10	19	6.2	9.8
22	44	516	37	62	71	49	322	32	13	15	4.4	13
23	37	498	36	55	69	130	330	37	15	11	3.6	16
24	31	477	34	51	62	392	342	45	14	9.1	3.2	28
25	33	435	32	48	58	427	325	51	16	8.3	3.5	42
26	35	377	30	45	56	471	284	64	18	8.3	4.0	34
27	33	320	29	44	55	536	263	57	19	7.8	2.3	24
28	28	282	33	45	53	627	279	51	17	19	2.3	19
29	26	201	36	44	-	655	240	43	15	17	24	17
30	22	143	180	39	-	655	187	41	12	14	81	20
31	20	-	599	37	-	643	-	46	-	16	50	-

Month	Observed				Change in contents (equivalent second-feet)†	Adjusted for change in reservoir contents		
	Second-foot-days	Maximum	Minimum	Mean		Mean	Per square mile	Runoff in inches
October	1,028.3	96	8.3	33.2	+0.34	33.5	0.484	0.56
November	6,330	525	17	211	+3.45	214	3.09	3.46
December	2,738	599	29	88.3	+65.0	153	2.21	2.55
Calendar year 1948	43,675.7	696	7.0	119	+5.78	125	1.81	24.61
January	6,189	627	37	200	-67.6	132	1.91	2.20
February	1,750	180	31	62.5	+.23	62.7	.906	.94
March	5,829	655	43	188	+78.3	266	3.84	4.44
April	10,702	619	187	357	-77.5	279	4.03	4.50
May	2,971	286	32	95.8	-3.27	92.6	1.34	1.54
June	474.0	43	8.0	15.8	-1.52	14.3	.207	.23
July	405.8	33	2.6	13.1	+.43	13.5	.195	.23
August	343.1	81	2.3	11.1	+1.36	12.4	.179	.21
September	437.0	42	4.2	14.6	-.73	13.8	.199	.22
Water year 1948-49	39,197.2	655	2.3	107	+.08	107	1.55	21.08

* Winter discharge measurement made on this day.
† Change in contents in Wrightsville Detention Reservoir.
Note.- No gage-height record July 31, Aug. 1, 4-17; discharge computed on basis of weather records, recorded range in stage, and records for Wrightsville Detention Reservoir, Dog River at Northfield Falls, and Moose River at Victory. Stage-discharge relation affected by ice Dec. 10, 11, 15-30, Jan. 14-16, Jan. 19 to Mar. 23.

Dog River at Northfield Falls, Vt.

Location.- Water-stage recorder, lat. 44°10'55", long. 72°38'30", 1 mile downstream from Northfield Falls, Washington County, and 1½ miles downstream from Cox Branch. Datum of gage is 603.00 feet above mean sea level (levels by Corps of Engineers).
Drainage area.- 76.1 square miles.
Records available.- November 1934 to September 1949.
Average discharge.- 15 years, 124 second-feet.
Extremes.- Maximum discharge during year, 6,150 second-feet Dec. 31 (gage height, 8.73 feet), from rating curve extended above 1,500 second-feet on basis of computation of flow over dam at gage height 8.49 feet and determinations of discharge by slope-area method at gage heights 8.96 and 11.53 feet; minimum, 5.5 second-feet Aug. 7.
1934-49: Maximum discharge, 9,750 second-feet Sept. 21, 1938 (gage height, 11.53 feet), by slope-area method; minimum, 4.3 second-feet Aug. 31, Sept. 7, 1942.
Remarks.- Records excellent except those for periods of ice effect, which are good. Some regulation at low flow caused by power plant above station.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

Oct. 1 to Dec. 31						Jan. 1 to Sept. 30					
0.6	8.0	1.2	50	2.8	530	0.55	6.1	1.0	30	1.7	150
.7	12	1.3	64	3.5	910	.6	7.7	1.1	39	2.1	269
.8	17	1.4	81	4.5	1,530	.65	9.7	1.2	50	2.5	420
.9	24	1.6	123	5.0	1,900	.7	12	1.3	64	3.0	655
1.0	30	1.9	198	5.5	2,320	.8	17	1.4	81	3.6	990
1.1	39	2.3	323	6.1	2,910	.9	24	1.5	101		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	23	89	620	*69	*78	*285	129	41	16	31	18
2	8.7	20	86	*370	61	69	243	119	43	8.1	19	15
3	12	19	79	*269	54	66	225	452	30	8.5	16	8.9
4	19	19	74	219	58	64	322	272	28	9.7	16	9.5
5	14	37	71	216	56	71	253	213	27	14	13	11
6	13	28	90	448	54	144	309	195	31	13	8.5	27
7	12	115	125	322	57	123	396	175	28	12	6.1	17
8	17	72	97	247	54	101	344	151	26	11	11	16
9	43	48	88	219	56	107	296	129	24	10	13	18
10	24	51	86	201	58	102	247	112	24	14	11	18
11	26	54	73	161	50	101	222	98	16	24	12	11
12	20	46	65	*119	47	94	207	91	20	14	8.9	15
13	14	41	76	130	54	84	198	83	24	14	8.2	14
14	17	54	*70	122	66	84	187	79	20	16	7.0	11
16	18	45	54	101	140	83	231	76	17	16	7.0	18
16	9.5	43	59	114	270	76	323	70	18	11	10	17
17	13	42	57	128	175	76	225	64	17	7.7	8.7	8.9
16	51	47	54	108	131	66	190	58	10	17	13	10
19	43	49	45	130	131	62	237	58	12	18	18	18
20	33	662	51	114	134	62	289	65	21	13	8.1	13
21	27	412	45	77	114	65	283	54	23	13	7.0	14
22	24	210	48	87	102	118	231	51	24	15	13	17
23	16	248	47	85	99	670	231	64	23	8.5	10	18
24	21	195	41	83	89	556	213	65	22	7.0	12	17
25	29	154	36	75	90	444	181	57	15	13	6.1	18
26	22	132	37	70	84	762	178	48	30	14	9.0	21
27	22	132	40	79	74	782	181	56	25	12	7.3	18
28	18	120	40	75	83	958	192	48	16	73	6.4	14
29	17	107	45	69	-	496	158	47	15	30	63	15
30	14	93	980	65	-	546	142	47	16	14	50	19
31	17	-	2,880	70	-	364	-	42	-	31	28	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	648	51	8.7	20.9	0.275	0.32
November	3,318	662	19	111	1.46	1.62
December	5,728	2,880	36	185	2.43	2.80
Calendar year 1948	39,657.6	2,880	8.2	108	1.43	19.40
January	5,193	620	65	168	2.21	2.54
February	2,510	270	47	89.6	1.18	1.23
March	7,474	958	62	241	3.17	3.65
April	7,219	396	142	241	3.17	3.53
May	3,268	452	42	105	1.38	1.60
June	686	43	10	22.9	.301	.34
July	497.5	73	7.0	16.0	.210	.24
August	459.3	63	6.1	14.8	.194	.22
September	463.3	27	8.9	15.4	.202	.23
Water year 1948-49	37,464.3	2,880	6.1	103	1.35	18.32

Peak discharge (base, 1,600 sec.-ft.).- Dec. 31 (4:30 a.m.) 6,150 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 19-30, Feb. 16, 17, Mar. 18-21, 23.

Mad River near Moretown, Vt.

Location.- Water-stage recorder and concrete control, lat. 44°16'40", long. 72°44'35", at highway bridge, 2.4 miles downstream from Moretown, Washington County, and 3.8 miles upstream from mouth.
Drainage area.- 139 square miles.
Records available.- July to November 1910, November 1928 to September 1949.
Average discharge.- 21 years (1928-49), 250 second-feet.
Extremes.- Maximum discharge during year, 8,780 second-feet Dec. 31 (gage height, 10.75 feet), from rating curve extended above 2,500 second-feet on basis of computations of flow over dam at gage heights 9.98, 11.51, 16.34, and 19.4 feet; minimum, 6.0 second-feet Oct. 7, 30, Nov. 4; minimum daily, 9.5 second-feet Aug. 28.
1910, 1928-49: Maximum discharge, 18,400 second-feet Sept. 22, 1938 (gage height, 16.34 feet, from floodmarks), from rating curve extended above 2,500 second-feet by method explained above; minimum, 1.4 second-feet Oct. 1, 1930.
Maximum discharge known, 23,000 second-feet Nov. 3, 1927 (gage height, 19.4 feet, from floodmarks), by computation of flow over dam.
Remarks.- Records excellent except those for periods of ice effect, which are fair. Regulation at low flow by mill in Moretown.
Revisions (water years).- W 744: Drainage area. W 854: 1934(M). W 1114: 1929, 1930(M), 1936, 1937.

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Backwater from debris July 13)

3.0	7.0	3.5	76	4.5	540
3.05	10	3.6	102	5.0	980
3.1	14	3.7	131	6.0	1,970
3.2	24	3.8	165	7.0	3,130
3.3	37	4.0	248	9.0	5,920
3.4	54	4.2	350		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	44	181	1,640	120	140	434	297	131	23	77	54
2	22	47	171	809	*110	130	*374	308	107	14	50	41
3	24	39	157	*505	100	120	345	510	90	17	29	29
4	39	39	146	392	98	105	491	388	80	18	26	23
5	26	91	138	381	97	125	380	292	72	30	25	25
6	26	75	230	1,100	95	280	610	287	67	28	18	38
7	18	559	364	674	100	240	809	272	60	24	14	40
8	30	260	239	470	100	190	588	235	59	19	25	31
9	249	155	193	398	100	200	505	201	59	18	15	46
10	74	186	171	350	97	180	410	176	56	18	13	39
11	53	177	152	280	92	170	386	158	49	68	15	32
12	45	138	*130	250	89	160	380	146	42	41	16	37
13	43	129	170	240	100	140	452	135	41	34	15	28
14	43	216	150	225	120	150	548	127	36	43	11	25
15	41	151	120	190	300	140	842	125	32	31	19	38
16	34	141	130	210	540	125	843	112	30	16	11	36
17	33	129	120	230	370	125	498	104	30	17	14	23
18	241	163	100	210	260	125	398	94	19	38	25	24
19	124	156	90	220	245	105	537	116	24	40	52	32
20	84	2,070	95	220	255	96	674	179	33	26	33	31
21	73	1,240	85	175	220	110	588	116	30	24	15	28
22	63	521	95	170	190	290	540	105	35	20	27	47
23	60	684	95	165	175	1,340	629	140	44	13	16	54
24	56	458	82	160	160	938	737	183	41	11	14	79
25	60	345	72	150	150	613	513	169	31	22	12	75
26	57	272	74	120	140	1,190	440	142	51	27	11	57
27	56	320	77	140	135	1,380	493	146	46	25	10	53
28	47	277	77	130	145	1,850	511	122	32	140	9.5	41
29	51	228	85	120	-	809	386	120	28	59	277	40
30	37	191	2,400	115	-	924	329	145	26	42	232	61
31	42	-	5,720	130	-	572	-	180	-	84	78	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,873	249	18	60.4	0.435	0.50
November	9,501	2,070	39	317	2.28	2.54
December	12,109	5,720	72	391	2.81	3.24
Calendar year 1948	87,456	5,720	17	239	1.72	23.40
January	10,569	1,640	115	341	2.45	2.83
February	4,703	540	89	168	1.21	1.26
March	13,042	1,850	96	421	3.03	3.49
April	15,470	843	329	516	3.71	4.14
May	5,810	510	94	187	1.35	1.55
June	1,481	131	19	49.4	.355	.40
July	1,028	140	11	33.2	.239	.28
August	1,204.5	277	9.5	38.9	.280	.32
September	1,205	79	23	40.2	.289	.32
Water year 1948-49	77,995.5	5,720	9.5	214	1.54	20.87

Peak discharge (base, 3,400 sec.-ft.).- Dec. 31 (3 a.m.) 8,780 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 12-30, Jan. 11 to Mar. 22.

Waterbury Reservoir near Waterbury, Vt.

Location.- Water-stage recorder, lat. 44°22'55", long. 72°46'15", at dam on Waterbury River, 2 2/3 miles upstream from mouth and 3½ miles north of Waterbury, Washington County. Datum of gage is at mean sea level (levels by Corps of Engineers).

Drainage area.- 109 square miles.

Records available.- September 1938 to September 1949.

Extremes.- Maximum elevation during year, 598.50 feet Jan. 1; minimum, 543.52 feet Mar. 22. 1938-49: Maximum elevation, 613.45 feet May 4, 1940; minimum observed, 501.3 feet Oct. 16, 1938.

Remarks.- Reservoir is formed by earth-fill dam completed by Corps of Engineers during summer of 1937 for conservation and flood control. Total usable capacity for flood control, 2,812,300,000 cubic feet between elevations 500.0 feet (bottom of lowest outlet) and 617.5 feet (crest of spillway) above mean sea level. Usable capacity for conservation, 1,582,700,000 cubic feet between elevations 500.0 and 592.0 feet (sill of taintor gate) above mean sea level.

Elevation at 12 p.m., water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	576.94	576.35	591.31	597.68	585.91	567.70	582.92	589.18	591.35	588.16	585.98	581.37
2	577.16	575.84	591.21	595.76	584.91	564.97	583.80	589.72	591.52	588.21	586.06	581.49
3	577.09	575.31	591.52	593.53	583.97	562.60	584.66	590.85	591.14	588.26	585.71	581.57
4	576.55	575.17	591.81	591.09	583.69	560.13	585.61	591.49	591.29	588.32	585.28	581.64
5	575.99	575.08	591.56	590.28	583.95	558.12	586.43	591.13	591.08	588.08	585.32	581.72
6	575.42	575.36	591.78	590.47	583.00	556.75	587.84	590.77	590.77	588.11	585.36	581.20
7	574.77	578.09	591.60	591.33	582.06	559.60	589.38	591.79	590.35	588.14	585.40	580.68
8	574.49	578.92	591.62	591.95	581.08	558.47	590.47	591.33	589.94	588.17	584.83	580.50
9	575.61	579.39	591.50	591.65	580.12	557.24	591.36	590.26	589.54	588.20	584.32	580.60
10	575.87	580.01	590.91	591.74	579.16	557.10	591.56	589.69	589.65	588.41	583.79	580.70
11	576.07	580.36	591.20	591.55	578.12	556.80	590.72	589.69	589.76	588.09	582.98	580.79
12	576.25	580.17	590.94	591.39	577.78	556.63	589.92	589.26	589.84	587.62	583.03	580.29
13	576.19	580.92	590.27	591.72	577.32	556.20	589.55	589.13	589.92	587.53	583.06	579.81
14	575.90	582.07	590.07	591.54	576.30	554.15	589.63	589.42	589.75	587.38	583.07	579.69
15	575.37	582.67	589.50	591.82	576.63	552.92	589.57	589.47	589.43	587.48	582.52	579.54
16	575.50	583.13	589.18	591.80	578.02	551.64	589.57	589.30	588.98	587.57	581.66	579.35
17	575.81	583.67	589.01	591.76	578.69	550.33	588.92	589.51	589.04	587.61	581.05	579.43
18	576.60	584.30	589.26	591.66	579.16	548.97	588.04	589.72	589.10	587.43	580.67	579.52
19	576.95	585.14	588.88	591.73	579.82	547.50	587.94	589.95	588.89	587.02	580.79	579.32
20	577.26	590.22	588.32	591.26	579.37	546.02	587.95	590.15	588.47	586.83	580.87	578.89
21	577.48	591.28	587.86	590.51	577.99	544.53	587.91	590.32	588.26	586.80	580.91	578.72
22	577.36	591.45	587.40	590.83	577.66	543.52	588.57	590.50	588.25	586.65	580.36	578.77
23	577.54	591.82	586.95	590.57	576.05	549.97	590.77	590.79	588.37	586.69	579.79	579.05
24	577.72	591.22	586.61	590.38	574.38	554.18	592.20	591.16	588.50	586.70	579.23	579.68
25	577.59	590.38	586.78	589.55	572.72	557.07	591.76	591.31	588.84	585.98	578.95	580.01
26	577.46	590.42	586.50	588.74	572.42	562.14	591.30	591.16	588.82	585.48	578.98	580.04
27	577.13	591.25	585.92	587.92	571.32	567.55	591.15	591.40	588.66	585.10	579.01	580.22
28	576.90	591.91	585.27	587.70	569.52	575.67	590.89	591.60	588.75	585.40	578.88	580.37
29	576.74	591.87	584.83	587.96	-	578.24	590.18	591.65	588.58	585.55	580.09	579.99
30	576.89	591.73	589.38	587.64	-	580.53	589.35	591.28	588.09	585.71	580.96	580.25
31	576.84	-	597.56	586.80	-	581.89	-	591.13	-	586.08	581.17	-

Monthly elevation and contents, water year October 1948 to September 1949

Date	Elevation (feet)†	Contents (millions of cubic feet)	Change in contents during month	
			Millions of cubic feet	Equivalent, second-feet
Sept.30	577.42	1,093.7	-	-
Oct. 31	576.84	1,076.9	-16.8	-6.27
Nov. 30	591.73	1,572.2	+495.3	+191
Dec. 31	597.56	1,808.9	+236.7	+88.4
Calendar year 1948	-	-	+1,042.3	+33.0
Jan. 31	586.80	1,391.6	-417.3	-156
Feb. 28	569.52	880.3	-511.3	-211
Mar. 31	581.89	1,228.8	+348.5	+130
Apr. 30	589.35	1,481.8	+253.0	+97.6
May 31	591.13	1,548.8	+67.0	+25.0
June 30	588.09	1,437.4	-111.4	-43.0
July 31	586.08	1,366.3	-71.1	-26.5
Aug. 31	581.17	1,205.7	-160.6	-60.0
Sept.30	580.25	1,176.4	-29.3	-11.3
Water year 1948-49	-	-	+82.7	+2.62

† Elevation at 12 p.m.

Waterbury River near Waterbury, Vt.

Location.- Water-atage recorder and concrete control, lat. 44°22'10", long. 72°46'10", 1 mile downstream from Waterbury Reservoir, 1 2/3 miles upstream from mouth, and 2½ miles north of Waterbury, Washington County. Datum of gage is 428.00 feet above mean sea level (levels by Corps of Engineers).

Drainage area.- 111 square miles.

Records available.- July to October 1910 (gage heights only), December 1935 to September 1949.

Average discharge.- 13 years, 231 second-feet (adjusted for change in reservoir contents).

Extremes.- Maximum discharge during year, 1,400 second-feet Jan. 1 (gage height, 9.29 feet); minimum daily, 2.1 second-feet Oct. 11, July 24.
1935-49: Maximum discharge, 6,520 second-feet Mar. 18, 1936 (gage height, 19.88 feet); minimum daily, 0.6 second-foot several times during summers of 1938, 1939, 1941, 1944.

Remarks.- Records excellent except those below 25 second-feet, which are good. Flow completely regulated by Waterbury Reservoir (see preceding page).

Revisions (water years).- W 824: 1936.

Rating table, water year 1948-49 (gage height, in feet, and discharge, in second-feet)

4.85	1.8	5.3	14	6.5	150
4.9	2.6	5.4	19	6.8	216
4.95	3.4	5.6	32	7.1	301
5.0	4.4	5.8	49	7.5	450
5.1	7.0	6.0	71	8.0	665
5.2	10	6.2	98	9.3	1,400

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	209	205	330	777	219	602	10	419	4.2	3.4	110	2.4
2	2.7	208	226	1,370	439	799	9.1	221	3.8	2.9	2.7	2.3
3	87	205	3.8	1,360	441	691	8.6	200	226	2.6	167	2.3
4	217	108	3.4	1,340	231	691	9.4	8.5	4.2	2.6	195	2.3
5	211	110	211	644	4.4	575	7.9	465	129	111	2.9	2.3
6	213	2.6	235	478	383	185	13	413	198	2.6	2.6	213
7	224	8.0	430	9.1	426	5.7	18	6.7	217	2.4	2.4	214
8	204	3.2	227	7.6	423	368	13	444	219	2.3	224	108
9	3.6	2.7	213	362	420	411	11	660	219	2.3	217	2.7
10	2.3	3.6	449	229	417	199	213	442	3.8	3.7	216	2.4
11	2.1	50	4.4	208	430	172	660	127	3.4	189	329	2.3
12	2.2	217	211	223	223	199	660	316	3.1	216	3.2	216
13	103	4.3	440	5.2	197	178	656	196	3.1	110	2.6	213
14	159	4.5	235	228	418	562	656	5.0	110	105	2.4	114
15	209	3.4	328	5.2	226	370	660	76	159	2.8	215	107
16	2.8	3.1	238	166	7.9	367	656	198	217	3.5	319	108
17	3.3	3.1	178	227	5.7	370	656	4.2	3.1	2.6	271	2.7
18	4.0	2.9	3.4	224	5.3	361	652	4.0	2.9	166	219	2.6
19	2.7	3.8	197	190	5.0	357	449	4.3	135	219	2.9	108
20	2.7	186	320	376	200	355	441	4.0	219	113	2.6	216
21	2.7	433	268	443	579	352	656	3.8	141	117	2.4	213
22	109	444	274	6.0	199	352	443	4.0	119	2.6	213	108
23	2.7	451	272	221	624	189	11	4.7	33	2.3	210	2.9
24	2.4	670	226	223	620	14	250	4.4	3.4	2.1	222	2.9
25	112	665	3.2	430	616	14	665	85	3.4	329	111	2.6
26	110	246	156	435	219	24	665	194	4.0	217	2.7	88
27	166	6.0	329	449	391	24	665	4.4	115	215	2.4	2.7
28	131	5.0	267	227	606	34	665	4.2	3.2	4.1	74	2.6
29	110	219	271	4.9	-	17	665	88	192	2.9	173	187
30	2.5	239	254	218	-	18	660	275	147	2.7	3.0	3.4
31	55	-	48	432	-	12	-	193	-	4.3	2.6	-

Month	Observed				Change in contents (equivalent, second-feet)†	Adjusted for change in reservoir contents		
	Second-foot-days	Maximum	Minimum	Mean		Mean	Per square mile	Runoff in inches
October	2,667.7	224	2.1	86.1	-6.27	79.8	0.719	0.83
November	4,712.2	670	2.6	157	+191	348	3.14	3.50
December	6,851.2	449	3.2	221	+88.4	309	2.78	3.21
Calendar year 1948	68,705.5	1,340	1.8	188	+33.0	221	1.99	27.06
January	11,518.0	1,370	4.9	372	-156	216	1.95	2.24
February	8,975.3	624	4.4	321	-211	109	.982	1.02
March	8,867.7	799	5.7	286	+130	416	3.75	4.32
April	11,804.0	665	7.9	393	+97.6	491	4.42	4.94
May	5,074.2	660	3.8	164	+25.0	189	1.70	1.96
June	2,840.6	226	2.9	94.7	-43.0	51.7	.466	.52
July	2,161.7	329	2.1	69.7	-26.5	43.2	.389	.45
August	3,522.4	329	2.4	114	-60.0	53.7	.484	.56
September	2,234.4	216	2.3	74.5	-11.3	63.2	.569	.64
Water year 1948-49	71,229.4	1,370	2.1	195	+2.62	198	1.78	24.19

† Change in contents in Waterbury Reservoir.

Lamoille River at Johnson, Vt.

Location.- Water-stage recorder, lat. 44°37'20", long. 72°40'50", at falls 0.9 mile upstream from bridge in Johnson, Lamoille County, and 1 1/8 miles upstream from Gihon River.
Drainage area.- 310 square miles.
Records available.- July 1910 to December 1913, September 1928 to September 1949.
Average discharge.- 21 years (1928-49), 520 second-feet.
Extremes.- Maximum discharge during year, 8,400 second-feet Dec. 31 (gage height, 13.32 feet); minimum, 30 second-feet July 17; minimum daily, 85 second-feet July 17.
1910-13, 1928-49: Maximum discharge, 13,000 second-feet Mar. 18, 1936 (gage height, 16.48 feet), by computation of flow over dam; minimum, 11 second-feet Sept. 2, 1935; minimum daily, 16 second-feet Oct. 26, 1947.
Remarks.- Records excellent except those for periods of ice effect, which are fair. Flow regulated by power plant above station.
Revisions (water years).- W 729: 1912(M). W 894: Drainage area. W 1114: 1933, 1934(M).

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

1.5	81	2.3	276	6.0	2,050
1.6	98	2.6	384	8.0	3,280
1.8	138	3.0	544	10.0	4,850
2.0	186	4.0	980	11.8	6,640

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	200	170	445	3,040	190	190	1,070	512	274	184	217	232
2	243	194	439	1,370	200	200	929	569	246	167	178	200
3	200	202	380	1,000	200	220	850	978	193	128	166	181
4	202	197	290	382	200	190	952	1,140	165	151	164	156
5	166	218	365	560	190	180	948	710	109	202	152	150
6	148	192	331	1,460	180	280	1,170	573	182	183	111	154
7	151	1,650	793	1,350	200	450	1,890	1,090	196	172	123	153
8	180	1,050	561	870	190	350	*1,510	869	188	165	168	148
9	606	599	472	718	200	280	1,110	649	175	166	162	139
10	342	550	416	714	200	270	828	504	172	178	158	150
11	297	592	380	*608	200	230	763	373	195	276	176	128
12	206	485	320	481	180	200	678	369	137	206	171	147
13	200	475	*386	240	170	*210	721	312	177	235	148	137
14	203	834	377	330	200	240	831	181	175	203	154	157
15	200	636	200	320	*230	240	853	167	161	176	149	152
16	161	567	260	270	600	230	1,160	341	150	165	147	149
17	131	509	250	330	570	240	884	322	177	85	155	144
18	607	522	230	340	400	260	734	234	178	199	190	125
19	484	475	170	330	290	230	765	226	224	201	184	137
20	335	3,440	220	340	270	200	1,140	235	207	188	156	156
21	299	2,680	180	320	280	240	1,270	235	182	204	136	184
22	228	1,460	190	200	230	210	1,240	179	248	175	136	209
23	186	1,320	210	210	230	1,400	1,000	289	203	149	146	186
24	134	879	220	290	220	2,600	1,090	273	184	111	138	219
25	226	822	140	240	230	1,890	966	261	188	154	131	186
26	189	678	150	230	200	2,860	769	298	148	162	134	178
27	208	758	190	200	180	3,060	1,040	260	199	155	144	161
28	163	857	200	220	230	5,140	1,060	223	187	163	125	152
29	158	655	200	220	-	2,640	840	206	167	169	416	152
30	153	505	1,300	220	-	2,030	657	266	182	172	492	171
31	107	-	6,640	220	-	1,500	-	313	-	185	190	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	7,313	607	107	236	0.761	0.88
November	24,171	3,440	170	806	2.60	2.90
December	16,905	6,640	140	545	1.76	2.03
Calendar year 1948	170,533	6,640	35	466	1.50	20.46
January	17,573	3,040	200	567	1.83	2.11
February	6,860	600	170	245	.790	.82
March	28,460	5,140	180	918	2.96	3.41
April	29,718	1,890	657	991	3.20	3.57
May	13,157	1,140	167	424	1.37	1.58
June	5,569	274	109	186	.600	.67
July	5,429	276	85	175	.565	.65
August	5,417	492	111	175	.565	.65
September	4,893	232	125	163	.526	.59
Water year 1948-49	165,465	6,640	85	453	1.46	19.86

Peak discharge (base, 5,400 sec.-ft.).- Dec. 31 (5:30 a.m.) 8,400 sec.-ft.; Mar. 28 (8:30 a.m.) 5,850 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 15-30, Jan. 13 to Mar. 24.

Lamoille River at East Georgia, Vt.

Location.- Water-stage recorder, lat. 44°40'45", long. 73°04'20", at East Georgia, Franklin County, 0.5 mile upstream from railroad bridge and 1 mile downstream from Beaver Meadow Brook.
Drainage area.- 686 square miles.
Records available.- October 1937 to September 1949. August 1929 to November 1937 at site near Milton, 3½ miles downstream, published as Lamoille River near Milton.
Average discharge.- 20 years, 1,223 second-feet, adjusted to present drainage area.
Extremes.- Maximum discharge during year, 17,200 second-feet Dec. 31; maximum gage height, 12.69 feet Mar. 23 (ice jam); minimum discharge, 70 second-feet Aug. 28; minimum daily, 145 second-feet Aug. 28.
1929-49: Maximum discharge, 23,200 second-feet Mar. 19, 1936, by computation of flow over dam; maximum gage height, 15.86 feet Mar. 11, 1946 (ice jam); minimum discharge, 49 second-feet July 30, 1933; minimum daily, 91 second-feet July 30, 1933.
Remarks.- Records excellent except those for periods of ice effect, which are fair. Low flow regulated by power plants above station.
Revisions.- W 894: Drainage area.

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

2.2	130	3.6	680	7.0	5,050
2.3	153	4.0	980	8.0	7,150
2.5	205	4.5	1,450	9.0	9,700
2.7	265	5.0	1,990	10.0	12,900
3.0	375	5.5	2,590	10.5	14,800
3.3	510	6.0	3,290		

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	270	290	1,130	10,200	470	470	2,740	1,450	694	288	570	545
2	379	341	1,020	4,060	480	450	2,290	1,390	578	269	405	578
3	433	348	972	2,400	470	430	2,040	1,780	478	256	306	450
4	352	364	900	1,500	450	410	2,150	2,260	412	235	290	318
5	318	369	844	1,300	430	450	2,120	1,600	328	235	252	248
6	270	458	1,050	4,700	450	600	2,530	1,370	346	338	242	301
7	254	3,300	2,120	4,350	460	900	4,470	1,530	380	244	153	324
8	257	3,350	1,580	2,660	480	800	*3,970	1,940	391	272	207	278
9	782	1,540	1,200	2,090	470	700	2,960	1,340	377	237	252	270
10	856	1,200	1,030	1,870	460	650	2,270	1,030	346	236	240	269
11	595	1,480	924	*1,550	450	620	1,900	892	336	492	288	276
12	474	1,200	740	750	400	580	1,690	743	384	473	336	225
13	387	1,020	868	600	410	560	1,740	668	271	350	249	245
14	418	2,110	*924	720	*430	540	2,160	656	323	406	176	257
15	414	1,660	640	720	940	580	2,210	528	276	314	274	300
16	365	1,320	560	740	1,350	520	2,480	510	268	248	235	347
17	316	1,140	610	780	1,150	540	2,240	644	244	274	225	244
18	854	1,190	580	750	920	530	1,780	620	268	184	346	294
19	1,180	1,150	440	750	840	500	1,630	542	348	274	354	258
20	752	5,930	500	760	700	480	2,310	610	492	293	312	372
21	654	7,650	540	590	620	450	2,720	567	366	274	250	404
22	590	4,060	410	470	540	620	3,420	545	448	270	164	525
23	472	3,660	420	540	580	3,000	2,950	470	512	186	208	535
24	375	2,650	500	550	510	5,900	3,550	834	391	197	240	496
25	371	2,090	440	560	520	4,700	2,960	771	382	243	220	510
26	467	1,630	360	540	540	5,500	2,180	750	347	206	197	382
27	402	2,060	370	490	470	6,780	2,720	694	391	238	167	398
28	396	2,220	450	500	450	9,690	2,840	620	359	276	145	294
29	360	1,640	470	500	-	8,210	2,280	510	320	304	678	306
30	312	1,310	2,100	500	-	5,310	1,780	578	246	419	2,280	364
31	312	-	14,000	490	-	3,880	-	674	-	408	878	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	14,637	1,180	254	472	0.688	0.79
November	58,730	7,650	290	1,958	2.85	3.18
December	38,692	14,000	360	1,248	1.82	2.10
Calendar year 1948	398,678	14,000	150	1,089	1.59	21.62
January	48,980	10,200	470	1,580	2.30	2.66
February	16,440	1,350	400	587	.856	.89
March	65,350	9,690	410	2,108	3.07	3.54
April	75,080	4,470	1,630	2,503	3.65	4.07
May	29,116	2,260	470	939	1.37	1.58
June	11,302	694	244	377	.550	.61
July	8,939	492	184	288	.420	.48
August	11,139	2,280	145	359	.523	.60
September	10,613	578	225	354	.516	.58
Water year 1948-49	389,018	14,000	145	1,066	1.55	21.08

Peak discharge (base, 10,400 sec.-ft.).- Dec. 31 (4:30 to 6:30 p.m.) 17,200 sec.-ft.; Mar. 28 (9 to 10 p.m.) 11,500 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 15-31, Jan. 3-6, Jan. 12 to Mar. 26 (no gage-height record Dec. 25-28, 30).

Missisquoi River near North Troy, Vt.

Location.- Water-stage recorder, lat. 44°58'20", long. 72°23'15", just upstream from Big Falls, 1½ miles downstream from Jay Branch and 2¼ miles upstream from North Troy, Troy County.
Drainage area.- 131 square miles.
Records available.- August 1931 to September 1949.
Average discharge.- 18 years, 268 second-feet.
Extremes.- Maximum discharge during year, 5,570 second-feet Mar. 28 (gage height, 10.72 feet), from rating curve extended above 3,600 second-feet by logarithmic plotting, verified by computation of flow over dam at gage height 11.70 feet; minimum, 9.4 second-feet Aug. 28 (gage height, 0.74 foot); minimum daily, 11 second-feet Aug. 28.
1931-49: Maximum discharge, 7,980 second-feet May 3, 1940 (gage height, 12.87 feet), from rating curve extended above 3,600 second-feet as described above; minimum, that of Aug. 28, 1949; minimum daily, that of Aug. 28, 1949.
Remarks.- Records excellent except those for periods of ice effect, which are fair. Some regulation from small power plant above station.
Revisions (water years).- W 924: 1940. W 1114: 1933(M), 1936-39.

Rating table, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)

0.8	11	1.5	48	3.5	533
.9	14	1.6	58	4.0	729
1.0	18	1.8	80	5.0	1,170
1.1	22	2.0	110	6.0	1,700
1.2	28	2.3	167	7.0	2,350
1.3	33	2.7	265	8.5	3,520
1.4	40	3.1	385	10.0	4,850

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	38	167	1,700	88	98	541	270	140	50	85	167
2	28	36	160	622	80	93	487	273	109	43	49	118
3	32	35	130	358	80	88	472	359	92	35	31	72
4	34	39	118	271	84	82	614	278	76	32	52	47
5	27	74	115	234	76	95	541	214	59	34	39	51
6	28	63	181	1,170	70	190	780	185	76	36	31	62
7	26	877	*464	691	68	190	1,090	294	57	32	17	63
8	27	392	255	392	71	140	995	229	65	30	24	34
9	104	170	185	321	88	138	*637	169	55	30	24	54
10	81	136	150	*324	80	125	446	140	58	47	24	43
11	54	150	115	207	74	*118	413	126	56	90	33	34
12	41	124	83	120	61	112	385	113	46	63	60	35
13	44	*138	155	130	*73	102	563	110	48	39	39	35
14	46	492	125	130	80	110	803	102	43	41	26	38
15	44	238	89	100	150	115	673	97	40	37	22	54
16	43	214	92	120	350	98	673	97	36	35	24	46
17	32	181	96	160	300	102	427	90	34	19	24	40
18	154	247	82	150	200	102	327	88	33	36	32	33
19	120	197	75	140	180	88	343	272	133	41	49	65
20	82	2,360	85	130	150	89	552	318	144	39	40	87
21	61	1,250	76	110	125	93	945	156	240	31	23	168
22	60	563	72	110	115	115	882	117	315	27	25	132
23	44	563	74	110	110	1,300	803	165	150	23	24	110
24	52	388	65	105	110	2,100	962	214	93	14	23	131
25	44	273	60	105	105	1,070	558	219	178	21	22	134
26	46	212	57	90	105	1,860	456	187	127	27	19	94
27	46	440	68	86	94	2,100	649	154	93	31	16	76
28	40	454	62	96	105	4,740	499	131	91	38	11	54
29	44	252	70	95	-	1,560	362	122	74	31	487	48
30	43	192	800	83	-	1,030	292	153	54	29	748	110
31	34	-	3,740	92	-	717	-	194	-	46	160	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,590	154	26	51.3	0.392	0.45
November	10,788	2,360	35	360	2.75	3.06
December	8,066	3,740	57	260	1.98	2.29
Calendar year 1948	84,726	3,740	21	231	1.76	24.06
January	8,552	1,700	83	276	2.11	2.43
February	3,272	350	61	117	.893	.93
March	18,960	4,740	82	612	4.67	5.38
April	18,170	1,090	292	606	4.63	5.16
May	5,636	359	88	182	1.39	1.60
June	2,615	315	33	93.8	.716	.80
July	1,127	90	14	36.4	.278	.32
August	2,283	748	11	73.6	.562	.65
September	2,235	168	33	74.5	.569	.63
Water year 1948-49	83,494	4,740	11	229	1.75	23.70

Peak discharge (base, 3,300 sec.-ft.).- Dec. 31 (7 a.m.) 4,160 sec.-ft.; Mar. 28 (11 a.m.) 5,570 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 2-5, 11-30, Jan. 12 to Mar. 24.

Missisquoi River near Richford, Vt.

Location.- Water-stage recorder, lat. 44°57'30", long. 72°41'55", 1 2/3 miles upstream from Trout River, 3 miles south of Richford, Franklin County, and 3¾ miles downstream from North Branch.

Drainage area.- 479 square miles.

Records available.- July 1911 to September 1923, October 1928 to September 1949.

Average discharge.- 29 years (1911-19, 1928-49), 926 second-feet.

Extremes - Maximum discharge during year, 10,400 second-feet Mar. 29; maximum gage height, 13.93 feet Mar. 23 (ice jam); minimum discharge, 39 second-feet Aug. 27 (gage height, 2.34 feet).

1911-23, 1928-49: Maximum discharge, 17,200 second-feet May 4, 1940 (gage height, 15.15 feet), from rating curve extended above 9,300 second-feet on basis of computation of flow over dam at gage height 14.70 feet, slope-area determination at gage height 12.90 feet, and study of discharge per foot of width at measuring section; maximum gage height, 18.92 feet Mar. 15, 1946 (ice jam); minimum discharge, 8 second-feet July 14, 1911.

Maximum discharge known, 45,000 second-feet during flood of November 1927 (gage height, 23.1 feet, from floodmarks), from rating curve extended above 9,300 second-feet by method explained above.

Remarks.- Records excellent except those below 300 second-feet, which are good, and those for periods of ice effect or no gage-height record, which are fair. Slight diurnal fluctuation at low flow.

Revisions (water years).- W 384: 1913(M). W 784: Drainage area.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used June 28 to Aug. 17)

Oct. 1 to Dec. 31						Jan. 1 to Sept. 30					
2.3	36	2.9	141	4.5	975	2.3	33	3.2	267	6.0	2,360
2.4	46	3.0	173	5.0	1,360	2.4	47	3.4	350	8.0	4,460
2.5	59	3.1	210	6.0	2,240	2.5	65	3.9	610	10.0	6,900
2.6	74	3.3	300	7.5	3,810	2.7	111	4.4	935	12.1	10.100
2.7	92	3.7	501	9.0	5,600	2.9	167	5.0	1,440		
2.8	114	4.1	720	10.7	7,900						

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	72	670	7,640	250	380	2,580	900	506	192	138	350
2	54	66	610	4,060	260	350	2,070	844	415	170	138	310
3	65	70	530	2,040	240	330	1,840	900	337	150	106	231
4	58	71	460	1,420	230	310	1,890	872	294	135	150	173
5	56	88	420	1,090	230	350	1,840	712	260	122	114	144
6	55	122	500	3,410	220	700	2,100	616	221	127	99	144
7	49	958	1,140	3,340	220	640	3,150	756	221	122	83	147
8	49	1,420	*968	2,070	220	520	3,230	802	201	111	74	144
9	62	648	709	1,640	230	440	*2,580	622	205	101	60	119
10	112	414	582	*1,520	220	420	1,910	511	182	148	60	127
11	117	414	440	1,000	220	400	1,550	450	179	250	114	109
12	88	384	370	500	200	*400	1,320	415	170	294	109	104
13	76	*388	460	530	*200	390	1,420	365	152	231	94	89
14	72	906	460	530	210	400	1,800	346	147	195	87	119
15	74	843	370	450	600	420	1,810	337	133	158	63	144
16	68	626	390	520	1,100	410	1,690	306	122	144	52	144
17	74	544	400	580	1,000	390	1,400	294	111	124	52	141
18	167	523	300	580	800	370	1,090	271	109	116	60	127
19	219	534	300	560	700	360	988	710	179	116	65	141
20	184	4,290	310	520	560	350	1,450	1,240	324	116	74	189
21	125	4,990	290	450	500	340	2,110	730	538	109	72	290
22	101	1,960	250	410	450	430	2,780	500	1,670	97	65	346
23	92	2,080	270	390	440	4,000	2,400	561	1,270	87	52	279
24	88	1,600	250	370	430	a6,000	3,050	844	664	76	46	267
25	87	1,130	230	340	410	a4,500	2,180	893	652	72	46	279
26	81	866	210	300	390	a6,200	1,640	802	634	65	44	245
27	85	1,220	200	290	380	a7,800	1,960	652	455	56	40	198
28	81	1,640	200	290	370	10,000	1,740	560	360	71	40	173
29	78	1,080	220	300	-	9,300	1,330	500	294	89	331	144
30	74	780	2,500	280	-	5,580	1,030	506	249	67	1,300	201
31	74	-	7,800	250	-	3,740	-	572	-	121	689	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	2,710	219	45	87.4	0.182	0.21
November	30,707	4,990	66	1,024	2.14	2.38
Decembar	22,809	7,800	200	736	1.54	1.77
Calendar year 1948	261,985	9,970	44	716	1.49	20.33
January	37,670	7,640	250	1,215	2.54	2.92
February	11,280	1,100	200	403	.841	.88
March	66,220	10,000	310	2,136	4.46	5.14
April	57,928	3,230	988	1,931	4.03	4.50
May	19,389	1,240	271	625	1.30	1.51
June	11,254	1,670	109	375	.783	.87
July	4,032	294	56	130	.271	.31
August	4,517	1,300	40	146	.305	.35
September	5,618	350	89	187	.390	.44
Water year 1948-49	274,134	10,000	40	751	1.57	21.28

Peak discharge (base, 7,600 sec.-ft.).- Jan. 1 (12:30 a.m.) 8,710 sec.-ft.; Mar. 29 (1 to 2 a.m.), 10,400 sec.-ft.

* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for station near North Troy.

Note.- Stage-discharge relation affected by ice Dec. 3-6, 11-31, Jan. 4, 5, Jan. 11 to Mar. 23 and during much of period of no gage-height record.

Lake Memphremagog at Newport, Vt.

Location.- Chain gage, lat 44°56'10", long. 72°12'15", on concrete highway bridge in Newport, Orleans County. Datum of gage is 673.00 feet above mean sea level, datum of 1929.

Records available.- May 1931 to September 1949.

Extremes.- Maximum gage height observed during year, 11.24 feet Mar. 29, 30; minimum observed, 7.24 feet Nov. 3, 4.
1931-49: Maximum gage height observed, 12.92 feet Apr. 20, 1933; minimum observed, 6.69 feet Nov. 4, 1934.

Remarks.- Gage read twice daily.

Gage height, in feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.63	7.26	9.17	9.81	9.72	9.50	11.06	10.07	9.66	9.22	8.41	7.89
2	7.65	7.27	9.20	10.11	9.75	9.47	10.93	10.01	9.67	9.20	8.40	7.88
3	7.65	7.24	9.20	10.14	9.72	9.47	10.78	9.96	9.68	9.22	8.33	7.90
4	7.60	7.24	9.20	10.16	9.74	9.42	10.68	9.95	9.66	9.19	8.40	7.90
5	7.57	7.26	9.20	10.14	9.70	9.42	10.50	9.96	9.60	9.22	8.40	7.87
6	7.57	7.26	9.22	10.26	9.69	9.43	10.40	9.96	9.57	9.19	8.37	7.88
7	7.54	7.45	9.22	10.23	9.68	9.44	10.42	9.95	9.52	9.20	8.33	7.89
8	7.52	7.48	9.25	10.19	9.68	9.42	10.44	10.01	9.49	9.10	8.30	7.85
9	7.50	7.52	9.33	10.11	9.66	9.41	10.40	9.96	9.46	9.06	8.31	7.82
10	7.52	7.61	9.32	10.12	9.63	9.41	10.33	10.14	9.40	9.02	8.30	7.77
11	7.51	7.65	9.32	10.10	9.68	9.37	10.15	10.08	9.28	9.04	8.30	7.74
12	7.53	7.67	9.31	10.08	9.56	9.40	10.14	9.94	9.19	9.03	8.30	7.73
13	7.52	7.71	9.29	10.08	9.41	9.42	10.07	9.92	9.12	9.00	8.26	7.71
14	7.50	7.75	9.31	10.08	9.41	9.41	10.08	9.92	9.09	8.99	8.21	7.73
15	7.50	7.74	9.21	10.10	9.42	9.37	10.10	9.72	9.04	8.92	8.16	7.72
16	7.49	7.83	9.15	10.10	9.49	9.35	10.17	9.69	9.03	8.89	8.10	7.79
17	7.48	7.82	9.14	10.07	9.60	9.33	10.24	9.68	8.99	8.89	8.02	7.77
18	7.51	7.91	9.15	10.06	9.60	9.31	10.25	9.57	8.99	8.84	8.00	7.69
19	7.49	8.27	9.11	10.00	9.65	9.29	10.25	9.67	9.02	8.82	7.88	7.74
20	7.53	8.42	9.11	9.94	9.66	9.28	10.23	9.68	9.05	8.77	7.81	7.77
21	7.47	8.51	9.07	9.91	9.67	9.30	10.25	9.63	9.04	8.79	7.91	7.74
22	7.43	8.64	9.05	9.90	9.66	9.26	10.21	9.90	9.26	8.71	7.81	7.73
23	7.46	8.82	9.03	9.90	9.64	9.33	10.24	9.86	9.27	8.65	7.91	7.75
24	7.43	8.86	8.99	9.88	9.60	9.59	10.31	9.82	9.23	8.62	7.81	7.74
25	7.43	8.93	8.99	9.86	9.58	10.04	10.34	9.69	9.30	8.51	7.85	7.81
26	7.40	8.86	8.99	9.86	9.58	10.14	10.31	9.74	9.34	8.49	7.85	7.68
27	7.40	9.09	8.99	9.85	9.59	10.57	10.28	9.80	9.33	8.43	7.87	7.64
28	7.38	9.13	8.97	9.90	9.55	11.14	10.28	9.70	9.31	8.40	7.86	7.80
29	7.33	9.19	8.99	9.70	-	11.24	10.26	9.68	9.29	8.40	7.92	7.90
30	7.37	9.18	9.07	9.69	-	11.24	10.17	9.89	9.26	8.41	7.90	7.83
31	7.33	-	9.51	9.70	-	11.17	-	9.67	-	8.43	7.91	-

Note.- Gage heights for periods Dec. 25-29, Jan. 15-17, 25-28, Jan. 30 to Feb. 12, Feb. 17-22, Mar. 17-22 were taken to top of ice.

Clyde River at Newport, Vt.

Location.- Water-stage recorder, lat. 44°56'20", long. 72°11'25", in Newport, Orleans County, just downstream from unnamed tributary entering from north and 1 mile upstream from mouth. Datum of gage is 682.36 feet above mean sea level, datum of 1929.
Drainage area.- 142 square miles.
Records available.- September 1938 to September 1949. May 1909 to September 1924 and November 1928 to May 1936 at site 0.65 mile upstream.
Average discharge.- 27 years (1909-19, 1929-35, 1938-49), 246 second-feet.
Extremes.- Maximum discharge during year, 1,220 second-feet Mar. 30 (gage height, 6.12 feet); minimum daily, 27 second-feet June 19, July 29.
1909-24, 1928-36, 1938-49: Maximum discharge, 3,900 second-feet Mar. 20, 1936 (gage height, 5.76 feet, site and datum then in use), by computation of flow over dam; minimum daily, 3.0 second-feet Oct. 27, 1930; practically no flow at times because of regulation.
Remarks.- Records good. Flow regulated by power plant and reservoirs above station.
Revisions (water years).- W 744: 1913(M), drainage area. W 924: 1940.

Rating tables, water year 1948-49, except periods of ice effect
(gage height, in feet, and discharge, in second-feet)
(Shifting-control method used Oct. 25 to Nov. 12)

Oct. 1 to Nov. 12				Nov. 13 to Sept. 30			
2.5	29	2.9	67	2.4	24	3.6	217
2.6	36	3.0	82	2.5	32	4.0	322
2.7	45	3.2	118	2.7	53	4.5	485
2.8	55	3.5	181	3.0	98	5.0	695
				3.3	152	6.0	1,160

Discharge, in second-feet, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	47	289	378	120	152	821	426	219	162	145	132
2	68	66	264	517	145	157	682	408	220	163	162	98
3	44	79	213	545	100	165	581	396	223	125	189	110
4	53	84	201	511	130	142	533	369	192	120	194	91
5	48	59	210	460	105	180	501	356	164	91	117	79
6	48	85	220	479	200	71	517	355	148	139	112	61
7	49	179	*142	444	120	157	569	360	134	112	68	59
8	58	141	164	415	164	149	614	370	124	79	61	115
9	60	110	156	393	163	161	*628	378	121	62	74	48
10	35	155	152	*400	136	140	614	380	126	46	122	29
11	35	151	158	363	164	*157	589	370	114	70	116	44
12	43	145	94	339	90	173	549	284	161	73	54	88
13	53	140	162	299	192	149	509	259	159	114	85	74
14	59	166	117	283	100	146	485	258	151	126	64	88
15	81	173	77	251	192	152	482	238	100	80	82	84
16	80	128	80	218	222	141	509	250	109	87	85	46
17	76	177	80	195	224	136	557	244	92	44	114	37
18	94	132	95	184	166	152	601	260	63	79	78	37
19	81	163	120	209	216	96	589	266	27	67	85	78
20	72	195	90	174	187	100	553	195	124	64	56	77
21	39	210	85	158	174	172	517	128	177	46	38	71
22	87	258	105	124	198	140	474	95	218	76	85	73
23	85	268	105	143	206	259	457	162	215	82	57	94
24	48	277	95	178	190	301	501	145	221	36	44	143
25	73	242	54	70	158	541	517	202	255	69	39	80
26	81	281	55	60	194	659	525	213	167	70	43	60
27	68	298	110	120	110	754	533	264	183	81	79	105
28	77	277	100	130	150	1,040	517	252	164	50	33	117
29	76	300	120	150	-	1,130	485	216	181	27	147	82
30	110	297	231	95	-	1,140	457	64	191	50	133	82
31	62	-	296	120	-	995	-	152	-	129	91	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
October	1,948	110	35	62.8	0.442	0.51
November	5,287	300	47	176	1.24	1.38
December	4,450	296	54	144	1.01	1.17
Calendar year 1948	69,726	1,010	15	191	1.35	18.25
January	8,396	545	60	271	1.91	2.20
February	4,536	224	90	162	1.14	1.19
March	10,007	1,140	71	323	2.27	2.62
April	16,466	821	457	549	3.87	4.31
May	8,315	426	64	268	1.89	2.18
June	4,743	255	27	158	1.11	1.24
July	2,619	163	27	84.5	.595	.69
August	2,832	194	33	91.4	.644	.74
September	2,382	143	29	79.4	.559	.62
Water year 1948-49	71,981	1,140	27	197	1.39	18.85

Peak discharge (base, 960 sec.-ft.).- Mar. 30 (8 a.m.) 1,220 sec.-ft.
* Winter discharge measurement made on this day.
Note.- Stage-discharge relation affected by ice Dec. 15-29, Jan. 25 to Feb. 4, Feb. 6, 12, 27, 28, Mar. 19, 20. Discharge in second-feet per square mile and runoff in inches may not represent natural flow because of regulation.

For several years records of the water-surface elevation of many of the lakes in Indiana have been collected by the Geological Survey under cooperative agreements with the Indiana Department of Conservation, Division of Water Resources. These records have not been published but are available in the files of the district office of the Geological Survey in Indianapolis. In general, the records are based on once-daily readings of a staff gage by a local observer and consist of daily, monthly, and yearly mean water-surface elevations as well as graphs showing the fluctuation in elevation.

The lakes for which records have been collected are listed in the following table. The established level, sometimes referred to as the legal level, is that elevation set by the courts to which the average level of the lake is to be held; it is normally set at about the average level that has prevailed for a number of years prior to the establishment of the level.

Lakes in Indiana in St. Lawrence River Basin for which records are available

Lake	County	Drainage area (square miles)	Surface area (acres)	Established Level*	Records available
Adams Lake near Wolcottville	LaGrange	5.69	267	953.59	1945-49
Attwood Lake near Wolcottville	LaGrange	1.31	156	-	1947-49
Bear Lake near Wolflake	Noble	6.12	125	-	1942-48
Big Turkey Lake at Stroh	LaGrange	34.6	424	-	1945-49
Bixler Lake at Kendallville	Noble	3.63	112	964.00	1945-49
Bower Lake near Pleasant Lake	Steuben	87.5	24	-	1945-49
Cedar Lake near Ontario	LaGrange	1.66	108	-	1948-49
Cedar Lake near Waterloo	DeKalb	21.8	27	-	1943-49
Cree Lake near Kendallville	Noble	4.90	54	-	1949
Crooked Lake at Crooked Lake	Steuben	11.9	733	988.17	1945-49
Dewart Lake near Leesburg	Kosciusko	7.88	476	867.70	1945-49
Diamond Lake near Wawaka	Noble	2.82	96	-	1945-49
Eagle Lake near Kimmel	Noble	1.77	59	-	1945-48
Fish Lake near Plato	LaGrange	10.8	91	-	1945-49
Fox Lake near Angola	Steuben	1.13	142	1,018.83	1945-49
Hackenburg Lake near Wolcottville	LaGrange	54.8	37	-	1945-49
Hamilton Lake at Hamilton	Steuben	12.8	765	698.83	1943-49
Heaton Lake near Elkhart	Elkhart	8.78	69	-	1945-49
Hogback Lake near Angola	Steuben	106	121	-	1945-49
Hunter Lake near Middlebury	Elkhart	.72	94	-	1945-49
Indiana Lake near Bristol	Elkhart	.53	129	-	1945-49
Jimerson Lake at Nevada Mills	Steuben	47.0	346	964.66	1945-49
Knapp Lake near Washington Center	Noble	6.52	77	-	1945-49
Lake Gage at Panama	Steuben	17.2	324	954.25	1945-49
Lake George at Hobart	Lake	124	282	-	1946-49
Lake George at Jamestown	Steuben	12.3	488	985.28	1945-49
Lake James at Lake James	Steuben	43.0	1,030	964.96	1942-49
Little Otter Lake near Fremont	Steuben	19.8	88	-	1945-49
Little Turkey Lake at Elmira	LaGrange	56.0	124	-	1945-49
Long Lake at Moonlight	Steuben	70.8	92	-	1945-49
Lower Long Lake near Albion	Noble	3.96	60	-	1945-49
Oliver Lake near Valentine	LaGrange	11.3	362	-	1945-49
Pleasant Lake at Pleasant Lake	Steuben	.94	50	-	1945-49
Pretty Lake near Stroh	LaGrange	2.91	185	-	1949
Round Lake at Clear Lake	Steuben	7.25	28	1,037.38	1943-49
Sand Lake near Burr Oak	Noble	15.0	44	-	1945-49
Silver Lake near Angola	Steuben	3.72	233	959.40	1945-49
Simonton Lake near Elkhart	Elkhart	4.37	245	-	1945-49
Skinner Lake near Albion	Noble	13.8	122	-	1945-49
Sparta Lake at Kimmel	Noble	.26	24	-	1945-49
Sylvan Lake at Rome City	Noble	31.5	575	-	1942-49
Syracuse Lake at Syracuse	Kosciusko	37.3	367	858.87	1943-49
Wabee Lake near Milford	Kosciusko	13.4	180	829.79	1945-49
Waldron Lake near Casperville	Noble	131	198	-	1947-49
Wawasee Lake near Wawasee	Kosciusko	37.3	2,620	858.89	1942-49
Witmer Lake near Wolcottville	LaGrange	35.8	215	-	1945-47
Wolf Lake near Goshen	Elkhart	.88	100	-	1947-49
Wolf Lake at Hammond	Lake	5.72	999	-	1946-48

* Elevation, in feet, above mean sea level.

Measurements of stream flow in the St. Lawrence River Basin made at points other than gaging stations are given in the following table:

Miscellaneous discharge measurements in St. Lawrence River Basin during water year October 1948 to September 1949

Streams tributary to Lake Superior

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
Oct. 14	Presque Isle River	Lake Superior.....	SW¼ sec. 19, T. 49 N., R. 44 W., near Tula, Mich.	46.2
14	....do.....	....do.....	NW¼ sec. 13, T. 49 N., R. 45 W., near Tula, Mich.	44.8
June 1	Middle Branch Ontonagon River.	Ontonagon River...	NE¼ sec. 22, T. 45 N., R. 40 W., near Watersmeet, Mich.	8.66
July 6	....do.....	....do.....	....do.....	45.9
Aug. 3	....do.....	....do.....	....do.....	9.73
31	....do.....	....do.....	....do.....	7.70
Sept. 22	....do.....	....do.....	....do.....	6.38
June 1	....do.....	....do.....	E½ sec. 23, T. 45 N., R. 40 W., near Watersmeet, Mich.	9.14
July 6	....do.....	....do.....	....do.....	50.0
Aug. 3	....do.....	....do.....	....do.....	10.3
31	....do.....	....do.....	....do.....	7.04
10	West Branch Ontonagon River.	....do.....	S½ sec. 29, T. 50 N., R. 39 W., below Victoria power plant, Mich.	517
10	....do.....	....do.....	....do.....	497
May 16	Little Gratiot River.	Lac La Belle.....	At Gratiot Lake outlet, sec. 3, T. 57 N., R. 30 W., near Phoenix, Mich.	37.7
Oct. 27	Iron River.....	Lake Superior.....	Sec. 13, T. 51 N., R. 27 W., at outlet of Lake Independence near Big Bay, Mich.	32.6
Apr. 29	....do.....	....do.....	....do.....	174
Jan. 10	Carp River.....	Deer Lake.....	NW¼ sec. 1, T. 47 N., R. 28 W., near Ishpeming, Mich.	.659
Mar. 30	....do.....	....do.....	....do.....	.734
Apr. 15	....do.....	....do.....	....do.....	2.47
25	....do.....	....do.....	....do.....	1.41
June 29	....do.....	....do.....	....do.....	.954
Apr. 15	....do.....	....do.....	NE¼ sec. 1, T. 47 N., R. 28 W., near Ishpeming, Mich.	1.42
25	....do.....	....do.....	....do.....	.406
May 31	....do.....	....do.....	....do.....	.373
June 15	....do.....	....do.....	....do.....	.556
21	....do.....	....do.....	....do.....	.802
July 6	....do.....	....do.....	....do.....	3.01
12	....do.....	....do.....	....do.....	.789
Aug. 2	....do.....	....do.....	....do.....	1.58
30	....do.....	....do.....	....do.....	.672
Oct. 8*	....do.....	....do.....	....do.....	2.36
Jan. 12*	....do.....	....do.....	....do.....	1.84
Mar. 30*	....do.....	....do.....	....do.....	2.47
May 31*	....do.....	....do.....	....do.....	3.14
June 15*	....do.....	....do.....	....do.....	3.22
21*	....do.....	....do.....	....do.....	4.34
July 6*	....do.....	....do.....	....do.....	16.6
Aug. 2*	....do.....	....do.....	....do.....	7.24
30*	....do.....	....do.....	....do.....	3.54
Oct. 26	Partridge Creek...	Carp River.....	SE¼ sec. 3, T. 47 N., R. 27 W., at Ishpeming, Mich.	.082
Nov. 9	....do.....	....do.....	....do.....	.286
Dec. 8	....do.....	....do.....	....do.....	1.70
14	....do.....	....do.....	....do.....	.485
Apr. 15	....do.....	....do.....	....do.....	8.84
29	....do.....	....do.....	....do.....	1.55
29	....do.....	....do.....	....do.....	1.61
May 5	....do.....	....do.....	....do.....	9.08
18	....do.....	....do.....	....do.....	1.34
24	....do.....	....do.....	....do.....	1.17
31	....do.....	....do.....	....do.....	.790
June 2	....do.....	....do.....	....do.....	.569
7	....do.....	....do.....	....do.....	.314
8	....do.....	....do.....	....do.....	.264
July 6	....do.....	....do.....	....do.....	9.80
11	....do.....	....do.....	....do.....	1.58
Aug. 10	....do.....	....do.....	....do.....	1.82
16	....do.....	....do.....	....do.....	.816
24	....do.....	....do.....	....do.....	.455
Sept. 6	....do.....	....do.....	....do.....	4.78
13	....do.....	....do.....	....do.....	2.97
15	....do.....	....do.....	....do.....	1.31
23	....do.....	....do.....	....do.....	.745
23	Au Train River....	Au Train Bay.....	NW¼ sec. 5, T. 46 N., R. 20 W., at county highway bridge at Au Train, Mich.	108
22	Anna River.....	South Bay.....	NE¼ sec. 11, T. 46 N., R. 19 W., at old bridge on State Highway 28, at Munising, Mich.	37.2
12	Betsy River.....	Whitefish Bay.....	SW¼ sec. 6, T. 49 N., R. 7 W., at Falls Road bridge, 12 miles west of Paradise, Mich.	2.59
14	....do.....	....do.....	....do.....	7.39
14	....do.....	....do.....	NE¼ sec. 3, T. 49 N., R. 6 W., at bridge on State Highway 123, at Shelldrake, Mich.	73.9
15	Tahquamenon River.	....do.....	NE¼ sec. 23, T. 46 N., R. 10 W., at bridge on State Highway 48, at Newberry, Mich.	216

* Location for these measurements is short distance downstream from location of above measurements and includes another tributary creek.

Miscellaneous discharge measurements in St. Lawrence River Basin during water year October 1948 to September 1949--Continued

Streams tributary to Lake Michigan

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
Oct. 2	McDonald Lake outlet	Lake Michigan.....	NE¼ sec. 9, T. 41 N., R. 13 W., at county highway bridge near Gulliver, Mich.	0.274
Feb. 3	....do.....	....do.....	....do.....	9.17
Apr. 26	....do.....	....do.....	....do.....	39.2
Oct. 6	Gulliver Lake outlet	....do.....	SW¼ sec. 2, T. 41 N., R. 14 W., near Gulliver, Mich.	0
Feb. 3	....do.....	....do.....	....do.....	5.41
Apr. 26	....do.....	....do.....	....do.....	0
Oct. 7	North Manistique Lake outlet.	Manistique Lake...	Sec. 20, T. 45 N., R. 11 W., at bridge on State Highway 98, ¼ mile east of Helmer, Mich.	.789
Feb. 2	....do.....	....do.....	....do.....	15.5
Apr. 25	....do.....	....do.....	....do.....	23.8
Sept.14	Sturgeon River.....	Big Bay de Noc....	NW¼ sec. 13, T. 42 N., R. 20 W., at bridge on Federal Forest Highway 13, 2 miles north of St. Jacques, Mich.	102
9	....do.....	....do.....	NW¼ sec. 6, T. 40 N., R. 19 W., at bridge on U. S. Highway 2, near St. Jacques, Mich.	94.2
21	Whitefish River.....	....do.....	SW¼ sec. 10, T. 41 N., R. 21 W., 50 feet below mouth of Bills Creek, near Rapid River, Mich.	168
14	Rapid River.....	Little Bay de Noc.	NW¼ sec. 29, T. 41 N., R. 21 W., at bridge on U. S. Highway 2, at Rapid River, Mich.	72.3
Oct. 26	Partridge Creek.....	Goose Lake.....	SW¼ sec. 6, T. 47 N., R. 26 W., at Negaunee, Mich.	1.38
26	....do.....	....do.....	....do.....	1.62
Nov. 9	....do.....	....do.....	....do.....	2.35
Dec. 14	....do.....	....do.....	....do.....	1.40
Apr. 9	....do.....	....do.....	....do.....	3.42
29	....do.....	....do.....	....do.....	2.33
May 18	....do.....	....do.....	....do.....	2.61
18	....do.....	....do.....	....do.....	3.12
31	....do.....	....do.....	....do.....	2.26
June 2	....do.....	....do.....	....do.....	2.05
15	....do.....	....do.....	....do.....	1.85
21	....do.....	....do.....	....do.....	2.14
July 5	....do.....	....do.....	....do.....	4.40
11	....do.....	....do.....	....do.....	1.95
Oct. 26	....do.....	....do.....	SW¼ sec. 5, T. 47 N., R. 26 W., at Negaunee, Mich.	1.03
26	....do.....	....do.....	....do.....	1.18
26	....do.....	....do.....	....do.....	1.56
Nov. 9	....do.....	....do.....	....do.....	2.13
Dec. 6	....do.....	....do.....	....do.....	2.68
14	....do.....	....do.....	....do.....	1.18
Apr. 9	....do.....	....do.....	....do.....	3.63
29	....do.....	....do.....	....do.....	2.67
May 18	....do.....	....do.....	....do.....	2.50
18	....do.....	....do.....	....do.....	3.46
31	....do.....	....do.....	....do.....	2.68
31	....do.....	....do.....	....do.....	2.37
June 2	....do.....	....do.....	....do.....	2.84
14	....do.....	....do.....	....do.....	1.97
15	....do.....	....do.....	....do.....	2.15
21	....do.....	....do.....	....do.....	3.11
23	....do.....	....do.....	....do.....	4.89
July 5	....do.....	....do.....	....do.....	5.19
11	....do.....	....do.....	....do.....	1.66
Aug. 10	....do.....	....do.....	....do.....	4.16
10	....do.....	....do.....	....do.....	3.46
16	....do.....	....do.....	....do.....	2.36
16	....do.....	....do.....	....do.....	2.47
24	....do.....	....do.....	....do.....	1.99
Sept.15	....do.....	....do.....	....do.....	2.84
23	....do.....	....do.....	....do.....	3.25
Nov. 4	Ford River.....	Lake Michigan.....	SE¼ sec. 22, T. 43 N., R. 28 W., at Ralph, Mich.	28.5
4	East Branch Sturgeon River.	Sturgeon River....	NE¼ sec. 20, T. 42 N., R. 28 W., near Felch, Mich.	12.9
4	West Branch Sturgeon River.	....do.....	NE¼ sec. 30, T. 42 N., R. 29 W., near Randville, Mich.	20.2
4	....do.....	....do.....	NW¼ sec. 35, T. 42 N., R. 29 W., at State Highway 69, near Felch, Mich.	19.6
4	Steel Creek.....	Pine Creek.....	NE¼ sec. 6, T. 41 N., R. 29 W., near Randville, Mich.	.319
3	Iron River.....	Brule River.....	Sec. 17, T. 43 N., R. 35 W., at county bridge near Iron River, Mich.	22.4
3	....do.....	....do.....	SE¼NW¼ sec. 16, T. 43 N., R. 35 W., near Iron River, Mich.	24.5
3	....do.....	....do.....	SW¼ sec. 15, T. 43 N., R. 35 W., at railroad bridge near Iron River, Mich.	24.5
3	....do.....	....do.....	SE¼ sec. 27, T. 43 N., R. 35 W., at county bridge near Iron River, Mich.	36.5
3	....do.....	....do.....	At 7th St. Bridge, Iron River, Mich.	36.5
3	....do.....	....do.....	At U. S. Highway 2, Iron River, Mich.	43.5
3	....do.....	....do.....	NW¼NW¼ sec. 1, T. 42 N., R. 35 W., above Caspian, Mich.	42.8
3	....do.....	....do.....	At East Caspian Ave. Bridge, Caspian, Mich.	45.8
3	....do.....	....do.....	Near E¼ corner sec. 13, T. 42 N., R. 35 W., below Caspian, Mich.	59.0
3	....do.....	....do.....	Above mouth, sec. 29, T. 42 N., R. 34 W., below Caspian, Mich.	56.0

Miscellaneous discharge measurements in St. Lawrence River Basin during water year October 1948 to September 1949--Continued

Streams tributary to Lake Michigan--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
Nov. 3	Sunset Creek.....	Iron River.....	NE¼NW¼ sec. 27, T. 43 N., R. 35 W., at railroad bridge near Iron River, Mich.	8.87
3	Stanley Creek.....	....do.....	Sec. 27, T. 43 N., R. 35 W., at U. S. Highway 2, near Iron River, Mich.	.601
Oct. 7	Chicagoan Creek.....	Paint River.....	SW¼ sec. 24, T. 43 N., R. 34 W., at bridge on U. S. Highway 2, near Iron River, Mich.	0
Feb. 4	....do.....	....do.....	....do.....	4.61
May 3	....do.....	....do.....	....do.....	14.1
Aug. 3	....do.....	....do.....	....do.....	0
Oct. 6	Briar Hill Creek....	....do.....	Fortune Lake outlet, SW¼ sec. 24, T. 43 N., R. 33 W., at New Bristol location, near Crystal Falls, Mich.	6.11
Mar. 3	....do.....	....do.....	....do.....	9.17
May 3	....do.....	....do.....	....do.....	6.43
Aug. 3	....do.....	....do.....	....do.....	.582
Oct. 14	Rose Lake outlet....	Coldwater River.....	SW¼ sec. 18, T. 7 S., R. 6 W., near Coldwater, Mich.	1.43
Nov. 23	....do.....	....Do.....	....do.....	9.28
Mar. 18	....do.....	....do.....	....do.....	13.5
16	Nottawa Creek.....	St. Joseph River....	NE¼ sec. 28, T. 3 S., R. 7 W., near Ceresco, Mich.	54.6
16	....do.....	....do.....	....do.....	48.8
June 2	....do.....	....do.....	....do.....	34.9
Mar. 16	....do.....	....do.....	SW¼ sec. 28, T. 3 S., R. 7 W., near Ceresco, Mich.	52.4
16	....do.....	....do.....	....do.....	52.7
June 2	....do.....	....do.....	....do.....	37.4
2	....do.....	....do.....	....do.....	38.6
Dec. 15	Portage River.....	St. Joseph River....	SW¼ sec. 16, T. 4 S., R. 10 W., near Vicksburg, Mich.	43.5
Mar. 22	....do.....	....do.....	....do.....	60.1
June 15	....do.....	....do.....	....do.....	59.7
Sept.15	....do.....	....do.....	....do.....	20.5
Dec. 15	Austin Lake outlet..	Portage River.....	SE¼ sec. 36, T. 3 S., R. 11 W., near Kalamazoo, Mich.	0
Mar. 22	....do.....	....do.....	....do.....	9.27
June 14	....do.....	....do.....	....do.....	6.41
Sept.15	....do.....	....do.....	....do.....	0
Dec. 17	Klinger Lake outlet.	Fawn River.....	SE¼ sec. 35, T. 7 S., R. 11 W., near White Pigeon, Mich.	24.2
Feb. 17	....do.....	....do.....	....do.....	23.4
June 16	....do.....	....do.....	....do.....	23.3
Dec. 3	Dowagiac Creek.....	St. Joseph River....	SW¼ sec. 24, T. 4 S., R. 15 W., near Decatur, Mich.	3.84
Jan. 11	....do.....	....do.....	....do.....	5.81
Nov. 17	Paw Paw River.....	....do.....	NW¼ sec. 18, T. 4 S., R. 18 W., at Benton Harbor, Mich.	344
Dec. 15	Gun Lake outlet.....	Gun River.....	NW¼ sec. 6, T. 2 N., R. 10 W., near Shelbyville, Mich.	31.5
Mar. 23	....do.....	....do.....	....do.....	38.3
June 20	....do.....	....do.....	....do.....	33.3
Sept.14	....do.....	....do.....	....do.....	0
Dec. 6	Black River.....	Lake Macatawa.....	NW¼ sec. 26, T. 5 N., R. 15 W., near Holland, Mich.	8.69
Nov. 29	Portage River.....	Grand River.....	SW¼ sec. 21, T. 1 S., R. 2 E., near Munith, Mich.	13.7
Mar. 15	....do.....	....do.....	....do.....	31.6
June 20	....do.....	....do.....	....do.....	27.6
Sept.27	....do.....	....do.....	....do.....	1.22
Nov. 29	....do.....	....do.....	On line between secs. 25 and 36, T. 1 S., R. 1 E., near Munith, Mich.	46.4
Mar. 15	....do.....	....do.....	....do.....	69.2
Nov. 29	Trist Branch Portage River.	Portage River.....	SW¼ sec. 33, T. 1 S., R. 2 E., near Munith, Mich.	10.2
Mar. 18	....do.....	....do.....	....do.....	16.7
June 20	....do.....	....do.....	....do.....	27.7
Sept.27	....do.....	....do.....	....do.....	2.66
Nov. 29	Portage Lake inlet..	....do.....	SE¼ sec. 6, T. 2 S., R. 2 E., near Munith, Mich.	2.42
Mar. 15	....do.....	....do.....	....do.....	2.19
June 20	....do.....	....do.....	....do.....	2.53
Sept.27	....do.....	....do.....	....do.....	2.03
Dec. 2	Lake Lansing outlet.	Cedar River.....	Center sec. 3, T. 4 N., R. 1 W., near Haslett, Mich.	0
Mar. 29	....do.....	....do.....	....do.....	4.35
June 23	....do.....	....do.....	....do.....	.90
24	....do.....	....do.....	....do.....	.77
Sept.28	....do.....	....do.....	....do.....	0
June 22	Bakers Creek.....	Maple River.....	On line between secs. 13 and 14, T. 8 N., R. 1 W., at Elsie, Mich.	1.77
July 18	....do.....	....do.....	....do.....	1.78
Aug. 26	....do.....	....do.....	....do.....	.16
Sept.28	....do.....	....do.....	....do.....	.11
Dec. 3	Morrison Lake outlet	Grand River.....	N½ sec. 36, T. 6 N., R. 8 W., near Clarksville, Mich.	0
Mar. 22	....do.....	....do.....	....do.....	4.37
June 13	....do.....	....do.....	....do.....	.18
Sept.12	....do.....	....do.....	....do.....	0
Dec. 3	Jordan Lake outlet..	Thornapple River....	NW¼ sec. 9, T. 4 N., R. 7 W., near Lake Odessa, Mich.	5.10
Mar. 22	....do.....	....do.....	....do.....	13.0
June 21	....do.....	....do.....	....do.....	6.51

Miscellaneous discharge measurements in St. Lawrence River Basin during water year October 1948 to September 1949--Continued

Streams tributary to Lake Michigan--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
Sept.12	Jordan Lake outlet.	Thornapple River..	NW¼ sec. 9, T. 4 N., R. 7 W., near Lake Odessa, Mich.	3.45
Apr. 1	Muskegon River.....	Lake Michigan.....	SE¼ sec. 16, T. 19 N., R. 6 W., ½ mile northwest of Temple, Mich.	2,110
5	....do.....	....do.....	....do.....	1,940
Oct. 19	Backus Creek.....	Houghton Lake.....	Sec. 5, T. 22 N., R. 2 W., Prudenville, Mich.	0
Dec. 27	....do.....	....do.....	....do.....	.58
Apr. 7	....do.....	....do.....	....do.....	48.3
7	....do.....	....do.....	....do.....	45.5
Aug. 15	....do.....	....do.....	....do.....	0
Oct. 4	Clam River.....	Muskegon River....	Sec. 21, T. 22 N., R. 8 W., near Jennings, Mich.	10.6
Nov. 9	....do.....	....do.....	....do.....	9.71
Dec. 23	....do.....	....do.....	....do.....	10.7
Jan. 27	....do.....	....do.....	....do.....	10.7
Feb. 24	....do.....	....do.....	....do.....	14.0
Mar. 31	....do.....	....do.....	....do.....	89.9
Apr. 27	....do.....	....do.....	....do.....	77.4
May 26	....do.....	....do.....	....do.....	17.6
June 28	....do.....	....do.....	....do.....	43.4
July 26	....do.....	....do.....	....do.....	13.8
Aug. 30	....do.....	....do.....	....do.....	9.48
Sept.28	....do.....	....do.....	....do.....	8.91
Dec. 7	Hess Lake outlet...	....do.....	NW¼ sec. 33, T. 12 N., R. 12 W., near Newaygo, Mich.	5.62
June 14	....do.....	....do.....	....do.....	6.10
Sept.13	....do.....	....do.....	....do.....	2.54
Dec. 7	Fremont Lake outlet	....do.....	NW¼ sec. 15, T. 12 N., R. 14 W., near Fremont, Mich.	6.86
Mar. 15	....do.....	....do.....	....do.....	17.9
June 14	....do.....	....do.....	....do.....	3.16
Nov. 16	Silver Lake outlet.	Lake Michigan.....	NE¼ sec. 36, T. 15 N., R. 19 W., near Mears, Mich.	8.04
Mar. 15	....do.....	....do.....	....do.....	23.6
June 14	....do.....	....do.....	....do.....	7.28
Sept.13	....do.....	....do.....	....do.....	7.54
Jan. 3	Portage Creek.....	Manistee River....	SW¼ sec. 8, T. 26 N., R. 4 W., near Grayling, Mich.	12.6
May 6	....do.....	....do.....	....do.....	21.0
Aug. 19	....do.....	....do.....	....do.....	12.4
Oct. 6	North Branch Manistee River.	....do.....	Sec. 3, T. 27 N., R. 6 W., near Kalkaska, Mich.	.34
Dec. 23	....do.....	....do.....	....do.....	2.47
Apr. 7	....do.....	....do.....	....do.....	6.35
July 27	....do.....	....do.....	....do.....	2.42
Oct. 6	Fife Lake outlet...	....do.....	Fife Lake, Mich.....	.52
Dec. 23	....do.....	....do.....	....do.....	3.62
Apr. 7	....do.....	....do.....	....do.....	8.52
July 27	....do.....	....do.....	....do.....	10.2
Oct. 8	Betsie River.....	Lake Michigan.....	Sec. 5, T. 25 N., R. 12 W., near Karlin, Mich.	25.2
Jan. 4	....do.....	....do.....	....do.....	5.08
Apr. 14	....do.....	....do.....	....do.....	75.0
Aug. 11	....do.....	....do.....	....do.....	25.0
Oct. 8	Crystal Lake outlet	Betsie River.....	Beulah, Mich.....	2.44
Jan. 4	....do.....	....do.....	....do.....	1.45
Apr. 14	....do.....	....do.....	....do.....	15.3
Aug. 11	....do.....	....do.....	....do.....	15.4
Oct. 8	Crystal River.....	Lake Michigan.....	Sec. 24, T. 29 N., R. 14 W., near Cedar, Mich.	30.4
Jan. 4	....do.....	....do.....	....do.....	57.9
Feb. 23	....do.....	....do.....	....do.....	61.1
Apr. 14	....do.....	....do.....	....do.....	11.9
Aug. 11	....do.....	....do.....	....do.....	21.3
May 12	Boardman River.....	Grand Traverse Bay	SE¼ sec. 4, T. 26 N., R. 9 W., near Mayfield, Mich.	91.8
June 9	....do.....	....do.....	....do.....	69.9
Aug. 24	....do.....	....do.....	....do.....	61.7
May 12	....do.....	....do.....	NE¼ sec. 18, T. 26 N., R. 9 W., Rudolfs Ranch near Mayfield, Mich.	112
June 9	....do.....	....do.....	....do.....	86.1
Aug. 24	....do.....	....do.....	....do.....	75.6
Feb. 17	....do.....	....do.....	Sec. 17, T. 26 N., R. 10 W., near Mayfield, Mich.	250
May 12	South Branch Boardman River.	Boardman River....	SW¼ sec. 3, T. 26 N., R. 9 W., near Mayfield, Mich.	41.7
June 9	....do.....	....do.....	....do.....	40.5
Aug. 24	....do.....	....do.....	....do.....	31.2
May 13	Parker Creek.....	....do.....	NE¼ sec. 21, T. 26 N., R. 10 W., near Mayfield, Mich.	18.7
June 9	....do.....	....do.....	....do.....	15.9
Aug. 24	....do.....	....do.....	....do.....	11.5
May 13	Swainstons Creek...	....do.....	SE¼ sec. 21, T. 26 N., R. 10 W., near Mayfield, Mich.	9.98
June 9	....do.....	....do.....	....do.....	10.1
Aug. 24	....do.....	....do.....	....do.....	6.50
May 13	Mitchell Creek.....	Grand Traverse Bay	SE¼ sec. 7, T. 27 N., R. 10 W., near Traverse City, Mich.	9.15
June 10	....do.....	....do.....	....do.....	7.37
Aug. 25	....do.....	....do.....	....do.....	5.11
25	Tobeco Creek.....	P-To-Ba-GO Pond...	NW¼ sec. 5, T. 28 N., R. 9 W., near Elk Rapids, Mich.	.0186
May 13	Battle Creek.....	Elk Lake.....	NW¼ sec. 2, T. 27 N., R. 9 W., near Williamsburg, Mich.	9.85
June 10	....do.....	....do.....	....do.....	9.85

Miscellaneous discharge measurements in St. Lawrence River Basin during water year October 1948 to September 1949--Continued

Streams tributary to Lake Michigan--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
Aug. 25	Battle Creek.....	Elk Lake.....	NW¼ sec. 2, T. 27 N., R. 9 W., near Williamsburg, Mich.	9.88
Oct. 12	Bear River.....	Lake Michigan.....	Walloon Lake, Mich.....	5.11
Dec. 15	....do.....	....do.....	....do.....	15.4
Apr. 21	....do.....	....do.....	....do.....	23.9
July 19	....do.....	....do.....	....do.....	14.2
Oct. 12	Carp Lake River.....	....do.....	Carp Lake, Mich.....	.21
Dec. 14	....do.....	....do.....	....do.....	11.8
Apr. 14	....do.....	....do.....	....do.....	34.1
July 15	....do.....	....do.....	....do.....	1.23
Jan. 5	Adams Lake outlet...	North Branch Elkhart River.	SE¼SW¼ sec. 36, T. 36 N., R. 10 E., near Wolcottville, Ind.	3.10
Feb. 18	....do.....	....do.....	....do.....	10.9
Mar. 9	....do.....	....do.....	....do.....	5.84
24	....do.....	....do.....	....do.....	4.01
Apr. 21	....do.....	....do.....	....do.....	4.27
Sept. 8	....do.....	....do.....	....do.....	.33
Mar. 4	Bear Lake outlet....	Thumma ditch.....	SW¼SW¼ sec. 8, T. 33 N., R. 9 E., near Wolflake, Ind.	6.67
Dec. 15	Big Turkey Lake outlet.	Turkey Creek.....	SW¼SE¼ sec. 12, T. 36 N., R. 11 E., at Stroh, Ind.	8.55
Feb. 18	....do.....	....do.....	....do.....	103
Mar. 10	....do.....	....do.....	....do.....	52.9
24	....do.....	....do.....	....do.....	32.6
May 5	....do.....	....do.....	....do.....	26.5
Sept. 8	....do.....	....do.....	....do.....	5.10
Feb. 2	Bixler Lake outlet..	Dieble Creek.....	NW¼ sec. 4, T. 34 N., R. 11 E., at Kendallville, Ind.	1.72
May 5	....do.....	....do.....	....do.....	1.93
Mar. 10	Cedar Lake outlet...	Fawn River.....	NW¼NW¼ sec. 22, T. 38 N., R. 10 E., near Ontario, Ind.	2.99
Apr. 29	....do.....	....do.....	....do.....	2.21
May 5	....do.....	....do.....	....do.....	2.05
Sept. 9	....do.....	....do.....	....do.....	1.97
Mar. 10	Crooked Lake outlet.	Crooked Creek.....	SE¼NE¼ sec. 8, T. 37 N., R. 13 E., at Crooked Lake, Ind.	6.84
1	Dewart Lake outlet..	Turkey Creek.....	SE¼SW¼ sec. 25, T. 34 N., R. 6 E., near Leesburg, Ind.	4.31
Aug. 30	....do.....	....do.....	....do.....	.07
Dec. 30	Diamond Lake outlet.	Willets ditch.....	SW¼SE¼ sec. 31, T. 35 N., R. 8 E., near Wawaka, Ind.	6.42
Mar. 4	....do.....	....do.....	....do.....	6.44
Apr. 22	....do.....	....do.....	....do.....	4.56
Mar. 10	Fish Lake outlet....	Pigeon River.....	SW¼NW¼ sec. 36, T. 37 N., R. 10 E., near Plato, Ind.	7.92
Apr. 21	....do.....	....do.....	....do.....	8.68
Sept. 8	....do.....	....do.....	....do.....	.31
Apr. 20	Fox Lake outlet.....	....do.....	NW¼NE¼ sec. 34, T. 37 N., R. 13 E., near Angola, Ind.	1.78
Mar. 17	Heaton Lake outlet..	Meyers ditch.....	SE¼NE¼ sec. 23, T. 38 N., R. 5 E., near Elkhart, Ind.	6.01
May 5	Hunter Lake outlet..	Little Elkhart River.	SE¼NW¼ sec. 25, T. 38 N., R. 7 E., near Middlebury, Ind.	2.61
Jan. 6	Jimerson Lake outlet	Fawn River.....	SW¼NW¼ sec. 30, T. 38 N., R. 13 E., at Nevada Mills, Ind.	39.7
Feb. 17	....do.....	....do.....	....do.....	25.9
Sept.15	....do.....	....do.....	....do.....	6.00
Dec. 1	Lake Gage outlet....	Crooked Creek.....	NW¼ sec. 5, T. 38 N., R. 12 E., at Panama, Ind.	.20
Feb. 17	....do.....	....do.....	....do.....	7.63
Apr. 20	....do.....	....do.....	....do.....	9.23
Feb. 17	Lake George outlet..	....do.....	SE¼ sec. 15, T. 38 N., R. 13 E., at at Jamestown, Ind.	30.6
Sept.15	....do.....	....do.....	....do.....	.67
May 5	Little Turkey Lake outlet.	Pigeon River.....	SE¼NE¼ sec. 11, T. 36 N., R. 11 E., at Elmira, Ind.	48.7
Sept. 8	....do.....	....do.....	....do.....	7.95
Mar. 3	Lower Long lake outlet.	Kirkpatrick ditch.	NE¼NW¼ sec. 28, T. 34 N., R. 8 E., near Albion, Ind.	5.65
Apr. 28	....do.....	....do.....	....do.....	2.31
Sept. 7	....do.....	....do.....	....do.....	.52
8	Oliver Lake outlet..	North Branch Elkhart River.	NW¼SW¼ sec. 17, T. 36 N., R. 10 E., near Valentine, Ind.	3.82
Mar. 3	Sand Lake outlet....	South Branch Elkhart River.	SW¼NW¼ sec. 9, T. 33 N., R. 10 E., near Burr Oak, Ind.	18.3
May 11	....do.....	....do.....	....do.....	2.97
Sept. 7	....do.....	....do.....	....do.....	2.30
Feb. 17	Silver Lake outlet..	Pigeon Creek.....	SE¼SW¼ sec. 30, T. 37 N., R. 13 E., near Angola, Ind.	9.17
Mar. 11	....do.....	....do.....	....do.....	3.46
Apr. 19	....do.....	....do.....	....do.....	2.61
Mar. 3	Skinner Lake outlet.	South Branch Elkhart River.	NW¼SE¼ sec. 16, T. 34 N., R. 10 E., near Albion, Ind.	17.1
Sept. 7	....do.....	....do.....	....do.....	1.59
Dec. 22	Wabee Lake outlet...	Turkey Creek.....	SW¼SE¼ sec. 16, T. 34 N., R. 6 E., near Milford, Ind.	4.04
Feb. 15	....do.....	....do.....	....do.....	12.8
Aug. 30	....do.....	....do.....	....do.....	1.01
Jan. 5	Waldron Lake outlet.	North Branch Elkhart River.	SW¼NE¼ sec. 14, T. 35 N., R. 9 E., near Cosperville, Ind.	142

Streams tributary to Lake Huron

Sept.19	Little Munuscong River.	St. Marys River..	NE¼ sec. 10, T. 44 N., R. 1 E., at highway bridge, 4 miles south of Barbeau, Mich.	0

Miscellaneous discharge measurements in St. Lawrence River Basin during water year October 1948 to September 1949--Continued

Streams tributary to Lake Huron--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
Sept. 19	Munuscong River.....	St. Marys River....	SW¼ sec. 21, T. 44 N., R. 1 E., at highway bridge at Stirlingville, Mich.	18.8
19	....do.....	....do.....	NE¼ sec. 16, T. 44 N., R. 1 E., at bridge on Hay Lake Road, 6 miles south of Barbeau, Mich.	.64
8	Pine River.....	St. Martin Bay.....	NE¼ sec. 10, T. 42 N., R. 3 W., at bridge on State Highway 134, near Charles, Mich.	22.6
9	Carp River.....	....do.....	NW¼ sec. 10, T. 42 N., R. 4 W., at bridge on Federal Forest Trail, near Greene, Mich.	48.6
8	....do.....	....do.....	SE¼ sec. 19, T. 42 N., R. 3 W., at bridge on U. S. Highway 2, near Charles, Mich.	49.9
Oct. 12	East Branch Maple River.	Maple River.....	Pellston, Mich.....	.68
Dec. 14	....do.....	....do.....	....do.....	1.03
Apr. 19	....do.....	....do.....	....do.....	27.2
July 15	....do.....	....do.....	....do.....	7.40
Dec. 2	Grand Lake outlet...	Lake Huron.....	Rogers City, Mich.....	.012
Apr. 6	....do.....	....do.....	....do.....	47.7
July 6	....do.....	....do.....	....do.....	49.2
Oct. 1	McCormick Lake outlet.	Thunder Bay River..	Atlanta, Mich.....	18.7
Dec. 3	....do.....	....do.....	....do.....	19.2
Apr. 5	....do.....	....do.....	....do.....	23.0
July 7	....do.....	....do.....	....do.....	17.5
Apr. 13	Thunder Bay River...	Lake Huron.....	Alpena, Mich.....	891
Oct. 1	Hunt Creek.....	Thunder Bay River..	Sec. 25, T. 29 N., R. 2 E., near Lewiston, Mich.	19.6
Dec. 30	....do.....	....do.....	....do.....	21.4
Apr. 12	....do.....	....do.....	....do.....	20.9
Aug. 22	....do.....	....do.....	....do.....	14.8
Oct. 1	Fuller Creek.....	Hunt Creek.....	S½NE¼ sec. 35, T. 29 N., R. 2 E., near Lewiston, Mich.	4.46
Dec. 30	....do.....	....do.....	....do.....	8.82
Apr. 12	....do.....	....do.....	....do.....	8.31
Aug. 22	....do.....	....do.....	....do.....	5.78
Oct. 1	East Fish Lake outlet.	Fuller Creek.....	NE¼ sec. 34, T. 29 N., R. 2 E., near Lewiston, Mich.	1.66
Dec. 30	....do.....	....do.....	....do.....	1.58
Apr. 12	....do.....	....do.....	....do.....	1.12
Aug. 22	....do.....	....do.....	....do.....	.763
Oct. 19	Lake St. Helen outlet.	Au Sable River.....	St. Helen, Mich.....	.27
Dec. 27	....do.....	....do.....	....do.....	8.63
Apr. 26	....do.....	....do.....	....do.....	98.2
Aug. 15	....do.....	....do.....	....do.....	6.66
Dec. 8	Au Gres River.....	Lake Huron.....	Sec. 28, T. 23 N., R. 4 E., near Lupton, Mich.	3.28
Apr. 11	....do.....	....do.....	....do.....	8.78
Aug. 10	....do.....	....do.....	....do.....	1.50
Oct. 25	East Branch Au Gres River.	Au Gres River.....	E½ sec. 8, T. 22 N., R. 6 E., near Whittemore, Mich.	18.2
Dec. 8	....do.....	....do.....	....do.....	18.5
Apr. 11	....do.....	....do.....	....do.....	37.0
Aug. 10	....do.....	....do.....	....do.....	15.5
Oct. 25	Guiley Creek.....	East Branch Au Gres River.	W½ sec. 9, T. 22 N., R. 6 E., near Whittemore, Mich.	9.59
Dec. 8	....do.....	....do.....	....do.....	9.66
Apr. 11	....do.....	....do.....	....do.....	14.8
Aug. 10	....do.....	....do.....	....do.....	9.30
Oct. 25	Rifle River.....	Lake Huron.....	Devoe Dam near Lupton, Mich.....	23.0
Nov. 11	....do.....	....do.....	....do.....	29.6
Dec. 8	....do.....	....do.....	....do.....	29.4
Jan. 7	....do.....	....do.....	....do.....	32.8
Feb. 3	....do.....	....do.....	....do.....	30.2
Mar. 8	....do.....	....do.....	....do.....	34.0
Apr. 11	....do.....	....do.....	....do.....	47.3
May 23	....do.....	....do.....	....do.....	37.1
June 27	....do.....	....do.....	....do.....	30.3
July 27	....do.....	....do.....	....do.....	26.3
Aug. 12	....do.....	....do.....	....do.....	28.7
Sept. 29	....do.....	....do.....	....do.....	20.9
Oct. 25	....do.....	....do.....	The Ranch near Lupton, Mich.....	55.8
Dec. 8	....do.....	....do.....	....do.....	67.2
Apr. 11	....do.....	....do.....	....do.....	101
July 27	....do.....	....do.....	....do.....	71.2
Oct. 25	Gamble Creek.....	Rifle River.....	Devoe Lake near Lupton, Mich.....	23.1
Dec. 8	....do.....	....do.....	....do.....	28.2
Apr. 11	....do.....	....do.....	....do.....	37.0
Aug. 12	....do.....	....do.....	....do.....	31.3

Streams tributary to Lake St. Clair

Dec. 1	Loon Lake outlet....	Clinton River.....	SW¼ sec. 10, T. 3 N., R. 9 E., at Drayton Plains, Mich.	52.9
Mar. 9	....do.....	....do.....	....do.....	92.4
June 9	....do.....	....do.....	....do.....	25.7
Sept. 15	....do.....	....do.....	....do.....	12.7
Dec. 1	Cass Lake outlet....	....do.....	NE¼ sec. 2, T. 2 N., R. 9 E., at Keego Harbor, Mich.	63.8
Mar. 9	....do.....	....do.....	....do.....	135

Miscellaneous discharge measurements in St. Lawrence River Basin during water year October 1948 to September 1949--Continued

Streams tributary to Lake St. Clair--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
June 10	Cass Lake outlet....	Clinton River.....	Keego Harbor, Mich.....	29.2
Sept.15	....do.....	....do.....	....do.....	14.2

Streams tributary to Lake Erie

July 13	Pontiac Lake outlet	Lake Erie.....	SW¼ sec. 13, T. 3 N., R. 8 E., near Drayton Plains, Mich.	1.46
Sept.30	....do.....	....do.....	....do.....	0
Dec. 1	....do.....	....do.....	....do.....	30.4
June 8	....do.....	....do.....	....do.....	0
Sept.15	....do.....	....do.....	....do.....	0
Nov. 30	Proud Lake outlet...	....do.....	SW¼ sec. 17, T. 2 N., R. 8 E., near Commerce, Mich.	80.0
Mar. 11	....do.....	....do.....	....do.....	102
June 23	....do.....	....do.....	....do.....	34.1
Sept.15	....do.....	....do.....	....do.....	20.7
May 20	Huron River.....	....do.....	N½ sec. 20, T. 1 N., R. 6 E., at bridge on U. S. Highway 23, near Hamburg, Mich.	580
26	....do.....	....do.....	....do.....	430
Apr. 6	....do.....	....do.....	....do.....	482
6	....do.....	....do.....	Center sec. 24, T. 1 N., R. 5 E., near Hamburg, Mich.	593
Oct. 15	Union Lake outlet...	Huron River.....	SE¼ sec. 1, T. 2 N., R. 8 E., near Commerce, Mich.	.42
Nov. 10	....do.....	....do.....	....do.....	6.00
Dec. 1	....do.....	....do.....	....do.....	4.84
Jan.. 6	....do.....	....do.....	....do.....	4.44
Feb. 2	....do.....	....do.....	....do.....	5.91
Mar. 9	....do.....	....do.....	....do.....	7.91
Apr. 7	....do.....	....do.....	....do.....	8.20
May 5	....do.....	....do.....	....do.....	6.84
June 9	....do.....	....do.....	....do.....	0
July 8	....do.....	....do.....	....do.....	0
Aug. 1	....do.....	....do.....	....do.....	0
Sept. 8	....do.....	....do.....	....do.....	0
Nov. 30	Horseshoe Lake outlet.	....do.....	SW¼ sec. 8, T. 1 S., R. 6 E., near Whitmore Lake, Mich.	.03
Mar. 16	....do.....	....do.....	....do.....	6.19
June 6	....do.....	....do.....	....do.....	1.38
Nov. 30	Portage Creek.....	....do.....	NW¼ sec. 34, T. 1 N., R. 3 E., near Unadilla, Mich.	18.2
Mar. 16	....do.....	....do.....	....do.....	27.8
June 22	....do.....	....do.....	....do.....	27.7
Sept.27	....do.....	....do.....	....do.....	11.2
Sept. 1	Pittsfield drain....	....do.....	On line between secs. 3 and 10, T. 3 S., R. 6 E., near Ann Arbor, Mich.	1.64
26	....do.....	....do.....	....do.....	1.48
1	....do.....	....do.....	NW¼ sec. 2, T. 3 S., R. 6 E., near Ann Arbor, Mich.	1.84
26	....do.....	....do.....	....do.....	1.84
1	Swift Run drain.....	....do.....	On line between secs. 2 and 11, T. 3 S., R. 6 E., near Ann Arbor, Mich.	0
26	....do.....	....do.....	....do.....	0
1	....do.....	....do.....	NE¼ sec. 2, T. 3 S., R. 6 E., near Ann Arbor, Mich.	.20
26	....do.....	....do.....	....do.....	.36
Dec. 14	Devils Lake outlet..	Bean Creek.....	NE¼ sec. 4, T. 6 S., R. 1 E., near Manitou Beach, Mich.	0
Mar. 16	....do.....	....do.....	....do.....	9.69
June 21	....do.....	....do.....	....do.....	6.92
Sept.16	....do.....	....do.....	....do.....	0
Dec. 1	Miami & Erie Canal..	Auglaize River....	Delphos, Ohio.....	9.50
Jan. 19	....do.....	....do.....	....do.....	37.4
Feb. 24	....do.....	....do.....	....do.....	9.55
Mar. 28	....do.....	....do.....	....do.....	14.1
Apr. 25	....do.....	....do.....	....do.....	4.41
June 6	....do.....	....do.....	....do.....	6.66
July 5	....do.....	....do.....	....do.....	9.36
Aug. 17	....do.....	....do.....	....do.....	9.13
Sept. 7	....do.....	....do.....	....do.....	7.92
Mar. 30	....do.....	Maumee River.....	Florida, Ohio.....	28.4
Apr. 27	....do.....	....do.....	....do.....	18.1
July 7	....do.....	....do.....	....do.....	3.71
Aug. 18	....do.....	....do.....	....do.....	14.1
Sept. 9	....do.....	....do.....	....do.....	20.6
Dec. 17	Sandusky River.....	Lake Erie.....	Tiffin, Ohio.....	5,310
Jan. 29	....do.....	....do.....	....do.....	6,960
Dec. 16	Tymochtee Creek.....	Sandusky River....	At bridge on County Highway 71, 1 mile north of Marseilles, Ohio.	2,010
Jan. 5	....do.....	....do.....	....do.....	2,400
7	....do.....	....do.....	....do.....	302
6	....do.....	....do.....	At bridge on U. S. Highway 30 N., 4 miles west of Upper Sandusky, Ohio	2,330
Dec. 16	....do.....	....do.....	At bridge on County Highway 47, 5½ miles northwest of Upper Sandusky, Ohio.	1,340
Jan. 5	....do.....	....do.....	....do.....	1,420

Miscellaneous discharge measurements in St. Lawrence River Basin during water year October 1948 to September 1949--Continued

Streams tributary to Lake Erie--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
Jan. 8	Tymochtee Creek.....	Sandusky River....	At bridge on County Highway 47, 5½ miles northwest of Upper Sandusky, Ohio.	509
Dec. 16	....do.....	....do.....	At bridge on County Highway 107, 4¼ miles east of Carey, Ohio.	1,490
Jan. 7	....do.....	....do.....	....do.....	2,510
8	....do.....	....do.....	....do.....	1,220
Apr. 6	Unnamed stream.....	East Branch Huron River.	Lat. 41°14'00", long. 82°32'30", T. 4 N., R. 21 W., 4 miles east of Norwalk, Ohio.	17.6
Mar. 25	Tinkers Creek.....	Cuyahoga River....	At Bedford, Ohio.....	224
Feb. 15	Hoskins Creek.....	Grand River.....	At Hartsgrove, Ohio.....	88.0
Mar. 21	....do.....	....do.....	....do.....	15.5
Sept. 16	Walnut Creek.....	Lake Erie.....	Weis Library, Pa.....	3.86
1	Mill Creek.....	....do.....	Erie, Pa.....	10.2
15	....do.....	....do.....	....do.....	1.60

Streams tributary to Lake Ontario

July 4	Branch Oak Orchard Creek.	Oak Orchard Creek.	At Langton Corners, near Elba, N. Y. Drainage area, 3.2 square miles.	a216
June 22	Oak Orchard Creek...	Lake Ontario.....	Medina, N. Y. Drainage area, 158 square miles.	2.26
July 8	....do.....	....do.....	....do.....	4.20
June 22	Irondequoit Creek...	Irondequoit River.	Bushnell Basin, N. Y. Drainage area, 55.6 square miles.	15.4
July 8	....do.....	....do.....	....do.....	20.1
June 21	Little Sodus Creek..	Lake Ontario.....	Sterling, N. Y. Drainage area, 44.4 square miles.	1.59
July 7	....do.....	....do.....	....do.....	.99
June 21	Owasco Lake inlet ..	Owasco Lake.....	Moravia, N. Y. Drainage area, 107 square miles.	33
July 7	....do.....	....do.....	....do.....	39.6
June 21	Chittenango Creek...	Oneida Lake.....	Chittenango, N. Y. Drainage area, 76.0 square miles.	38
July 7	....do.....	....do.....	....do.....	29.1
Nov. 20	Virgil Creek.....	Fall Creek.....	At bridge on State Highway 90 east of Virgil, N. Y. Drainage area, 2.44 square miles.	a1,100
Aug. 18	Kelley Corners Creek	Black River.....	Watertown, N. Y. Drainage area, 1.02 square miles.	b180

a Flow at crest stage; computed by contracted-opening method.
b Flow at crest stage computed by slope-area method.

Streams tributary to St. Lawrence River

Dec. 31	East Branch Ausable River.	Ausable River.....	Keene Valley, N. Y. Drainage area, 49.2 square miles.	a5,300
31	....do.....	....do.....	Keene, N. Y. Drainage area, 93.1 square miles.	c9,700
31	Johns Brook.....	East Branch Ausable River.	Keene Valley, N. Y. Drainage area, 16.2 square miles.	a4,200
31	Unnamed stream.....	East Branch Ausable River.	Near Keene, N. Y. Drainage area, 7.5 square miles.	a750
31	West Branch Ausable River.	Ausable River.....	Wilmington, N. Y. Drainage area, 140 square miles.	d9,030

a Flow at crest stage; computed by contracted-opening method.
c Flow at crest stage; computed from flow over dam and by contracted-opening methods.
d Flow at crest stage; computed from flow over dam.

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