A, Kalamazoo River near Battle Creek, Mich.

B, Huron River at Milan, Ohio

C, Fall Creek near Ithaca, N. Y. (Photo by Ithaca Journal)

FIGURE 1.—GAGING STATION STRUCTURES

stage-discharge relation is affected by ice, this information is given in a note to the table. No mention is made of occasional days of ice effect if the degree of accuracy of daily records is not changed.

The data herein presented generally comprise a description of the station, a skeleton rating table, and a table showing the daily discharge and monthly and yearly discharge and runoff of the stream. Records are published for the water year which begins on October 1 and ends on September 30. A calendar for the water year 1956 is shown on page IV for the purpose of finding the day of the week for any date.

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

Previously published records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published along with the current records in one of the annual reports. In order to make it easier to find such revised records, a paragraph headed "Revisions (water years)" has been added to the description of all stations for which revised records have been published. Listed therein are all the reports in which revisions have been published, each followed by the water years for which figures are revised in that report. In listing the water years only one number is given; for instance, 1933 stands for the water year October 1, 1932, to September 30, 1933. If no daily, monthly, or annual figures of discharge are concerned in the revision, that fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that

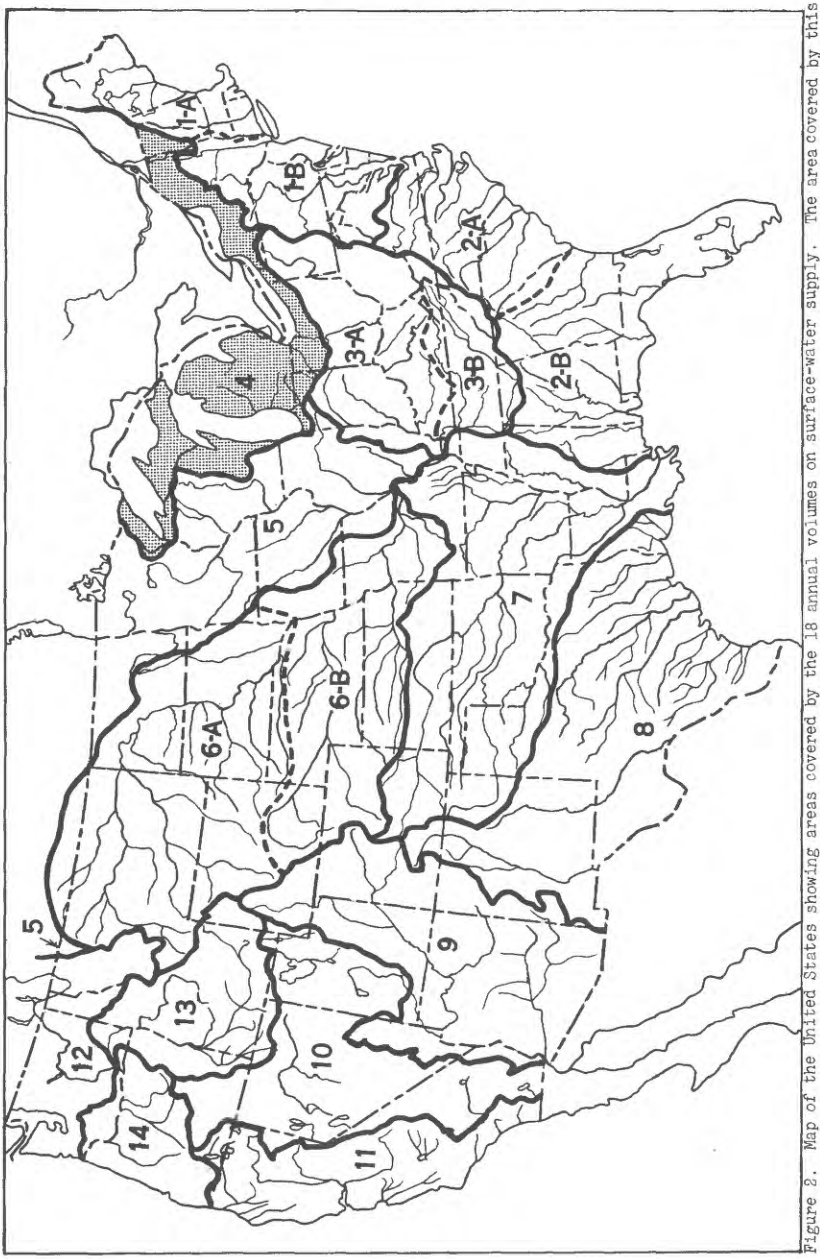

Figure 2. Map of the United States showing areas covered by the 18 annual volumes on surface-water supply. The area covered by this report is shaded.

analyses and compilations of data relating to earlier notable floods. The following list gives the numbers and titles of these reports:

Report	Issued by
WSP 147: Destructive floods in the United States in 1904.	U. S. Geological Survey.
WSP 162: Destructive floods in the United States in 1905.	Do.
WSP 636-C: The New England flood of November 1927.	Do.
WSP 771: Floods in the United States, magnitude and frequency.	Do.
WSP 773-E: The New York State flood of July 1935.	Do.
WSP 798: The floods of March 1936, part 1, New England Rivers.	Do.
WSP 799: The floods of March 1936, part 2, Hudson River to Susquehannah River region.	Do.
WSP 847: Maximum discharges at stream-measurement stations through September 1938.	Do.
WSP 867: Hurricane floods of September 1938.	Do.
WSP 1137-G: Floods of 1950 in the Upper Mississippi River and Lake Superior basins in Minnesota.	Do.
WSP 1137-I: Summary of floods in the United States during 1950.	U. S. Geological Survey.
Bull. 1: Magnitude and frequency of floods in Minnesota.	Minnesota Division of Waters.
Bull. 7: Floods in Ohio, magnitude and frequency.	Ohio Water Resources Board.
Bull. 14: Local floods in Ohio during 1947.	Do.

RECORDS OF DISCHARGE COLLECTED BY AGENCIES OTHER THAN THE GEOLOGICAL SURVEY

The table below contains a list of gaging stations for the area covered by this report, at which records of discharge were collected during the water year October 1955 to September 1956 by agencies other than the Geological Survey. The records of these stations are not contained in publications of the Geological Survey, nor have they been published elsewhere.

Records of discharge collected by agencies other than the Geological Survey

Stream	Location	Period	Collected by
Cayuga Lake Outlet...	Lock 1 (Mud lock), N. Y.....	1926-56	State Department of Public Works, Syracuse, N. Y.
Clyde River.....	Clyde, N. Y.....	1924-56	Do.
Indian River.....	Theresa, N. Y.....	1934-56	Niagara Mohawk Power Corporation, Syracuse, N. Y.
Oswegatchie River, East Branch.	Brown Falls, N. Y.....	1934-56	Do.
Oswego River.....	Dam O-5, Minetto, N. Y.....	1928-56	State Department of Public Works, Syracuse, N. Y.
Do.....	Lower Dam, Fulton, N. Y.....	1928-56	Oswego River Watershed Corporation, Fulton, N. Y.
Do.....	High Dam, Oswego, N. Y.....	1940-56	Niagara Mohawk Power Corporation, Syracuse, N. Y.
Raquette River.....	Colton, N. Y.....	1934-56	Do.
St. Regis River, West Branch.	Parishville, N. Y.....	1934-56	Do.
Salmon River.....	Bennetts Bridge, Altmar, N. Y..	1934-56	Do.
Saranac River.....	Kents Falls, N. Y.....	1934-56	System Properties, Inc., Cadyville, N. Y.
Seneca River.....	Seneca Falls, N. Y.....	1931-56	New York State Electric & Gas Corp., Geneva, N. Y.
Do.....	Waterloo, N. Y.....	1931-56	Do.
Skaneateles Lake Outlet.	Skaneateles, N. Y.....	1922-56	City of Syracuse, N. Y.

Note.--Records for the stations given in the above table are unpublished but are available at the office of the organization by which the station was operated. In addition to the records listed in the above table, the Agricultural Research Service of the U. S. Department of Agriculture (beginning in 1941) has collected records of runoff from 3 areas of less than 2 acres each near East Lansing, Mich.

During the water year 1956, streamflow ranged from very deficient to highly excessive for the area covered by this report. Flow of Manistee River near Sherman, Mich., was deficient for nine consecutive months, including the last three of the preceding water year. Flow of Oconto River near Gillett, Wis., was deficient from February 1955 to July 1956. Record-low flow for March was recorded on Sturgeon River near Sidnaw, Mich. In western New York heavy rain and melting snow caused floods March 7-8; peak discharges exceeded previous maximums at some gaging stations with more than 50 years of record. Monthly mean discharge of Cedar River at East Lansing, Mich., was record-high in May and August. Floods in northern Indiana and Ohio in May were the highest in 10 to 15 years. For two key gaging stations in the area covered by this report, a comparison of monthly and yearly mean discharges during the 1956 water year with the median discharges for the 25-year period (1921-45) is shown in figure 3 below.

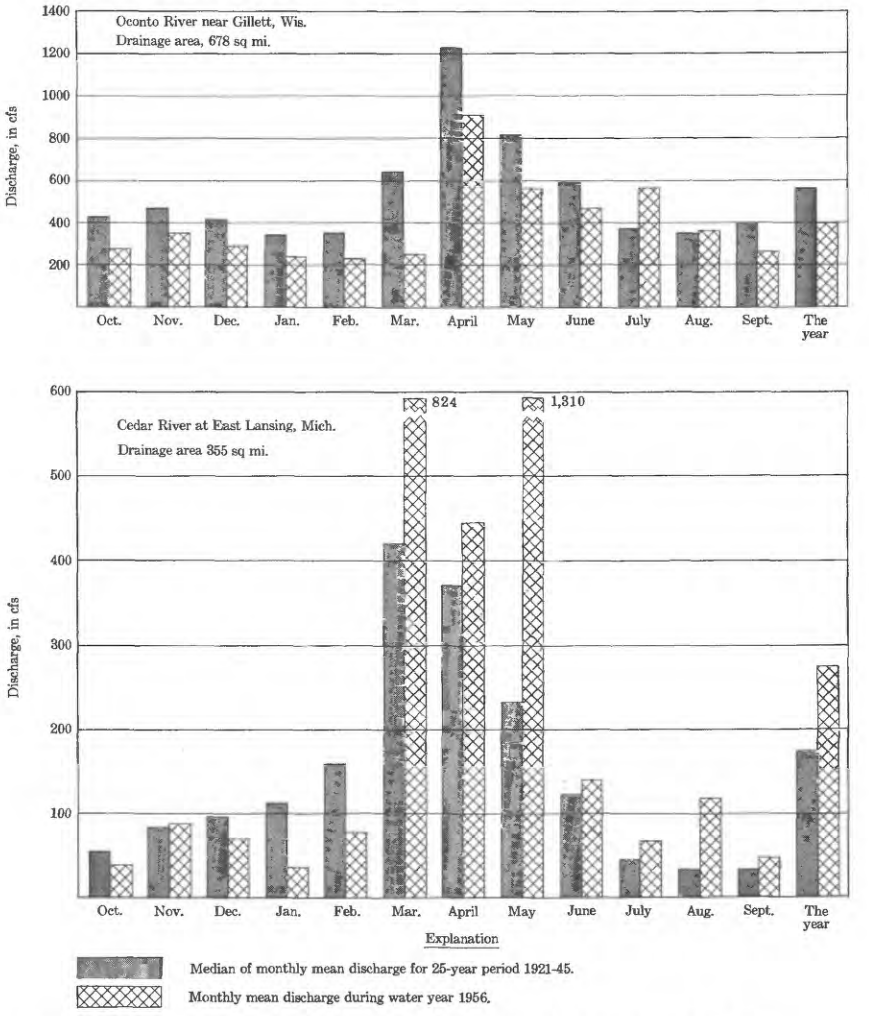

Figure 3. Comparison of discharge at two key gaging stations during 1956 water year with median discharge for 25-year period.

STREAMS TRIBUTARY TO LAKE SUPERIOR

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

(International gaging station)

Location.--Lat 48°00'44", long 89°36'58", in NE¼ sec. 24, T. 64 N., R. 6 E., on right bank 400 ft upstream from Middle Falls, 3½ miles upstream from mouth, and 5¾ miles downstream from International Bridge.

Drainage area.--600 sq mi.

Records available.--April 1924 to September 1956 in reports of Geological Survey. Published as "at International Bridge" April 1924 to September 1940. October 1923 to September 1932 in House Document 92, 73d Congress, 1st session. June 1921 to September 1956 in reports of Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Gage.--Water-stage recorder. Datum of gage is 789.58 ft above mean sea level, datum of 1929. Oct. 1, 1923, to Sept. 1, 1936, staff gage and Sept. 2, 1936, to Sept. 30, 1940, wire-weight gage, at International Bridge 5¾ miles upstream at datum 100.24 ft higher.

Average discharge.--33 years (1923-56), 507 cfs.

Extremes.--Maximum discharge during year, 4,200 cfs May 14 (gage height, 7.24 ft); minimum, 96 cfs Oct. 2 (gage height, 0.75 ft).

1923-56: Maximum discharge, 11,000 cfs May 5, 1934 (gage height, 7.6 ft, site and datum then in use), from rating curve extended above 7,000 cfs; minimum, 27 cfs Nov. 4, 1945 (gage height, -0.08 ft).

Remarks.--Records good except those for 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.

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

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.7	90	4.0	1,260
1.0	137	5.0	1,940
2.0	414	6.0	2,800
3.0	775	7.2	4,150

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	105	1,100	190	150	149	148	160	1,720	1,830	365	239	350
2	102	910	185	150	150	150	190	2,080	*1,710	353	231	338
3	130	718	180	150	150	152	250	1,930	1,500	*338	217	326
4	200	575	170	150	151	154	350	2,140	1,290	323	215	335
5	420	500	160	150	153	155	560	2,620	1,060	314	212	*347
6	550	461	158	150	155	157	*609	*2,870	960	311	209	353
7	380	433	152	150	158	155	570	2,650	914	308	*207	344
8	290	408	150	150	159	152	550	2,480	852	341	207	332
9	220	380	150	150	159	150	560	2,590	793	399	212	314
10	190	359	145	150	158	146	630	2,680	723	402	212	308
11	170	359	142	150	157	142	700	3,000	666	368	209	300
12	155	*356	140	150	155	140	770	3,610	624	359	202	291
13	155	335	138	150	153	138	850	3,670	585	350	196	294
14	150	266	*137	150	152	135	920	4,050	554	338	199	300
15	145	286	137	150	152	135	1,010	3,550	524	329	191	297
16	140	303	136	149	155	138	1,130	2,960	497	314	186	297
17	138	286	135	148	155	138	1,130	2,480	480	311	183	297
18	*135	294	135	*148	157	138	1,100	2,210	458	306	181	291
19	129	274	135	148	158	138	1,250	2,100	445	291	176	280
20	128	261	135	148	159	136	1,500	1,960	433	283	173	272
21	128	242	137	148	*160	135	1,700	1,830	420	286	176	255
22	128	261	138	148	158	134	1,780	1,730	405	297	178	242
23	124	253	139	148	157	132	*1,780	1,700	395	311	183	234
24	*120	247	140	148	155	130	1,580	1,650	399	320	189	228
25	118	240	140	148	152	130	1,590	1,520	389	303	189	223
26	115	230	142	148	150	129	1,530	1,570	395	294	186	215
27	112	220	143	148	148	*129	1,750	1,890	423	300	181	207
28	114	210	145	148	148	129	1,440	1,770	430	297	231	202
29	213	200	146	148	146	130	*1,380	1,620	402	280	297	194
30	1,350	190	147	148	-------	135	1,440	1,640	377	258	317	186
31	1,380	-------	149	-------	-------	145	-------	1,690	-------	247	344	-------
Total	7,934	11,157	4,576	4,620	4,469	4,355	30,759	71,960	20,933	9,896	6,528	8,452
Mean	256	372	148	149	154	140	1,025	2,321	698	319	211	282
Cfsm	0.427	0.620	0.247	0.248	0.257	0.233	1.71	3.87	1.16	0.532	0.352	0.470
In.	0.49	0.69	0.28	0.29	0.28	0.27	1.91	4.46	1.30	0.61	0.40	0.52

Calendar year 1955: Max 3,020 Min 48 Mean 312 Cfsm 0.520 In. 7.05
Water year 1955-56: Max 4,050 Min 102 Mean 507 Cfsm 0.845 In. 11.50

Peak discharge (base, 3,000 cfs).--May 14 (4 a.m.) 4,200 cfs (7.24 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 25 to Apr. 21. No gage-height record Oct. 1-17; discharge estimated on basis of weather records, recorded range in stage, and records for Poplar River at Lutsen.