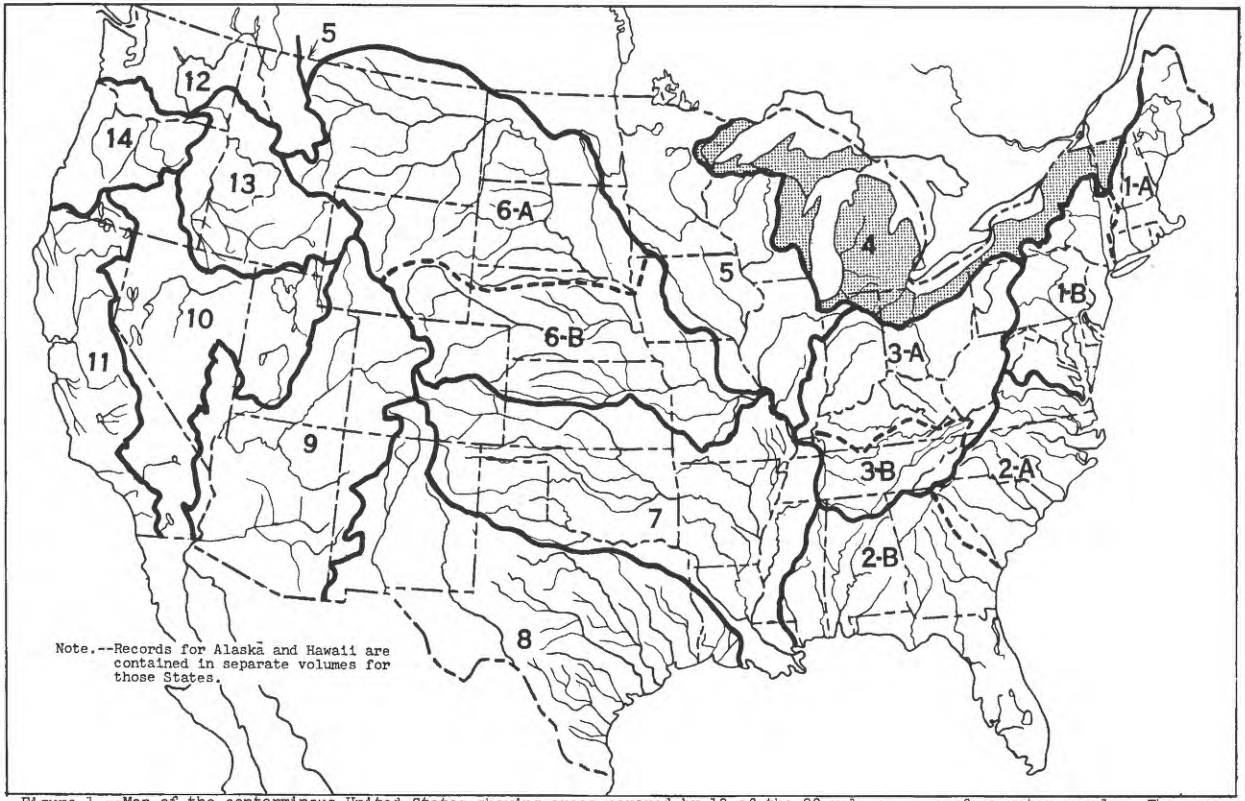

Figure 1.--Map of the conterminous United States showing areas covered by 18 of the 20 volumes on surface water supply. The area covered by this report is shaded

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

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

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

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

3. Sets are available for consultation in the offices of the Water Resources Division of the Geological Survey. Addresses of the offices in the area covered by this report are given on page 2.

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

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

(A = Annual Report; B = Bulletin)

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

HYDROLOGIC CONDITIONS

During most of the 1959 water year, streamflow in the area covered by this report was near median or deficient. The monthly mean discharge of Fox River at Berlin, Wis., was the lowest for October in 60 years of record. The most significant departure from this trend was in January and February, when major floods occurred in Indiana and Ohio. Heavy rains on frozen ground produced rapid runoff; flooding was aggravated by ice jams. The stage of St. Marys River at Fort Wayne, Ind., on February 12 was the highest in 29 years of record. Some streams in Ohio reached the highest stages since the record flood of 1913. Record-breaking floods occurred in the northern part of the lower peninsula of Michigan in April and again in May.

Figure 2, below, for which records of two long-term representative gaging stations were used, shows a comparison of the monthly and yearly mean discharges during the 1959 water year with the median discharge for the period 1921-45.

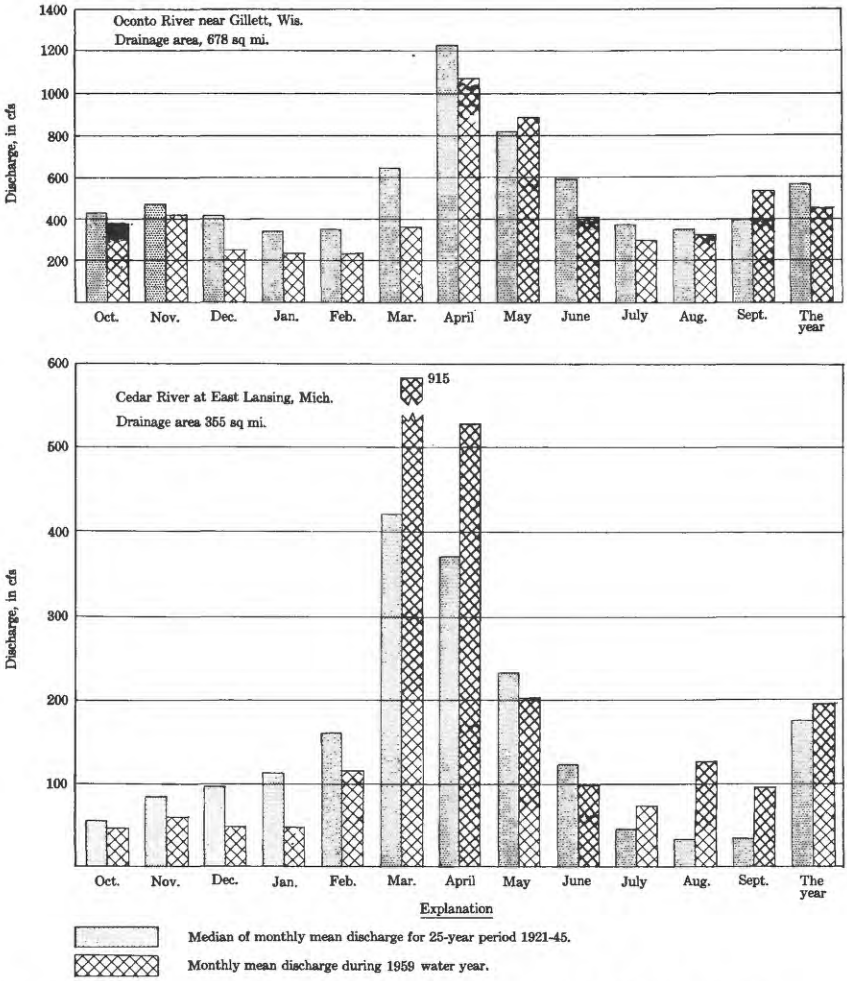

Figure 2. Comparison of discharge at two key gaging stations during 1959 water year with median discharge for 25-year period.

STREAMS TRIBUTARY TO LAKE SUPERIOR

105. 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 5⅞ miles downstream from International Bridge.
Drainage area.--600 sq mi.
Records available.--June to October 1921, May to November 1922, May 1923, July 1923 to September 1959. Published as "at International Bridge" April 1924 to September 1940. Monthly discharge only for some periods, published in WSP 1307. June 1921 to September 1959 in reports of Water Resources Division, 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. Prior to Sept. 2, 1936, staff gage and Sept. 2, 1936, to Sept. 30, 1940, wire-weight gage at International Bridge, 5⅞ miles upstream at datum 100.24 ft higher.
Average discharge.--36 years (1923-59), 491 cfs.
Extremes.--Maximum discharge during year, 2,160 cfs May 7 (gage height, 5.19 ft); minimum daily, 68 cfs Feb. 20-23.
1923-59: 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, which are fair.
Cooperation.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.
Revisions (water years).--WSP 744: 1927, 1928. WSP 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 tables, water year 1958-59, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 16				Apr. 17 to Sept. 30			
0.7	90	3.0	775	0.5	75	3.0	810
1.0	137	4.0	1,260	.8	121	4.0	1,320
2.0	414	5.0	1,940	1.2	208	6.0	2,920
				2.0	444		

Discharge, in cubic feet per second, water year October 1958 to September 1959

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	530	110	210	160	92	80	*148	438	1,490	309	102	342
2	507	108	210	160	92	82	155	491	1,310	300	102	309
3	474	104	200	155	92	84	165	722	1,190	291	114	416
4	445	103	200	135	92	84	180	1,340	1,100	271	107	565
5	411	110	190	125	92	84	210	1,530	1,070	198	104	478
6	323	110	190	120	90	84	300	1,660	1,040	161	104	419
7	189	114	180	120	88	82	470	2,110	966	153	127	507
8	96	170	180	115	86	80	690	1,660	894	155	130	488
9	91	291	170	115	84	80	670	1,440	842	157	119	416
10	137	286	170	110	84	82	582	1,560	792	157	107	365
11	239	255	170	110	82	82	507	1,710	761	159	101	342
12	263	231	170	110	82	84	461	1,700	735	163	101	306
13	228	209	165	110	80	86	480	1,500	706	159	106	276
14	202	194	165	115	80	88	600	1,320	673	163	107	265
15	186	183	165	115	78	88	770	1,200	646	161	106	259
16	170	178	*164	115	78	90	910	1,110	620	161	93	*256
17	153	365	165	110	76	90	889	1,040	599	148	87	245
18	137	1,570	160	110	74	92	685	1,010	*572	138	85	229
19	131	1,310	160	110	70	95	572	*1,260	559	129	892	221
20	128	*973	155	*109	68	95	569	1,640	542	129	1,000	221
21	124	670	155	105	68	92	*549	1,670	533	130	575	237
22	*124	544	155	105	68	92	575	1,740	521	125	379	245
23	122	450	160	105	68	94	642	1,580	494	130	297	242
24	122	380	160	105	*69	94	599	1,360	469	123	254	234
25	124	310	165	100	70	98	559	1,220	447	*119	549	332
26	128	270	165	99	72	102	520	1,140	432	116	1,080	1,110
27	129	250	170	98	74	110	481	1,390	432	112	*828	1,140
28	126	240	170	98	77	115	456	1,330	376	112	669	1,040
29	120	230	165	95	-	120	453	1,280	339	112	596	759
30	116	220	165	95	-------	125	444	1,230	324	111	450	582
31	114	-------	165	95	-------	135	-------	1,420	-------	107	366	-------
Total	6,389	10,538	5,334	3,529	2,226	2,889	15,291	41,801	21,474	4,959	9,837	12,866
Mean	206	351	172	114	79.5	93.2	510	1,348	716	160	317	429
Cfsm	0.343	0.585	0.287	0.190	0.132	0.155	0.850	2.25	1.19	0.267	0.528	0.715
In.	0.40	0.65	0.33	0.22	0.14	0.18	0.95	2.59	1.33	0.31	0.61	0.80

Calendar year 1958: Max 1,570 Min 57 Mean 187 Cfsm 0.312 In. 4.22
Water year 1958-59: Max 2,110 Min 68 Mean 376 Cfsm 0.627 In. 8.51

Peak discharge (base, 3,000 cfs).--No peak above base.

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 23 to Apr. 9, Apr. 13-16 (no gage-height record Nov. 27 to Dec. 15; discharge estimated on basis of weather records and records for Baptism River near Beaver Bay).