

<u>State</u>	<u>District office</u>	<u>Address</u>
Illinois <u>a/</u>	Champaign.....	605 South Neil Street.
Indiana <u>b/</u>	Indianapolis.....	311 West Washington Street.
Kentucky <u>c/</u>	Louisville.....	830 West Broadway.
Maryland <u>d/</u>	College Park.....	106 Engineering Building, University of Maryland.
New York.....	Albany.....	528 Federal Building.
North Carolina.....	Raleigh.....	Federal Building.
Ohio <u>e/</u>	Columbus.....	1509 Hess Street.
Pennsylvania <u>f/</u>	Harrisburg.....	450 Education Building.
Virginia.....	Charlottesville.....	Natural Resources Building, University of Virginia.
West Virginia <u>g/</u>	Charleston.....	111 United States Court House.

a/ Except for Ohio River at Golconda and at Metropolis, and Wabash River at Mount Carmel.

b/ Except for Ohio River at Evansville.

c/ Including Ohio River at Cincinnati, Ohio, at Evansville, Ind., at Golconda and at Metropolis, Ill., and Wabash River at Mount Carmel, Ill.

d/ Including Big Piney Run near Salisbury, Pa.

e/ Except for Ohio River at Bellaire, Cincinnati, and Pomeroy.

f/ Except Big Piney Run near Salisbury and Monongahela River at lock 8, at Point Marion but including Ohio River at Bellaire, Ohio.

g/ Including Ohio River at Pomeroy, Ohio, and Monongahela River at lock 8, at Point Marion, Pa.

Information of a more detailed nature than that published for most of the gaging stations given in this report is on file in the district offices listed above. Provisional records of discharge prior to publication, and other unpublished data concerning the gaging-station records may usually be obtained from the district office.

DEFINITION OF TERMS AND ABBREVIATIONS

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

Cubic foot per second (cfs) is the rate of discharge of a stream whose channel is 1 square foot in cross-sectional area and whose average velocity is 1 foot per second.

Cubic feet per second per square mile (cfs/m) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

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

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

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

Stage-discharge relation is the relation between gage height and the amount of water flowing in a channel, expressed as volume per unit of time.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, a long reach of the channel, or an artificial structure.

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

The drainage area of a stream at a specified location is that area, measured in a horizontal plane, which is so enclosed by a topographic divide that direct surface runoff from precipitation normally would drain by gravity into the river above the specified point.



A, Mill Creek near Coshocton, Ohio.



B, Stillwater River at Pleasant Hill, Ohio.



C, Wabash River at Delphi, Ind.

FIGURE 1.—GAGING-STATION STRUCTURES.

not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur when relatively large negative adjustments are made or when evaporation is large in comparison with the observed discharge.

Many gaging stations on streams in the irrigated areas of the United States are situated above most of the diversions from those streams, and therefore the discharge recorded does not actually show the water supply available at the stations for further development, because water must first be supplied to existing irrigation systems.

PUBLICATIONS

To facilitate publication of the annual series of reports, the area of the United States is divided into 14 parts whose boundaries coincide with certain natural drainage lines. Formerly, the results of streamflow measurements were published in 14 volumes, one for each of the 14 parts. Beginning with the reports for 1951, the records are published in 18 volumes, there being 2 volumes each for Parts 1, 2, 3, and 6. The boundaries of the various parts are indicated by the following list and the map in figure 2.

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

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

1. Copies may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., who will, on application, furnish lists giving prices. A list of Geological Survey publications may also be obtained by applying to the Director, Geological Survey, Washington, D. C.
2. Sets of the reports may be consulted in the libraries of the principal cities in the United States.
3. Sets are available for consultation in the offices of the Water Resources Division of the Geological Survey. Addresses of the offices in the area covered by this report are given on page 3.

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. 2do.....	1884 to June 30, 1891.
13th A, pt. 3	Monthly discharge.....	1884-92.
14th A, pt. 2	Monthly discharge.....	1886-93.
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.
15th 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.

Reports on surface-water supply containing records from 1899 to date for drainage basins in this report are listed below. The data for any particular gaging station will, in general, be found in the reports covering the years during which the station was maintained. Before 1951, records for the Cumberland and Tennessee River basins were included with those of the other rivers of the Ohio River basin.

Numbers of water-supply papers containing results of stream measurements in Ohio River basin except Cumberland and Tennessee River basins, 1898-1953

Year	WSP	Year	WSP	Year	WSP	Year	WSP	Year	WSP
1899	36	1911	303	1923	563	1934	756	1944	1003
1900	48, 49	1912	323	1924	583	1935	783	1945	1033
1901	65, 75	1913	353	1925	603	1936	803	1946	1053
1902	83	1914	363	1926	623	1937	823	1947	1083
1903	98	1915	403	1927	643	1938	853	1948	1113
1904	128	1916	433	1928	663	1939	873	1949	1143
1905	169	1917	453	1929	683	1940	893	1950	1173
1906	205	1918	473	1930	698	1941	923	1951	1205
1907-8	243	1919-20	503	1931	713	1942	953	1952	1235
1909	263	1921	523	1932	728	1943	973	1953	1275
1910	283	1922	543	1933	743				

a Olentangy and Scioto Rivers only.

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

Each of the reports on the surface-water supply for the year 1939 (Water-Supply Paper 873 for the Ohio River basin) contains, for the area included in that report, a summary of yearly discharge at gaging stations at which 10 or more complete years of record has been collected. These summaries were reprinted separately.

Reports also 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 may have been revised), as well as some records not contained in the

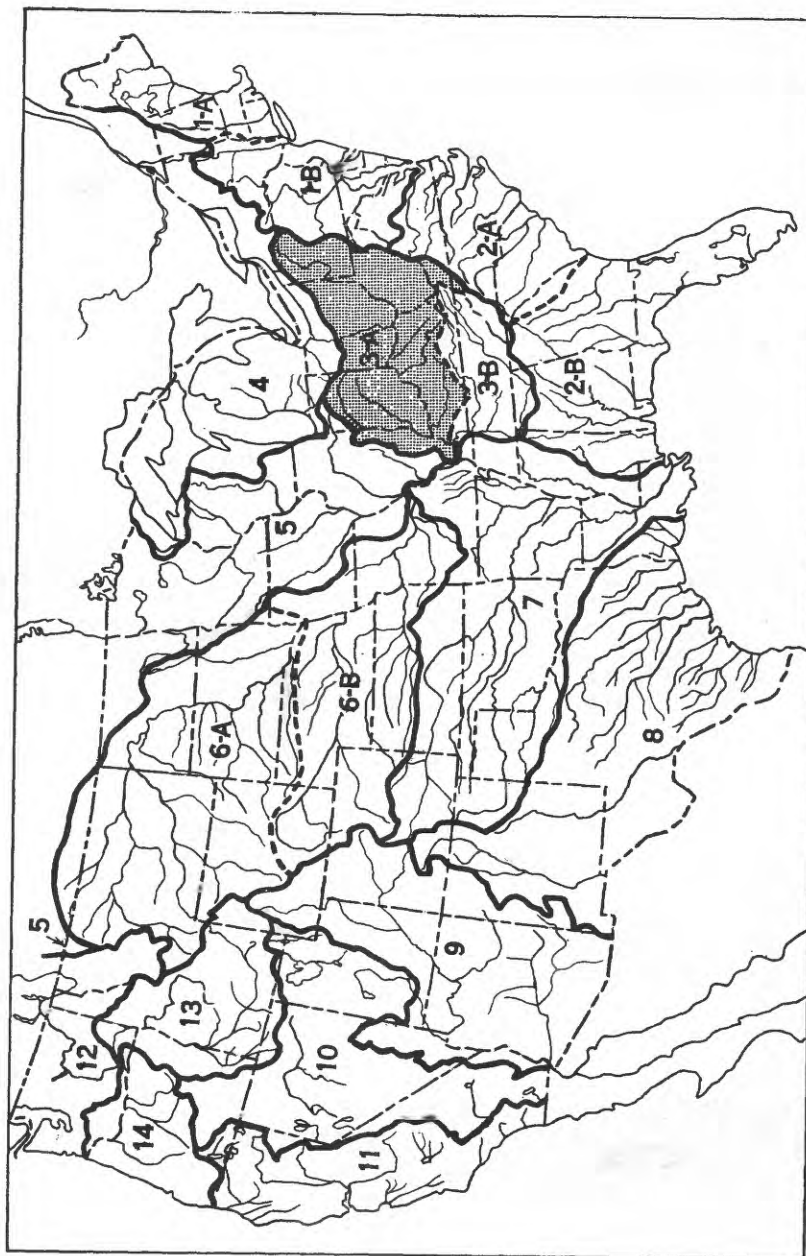


Figure 2.--Map of the United States showing areas covered by the 18 annual volumes on surface-water supply. The area covered by this report is shaded.

annual series of water-supply papers. The only such report for any part of the area covered by this report is Water-Supply Paper 536, "Surface water supply of New-Kanawha River basin (N. C., Va., W. Va.), 1895-1920."

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 for the area covered by this report.

State reports containing compilations of records of discharge

State	Period	Report	Issued by
Illinois.....	1908-11	Water resources of Illinois.....	Rivers and Lake Commission.
Do.....	1900-1934	Streamflow 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.
Kentucky.....	1910-20	Surface waters of Kentucky.....	Kentucky Geological Survey.
Maryland.....	1892-1943	Bull. 1, Summary of records of surface waters of Maryland and the Potomac River basin.	Department of Geology, Mines, and Water Resources.
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. ^a	Do.
Ohio.....	1896-1921	Bull. 73, Ohio streamflow, Part 1.....	Engineering Experiment Station, Ohio State University.
Do.....	1898-1939	Bull. 111, Ohio stream-drainage areas and flow-duration tables.	Do.
Do.....	1898-1944	Bull. 127, Ohio streamflow, Part 2.....	Do.
Do.....	1902-39	Bull. 200, Compilation of streamflow records of Ohio.	Department of Agriculture, Division of Conservation and Natural Resources.
Pennsylvania..	1890-1911	Report of Water Supply Commission of Pennsylvania.	Water Supply Commission of Pennsylvania.
Do.....	1928-32	Streamflow records of Pennsylvania.....	Department of Forests and Waters.
Virginia.....	1895-1927	Bull. 31, Water resources of Virginia.....	Virginia Geological Survey.
Do.....	1927-42	Bull. 7, Surface water supply of Virginia (New, Tennessee, and Big Sandy River basins).	Virginia Conservation Commission.
Do.....	1942-50	Bull. 15, Surface water supply of Virginia (New, Tennessee, and Big Sandy River basins).	Do.

^a/ Contains records of maximum and minimum daily, weekly and monthly discharge and yearly mean discharge.

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: Indiana, New York, and Pennsylvania.

The reports listed in the foregoing tables contain the customary records of discharge collected during the systematic operation of gaging stations. Detailed information on the stage and discharge of many streams during major floods has been included in special reports on these floods published by the Geological Survey or other agencies. The more recent of these special reports also contain other pertinent hydrologic information and analyses and compilations of data relating to earlier notable floods. The following is a list 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 334: The Ohio Valley flood of March-April 1913.	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 800: The floods of March 1936, part 3, Potomac, James, and upper Ohio Rivers.	Do.
WSP 838: Floods of Ohio and Mississippi Rivers, January-February 1937.	Do.
WSP 847: Maximum discharges at stream-measurement stations through September 1938.	Do.
WSP 869: Flood of August 1935 in Muskingum River basin, Ohio	Do.
WSP 967-B: Flood of July 5, 1939, in eastern Kentucky.	Do.
WSP 1066: Floods of August 1940 in the southeastern States.	Do.
WSP 1134-A: Floods of August 4-5, 1943, in Central West Virginia.	Do.
WSP 1134-B: Floods of July 18, 1942, in North Central Pennsylvania.	Do.
WSP 1137-I: Summary of floods in the United States during 1950.	Do.

