Beginning with the series of reports for the water year ending September 30, 1951, the order of listing gaging-station records has been changed. In this report, in a downstream direction along the main stem all stations on a tributary entering above a main-stem station are listed before that station. If a tributary enters between two main-stem stations, it is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. To indicate the rank of any tributary on which a gaging station is situated and the stream to which it is immediately tributary, each indention in the listing of gaging stations in the table of contents of this report represents one rank. This new downstream order and system of indention show which gaging stations are on tributaries between any two stations on a main stem and the rank of the tributary on which each gaging station is situated.

The order of listing used before the publication of the 1951 report listed first all stations on the main stem from headwaters toward mouth, then all stations on the uppermost tributary to the main stem from the tributary's source to mouth, and then all stations from source to mouth of the uppermost tributary to the tributary.

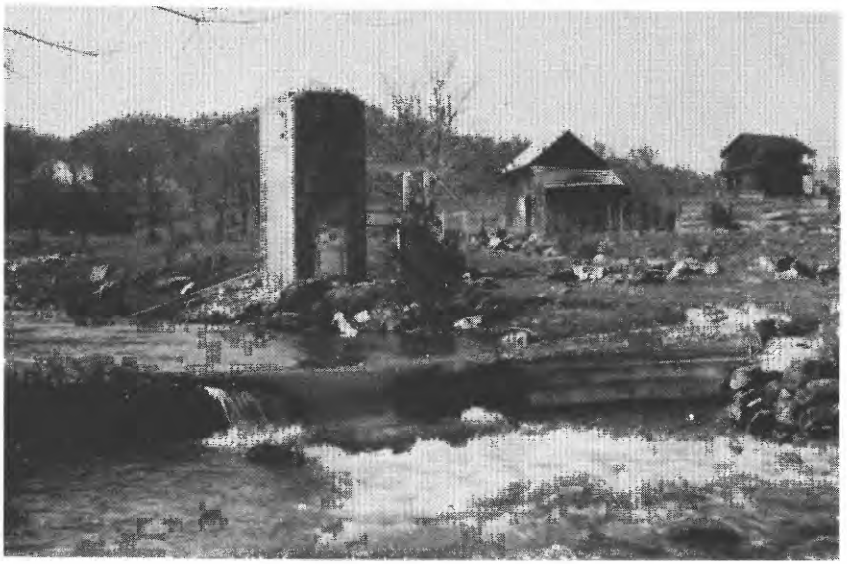
EXPLANATION OF DATA

The base data collected at gaging stations consist of records of stage and measurements of discharge. In addition, observations of factors affecting the stage-discharge relation, weather records, and other information is used to supplement base data 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 fluctuations. Measurements of discharge are made with a current meter by the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in Water-Supply Paper 888 and are also outlined in standard textbooks on the measurement of stream discharge. Typical structures in use at gaging stations are shown in figure 1.

Rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, computation of flow over dams or weirs, and by other methods), velocity-area studies, and logarithmic plotting. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the monthly and 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. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is essentially the shifting-control method.

At some gaging stations the stage-discharge relation is affected by backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope

A. Roanoke River at Niagara, Va.



B. Meadow Creek at Newcastle, Va.

FIGURE 1.-GAGING STATION STRUCTURES

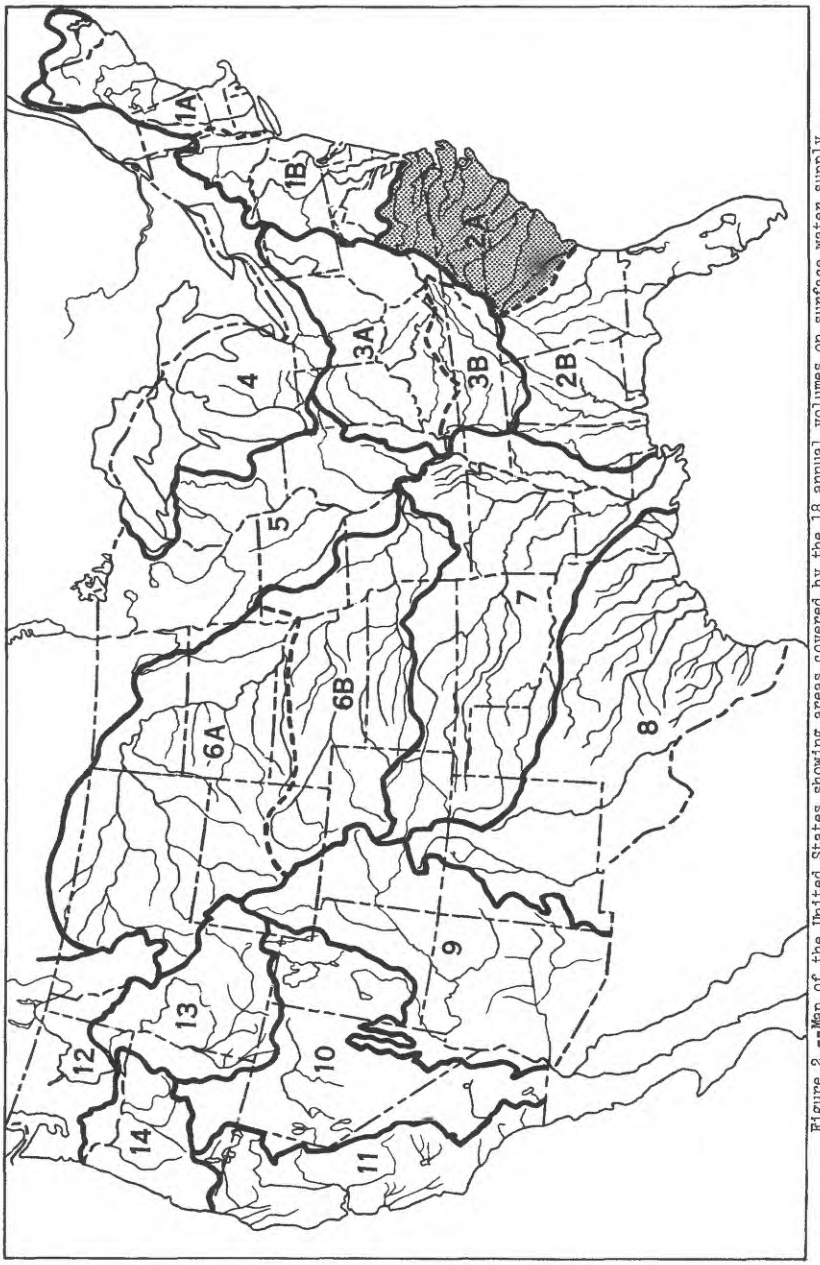


Figure 2.--Map of the United States showing areas covered by the 18 annual volumes on surface water supply. The shaded portion represents the area covered by this volume.

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

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

Report	Character of data	Year
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.

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 South Atlantic slope basins, James River to Savannah River, were included with those for the South Atlantic slope and eastern Gulf of Mexico basins.

Numbers of water-supply papers containing results of stream measurements in the South Atlantic slope basins, James River to Savannah River, 1899-1951

Year	W.S.P.	Year	W.S.P.	Year	W.S.P.	Year	W.S.P.
1899.....	a35,36	1913.....	352	1927.....	642	1940.....	892
1900.....	48	1914.....	382	1928.....	662	1941.....	922
1901.....	65,75	1915.....	402	1929.....	682	1942.....	952
1902.....	a82,83	1916.....	432	1930.....	697	1943.....	972
1903.....	a97,98	1917.....	452	1931.....	712	1944.....	1002
1904.....	b126,127	1918.....	472	1932.....	727	1945.....	1032
1905.....	b167,168	1919-20..	502	1933.....	742	1946.....	1052
1906.....	b203,204,205	1921.....	522	1934.....	757	1947.....	1082
1907-8...	242	1922.....	542	1935.....	782	1948.....	1112
1909.....	262	1923.....	562	1936.....	802	1949.....	1142
1910.....	282	1924.....	582	1937.....	822	1950.....	1172
1911.....	302	1925.....	602	1938.....	852	1951.....	1203
1912.....	322	1926.....	622	1939.....	872		

a James River only.
b Susquehanna River to Yadkin River.

The records at most of the stations discussed in these reports extend over many 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 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 872 for the South Atlantic slope basins, James River to Savannah River), 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 had 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 annual series of water-supply papers. The only such report for any part of the area covered by this report is Water-Supply Paper 197, "Water resources of Georgia, 1895-1905."

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
Georgia.....	1895-1906	Bull. 16, Water powers of Georgia.....	Geological Survey of Georgia
Do.....	1907-19	Bull. 38, Water powers of Georgia.....	Do.
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.[1]	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.
South Carolina	1884-1946	Bull. 17, Summary of records of surface water supply of South Carolina.	South Carolina Research, Planning and Development Board.
Virginia.....	1895-1927	Bull. 31, Water resources of Virginia.....	Virginia Geological Survey.
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.....	1942-50	Bull. 13, Surface water supply of Virginia (James River basin).	Do.

[1] Contains records of maximum and minimum daily, weekly, and monthly discharge and yearly mean discharge.

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 notable floods. The following list gives the numbers and titles of these reports:

Water-Supply Paper	Title
96.....	Destructive floods in the United States in 1903.
771.....	Floods in the United States, magnitude and frequency.
800.....	The floods of March 1936, Part 3, Potomac, James, and upper Ohio Rivers.
847.....	Maximum discharges at stream-measurement stations through September 1938.
1066.....	Floods of August 1940 in southeastern States.

RECORDS OF DISCHARGE COLLECTED BY AGENCIES OTHER THAN THE GEOLOGICAL SURVEY

The city of Lynchburg, Va., has collected records of daily discharge of Pedlar River at Pedlar Dam, Va., since August 1921 and the Corps of Engineers has collected records of discharge on Island Creek near Tungston Mines, Townsville, N. C., since November 1946.

HYDROLOGIC CONDITIONS

The water year 1951 was characterized by below normal runoff over most of the South Atlantic slope basins, James River to Savannah River. Runoff for the year varied from near normal at the northern and western boundaries of this area to less than 60 percent of normal over much of the eastern half of the area. There were no notable floods in the area covered by this report during the water year. For three key stations in the area covered by this report, a comparison of monthly and yearly mean discharges during the 1951 water year with the median discharge for the 25-year period 1921-45 is shown in figure 3 on the following page.

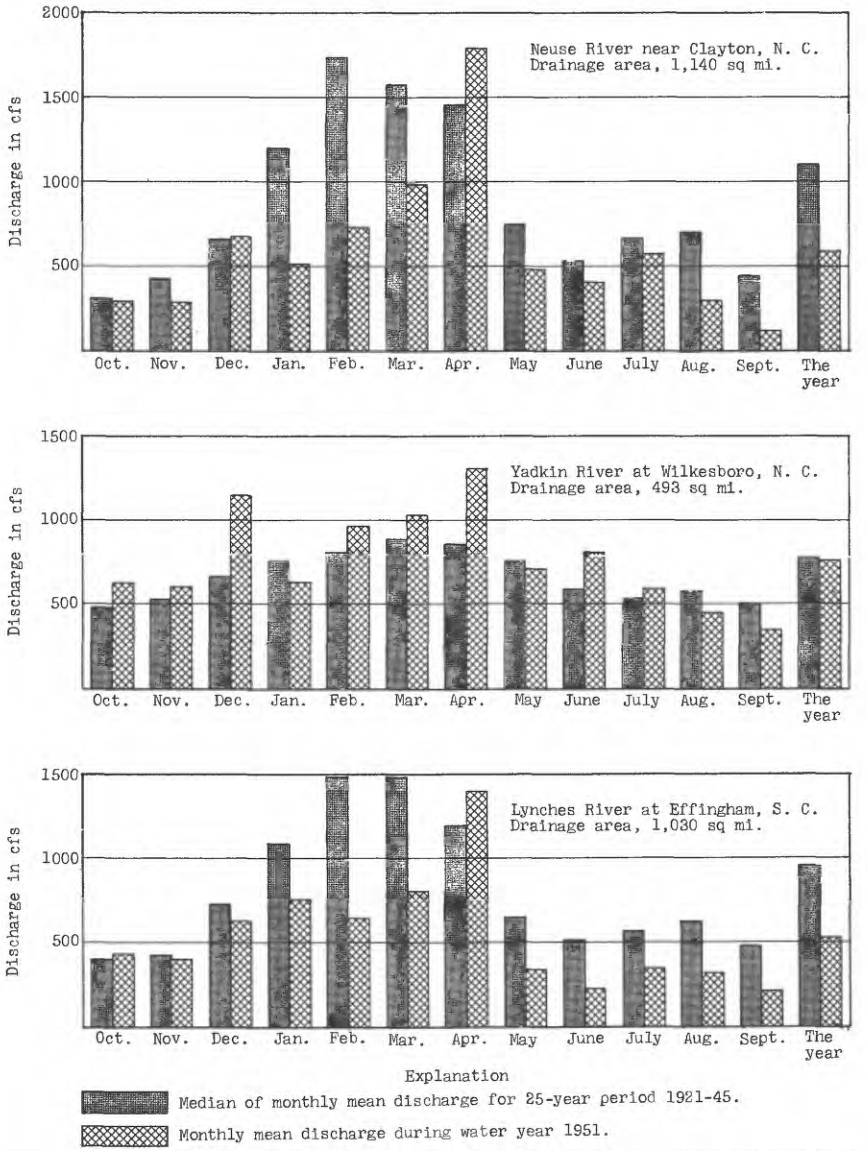

Figure 3.--Comparison of discharge at three key gaging stations during 1951 water year with median discharge for 25-year period.