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. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

DOWNSTREAM ORDER OF LISTING GAGING STATIONS

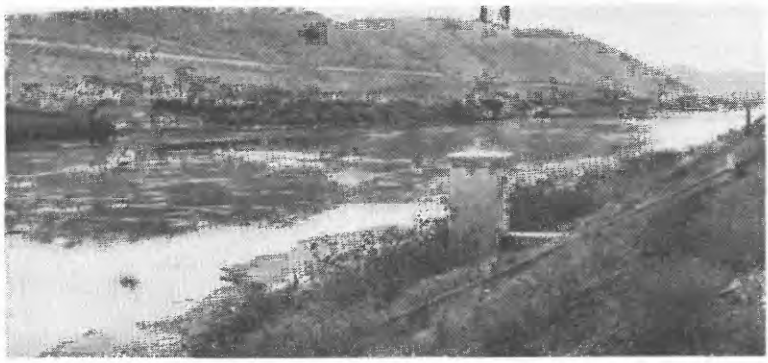
Beginning with the series of reports for the water year ending September 30, 1951, the order of listing gaging-station records was changed. In this report, in a downstream direction along the main stem all stations on a tributary entering above a main-stem station are listed before that station. If a 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 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.

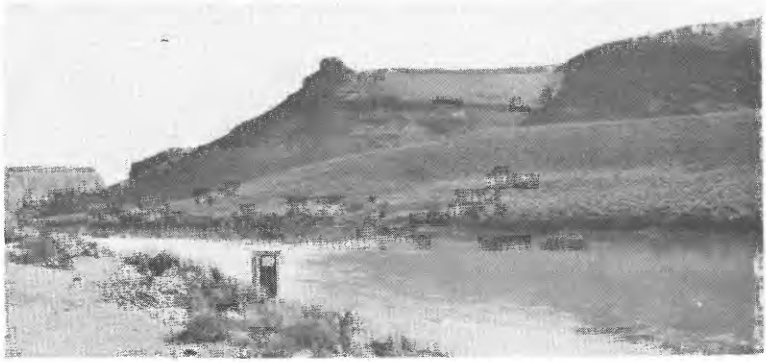
EXPLANATION OF DATA

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 are used to supplement base date 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.

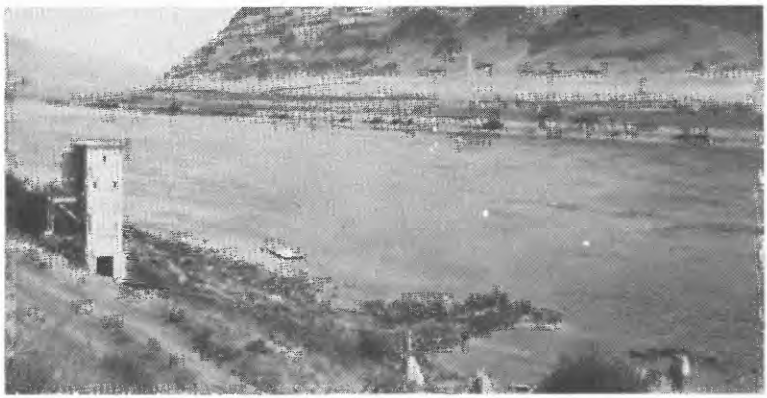
Rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, they are made on the basis of indirect measurements of peak discharge (such as slope-area 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



A, SNAKE RIVER AT KING HILL, IDAHO



B, SNAKE RIVER NEAR MURPHY, IDAHO



C, SNAKE RIVER NEAR CLARKSTON, WASH.

FIGURE 1.—GAGING-STATION STRUCTURES

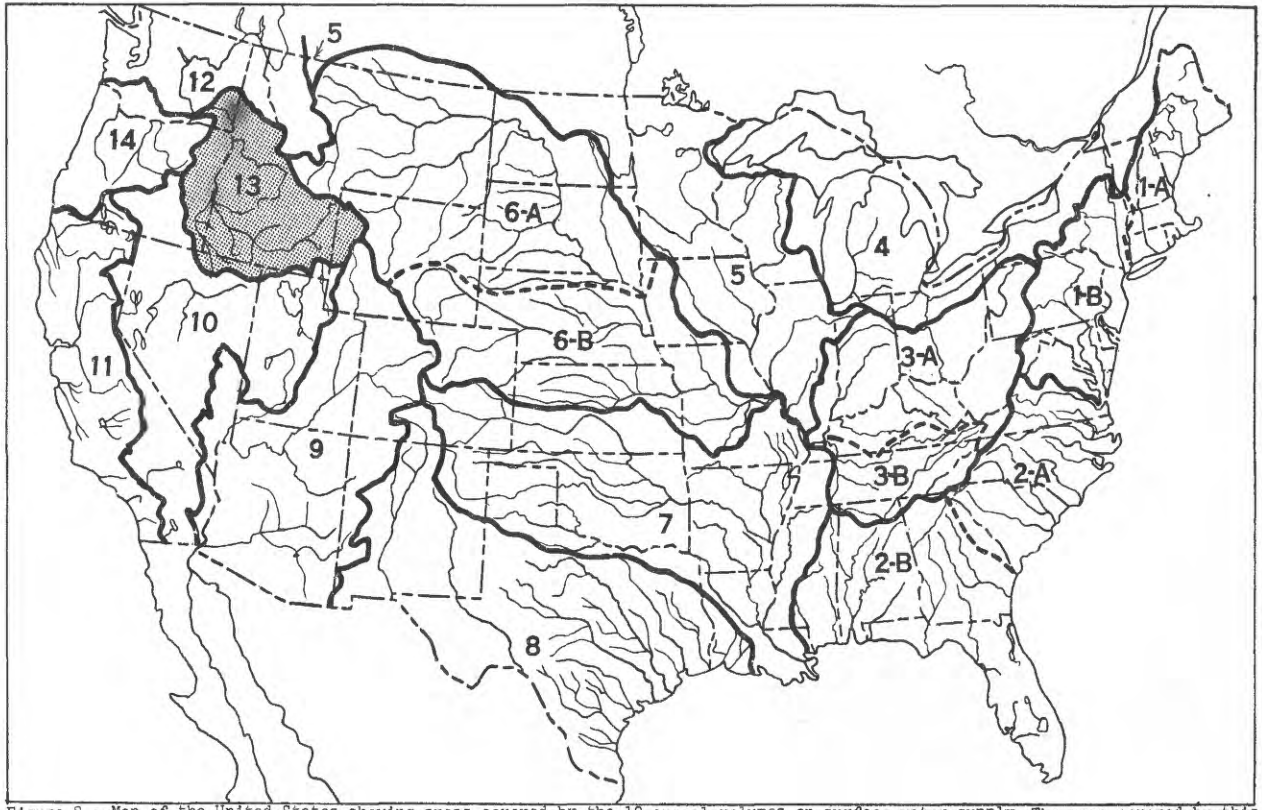


Figure 2.--Map of the United States showing areas covered by the 18 annual volumes on surface-water supply. The area covered by this report is shaded.

Streamflow 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 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.
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, by found in the reports covering the years during which the station was maintained.

Numbers of water-supply papers containing results of stream measurements in Snake River basin, 1899-1952

Year	W.S.P.	Year	W.S.P.	Year	W.S.P.	Year	W.S.P.	Year	W.S.P.
1899	38	1911	312	1923	573	1933	753	1943	983
1900	51	1912	332-B	1924	593	1934	768	1944	1013
1901	66, 75	1913	362-B	1925	613	1935	793	1945	1043
1902	85	1914	393	1926	633	1936	813	1946	1063
1903	100	1915	413	1927	653	1937	823	1947	1093
1904	135	1916	443	1928	673	1938	863	1948	1123
1905	178	1917	463	1929	693	1939	883	1949	1153
1906	214	1918	483	1930	708	1940	903	1950	1183
1907-8	252	1919-20	513	1931	723	1941	933	1951	1217
1909	272	1921	533	1932	738	1942	963	1952	1247
1910	292	1922	553						

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 883 for the Snake 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 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 following table contains a list of these reports for the area covered by this report.

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

Water-Supply Paper	Period	Report
370.....	1878-1910	Surface water supply of Oregon.
469.....	1894-1921	Surface waters of Wyoming and their utilization.
492.....	1878-1919	Summary of hydrometric data in Washington.
870.....	1919-35	Summary of records of surface waters of Washington.

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
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.
Do.....	1930-36	Bull. 9, Water resources of the State of Oregon..	Do.
Do.....	1936-41	Bull. 10, Water resources of the State of Oregon.	Do.
Utah.....	1889-1905	5th biennial report.....	Do.
Do.....	1906-10	7th biennial report.....	Do.
Do.....	1911-16	10th biennial report.....	Do.
Washington...	1878-1933	Bull. 5, Monthly and yearly summaries of hydrometric data.	Department of Conservation and Development.

Note.--In addition to the records contained in the reports listed above, the States of Idaho, Nevada, Oregon, Washington, and Wyoming have issued annual or biennial reports in which are contained records of 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
771.....	Floods in the United States, magnitude and frequency.
847.....	Maximum discharges at stream-measurement stations through September 1938.
1080.....	Floods of May-June 1948 in Columbia River basin.

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 1951 to September 1952 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 agenices other than the Geological Survey

Stream	Location	Period	Collected by
American Falls Reservoir, inflow to.	Near American Falls, Idaho.....	1927-28, 1932-52	Idaho Water District 36.
Burnt River, South Fork	SW¼ sec. 14, T. 13 S., R. 36 E., above Whited Reservoir, 3½ miles west of Unity, Colo.	1951-52	Oregon State engineer.
Do.....	NW¼ sec. 13, T. 13 S., R. 36 E., 200 ft below Whited Reservoir, 2¾ miles west of Unity, Colo.	1951-52	Do.
Malheur River.....	SW¼ sec. 32, T. 20 S., R. 41 E., near Namorf, Oreg.	1931-52†	Do.
Do.....	SW¼ sec. 21, T. 18 S., R. 45 E., below Nevada Dam, near Vale, Oreg.	1936-42, 1944-52†	Do.
Snake River tributaries	Near Irwin, Idaho.....	1940-52‡	Idaho Water District 36.
Teton basin tributaries	Near Driggs, Idaho.....	1934-52‡	Do.

† Records for some earlier years published in water-supply papers of the Geological Survey.
‡ Fragmentary.
Note.--Of the records for the stations operated by the Oregon State engineer, those for 1931-36 (including some to December 1936) are published in Bulletin 9 of the State engineer and those for 1937-41 in Bulletin 10; those for 1942-52 have not been published. Records for the stations operated by Idaho Water District 36 are published in the annual reports of that organization.

HYDROLOGIC CONDITIONS

The water year 1952 was characterized by well above normal runoff over most of the Snake River basin. Floods during April occurred in Owyhee, Malheur, Powder, and Grande Ronde River basins in Oregon, mostly as a result of snow melt. For two key gaging stations in the area covered by this report, a comparison of monthly and annual mean discharges during the 1952 water year with the median discharge for the 25-year period 1921-45 is shown in figure 3 below.

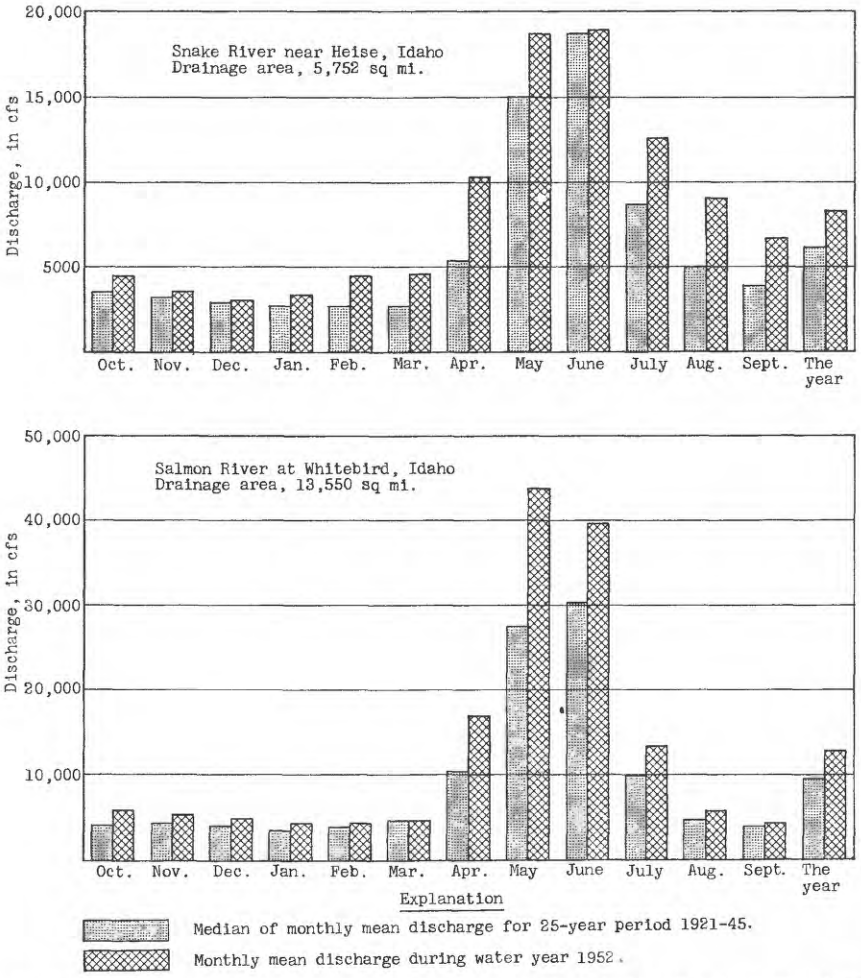


Figure 3.--Comparison of discharge at two key gaging stations during 1952 water year with median discharge for 25-year period.