Surface Water Supply of the United States 1960

Part 12. Pacific Slope Basins in Washington and Upper Columbia River Basin

Prepared under the direction of E. L. HENDRICKS, *Chief, Surface Water Branch*

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PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Idaho, Montana, and Washington, and with other agencies, by personnel of the Water Resources Division, L. B. Leopold, chief, under the general direction of E. L. Hendricks, chief, Surface Water Branch, and F. J. Flynn, chief, Basic Records Section.

The data were collected and computed under supervision of district engineers, Surface Water Branch, as follows:

Frank Stermitz..... Helena, Mont.
W. I. Travis..... Boise, Idaho
F. M. Veatch..... Tacoma, Wash.

CALENDAR FOR WATER YEAR 1960

OCTOBER 1959

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

NOVEMBER 1959

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

DECEMBER 1959

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

JANUARY 1960

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

FEBRUARY 1960

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29					

MARCH 1960

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

APRIL 1960

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

MAY 1960

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

JUNE 1960

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

JULY 1960

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

AUGUST 1960

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

SEPTEMBER 1960

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

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SCOPE OF WORK

This volume is one of a series of 20 reports presenting records of stage, discharge, and content of streams, lakes, and reservoirs in the United States during the 1960 water year. Since 1888, when the United States Geological Survey first studied streamflow in relation to problems of irrigation, similar records have been obtained at more than 15,500 gaging stations in the 50 States. On September 30, 1960, the Geological Survey and cooperating organizations were maintaining 7,300 gaging stations. Partial-record stations for low flow or for flood flow have been operated at many other points. In addition, discharge measurements are made at miscellaneous sites. The records for the 1960 water year at gaging stations, partial-record stations, and miscellaneous sites in the Pacific slope basins in Washington and Upper Columbia River basin are given in this report.

COOPERATION

Many State, municipal, and private organizations have cooperated with the Geological Survey in this work by either furnishing or helping to collect data. Organizations that supplied data are acknowledged in station descriptions, and organizations that assisted in the collection of data through cooperative agreements with the Survey are:

Idaho: Idaho Department of Reclamation, G. N. Carter, State reclamation engineer.

Montana: Office of State Engineer, F. E. Buck; State Water Conservation Board; State Highway Commission.

Washington: State Department of Conservation, Earl Coe, director, and W. G. Walker, supervisor of the Division of Water Resources; State Department of Fisheries, M. E. Moore, director; State Department of Game, J. A. Biggs, director; State Department of Highways, W. A. Bugge, director; cities of Aberdeen, Bremerton, Everett, Kent, Olympia, Seattle, and Tacoma; Intercounty River Improvement Commission; Chelan County Public Utility District No. 1, Grant County Public Utility District No. 2, Mason County Public Utility District No. 3, Pend Oreille County Public Utility District No. 1, and Stevens County Public Utility District No. 1; Skagit and Whatcom Counties.

Assistance in the form of funds or services was given by the Corps of Engineers, Department of the Army, in collecting records published herein for 4 gaging stations in Idaho, 2 in Montana, and 13 in Washington.

Assistance was also furnished by the Agricultural Research Service and the Forest Service of the United States Department of Agriculture, the United States Department of the Army, the Bonneville Power Administration, the Weather Bureau of the United States Department of Commerce, Bureau of Reclamation and the Bureau of Indian Affairs of the United States Department of the Interior, the Shellfish Sanitation Laboratory of the United States Department of Health, Education and Welfare, and the United States Department of State. Acknowledgment is due to the Forest Service of the United States Department of Agriculture and the Weather Bureau for occupation permits and furnishing special reports of watershed conditions and precipitation records.

On waters adjacent to the international boundary, certain gaging stations are maintained by the United States (or Canada) under agreement with Canada (or the United States) and the records are obtained and compiled in a manner equally acceptable in both countries. These stations are designated herein as "International gaging stations."

The following organizations aided in collecting records:

Idaho: Washington Water Power Co.

Montana: The Montana Power Co.; Washington Water Power Co.; and Northern Lights, Incorporated.

Washington: Crown Zellerbach Corporation; Puget Sound Power & Light Co.; Rayonier, Inc.; and Washington Water Power Co.

DIVISION OF WORK

The stream-gaging work was done by the Water Resources Division of the Geological Survey under the direction of personnel shown in the preface. The data for stations in the several States were collected and prepared for publication in the district offices listed below.

State	District office	Address
Idaho a/	Boise	914 Jefferson Street.
Montana	Helena	409 Federal Building.
Washington b/	Tacoma	207 Federal Building.

a/ Including Pend Oreille River at Newport, Wash.
b/ Except Pend Oreille River at Newport.

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. Some gaging-station records in Washington have been analyzed by electronic computer to give: (1) the number of days in each year that the daily discharge was between selected limits (duration table); and (2) the lowest mean discharge for selected number of consecutive days in each year. Provisional records of discharge, information on the availability of electronic computer results, and other unpublished data concerning the gaging-station records may generally 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:

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied herein only to those gaging stations where a continuous record of discharge is obtained.

Partial-record station is a particular site where limited streamflow data are collected systematically over a period of years for use in hydrologic analyses.

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 (cfsm) 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 (in.) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Acre-foot (ac-ft) is the quantity of water required to cover an acre to the depth of 1 foot and is equivalent to 43,560 cubic feet.

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

WSP is used as an abbreviation for "Water-Supply Paper" in references to previously published reports.

DOWNSTREAM ORDER AND STATION NUMBERS

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.

As an added means of identification, each gaging station and partial-record station has been assigned a station number. The numbers have been assigned in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record stations and regular gaging stations, so that the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the numbers to allow for new stations that may be established; hence the numbers are not consecutive. The complete number for each station includes the part number, but the station number shown in this report, just to the left of the station name, consists of only the essential digits of the complete number. For example, for a

station with the complete number 12-0115.00, the station number shown in this report is 115. The notation to the left of the hyphen is the part number; it is 12 for all stations in this report and is therefore omitted.

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 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 1878. These methods are described in Water-Supply Paper 888 and are also outlined in standard textbooks on the measurement of stream discharge.

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 these 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 method in which the slope or fall in a reach of the stream is a factor in determining discharge. Information requisite for determining the slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage. If so, the rate of change in stage is used as a factor in the determination of discharge.

At most gaging stations in the northern part of the United States and at some in the mountainous regions of other parts the stage-discharge relation is affected by ice during the winter, and it becomes impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed on the basis of the gage-height record and occasional winter discharge measurements, consideration being given to the available information on temperature and precipitation, notes by gage observers and engineers, and comparable records of discharge for other stations in the same or nearby basins. If the 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 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 1960 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 of 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 of gages, locations, and datums of previous gages used during the period of records available. The references to "datum of 1929" and adjustments of other years are to the datum and adjustments of the U. S. Coast and Geodetic Survey. 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 gage, 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 only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the revised figure

was first published is given. It should be noted that for all stations for which cubic feet per second per square mile and runoff in inches are published, a revision of the drainage area necessitates corresponding revision of all figures based on the drainage area. Revised figures of cubic feet per second per square mile and runoff in inches resulting from a revision of the drainage area only are usually not published in the annual series of reports.

Skeleton rating tables are published for all stations except those at which the daily discharge for the greater part of the open-water period was determined by the shifting-control method, the slope method, or other special methods involving an equivalent adjustment to the gage height of more than one-tenth foot. Skeleton rating tables are generally not published for stations on canals.

For stations equipped with water-stage recorders, except those on streams subject to sudden or rapid fluctuation, the daily table gives the discharge corresponding to the daily mean gage height. For stations subject to such fluctuation the daily mean gage height may not indicate the true daily mean discharge, which must be obtained by averaging the discharge for parts of the day or by using the discharge integrator, an instrument for obtaining the daily mean discharge from a continuous gage-height graph and containing, as an essential element, a curve representing the stage-discharge relation at the station. For stations equipped with nonrecording gages, the table of daily discharge gives the discharge corresponding to once-daily readings of the gage, or to the mean of twice-daily readings, or to the mean gage height determined from gage-height graphs based on gage readings. For periods of rapidly changing stage, the daily mean discharge is determined from gage-height graphs based on gage readings, the frequency of which is stated in the station description.

In the table of daily discharge, the figures for the maximum day and minimum day for each month are underlined. If the figure is repeated, it is underlined only on the first day of its occurrence.

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily figures; it is the total cfs-days for the month. The line headed "Mean" gives the average flow in cubic feet per second during the month. Discharge for the month may be expressed in cubic feet per second per square mile (line headed "Cfsm"), or in inches (line headed "In."), or in acre-feet (line headed "Ac-ft"). Figures for cubic feet per second per square mile and runoff in inches are omitted if the drainage area includes large noncontributing areas, or if the average annual rainfall over the drainage basin is usually less than 20 inches.

In the yearly summary below the monthly summary, the figures of maximum are the maximum daily discharges, not the momentary discharges when the water was at crest stage. Likewise, the minimums in this summary are the minimum daily discharges.

Peak discharges and the times of their occurrence and corresponding gage heights of most stations are listed below the table of daily and monthly discharge. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man.

Footnotes to the table of daily discharge indicate periods when discharge was computed or estimated by unusual or special methods during periods of no gage-height record and ice effect, or by other effects that reduce the degree of accuracy of the records. Days on which discharge measurements were made are indicated by asterisk and footnote unless they were made at frequent regular intervals, in which instance the general frequency of discharge measurements is given under "Remarks" in the station description.

For most gaging stations on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents. For some reservoirs a table showing daily contents or stage is given. A skeleton table of capacity at given stages is published each year for all reservoirs for which records are published on a daily basis, but is not published for reservoirs for which only monthly data are given.

At many gaging stations water samples are collected from the streams for the purpose of making chemical analyses, computing dissolved solids, suspended sediment loads, and particle-size distribution, or measuring water temperatures. For most of these samples the results are published in an annual series of water-supply papers entitled "Quality of Surface Waters of the United States" which is issued in four volumes. In this report under "Remarks" a reference is made to quality-of-water records collected at gaging stations on a regular basis and published in the quality-of-water reports. At many other gaging stations quality-of-water data are obtained at irregular intervals and published as "miscellaneous analyses" in quality-of-water reports; such records are not referred to in "Remarks" paragraph in this report. At many gaging stations water temperature is obtained also at the time a discharge measurement is made; such temperature readings are not reported in the quality-of-water annual reports.

Data collected at partial-record stations and at miscellaneous sites are given at the end of each report. Partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements at miscellaneous sites are given in a third table. Occasionally, a series of discharge measurements are made within a short time period to investigate the seepage gains or losses along a reach of a stream or to determine the low-flow characteristics of an area. Such measurements are given in special tables after the list of measurements at miscellaneous sites.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of stream flow data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretation of records.

The station description states the degree of accuracy of the records. "Excellent" indicates that, in general, the error in the daily records is believed to be less than 5 percent; "good," less than 10 percent; "fair," less than 15 percent; and "poor," probably more than 15 percent. The records of monthly and yearly mean discharge and runoff are, in general, more nearly accurate than the daily records.

Discharge at some stations, as indicated by the monthly mean, may vary widely from natural runoff, owing to diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is 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

Basic data for gaging stations are published in an annual series of reports consisting of 20 volumes, including one each for the States of Alaska and Hawaii. The area of the other 48 States is divided into 14 parts whose boundaries coincide with certain natural drainage lines. Formerly, the annual series of reports on surface-water supply consisted of 14 volumes, one for each of the 14 parts. Beginning with the reports for 1951, the records for the 48 States were 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 1.

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.

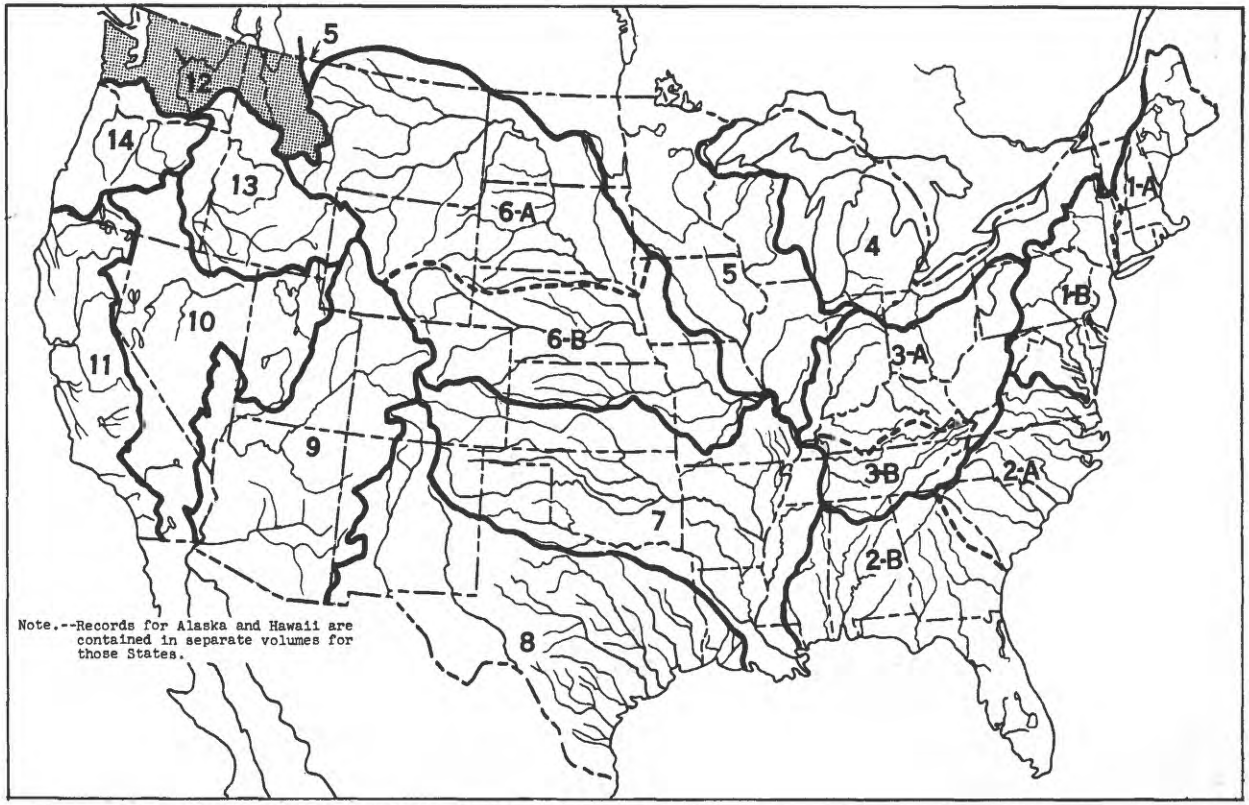

Figure 1.--Map of conterminous United States showing areas covered by 18 of the 20 volumes on surface water supply. The area covered by this report is shaded.

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.

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.

Numbers of water-supply papers containing results of stream measurements in Pacific slope basins in Washington and upper Columbia River basin, 1899-1960

Year	WSP	Year	WSP	Year	WSP	Year	WSP	Year	WSP
1899	38	1912	332-A	1925	612	1937	832	1949	1152
1900	51	1913	362-A	1926	632	1938	862	1950	1182
1901	66, 75	1914	392	1927	652	1939	882	1951	1216
1902	85	1915	412	1928	672	1940	902	1952	1246
1903	100	1916	442	1929	692	1941	932	1953	1286
1904	135	1917	462	1930	707	1942	962	1954	1346
1905	178	1918	482	1931	722	1943	982	1955	1396
1906	214	1919-20	512	1932	737	1944	1012	1956	1446
1907-8	252	1921	532	1933	752	1945	1042	1957	1516
1909	272	1922	552	1934	767	1946	1062	1958	1566
1910	292	1923	572	1935	792	1947	1092	1959	1636
1911	312	1924	592	1936	812	1948	1122	1960	1716

A compilation of records for the area covered by this report through September 1950 has been published as Water-Supply Paper 1316. That report contains a summary of monthly and annual discharges for all previously published records as well as some records not contained in the annual series of water-supply papers. All records were reexamined and revised where warranted. Estimates of discharge were made to fill short gaps whenever practical.

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 is a list of these reports:

Report

WSP 771: Floods in the United States, magnitude and frequency.
WSP 847: Maximum discharges at stream-measurement stations through September 1938.
WSP 968-B: Floods of the Puyallup and Chehalis River basins, Washington.
WSP 1080: Floods of May-June 1948 in Columbia River basin.
WSP 1137-I: Summary of floods in the United States during 1950.
WSP 1227-D: Summary of floods in the United States during 1951.
WSP 1260-F: Summary of floods in the United States during 1952.
Cir. 191: Floods in western Washington, frequency and magnitude in relation to drainage basin characteristics.
WSP 1320-E: Summary of floods in the United States during 1953.
WSP 1370-C: Summary of floods in the United States during 1954.

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 1959 to September 1960 by agencies other than the Geological Survey. The records of these stations are not contained in publications of the Geological Survey.

Records of discharge collected by agencies other than the Geological Survey

Stream	Location	Period	Collected by	Remarks
Lake Whatcom.....	Bellingham, Wash.....	1923-60	City of Bellingham....	Unpublished.
Reservation drain.....	Alfalfa, Wash.....	1912-60	Bureau of Indian Affairs.	†Unpublished since 1923.
Satus Creek.....	Downstream from Dry Creek, near Toppenish, Wash.	1913-60	....do.....	†Unpublished since 1924.
Do.....	Near Satus, Wash.....	1932-60	....do.....	Unpublished.
Toppenish Creek.....	Near Fort Simcoe, Wash.	1909-60	....do.....	†Unpublished since 1924.
Do.....	Near Alfalfa, Wash.....	1932-60	....do.....	Unpublished.
Yakima River.....	Easton, Wash.....	1904, 1910-15, 1940-60	Bureau of Reclamation.	†‡Unpublished since 1953.

† Records for earlier years published in water-supply papers of Geological Survey.
‡ Monthly discharge, prior to 1951, published in WSP 1316; prior to 1954, in Washington State Water-Supply Bulletin No. 6.
Note.--Records of daily discharge for many streams, canals, and drains in Washington and Montana for 1960 and earlier years have been collected by the Bureau of Reclamation and the Bureau of Indian Affairs of the United States Department of the Interior in connection with irrigation and drainage projects. These records have not been published. The Inter-Rocky Mountain Forest and Range Experiment Station collects records of runoff from an area of 950 acres on Benton Creek near Priest River, Idaho.

HYDROLOGIC CONDITIONS

Streamflow was generally above median for the water year. During the months of October to December, March, April, August, and September streamflow was generally above median to excessive over most of the area. During the other months of the year streamflow was generally below median to near median. In the latter part of November and mid-December a combination of wind, rain, and snowmelt on the west slope of the Cascade Range caused record-breaking floods in several basins in western Washington. No other noteworthy floods occurred during the water year.

Figure 2 on page 12, for which records of two long-term gaging stations were used, shows a comparison of the monthly and yearly mean discharges for the 1960 water year with the median discharge for the period 1931-60. For Spokane River at Spokane, Wash., the discharges shown have been adjusted for storage.

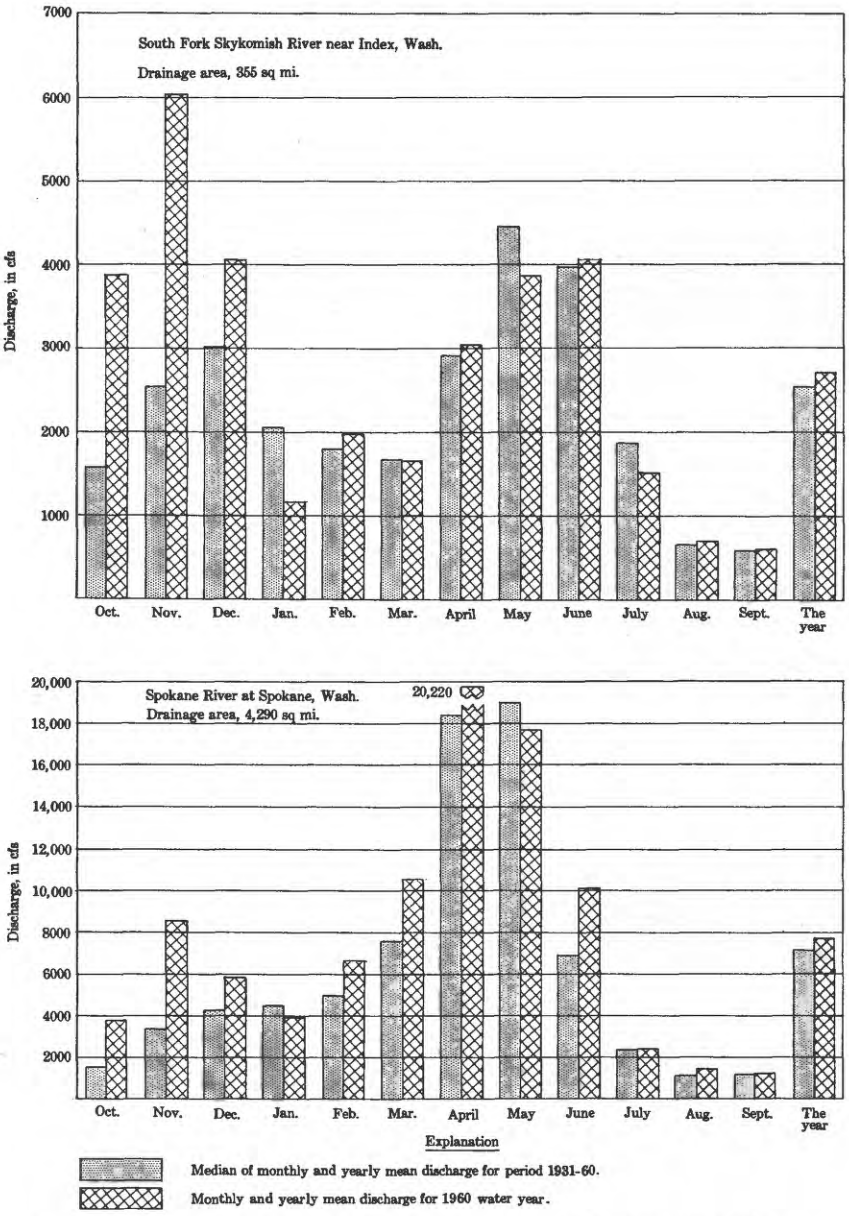

Figure 2. Comparison of discharge at three long-term representative gaging stations during 1960 water year with median discharge for period 1931–60.

PACIFIC SLOPE BASINS NORTH OF COLUMBIA RIVER

NASELLE RIVER BASIN

100. Naselle River near Naselle, Wash.

Location.--Lat 46°22'25", long 123°44'45", in SW¼ sec.1, T.10 N., R.9 W., on left bank at downstream side of highway bridge, 1½ miles upstream from Salmon Creek and 3½ miles east of Naselle.

Drainage area.--55.3 sq mi.

Records available.--May 1929 to September 1960.

Gage.--Wire-weight gage, usually read twice daily, and crest-stage gage. Altitude of gage is 24 ft (by barometer). Prior to Jan. 11, 1957, staff gage and crest-stage gage at site 150 ft downstream at same datum.

Average discharge.--31 years, 431 cfs (312,000 acre-ft per year).

Extremes.--Maximum discharge during year, 5,950 cfs Nov. 22 (gage height, 11.30 ft); minimum observed, 29 cfs Sept. 17, 19; minimum gage height, 1.78 ft Sept. 19.
1929-60: Maximum discharge, 11,100 cfs Jan. 22, 1935 (gage height, 15.9 ft, from floodmarks), from rating curve extended above 4,000 cfs on basis of slope-area measurement at gage height 15.2 ft; minimum observed, 19 cfs Sept. 12-14, 1949, Sept. 21-24, 1951; minimum gage height observed, 1.60 ft Sept. 8, 1956.

Remarks.--Records good. No regulation or diversion above station.

Revisions (water years).--WSP 1216: Drainage area. WSP 1316: 1930(M), 1932-40(M), 1945-46(M).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

1.6	20	4.0	660
1.9	58	6.0	1,680
2.4	146	8.0	3,040
3.0	310	10.0	4,770

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	334	316	380	268	856	205	890	280	274	91	36	40
2	280	292	374	250	1,030	194	764	277	244	91	39	35
3	244	352	349	233	910	216	612	244	227	84	38	35
4	227	310	313	216	*852	199	524	227	205	76	38	40
5	233	265	292	197	925	292	454	216	194	73	38	55
6	197	244	280	233	1,830	352	394	289	182	68	38	51
7	205	233	274	*199	2,630	454	352	262	172	64	35	40
8	290	210	*250	192	1,780	660	316	233	164	62	35	39
9	349	194	238	179	1,450	604	286	218	153	62	35	34
10	274	174	316	169	1,100	*628	256	205	144	64	35	*31
11	812	182	1,330	174	828	600	271	199	133	62	34	32
12	660	174	1,080	169	748	538	340	210	125	61	34	31
13	524	169	796	164	840	496	322	210	125	58	34	31
14	440	162	1,520	169	1,860	545	*426	189	138	55	35	31
15	412	192	4,100	184	1,760	1,380	454	182	148	52	39	31
16	340	194	2,020	205	1,150	990	524	233	189	54	36	30
17	310	247	1,210	238	844	776	496	545	151	52	*39	29
18	274	756	900	230	684	632	566	517	127	48	38	30
19	256	856	688	221	552	531	800	611	125	48	35	30
20	780	2,140	552	213	600	461	1,620	1,100	144	48	31	36
21	700	2,410	496	205	461	405	1,200	880	131	48	67	31
22	*1,730	3,940	440	216	398	355	832	740	117	44	61	30
23	1,400	3,570	394	364	352	316	676	624	*116	44	45	38
24	930	1,780	447	1,090	325	280	596	*528	110	44	96	41
25	870	1,200	454	1,120	301	256	545	*454	106	41	75	67
26	700	848	412	1,310	268	274	482	405	106	39	79	44
27	604	700	384	1,240	250	244	419	377	104	39	61	39
28	531	620	358	1,610	227	274	377	340	96	39	51	32
29	430	524	328	3,920	216	1,120	340	304	94	39	48	32
30	391	433	340	1,950	------	1,120	307	313	91	38	48	32
31	349	------	286	1,160	------	1,110	------	313	------	38	45	------
Total	16,076	23,687	21,601	18,288	26,027	16,507	16,441	11,725	4,435	1,726	1,398	1,097
Mean	519	790	697	590	897	532	548	378	148	55.7	45.1	36.6
Cfsm	9.39	14.3	12.6	10.7	16.2	9.62	9.91	6.84	2.68	1.01	0.816	0.662
In.	10.81	15.93	14.53	12.30	17.50	11.10	11.06	7.89	2.98	1.16	0.94	0.74
Ac-ft	31,890	46,980	42,840	36,270	51,620	32,740	32,610	23,260	8,800	3,420	2,770	2,180

Calendar year 1959: Max 4,260 Min 38 Mean 489 Cfsm 8.84 In. 119.97 Ac-ft 353,800
Water year 1959-60: Max 4,100 Min 29 Mean 434 Cfsm 7.85 In. 106.94 Ac-ft 315,400

Peak discharge (base, 4,000 cfs).--Probably Nov. 20 (time unknown) about 4,320 cfs; Nov. 22 (time unknown) 5,950 cfs (11.30 ft); Dec. 15 (time unknown) 4,580 cfs (9.79 ft); Jan. 29 (time unknown) 4,430 cfs (9.62 ft); Feb. 6 (time unknown) 4,470 cfs (9.67 ft).

* Discharge measurement made on this day.

105. Salmon Creek near Naselle, Wash.

Location.--Lat 46°21'20", long 123°45'00", in NE¼ sec.14, T.10 N., R.9 W., on left bank half a mile upstream from last crossing of U. S. Highway 830, 2 miles upstream from mouth, and 3 miles southeast of Naselle.

Drainage area.--16.4 sq mi.

Records available.--June 1953 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 80 ft (from topographic map). Prior to Aug. 20, 1958, at datum 0.26 ft lower.

Average discharge.--7 years, 118 cfs (85,430 acre-ft per year).

Extremes.--Maximum discharge during year, 2,350 cfs Nov. 22 (gage height, 8.03 ft), from rating curve extended above 560 cfs by logarithmic plotting; minimum, 2.5 cfs Aug. 21 (gage height, 1.36 ft).
1953-60: Maximum discharge, that of Nov. 22, 1959; minimum, 2.4 cfs Sept. 20, 1953 (gage height, 0.90 ft).

Remarks.--Records good except those above 1,000 cfs, which are fair. Slight regulation from millpond. Possibly some diversion for domestic use.

Revisions (water years).--WSP 1346: 1953(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22				Nov. 22 to Sept. 30			
2.0	35	5.0	605	1.3	1.8	3.0	168
2.5	82	6.0	1,010	1.5	5	4.0	393
3.0	151	7.5	1,840	1.7	13	5.0	710
4.0	335			2.0	40	7.0	1,670
				2.5	94		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	76	74	84	60	240	45	246	70	66	13.5	4.8	4.6
2	67	67	82	56	238	42	203	67	58	13	4.8	4.4
3	60	94	78	53	244	48	160	62	54	12	4.6	3.8
4	56	72	69	50	*217	55	130	56	49	11.5	4.4	4.6
5	51	64	62	47	221	84	112	50	46	10.5	4.2	9.5
6	51	58	60	54	793	93	96	75	43	9.0	3.8	7.1
7	52	54	61	*47	970	132	84	68	39	8.0	3.4	5.6
8	91	50	*55	43	584	184	75	59	37	8.0	3.4	4.8
9	110	48	*52	40	*393	192	70	52	34	8.0	3.4	4.4
10	93	44	94	39	296	*221	63	51	32	8.0	3.2	*4.0
11	215	42	371	39	219	197	68	50	28	7.4	3.2	4.0
12	178	42	308	38	236	160	110	52	27	7.1	3.6	3.8
13	144	38	219	36	233	151	102	48	24	6.8	2.9	3.8
14	121	37	487	43	610	156	*120	45	35	6.8	3.0	3.6
15	106	41	966	55	519	328	156	42	38	6.5	3.2	3.6
16	90	37	552	62	335	242	146	57	44	6.2	3.6	3.4
17	80	82	315	72	231	190	140	147	33	5.9	*3.8	3.4
18	72	197	236	67	173	153	168	119	27	5.6	3.6	3.6
19	67	241	166	64	135	126	229	191	29	5.6	3.0	3.6
20	157	582	145	60	114	105	574	291	33	5.3	2.8	4.6
21	142	757	116	57	113	92	390	242	27	5.3	6.8	4.0
22	370	1,510	99	68	93	81	261	190	23	5.3	11	3.8
23	*308	1,180	92	150	80	72	207	154	21	4.8	10.5	6.2
24	254	531	107	340	73	64	170	129	*19.5	4.6	20	11
25	208	313	107	301	67	58	143	*117	18.5	4.4	11	10
26	170	215	95	332	59	59	123	106	18	4.4	9.5	6.5
27	150	163	88	325	55	54	104	95	16.5	4.4	7.4	5.3
28	132	137	81	530	51	69	95	84	16	4.2	6.5	4.8
29	111	117	74	1,260	48	284	84	75	14.5	4.0	5.9	4.4
30	95	98	78	629		293	76	75	14.5	4.0	5.6	4.0
31	84		68	345		303		74		4.4	5.3	
Total	3,961	6,985	5,467	5,364	7,640	4,333	4,705	2,993	964.5	214.5	172.2	150.0
Mean	128	233	176	173	263	140	157	96.5	32.2	6.92	5.55	5.00
Cfsm	7.80	14.2	10.7	10.5	16.0	8.54	9.57	5.88	1.96	0.422	0.338	0.305
In.	8.98	15.84	12.40	12.16	17.33	9.83	10.67	6.79	2.19	0.49	0.39	0.34
Ac-ft	7,860	13,850	10,840	10,640	15,150	8,590	9,330	5,940	1,910	425	342	298

Calendar year 1959: Max 1,510 Min 4.6 Mean 121 Cfsm 7.38 In. 100.03 Ac-ft 87,480
Water year 1959-60: Max 1,510 Min 2.8 Mean 117 Cfsm 7.13 In. 97.41 Ac-ft 85,180

Peak discharge (base, 1,300 cfs).--Nov. 22 (2:30 p.m.) 2,350 cfs (8.03 ft); Jan. 29 (5 a.m.) 1,590 cfs (6.86 ft); Feb. 6 (9:30 p.m.) 2,130 cfs (7.72 ft).

* Discharge measurement made on this day.

115. Willapa River at Lebam, Wash.

Location.--Lat 46°33'50", long 123°33'50", in SW¼ sec.33, T.13 N., R.7 W., on left bank half a mile west of Lebam and 1 mile upstream from Walker Creek.

Drainage area.--41.4 sq mi.

Records available.--June 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 154.0 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--12 years, 196 cfs (141,900 acre-ft per year).

Extremes.--Maximum discharge during year, 2,890 cfs Nov. 21 (gage height, 11.72 ft); minimum, 7.9 cfs Aug. 8, 9 (gage height, 2.42 ft).
1948-60: Maximum discharge, 4,930 cfs Feb. 22, 1949 (gage height, 17.53 ft, from high-water mark in gage house), from rating curve extended above 2,200 cfs; minimum, 1.4 cfs Sept. 22, 1951; minimum gage height, 2.39 ft Aug. 22, 23, 1951, Oct. 27, 1952, Sept. 7, 1958.

Remarks.--Records good except those for period of no gage-height record, which are fair. No regulation. Some diversion for irrigation and domestic use. Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

2.4	5.5	4.0	310
2.7	32	5.0	590
3.0	77	7.0	1,190
3.5	178	9.1	1,840

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	86	143	108	419	98	478	128	91	26	12	13
2	46	80	136	101	*470	92	372	118	86	23	13	12
3	43	92	*132	96	472	96	305	122	75	22	*12	10.5
4	41	80	118	92	402	103	251	116	71	20	13	13
5	39	74	112	*87	430	147	208	107	66	19.5	11.5	19.5
6	38	69	108	86	894	178	180	110	60	18.5	10.5	17.5
7	39	64	107	82	1,210	224	159	107	56	16.5	9.8	14
8	46	61	98	*77	914	*327	145	96	54	17.5	8.5	*12
9	72	60	94	74	719	341	132	92	48	16.5	8.5	12
10	60	58	103	72	542	380	122	87	43	17.5	9.2	11.5
11	132	56	372	72	419	352	126	89	43	16.5	8.5	12
12	139	55	551	72	453	286	*147	98	41	15.5	9.8	12
13	116	50	374	67	442	259	161	91	38	15	9.2	12
14	98	49	567	a68	797	261	261	84	41	15	9.2	12
15	84	48	1,360	a70	821	565	341	80	42	13	9.8	12
16	72	48	812	a72	562	453	321	99	42	13	9.2	12
17	67	64	489	a74	422	363	291	213	38	12	9.2	11.5
18	63	173	369	a72	330	299	310	245	34	12	9.2	11.5
19	58	278	278	a68	261	251	422	*242	37	11.5	9.2	11.5
20	*193	1,170	256	a66	224	219	836	400	39	11.5	8.5	11.5
21	208	1,580	213	a65	221	190	644	391	*35	11.5	13	11.5
22	*330	1,190	186	a70	180	166	481	349	32	12	19.5	11.5
23	316	1,000	171	a80	156	147	388	278	31	12	14	11.5
24	248	576	180	338	150	132	316	237	28	12	28	15
25	219	397	180	369	136	122	264	200	28	12	23	19.5
26	180	296	159	369	128	118	232	173	28	11.5	29	15
27	154	240	147	422	116	114	200	152	28	11.5	24	12
28	134	211	139	684	110	128	178	134	27	12	19.5	12
29	118	186	126	1,820	103	638	154	120	24	10.5	13	10.5
30	105	156	132	896	------	755	136	108	25	11.5	14	9.8
31	96	------	118	551	------	617	------	107	------	12	14	------
Total	3,606	8,547	8,330	7,240	12,503	8,423	8,561	4,973	1,331	460.5	407.8	381.3
Mean	116	285	269	234	431	272	285	160	44.4	14.9	13.2	12.7
Cfsm	2.80	6.88	6.50	5.65	10.4	6.57	6.88	3.86	1.07	0.360	0.319	0.307
In.	3.24	7.68	7.48	6.50	11.23	7.57	7.69	4.47	1.20	0.41	0.37	0.34
Ac-ft	7,150	16,950	16,520	14,360	24,800	16,710	16,980	9,860	2,640	913	813	756

Calendar year 1959: Max 1,610 Min 8.5 Mean 180 Cfsm 4.35 In. 58.92 Ac-ft 130,100
Water year 1959-60: Max 1,820 Min 8.5 Mean 177 Cfsm 4.28 In. 58.18 Ac-ft 128,500

Peak discharge (base, 1,800 cfs).--Nov. 21 (1 a.m.) 2,890 cfs (11.72 ft); Jan. 29 (6 a.m.) 2,400 cfs (10.50 ft); Feb. 6 (10 p.m.) 2,220 cfs (10.04 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for Chehalis River near Doty.

120. Fork Creek near Lebam, Wash.

Location.--Lat 46°33'20", long 123°35'00", in NW¼ sec.5, T.12 N., R.7 W., on right bank three-quarters of a mile upstream from mouth and 1½ miles southwest of Lebam.

Drainage area.--20.4 sq mi.

Records available.--June 1953 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 155 ft (from topographic map).

Average discharge.--7 years, 151 cfs (109,300 acre-ft per year).

Extremes.--Maximum discharge during year, 2,320 cfs Feb. 6 (gage height, 6.36 ft), from rating curve extended above 940 cfs as explained below; minimum, 6.3 cfs Aug. 16 (gage height, 1.66 ft).
1953-60: Maximum discharge, 3,500 cfs Dec. 9, 1956 (gage height, 7.75 ft), from rating curve extended above 940 cfs on basis of slope-area measurement of peak flow; minimum, 3.4 cfs Sept. 6-8, 1958; minimum gage height, 1.57 ft Aug. 27, 27, Sept. 6-8, 1958.

Remarks.--Records good. Small diversion to State fish hatchery with possibly some regulation.

Revisions (water years).--WSP 1636: 1955(M).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

1.65	5.6	3.0	262
1.7	7.6	4.0	735
2.0	30	5.5	1,680
2.4	91		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	68	102	77	262	69	340	91	89	26	12	13.5
2	45	61	98	71	387	66	281	87	81	24	12.5	11
3	41	87	*91	66	394	69	217	83	73	24	*12	10.5
4	37	66	81	63	312	71	175	75	66	23	10.5	13.5
5	35	60	75	*60	*316	124	147	68	60	22	9.8	32
6	35	57	73	68	867	147	129	87	57	21	9.2	21
7	35	52	68	63	904	201	112	87	54	20	9.2	16
8	81	48	63	58	636	*270	100	79	50	19.5	8.6	*13.5
9	96	46	60	57	525	230	93	69	46	19.5	8.6	12
10	69	45	85	57	390	234	85	71	45	19.5	8.6	11
11	292	42	423	57	281	214	98	68	43	18.5	8.6	10.5
12	186	41	430	54	312	180	*150	85	41	18	9.2	9.2
13	124	38	244	52	332	175	158	79	38	18	9.2	9.2
14	93	37	690	57	931	221	211	73	46	17	8.6	9.2
15	77	42	1,580	60	713	615	252	66	46	16	9.2	8.6
16	66	37	635	63	426	349	217	89	60	16	8.6	8.1
17	58	83	349	69	296	270	205	231	48	16	9.2	8.1
18	52	205	285	63	227	221	262	172	42	15.5	8.5	8.1
19	50	270	195	60	183	192	385	188	45	15	7.6	8.6
20	*300	1,120	172	58	161	175	790	332	46	14	7.1	9.2
21	217	970	147	57	169	152	462	255	41	14	19.5	7.6
22	*415	1,200	129	79	144	132	308	214	*36	13.5	20	7.6
23	285	975	119	204	126	114	252	175	34	13.5	28	10.5
24	234	490	144	367	114	100	217	*150	32	13.5	41	13.5
25	211	328	144	336	105	91	189	134	32	12.5	34	13.5
26	158	230	129	372	96	91	161	122	30	12.5	32	9.8
27	129	185	116	367	85	85	142	114	29	12.5	26	8.1
28	109	161	107	645	79	137	124	105	28	12	19.5	7.6
29	91	136	98	1,200	75	589	112	93	27	12	18	7.1
30	83	114	96	575	------	580	100	93	27	10.5	15.5	6.7
31	73	------	85	349	------	457	------	109	------	11	15	------
Total	3,827	7,292	7,086	5,784	9,848	6,621	6,474	3,744	1,392	520.0	455.4	334.8
Mean	123	243	229	187	340	214	216	121	46.4	16.8	14.7	11.2
Cfsm	6.03	11.9	11.2	9.17	16.7	10.5	10.6	5.93	2.27	0.824	0.721	0.549
In.	6.98	13.29	12.92	10.54	17.95	12.07	11.80	6.83	2.54	0.95	0.83	0.61
Ac-ft	7,590	14,460	14,050	11,470	19,530	13,130	12,840	7,430	2,760	1,030	903	664

Calendar year 1959: Max 1,580 Min 5.9 Mean 153 Cfsm 7.50 In. 102.11 Ac-ft 111,100
Water year 1959-60: Max 1,580 Min 6.7 Mean 146 Cfsm 7.16 In. 97.31 Ac-ft 105,900

Peak discharge (base, 2,000 cfs).--Nov. 20 (10 p.m.) 2,100 cfs (6.09 ft); Feb. 6 (8 p.m.) 2,320 cfs (6.36 ft).

* Discharge measurement made on this day.

145. South Fork Willapa River near Raymond, Wash.

Location.--Lat 46°37'45", long 123°42'00", in E½ sec.8, T.13 N., R.8 W., on left bank at downstream side of logging bridge, a quarter of a mile downstream from Rue Creek and 4¼ miles southeast of junction of Highways 101 and 12 at Raymond.

Drainage area.--27.3 sq mi.

Records available.--May 1953 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 155 ft (from topographic map). Prior to Aug. 7, 1957, at site 40 ft upstream at same datum.

Average discharge.--7 years, 167 cfs (120,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,390 cfs Dec. 15 (gage height, 5.60 ft); minimum daily, 22 cfs Sept. 30.
1953-60: Maximum discharge, 2,060 cfs Dec. 11, 1955 (gage height, 6.92 ft); minimum, 18.5 cfs Sept. 22-26, Oct. 12, 1957; minimum gage height, 1.38 ft Sept. 20-22, 1953.

Remarks.--Records good except those for period of no gage-height record, which are fair. Some small diversions for domestic use. No regulation.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 20-29, Nov. 18, 19, 22, 23, Aug. 17-28)

Oct. 1 to Nov. 21				Nov. 22 to Sept. 30			
1.7	71	3.0	383	1.4	15	3.0	375
2.0	128	4.0	725	1.6	34	4.0	725
2.5	243			2.0	95	5.5	1,340
				2.5	210		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	91	141	180	135	333	133	258	151	133	58	34	29
2	85	132	178	130	417	130	228	146	128	58	34	28
3	80	147	168	124	*378	133	200	142	119	57	33	28
4	80	130	153	119	322	130	182	135	115	55	33	30
5	76	124	144	115	354	142	170	128	111	52	33	37
6	78	118	139	117	503	155	158	142	107	51	32	31
7	76	114	130	115	658	168	148	135	101	50	31	29
8	107	110	126	*111	606	225	142	128	97	48	31	28
9	108	106	122	107	529	*225	137	122	95	48	30	*27
10	93	102	135	105	445	255	128	117	90	47	31	27
11	215	100	319	107	361	234	126	115	84	46	30	26
12	176	100	319	103	378	205	137	117	82	44	31	26
13	143	93	240	103	361	192	139	117	81	44	30	26
14	126	91	504	109	630	208	*153	113	86	43	30	26
15	116	97	1,230	117	624	442	172	107	82	42	31	25
16	108	87	732	119	480	319	160	126	91	42	*30	24
17	102	129	501	124	392	258	160	266	81	41	30	24
18	97	180	396	117	326	222	182	219	75	41	28	24
19	93	180	319	115	277	198	243	225	75	41	26	25
20	270	510	284	111	246	182	476	386	77	41	26	25
21	*211	649	240	107	246	170	392	312	72	39	34	23
22	455	985	216	117	213	160	312	258	69	39	30	23
23	350	*988	200	148	198	151	280	225	*67	38	33	28
24	296	634	205	237	185	144	258	*205	66	37	42	a32
25	272	466	200	255	175	137	231	182	66	37	41	a40
26	223	368	182	270	162	137	208	175	64	36	41	a35
27	196	298	172	298	155	133	192	172	63	36	34	a30
28	180	261	162	331	148	137	180	158	61	36	30	a25
29	169	228	153	840	139	282	170	144	60	34	32	a23
30	156	198	153	596	---	298	160	144	60	34	31	a22
31	147	---	142	410	---	302	---	144	---	34	32	---
Total	4,975	7,866	8,344	5,912	10,241	6,207	6,082	5,256	2,558	1,349	994	826
Mean	160	262	269	191	353	200	203	170	85.3	43.5	32.1	27.5
Cfsm	5.86	9.60	9.85	7.00	12.9	7.33	7.44	6.23	3.12	1.59	1.18	1.01
In.	6.78	10.72	11.37	8.05	13.95	8.46	8.29	7.16	3.48	1.84	1.35	1.13
Ac-ft	9,870	15,600	16,550	11,730	20,310	12,310	12,060	10,430	5,070	2,680	1,970	1,640

Calendar year 1959: Max 1,230 Min 29 Mean 176 Cfsm 6.45 In. 87.29 Ac-ft 127,100
Water year 1959-60: Max 1,230 Min 22 Mean 166 Cfsm 6.08 In. 82.58 Ac-ft 120,200

Peak discharge (base, 1,500 cfs).--No peak above base.

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.

155. North River near Brooklyn, Wash.

Location.--Lat 46°46'55", long 123°28'50", in S½ sec.18, T.15 N., R.6 W., on left bank 1¼ miles upstream from Fall River and 1½ miles northeast of Brooklyn.

Drainage area.--29.8 sq mi.

Records available.--June 1953 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 190 ft (from topographic map).

Average discharge.--7 years, 113 cfs (81,810 acre-ft per year).

Extremes.--Maximum discharge during year, 2,160 cfs Dec. 15 (gage height, 7.66 ft); minimum, 5.4 cfs Aug. 8, 9, 10; minimum gage height, 0.43 ft July 30.
1953-60: Maximum discharge, 2,640 cfs Dec. 9, 1956 (gage height, 8.69 ft); minimum, 5.4 cfs Aug. 22, 23, 1958, Aug. 8, 9, 10, 1960; minimum gage height, 0.34 ft Aug. 22, 23, 1958.

Remarks.--Records good. No regulation. Possibly some small diversion for irrigation and domestic use.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 3 to Sept. 30)

0.3	3.6	1.0	102
.4	8.0	2.0	390
.5	15	4.0	920
.7	41	7.0	1,900

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	63	117	73	231	79	183	79	63	19.5	8.0	7.6
2	29	59	112	71	291	75	156	77	57	19.5	8.0	7.1
3	28	67	107	65	*261	75	137	75	54	17	7.1	6.7
4	25	55	97	63	219	75	120	75	50	17	7.1	8.0
5	25	50	90	63	219	88	104	67	46	16	7.1	13
6	24	48	88	*67	413	110	93	79	41	15	6.7	11.5
7	24	45	93	69	602	120	86	75	40	14.5	6.2	8.7
8	30	43	86	67	438	204	79	67	40	14.5	5.8	7.6
9	36	41	81	61	360	*201	75	59	36	13.5	5.8	*6.7
10	30	40	97	59	294	234	69	57	35	14.5	6.2	6.7
11	164	38	304	59	240	219	71	63	34	13.5	6.7	7.1
12	135	40	442	57	267	177	75	75	32	13.5	6.7	6.7
13	90	36	267	55	294	156	*84	75	30	13	6.7	7.1
14	73	35	618	59	523	161	137	69	40	12	6.2	7.6
15	65	38	1,780	63	515	363	169	61	45	11.5	*10	7.6
16	54	35	727	67	364	267	153	73	45	11	9.4	7.6
17	48	85	398	77	276	204	135	112	36	10	11	7.6
18	45	210	282	71	219	169	135	117	32	10	10	7.1
19	41	234	210	69	180	145	177	134	32	10	7.6	8.0
20	138	919	192	67	161	130	336	*294	35	10	7.1	8.7
21	*143	1,100	161	67	175	114	315	222	30	9.4	18	8.0
22	342	1,050	143	71	143	102	249	177	28	9.4	15	8.7
23	258	926	132	122	130	100	201	145	*25	9.4	13.5	11
24	189	*490	130	213	120	86	172	127	24	9.4	24	15
25	175	336	127	273	112	81	145	110	24	9.4	25	16
26	145	255	110	252	100	77	130	95	23	8.7	26	11.5
27	122	201	100	219	93	77	114	88	22	8.7	17	9.4
28	100	169	93	264	88	79	102	79	20	8.7	9.4	8.0
29	86	150	88	791	84	187	90	73	19.5	8.0	8.7	8.0
30	75	130	88	480	------	222	86	71	19.5	7.6	8.7	8.0
31	69	------	79	306	------	225	------	73	------	8.0	8.7	------
Total	2,840	6,988	7,439	4,360	7,402	4,602	4,178	3,043	1,058.0	372.2	323.4	262.3
Mean	91.6	233	240	141	255	148	139	98.2	35.3	12.0	10.4	8.74
Cfsm	3.07	7.82	8.05	4.73	8.56	4.97	4.66	3.30	1.18	0.403	0.349	0.293
In.	3.54	8.72	9.28	5.44	9.24	5.74	5.21	3.80	1.32	0.46	0.40	0.33
Ac-ft	5,630	13,860	14,760	8,650	14,680	9,130	8,290	6,040	2,100	738	641	520

Calendar year 1959: Max 1,780 Min 9.4 Mean 121 Cfsm 4.06 In. 55.09 Ac-ft 87,570
Water year 1959-60: Max 1,780 Min 5.8 Mean 117 Cfsm 3.93 In. 53.48 Ac-ft 85,040

Peak discharge (base, 1,000 cfs).--Nov. 21 (1 a.m.) 2,080 cfs (7.44 ft); Nov. 22 (8 p.m.) 1,530 cfs (6.07 ft); Dec. 15 (1 p.m.) 2,160 cfs (7.66 ft); Jan. 29 (7:30 a.m.) 1,000 cfs (4.29 ft).

* Discharge measurement made on this day.

170. North River near Raymond, Wash.

Location.--Lat 46°48'30", long 123°51'00", in sec.6, T.15 N., R.9 W., on left bank 11 miles upstream from Salmon Creek and 10 miles northwest of Raymond.

Drainage area.--219 sq mi.

Records available.--August 1927 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 7.39 ft above mean sea level (Western Washington Electric Light & Power Co. bench mark).

Average discharge.--33 years, 954 cfs (690,700 acre-ft per year).

Extremes.--Maximum discharge during year, 11,500 cfs Nov. 22 (gage height, 10.24 ft); minimum daily, 54 cfs Aug. 10-12, Sept. 16-18; minimum gage height, 1.32 ft Sept. 18,19. 1927-60: Maximum discharge, 35,000 cfs Dec. 10, 1933 (gage height, 15.8 ft, from floodmarks), from rating curve extended above 7,500 cfs; minimum, 21 cfs Aug. 24, 1951 (gage height, 1.01 ft).

Remarks.--Records excellent except those for period July 16-31, which are good, and those for period of no gage-height record, which are fair. Some diversion for farm and domestic use. No regulation.

Revisions (water years).--WSP 792: 1934. WSP 832: 1935-36. WSP 1286: 1952.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

1.3	50	4.0	1,420
1.5	76	5.0	2,580
2.0	181	7.0	5,370
2.5	355	10.0	11,000
3.0	615		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	445	628	1,060	687	2,440	603	2,240	708	634	176	a97	84
2	391	579	962	628	2,320	567	1,750	674	651	174	a98	78
3	351	597	932	603	*2,600	555	1,440	622	511	161	a98	73
4	315	603	880	567	2,240	561	1,210	609	480	156	a98	69
5	296	522	799	538	1,930	603	1,050	573	450	151	a95	76
6	278	470	757	*555	2,590	736	932	729	405	142	a94	76
7	271	445	771	597	5,580	828	820	771	386	133	a92	84
8	319	415	757	603	5,080	1,100	757	674	360	127	a90	78
9	331	396	708	555	3,710	*1,430	694	573	347	120	a86	*68
10	386	378	820	528	2,840	1,540	654	538	323	116	a54	62
11	729	364	1,760	538	2,280	1,740	622	533	308	114	a54	60
12	1,190	360	3,050	533	2,140	1,520	715	573	293	114	a54	57
13	1,000	351	2,930	511	2,500	1,270	*729	597	278	112	a56	58
14	764	323	3,190	538	3,600	1,180	813	579	278	108	a57	56
15	648	368	8,380	567	4,840	2,320	1,140	544	339	104	a90	55
16	567	364	9,510	597	3,770	2,830	1,300	573	410	101	*81	54
17	495	572	6,220	615	2,630	2,080	1,190	813	382	99	68	54
18	450	1,650	2,960	622	2,000	1,580	1,200	1,010	323	93	66	54
19	410	2,200	2,110	573	1,580	1,310	1,430	1,070	293	90	65	55
20	688	4,580	1,730	567	1,330	1,110	2,590	*2,110	296	88	62	56
21	*1,430	9,050	1,500	555	1,300	978	3,090	2,360	308	84	76	55
22	1,810	10,400	1,260	597	1,220	880	2,500	1,870	*268	81	88	55
23	2,930	*9,330	1,120	983	1,050	792	1,880	1,470	246	79	125	61
24	2,220	7,980	1,090	2,420	948	729	1,590	1,210	230	78	138	78
25	1,910	4,330	1,130	2,900	880	674	1,340	1,040	217	73	149	102
26	1,610	2,720	1,050	2,780	813	634	1,170	948	210	72	142	108
27	1,290	2,030	925	2,360	743	622	1,040	858	207	70	149	97
28	1,080	1,640	872	2,340	694	634	918	792	196	68	138	79
29	910	1,390	806	6,130	641	1,230	828	694	187	66	122	69
30	865	1,210	771	6,830	------	2,520	757	701	178	66	97	62
31	701	------	743	3,820	------	2,710	------	701	------	65	91	------
Total	27,080	66,245	61,553	43,237	66,289	37,866	38,389	27,517	9,904	3,281	2,550	2,073
Mean	874	2,208	1,986	1,395	2,286	1,221	1,280	888	330	106	82.3	69.1
Cfsm	3.99	10.1	9.07	6.37	10.4	5.58	5.84	4.05	1.51	0.484	0.376	0.316
In.	4.60	11.25	10.45	7.34	11.26	6.43	6.52	4.67	1.68	0.56	0.43	0.35
Ac-ft	53,710	131,400	122,100	85,760	131,500	75,110	76,140	54,580	19,640	6,510	5,060	4,110

Calendar year 1959: Max 10,400 Min 61 Mean 1,115 Cfsm 5.09 In. 69.08 Ac-ft 806,900
Water year 1959-60: Max 10,400 Min 54 Mean 1,055 Cfsm 4.82 In. 65.54 Ac-ft 765,600

Peak discharge (base, 4,000 cfs).--Nov. 22 (12:30 p.m.) 11,500 cfs (10.24 ft); Dec. 16 (2:30 p.m.) 9,730 cfs (9.39 ft); Jan. 30 (2 a.m.) 7,510 cfs (8.24 ft); Feb. 7 (7 p.m.) 6,030 cfs (7.40 ft); Feb. 15 (12 m. to 3 p.m.) 4,940 cfs (6.73 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.

200. Chehalis River near Doty, Wash.

Location.--Lat 46°37'00", long 123°16'40", in NW¼ sec.14, T.13 N., R.5 W., on right bank 1½ miles upstream from Elk Creek, 1½ miles south of Doty, and 3½ miles north of Pe Ell.

Drainage area.--113 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Staff gage read twice daily, and crest-stage gage. Datum of gage is 302.1 ft above mean sea level (river-profile survey).

Average discharge.--21 years, 571 cfs (413,400 acre-ft per year).

Extremes.--Maximum discharge during year, 9,180 cfs Dec. 15 (gage height, 11.44 ft); minimum observed, 32 cfs Aug. 13, 14 (gage height, 0.96 ft).
1939-60: Maximum discharge, 18,100 cfs Feb. 7, 1945 (gage height, 17.80 ft, water over gage, discharge based on observer's estimate of maximum gage height); minimum observed, 18 cfs Oct. 14, 1952, Aug. 25-28, 1958; minimum gage height, 0.84 ft Aug. 25-27, Sept. 21, 22, 1951, Aug. 25-28, 1958.

Remarks.--Records good. No regulation or diversion above station. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1316: 1943(M). WSP 1446: 1946(M).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

0.9	23	2.0	298	5.0	2,260
1.2	66	3.0	810	7.0	4,000
1.6	157	4.0	1,490	10.0	7,360

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	237	267	421	315	1,110	282	1,540	394	315	97	43	56
2	208	252	376	298	*1,240	267	1,260	362	282	92	43	52
3	188	267	*376	282	1,530	267	972	340	259	90	*45	49
4	176	271	358	259	1,400	267	786	332	244	88	43	52
5	157	237	332	*259	1,320	275	652	294	226	84	43	73
6	151	215	306	259	1,380	340	550	282	212	80	42	75
7	157	198	315	244	3,840	608	480	315	198	77	40	61
8	208	188	282	237	3,490	*1,180	430	278	188	73	39	*54
9	570	182	267	229	2,370	1,110	385	271	182	69	38	48
10	480	176	319	222	1,830	1,020	344	259	172	66	36	43
11	1,430	169	1,410	215	1,250	930	376	259	163	66	35	43
12	1,180	163	2,200	202	1,100	786	*470	336	157	66	34	40
13	702	154	1,350	195	1,360	674	570	302	151	66	32	40
14	510	151	1,560	202	2,420	726	1,040	282	149	64	32	40
15	398	149	7,020	202	3,030	2,590	1,320	267	163	62	35	38
16	323	146	3,260	208	2,460	1,720	1,150	290	182	61	35	38
17	282	188	1,720	219	1,250	1,380	958	475	163	59	35	36
18	252	750	1,240	215	958	1,200	972	702	157	56	35	35
19	229	1,240	951	208	762	1,090	1,590	*570	169	52	36	35
20	*756	4,230	750	202	646	1,080	3,140	1,240	172	49	35	35
21	958	5,110	630	195	624	951	2,350	1,070	*151	48	43	35
22	937	3,800	550	202	570	804	1,570	888	143	46	62	35
23	1,170	3,580	495	237	495	674	1,240	720	132	45	61	40
24	834	2,040	490	550	445	613	1,010	608	124	43	160	52
25	834	1,410	465	1,500	430	520	882	520	119	43	129	62
26	640	1,010	445	1,380	380	490	762	500	115	43	169	46
27	520	786	430	1,280	340	500	635	450	112	42	115	40
28	435	657	408	1,460	315	550	510	408	110	40	86	39
29	380	555	367	4,420	302	2,460	450	367	105	40	67	38
30	332	470	367	2,620	------	2,630	426	340	101	40	62	35
31	298	------	340	1,620	------	1,940	------	340	------	40	59	------
Total	15,932	29,011	29,800	20,136	38,647	29,924	28,820	14,061	5,116	1,887	1,769	1,365
Mean	514	967	961	650	1,333	965	961	454	171	60.9	57.1	45.5
Cfsm	4.55	8.56	8.50	5.75	11.8	8.54	8.50	4.02	1.51	0.539	0.505	0.403
In.	5.24	9.55	9.81	6.63	12.72	9.85	9.49	4.63	1.68	0.62	0.58	0.45
Ac-ft	31,600	57,540	59,110	39,940	76,660	59,350	57,160	27,890	10,150	3,740	3,510	2,710

Calendar year 1959: Max 7,020 Min 32 Mean 628 Cfsm 5.56 In. 75.47 Ac-ft 454,800
Water year 1959-60: Max 7,020 Min 32 Mean 591 Cfsm 5.23 In. 71.25 Ac-ft 429,400

Peak discharge (base, 6,800 cfs).--Probably Nov. 20 (time unknown) 8,900 cfs (11.22 ft); Dec. 15 (time unknown) 9,180 cfs (11.44 ft).

* Discharge measurement made on this day.

240. South Fork Newaukum River near Onalaska, Wash.

Location.--Lat 46°34'35", long 122°41'00", on line between secs.28 and 33, T.13 N., R.1 E., on right bank 0.9 mile upstream from Lost Creek and 1¾ miles east of Onalaska.

Drainage area.--42.4 sq mi (revised).

Records available.--July to October 1942, July to October 1943, July 1944 to November 1948, June 1957 to September 1960. October 1943 to September 1958, published as Newaukum River near Onalaska.

Gage.--Water-stage recorder. Altitude of gage is 540 ft (from topographic map). Prior to Sept. 28, 1944, staff gage at datum 0.93 ft higher.

Average discharge.--7 years (1944-48, 1957-60), 208 cfs (150,600 acre-ft per year).

Extremes.--Maximum discharge during year, 2,190 cfs Nov. 23 (gage height, 6.46 ft); minimum, 28 cfs Aug. 9, 10 (gage height, 1.34 ft).
1942-48, 1957-60: Maximum discharge, 3,810 cfs Dec. 11, 1946 (gage height, 8.40 ft); minimum, 17.5 cfs Sept. 6-8, 1958 (gage height, 1.26 ft).

Remarks.--Records excellent except those for period June 1-14, which are good. No regulation or diversion above station.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 14, June 1 to Sept. 30				Dec. 15 to May 31			
1.3	21	3.0	440	1.8	98	4.0	875
1.6	55	4.0	875	2.3	220	5.0	1,370
2.0	127	6.0	1,920	3.0	455		
2.5	260						

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	98	145	230	152	298	136	438	202	185	60	35	45
2	91	136	242	142	315	131	434	190	170	56	36	41
3	84	175	227	133	354	127	374	180	158	54	36	39
4	78	148	*206	131	318	127	315	170	145	52	35	61
5	75	134	192	127	308	148	274	158	134	51	*35	78
6	75	125	190	158	368	158	247	185	123	48	33	66
7	84	119	195	145	639	148	226	214	116	47	32	55
8	118	112	175	136	*587	229	211	182	110	47	31	47
9	188	108	175	129	535	235	202	162	106	47	30	43
10	145	102	209	127	476	226	180	158	100	46	30	41
11	469	98	278	125	406	208	226	165	96	46	31	40
12	476	102	460	118	378	199	202	178	89	45	31	38
13	312	93	354	114	382	199	199	182	87	45	30	38
14	227	89	443	112	675	211	312	178	104	43	31	*36
15	190	102	1,140	116	816	584	430	162	110	42	43	34
16	160	93	812	136	567	*427	378	232	116	41	36	34
17	141	213	523	131	438	357	350	418	102	41	36	33
18	125	650	413	120	364	326	329	444	93	41	32	32
19	116	668	332	*118	308	308	364	396	98	41	31	34
20	352	863	298	112	265	322	*692	663	102	40	30	33
21	386	1,330	256	110	256	326	599	591	89	40	35	31
22	512	1,400	229	112	223	294	455	519	82	40	39	31
23	452	1,580	211	186	202	265	396	406	77	40	52	43
24	386	965	298	343	193	238	371	350	72	38	77	47
25	376	776	274	315	185	226	346	301	70	38	119	43
26	302	556	241	364	168	214	315	274	67	36	162	36
27	248	428	217	329	155	196	280	268	64	36	89	33
28	215	368	193	322	148	229	268	247	*62	35	66	32
29	*185	312	180	571	140	420	244	220	61	34	55	31
30	170	264	182	448	------	507	220	208	60	35	48	31
31	158	------	168	354	------	483	------	*217	------	36	51	------
Total	6,994	12,254	9,543	6,036	10,467	8,204	9,877	8,420	3,048	1,341	1,457	1,226
Mean	226	408	308	195	361	265	329	272	102	43.3	47.0	40.9
Cfsm	5.33	9.62	7.26	4.60	8.51	6.25	7.76	6.42	2.41	1.02	1.11	0.965
In.	6.13	10.75	8.37	5.29	9.18	7.20	8.66	7.39	2.67	1.18	1.28	1.08
Ac-ft	13,870	24,310	18,930	11,970	20,760	16,270	19,590	16,700	6,050	2,660	2,890	2,430

Calendar year 1959: Max 1,580 Min 31 Mean 225 Cfsm 5.31 In. 71.99 Ac-ft 162,800
Water year 1959-60: Max 1,580 Min 30 Mean 215 Cfsm 5.07 In. 69.18 Ac-ft 156,400

Peak discharge (base, 1,300 cfs).--Nov. 20 (12 p.m.) 1,960 cfs (6.07 ft); Nov. 23 (1:30 a.m.) 2,190 cfs (6.46 ft); Dec. 15 (4:30 p.m.) 1,350 cfs (4.96 ft).

* Discharge measurement made on this day.

245. North Fork Newaukum River near Forest, Wash.

Location.--Lat 46°39'20", long 122°46'40", in SW¼ sec.35, T.14 N., R.1 W., on left bank 1¼ miles upstream from Lucas Creek and 5½ miles northeast of Forest.

Drainage area.--31.5 sq mi (revised).

Records available.--July to November 1944, July 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 380 ft (from topographic map). July 25 to Nov. 6, 1944, at site 150 ft upstream at different datum.

Extremes.--Maximum discharge during year, 1,490 cfs Nov. 20 (gage height, 4.84 ft); minimum, 4.4 cfs Aug. 10 (gage height, 1.16 ft).
1944, 1957-60: Maximum discharge, 1,720 cfs Nov. 12, 1958 (gage height, 5.17 ft); minimum, 1.2 cfs Aug. 20, probably 26, 1958 (gage height, 0.96 ft).

Remarks.--Records good except those for period of no gage-height record, which are fair. Cities of Chehalis and Centralia divert about 15 cfs above station for municipal use. No regulation.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 20				Nov. 21 to Sept. 30			
1.3	18.5	2.0	150	1.1	3.4	2.0	125
1.5	40	3.0	525	1.3	11	3.0	500
1.7	73			1.5	28	4.0	980
				1.7	56		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	54	107	88	153	70	236	104	81	26	8.4	12
2	27	52	109	83	201	66	220	99	74	24	10.5	10.5
3	26	80	109	76	255	66	210	90	68	23	11	9.4
4	25	62	*102	74	208	68	180	85	64	21	9.8	19
5	24	55	94	72	181	99	150	78	60	20	*9.4	22
6	25	52	94	85	*204	131	130	90	54	*17	7.6	15.5
7	28	49	94	81	403	115	120	99	53	16.5	7.2	12
8	35	46	88	76	443	246	110	85	51	15.5	6.4	10.5
9	55	44	92	72	347	218	110	78	46	15.5	5.4	9.4
10	38	43	117	70	267	181	90	78	45	16.5	5.0	8.9
11	242	42	178	*70	218	156	120	83	43	15.5	6.0	8.4
12	192	43	295	64	204	*139	110	90	42	14.5	6.4	8.0
13	112	39	194	62	208	128	100	97	39	15.5	6.0	8.4
14	82	39	288	62	398	136	180	107	46	14.5	6.0	*8.0
15	68	43	835	64	504	444	320	90	50	13.5	16	8.0
16	57	39	540	81	347	283	220	131	48	12.5	10.5	8.0
17	50	113	307	81	255	215	185	271	40	12	11	7.6
18	46	404	225	72	204	198	*181	263	38	12	9.8	7.2
19	43	380	181	70	172	181	194	204	42	12	7.6	8.0
20	158	506	165	62	150	165	403	295	45	11.5	6.8	8.9
21	168	801	145	60	147	184	359	248	36	11.5	8.0	8.4
22	180	817	131	66	125	136	255	204	34	10.5	9.8	8.0
23	159	785	120	180	112	125	215	*172	32	10.5	34	15.5
24	129	460	181	275	104	112	201	156	30	10.5	46	14.5
25	120	347	184	218	99	104	187	136	30	9.8	57	14
26	*100	240	150	208	90	99	168	125	30	9.4	68	10.5
27	86	184	131	168	83	94	147	120	28	8.9	26	8.9
28	77	162	117	165	78	109	133	112	25	8.0	16.5	8.0
29	68	142	107	367	74	454	117	99	25	7.6	14	7.6
30	60	120	107	259	------	379	109	92	26	8.0	13.5	6.8
31	57	------	97	187	------	279	------	90	------	8.9	14	------
Total	2,566	6,243	5,684	3,618	6,234	5,380	5,460	4,071	1,325	432.1	473.6	311.9
Mean	82.8	208	183	117	215	174	182	131	44.2	13.9	15.3	10.4
Cfsm	2.63	6.60	5.81	3.71	6.83	5.52	5.78	4.16	1.40	0.441	0.486	0.330
In.	3.03	7.37	6.71	4.27	7.36	6.35	6.45	4.81	1.56	0.51	0.56	0.37
Ac-ft	5,090	12,380	11,270	7,180	12,360	10,670	10,830	8,070	2,630	857	939	619

Calendar year 1959: Max 861 Min 8.9 Mean 121 Cfsm 3.84 In. 52.18 Ac-ft 87,640
Water year 1959-60: Max 835 Min 5.0 Mean 114 Cfsm 3.62 In. 49.35 Ac-ft 82,900

Peak discharge (base, 600 cfs, revised).--Nov. 20 (12 p.m.) 1,490 cfs (4.84 ft); Nov. 22 (7:30 p.m.) 1,200 cfs (4.37 ft); Dec. 15 (4:30 p.m.) 965 cfs (3.94 ft); Feb. 14 (9:30 p.m.) 608 cfs (3.24 ft); Mar.15 (8 a.m.) 644 cfs (3.32 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Apr. 2-17; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations.

250. Newaukum River near Chehalis, Wash.

Location.--Lat 46°37'10", long 112°56'40", on line between secs.9 and 16, T.13 N., R.2 W., on left bank at highway bridge, 2½ miles southeast of Chehalis and 3½ miles upstream from mouth.

Drainage area.--155 sq mi (revised).

Records available.--March 1929 to September 1931, July 1942 to September 1960.

Gage.--Staff gage, usually read twice daily, and crest-stage gage. Altitude of gage is 190 ft (from topographic map). Prior to Oct. 1, 1929, at datum 1.0 ft higher.

Average discharge.--20 years, 506 cfs (366,300 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 5,150 cfs Nov. 21 (gage height, 11.42 ft); minimum observed, 33 cfs Aug. 10 (gage height, 0.77 ft).
1929-31, 1942-60: Maximum discharge, 7,400 cfs Dec. 9, 1953 (gage height, 13.62 ft), from rating curve extended above 3,800 cfs by logarithmic plotting; minimum observed, 12 cfs Sept. 13, 14, 1949.

Remarks.--Records good except those for periods of doubtful or no gage-height record, which are fair. Cities of Chehalis and Centralia divert about 15 cfs for municipal use. No regulation.

Revisions (water years).--WSP 1012: 1943. WSP 1182: 1949(M). WSP 1316: 1929-31(M), 1945-46(M), 1950(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 24				Jan. 25 to Sept. 30			
1.3	100	6.0	2,000	0.7	26	2.0	275
2.0	262	11.0	4,860	1.0	60	3.0	665
3.0	610			1.4	125	7.0	2,680

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	d125	240	586	406	980	291	1,340	483	381	105	47	d80
2	d120	229	602	340	832	278	1,180	467	370	98	47	d75
3	d115	259	*626	315	1,460	269	976	455	269	97	45	d70
4	d110	327	590	d310	1,140	269	818	419	217	92	43	d90
5	a105	256	469	d300	1,030	348	732	334	237	85	40	107
6	d105	d240	448	333	*1,020	535	638	345	220	80	38	105
7	133	d220	546	346	2,240	710	523	377	212	77	36	*88
8	218	211	469	321	2,130	890	463	392	196	76	36	77
9	506	208	469	297	2,010	1,380	419	348	184	74	34	d72
10	654	203	534	282	1,560	1,260	381	370	177	74	33	a68
11	987	188	848	*276	1,240	1,050	535	400	165	71	34	d64
12	1,320	198	1,540	a269	962	854	*551	411	160	68	35	60
13	1,770	193	1,180	262	a1,000	710	511	415	167	66	36	59
14	834	188	1,790	256	2,030	678	890	415	174	64	40	56
15	594	d200	3,050	251	2,380	*1,970	980	471	191	63	60	a54
16	498	d180	2,390	368	1,780	1,320	1,480	629	204	61	52	52
17	346	848	1,470	378	1,340	a1,180	1,200	953	172	59	51	52
18	213	2,060	1,150	355	1,220	908	1,000	1,480	145	55	48	a52
19	*198	2,220	884	324	868	840	1,160	1,080	147	52	39	52
20	213	2,010	780	294	746	782	2,070	d2,000	a165	50	38	60
21	490	4,000	690	285	d600	737	1,990	d1,500	*158	47	43	52
22	874	3,300	562	297	d550	656	d1,500	1,180	154	47	*55	d53
23	861	4,230	530	658	d500	611	d1,300	*1,080	152	a47	56	d58
24	717	2,500	807	1,230	471	a530	1,120	917	147	d47	107	d62
25	626	1,750	a750	1,080	447	a490	d950	827	143	47	251	67
26	554	1,360	690	1,100	404	a460	d850	750	141	45	145	68
27	462	1,070	622	976	363	a430	d800	647	129	44	111	60
28	392	915	534	922	314	499	d700	588	125	40	105	52
29	352	789	462	1,700	304	1,620	a650	491	120	39	d95	d50
30	291	694	444	1,540	------	1,730	571	443	118	39	d90	a48
31	279	------	427	1,120	------	1,480	------	423	------	45	d85	------
Total	15,062	31,286	26,939	17,191	31,921	25,765	28,278	21,090	5,540	1,954	1,975	1,963
Mean	486	1,043	869	555	1,101	831	943	680	185	63.0	63.7	65.4
Ac-ft	29,880	62,050	53,430	34,100	63,310	51,100	56,090	41,830	10,990	3,880	3,920	3,890

Calendar year 1959: Max 4,230 Min 47 Mean 574 Ac-ft 415,900
Water year 1959-60: Max 4,230 Min 33 Mean 571 Ac-ft 414,500

Peak discharge (base, 4,000 cfs).--Nov. 21 (time unknown) 5,150 cfs (11.42 ft); Nov. 23 (time unknown) 5,070 cfs (11.3 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.
d Doubtful gage-height record; discharge estimated on basis of records for nearby stations.

260. Skookumchuck River near Centralia, Wash.

Location.--Lat 46°47'15", long 122°42'45", in SW¼NW¼ sec.17, T.15 N., R.1 E., on left bank half a mile upstream from Bloody Run Creek, 4½ miles upstream from Thompson Creek, and 12 miles northeast of Centralia.

Drainage area.--61.7 sq mi (revised).

Records available.--April 1929 to November 1933, October 1939 to December 1958, October 1959 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 300.00 ft above mean sea level (river-profile survey). Apr. 1, 1929, to Sept. 30, 1931, and Feb. 1, 1932, to Dec. 6, 1933, staff gage at site a quarter of a mile downstream at different datum. Oct. 9 to Nov. 29, 1939, staff gage at present site and datum.

Average discharge.--24 years (1929-33, 1939-58, 1959-60), 247 cfs (178,800 acre-ft per year).

Extremes.--Maximum discharge during year, 3,860 cfs Nov. 22 or 23 (gage height, 45.6 ft, from floodmark); minimum, 28 cfs Aug. 11 (gage height, 39.08 ft).
1929-33, 1939-58, 1959-60: Maximum discharge, 6,710 cfs Dec. 9, 1953 (gage height, 48.59 ft); minimum, 15.5 cfs Nov. 28, 29, 1952 (gage height, 39.22 ft).

Remarks.--Records excellent except those for period of no gage-height record, which are fair. No regulation or diversion above station. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 722: 1929-30. WSP 1286: 1930, 1945.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

39.0	22	41.0	510
39.3	48	42.0	1,080
39.6	88	43.0	1,750
40.0	166	45.0	3,320

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	130	145	227	166	362	142	678	208	164	66	36	45
2	110	140	222	155	492	138	565	195	151	64	37	42
3	100	180	213	146	545	136	452	180	*144	61	37	40
4	90	150	195	140	452	134	384	171	134	58	36	55
5	85	135	185	136	424	164	322	155	126	55	35	65
6	85	125	178	153	497	230	282	176	120	*54	34	60
7	100	120	173	142	1,140	222	256	216	114	52	33	52
8	200	115	166	138	1,030	388	241	190	109	52	32	47
9	300	110	166	128	852	392	233	168	105	52	30	44
10	250	105	190	126	678	336	200	171	98	50	30	42
11	800	100	*400	126	530	298	227	183	95	50	29	40
12	550	100	918	120	*501	256	227	213	91	49	30	38
13	400	100	560	114	595	238	241	219	86	49	30	38
14	250	100	510	113	1,020	247	478	216	95	48	30	38
15	200	100	1,890	114	1,340	*954	720	198	103	47	38	*36
16	180	100	*1,250	116	816	570	535	238	109	46	35	36
17	160	375	702	116	560	420	442	392	95	44	33	35
18	150	1,150	474	111	420	365	*416	452	86	44	31	35
19	250	1,180	369	109	343	340	530	373	91	42	30	35
20	400	1,520	308	107	282	388	1,370	620	96	41	29	36
21	450	2,340	266	*103	275	420	1,070	530	88	41	32	34
22	550	2,470	238	109	238	388	660	416	85	40	*38	33
23	650	2,770	219	222	216	347	474	380	80	39	52	38
24	400	1,440	298	565	206	305	388	295	78	38	86	39
25	300	876	329	456	193	278	340	260	78	38	100	38
26	250	595	275	520	178	266	305	244	78	37	146	36
27	200	434	244	424	166	238	275	230	76	37	88	35
28	180	354	219	376	157	272	253	213	72	36	63	32
29	170	301	203	900	148	1,060	238	193	68	36	55	31
30	160	263	193	684	------	1,270	219	180	66	36	49	30
31	150	------	180	465	------	858	------	183	------	37	48	------
Total	8,250	17,993	11,960	7,400	14,656	12,060	13,021	8,058	2,981	1,439	1,412	1,205
Mean	266	600	386	239	505	389	434	260	99.4	46.4	45.5	40.2
Cfsm	4.31	9.72	6.26	3.87	8.18	6.40	7.03	4.21	1.61	0.752	0.737	0.652
In.	4.97	10.85	7.21	4.46	8.83	7.27	7.85	4.86	1.80	0.87	0.85	0.73
Ac-ft	16,360	35,690	23,720	14,680	29,070	23,920	25,830	15,980	5,910	2,850	2,800	2,390

Calendar year 1959: Max - Min - Mean - Cfsm - In. - Ac-ft -
Water year 1959-60: Max 2,770 Min 29 Mean 274 Cfsm 4.44 In. 60.55 Ac-ft 199,200

Peak discharge (base, 2,000 cfs).--Nov. 22 or 23 (time unknown) 3,860 cfs (45.6 ft); Dec. 15 (5 p.m.) 2,480 cfs (43.99 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 1 to Nov. 24; discharge estimated on basis of floodmark and record for South Fork Newaukum River near Onalaska.

275. Chehalis River near Grand Mound, Wash.

Location.--Lat 46°46'35", long 123°02'05", in NE¼ sec.22, T.15 N., R.3 W., on left bank at downstream side of highway bridge at Meadows, 1½ miles southwest of Grand Mound and 6 miles downstream from Skookumchuck River.

Drainage area.--895 sq mi.

Records available.--October 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 123.27 ft above mean sea level, datum of 1929. Prior to Oct. 3, 1934, staff gage at same site at datum 3.0 ft higher.

Average discharge.--32 years, 2,777 cfs (2,010,000 acre-ft per year).

Extremes.--Maximum discharge during year, 24,700 cfs Nov. 24 (gage height, 14.82 ft); minimum, 170 cfs Aug. 11, 12 (gage height, 1.22 ft).
1928-60: Maximum discharge, 48,400 cfs Dec. 29, 1937 (gage height, 18.39 ft); minimum, 90 cfs Aug. 23-26, 1951; minimum gage height, 0.83 ft Aug. 27, 1958.

Remarks.--Records excellent except those for period Jan. 29 to Feb. 1, which are good. Many small diversions for irrigation and domestic use above station, including about 15 cfs for municipal water supply for Centralia and Chehalis. No regulation. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1216: Drainage area. WSP 1286: 1929-30(M), 1931, 1932-34(M).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

1.2	165	3.0	1,020	8.0	7,000
1.5	255	4.0	1,840	11.0	12,600
2.0	470	6.0	4,130	15.0	25,600

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	780	1,120	2,890	1,960	7,600	1,640	9,110	2,380	1,700	510	213	307
2	697	1,040	2,570	1,750	6,280	1,560	7,220	2,250	1,520	505	219	*287
3	626	1,030	2,580	1,650	7,680	1,520	5,760	2,070	*1,380	485	222	262
4	585	1,230	2,440	1,530	7,780	1,550	4,690	1,950	1,250	455	222	259
5	555	1,060	2,180	1,480	6,760	1,790	3,920	1,760	1,160	*440	219	299
6	525	966	2,030	1,510	6,260	2,830	3,360	1,630	1,060	425	213	365
7	520	906	2,080	1,590	11,800	3,320	2,920	1,870	990	406	201	365
8	530	858	1,970	1,510	14,500	5,120	2,590	1,770	942	383	192	311
9	892	807	1,830	1,410	14,400	8,300	2,420	1,580	894	374	184	280
10	1,220	774	1,900	1,330	11,700	8,480	2,160	1,430	846	370	178	255
11	1,580	752	*3,140	1,320	8,770	7,820	2,150	1,500	807	370	173	245
12	4,230	730	7,680	1,310	*6,740	6,220	2,400	1,700	774	365	173	238
13	3,020	719	8,370	1,250	7,200	4,880	2,600	1,810	741	348	173	229
14	2,100	675	6,180	1,200	7,960	*4,360	3,640	1,700	724	335	173	229
15	1,600	653	13,100	1,220	13,200	7,060	6,710	1,570	829	331	184	*222
16	1,310	680	19,700	1,290	12,600	11,200	7,990	1,540	858	323	207	219
17	1,100	697	16,600	1,450	9,160	7,700	6,280	2,300	864	307	216	213
18	978	3,000	10,400	1,430	6,740	6,060	5,290	4,420	785	291	207	210
19	894	5,870	6,890	1,360	5,180	4,990	*5,570	3,780	736	280	201	207
20	972	7,120	5,210	1,360	4,230	4,580	8,240	5,060	796	269	189	210
21	3,740	16,300	4,400	*1,300	3,950	4,310	12,400	5,990	785	262	187	210
22	3,240	20,000	3,740	1,310	3,560	3,880	10,300	5,290	702	259	195	201
23	4,620	22,300	3,280	1,830	3,040	3,420	7,780	4,380	648	248	259	210
24	3,610	22,200	3,210	5,240	2,710	3,000	6,310	3,690	615	242	348	242
25	3,260	15,200	3,740	7,310	2,550	2,680	5,400	3,430	585	238	620	280
26	2,810	9,790	3,360	7,360	2,300	2,470	4,700	3,180	585	232	708	295
27	2,260	6,490	2,910	6,580	2,060	2,310	3,990	2,830	565	225	790	259
28	1,880	4,940	2,620	5,570	1,870	2,320	3,490	2,570	525	222	575	229
29	1,610	4,030	2,370	g10,900	1,740	4,280	3,060	2,230	530	213	430	213
30	*1,400	3,380	2,260	g14,400	------	12,300	2,680	1,970	515	207	361	201
31	1,220	------	2,190	g11,000	------	*11,100	------	1,860	------	204	327	------
Total	54,364	155,317	153,820	101,710	200,320	153,050	155,130	81,490	25,711	10,124	8,759	7,552
Mean	1,754	5,177	4,962	3,281	6,908	4,937	5,171	2,629	857	327	283	252
Cfsm	1.96	5.78	5.54	3.67	7.72	5.52	5.78	2.94	0.958	0.365	0.316	0.282
In.	2.26	6.45	6.39	4.23	8.32	6.36	6.45	3.39	1.07	0.42	0.36	0.31
Ac-ft	107,800	308,100	305,100	201,700	397,300	303,600	307,700	161,600	51,000	20,080	17,370	14,980

Calendar year 1959: Max 22,300 Min 184 Mean 3,116 Cfsm 3.48 In. 47.25 Ac-ft 2,256,000
Water year 1959-60: Max 22,300 Min 173 Mean 3,026 Cfsm 3.38 In. 46.01 Ac-ft 2,196,000

Peak discharge (base, 13,000 cfs).--Nov. 24 (1:30 a.m.) 24,700 cfs (14.82 ft); Dec. 16 (2:30 p.m.) 20,300 cfs (13.76 ft); Jan. 30 (time unknown) 14,900 cfs (11.96 ft); Feb. 8 (2 a.m.) 14,800 cfs (11.92 ft); Feb. 15 (6 p.m.) 14,300 cfs (11.71 ft); Mar. 30 (1 to 3 p.m.) 13,000 cfs (11.20 ft).

* Discharge measurement made on this day.
g Computed from high-water mark in well and once-daily staff-gage readings.

300. Rock Creek at Cedarville, Wash.

Location.--Lat 46°52'05", long 123°18'25", in SW¼SW¼ sec.15, T.16 N., R.5 W., on left bank 0.2 mile downstream from Williams Creek, 1 mile west of Cedarville, and 1¼ miles upstream from mouth.

Drainage area.--24.8 sq mi.

Records available.--July to October 1942, July to October 1943, June 1944 to September 1960. Monthly discharge only October 1942, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 70 ft (from topographic map). Prior to Aug. 17, 1944, staff gage at railroad bridge three-quarters of a mile downstream at different datum.

Average discharge.--16 years (1944-60), 88.4 cfs (64,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,460 cfs Nov. 21 (gage height, 13.63 ft), from rating curve extended above 850 cfs; minimum, 1.6 cfs Aug. 9, 10, 14, Sept. 22; minimum gage height, 2.50 ft Aug. 9, 10.
1942-60: Maximum discharge, 1,660 cfs Feb. 9, 1951 (gage height, 13.77 ft), from rating curve extended above 850 cfs; minimum, 0.3 cfs Sept. 25, 1946.

Remarks.--Records good. No regulation. Some diversion for irrigation.

Revisions (water years).--WSP 982: 1942. WSP 1092: 1945-46(M).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 20-30)

2.4	1.2	4.0	119
2.6	3.9	5.0	255
2.8	9.3	6.0	395
3.0	19	8.0	665
3.5	61	12.0	1,220

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15.5	45	87	51	219	50	200	61	42	11	4.1	3.3
2	14.5	40	*81	48	237	47	161	57	39	10.5	*4.3	2.8
3	12.5	46	76	46	234	48	129	52	37	9.0	3.7	2.7
4	11.5	42	69	*44	202	46	107	51	34	8.6	3.5	2.8
5	11	36	65	42	193	50	92	48	32	7.9	3.2	3.7
6	10.5	34	64	45	*312	62	81	50	31	7.6	2.8	4.1
7	11	31	65	45	688	*73	71	51	30	6.7	2.4	*3.5
8	12.5	29	61	44	437	168	63	45	28	6.4	2.1	2.8
9	15	28	60	42	352	179	59	42	26	6.4	1.7	2.4
10	14.5	27	69	41	280	220	51	40	25	6.7	1.6	2.1
11	80	26	220	41	226	224	*55	40	23	6.7	1.9	2.1
12	89	26	364	40	223	170	54	44	22	6.2	2.1	2.0
13	60	25	249	40	252	138	57	44	19	6.2	1.9	2.2
14	46	24	503	42	444	133	88	45	22	6.4	1.7	2.1
15	39	25	926	46	500	384	145	42	26	6.0	*2.7	2.1
16	32	25	601	49	335	275	152	51	25	5.4	2.8	2.1
17	28	52	331	56	240	198	129	70	23	5.0	3.0	2.1
18	25	287	221	56	175	146	120	79	20	4.7	3.0	2.2
19	*23	339	164	56	136	119	182	*88	19	4.3	2.8	2.2
20	67	755	138	54	114	96	420	294	*19	4.3	2.4	2.1
21	30	1,080	114	51	115	84	377	227	18	3.9	3.7	2.0
22	273	891	99	53	96	73	283	164	16.5	3.7	5.7	1.7
23	275	855	90	129	86	67	212	128	15.5	3.3	5.2	2.2
24	181	472	89	315	79	61	162	102	14.5	3.2	7.6	3.0
25	162	315	82	377	73	56	132	88	14.5	3.0	6.4	4.3
26	127	230	73	310	67	53	107	78	14	2.8	6.7	3.5
27	102	177	69	241	62	50	93	70	13.5	2.8	6.2	3.0
28	80	144	65	286	57	51	82	62	12.5	2.7	4.5	2.6
29	67	123	61	656	52	104	72	54	11.5	2.6	4.1	2.1
30	58	101	60	507	----	195	68	48	11.5	2.7	3.7	1.7
31	49	------	55	319	------	230	------	47	------	3.0	3.5	------
Total	2,021.5	6,330	5,271	4,372	6,486	3,850	4,004	2,362	684.0	169.7	111.0	77.5
Mean	65.2	211	170	141	224	124	133	76.2	22.8	5.47	3.58	2.58
Cfsm	2.63	8.51	6.85	5.69	9.03	5.00	5.36	3.07	0.919	0.221	0.144	0.104
In.	3.03	9.49	7.90	6.56	9.73	5.77	6.00	3.54	1.03	0.25	0.17	0.12
Ac-ft	4,010	12,560	10,450	8,670	12,860	7,640	7,940	4,680	1,360	337	220	154

Calendar year 1959 : **Max** 1,080 **Min** 2.4 **Mean** 100 **Cfsm** 4.03 **In.** 54.98 **Ac-ft** 72,720
Water year 1959-60 : **Max** 1,080 **Min** 1.6 **Mean** 97.6 **Cfsm** 3.94 **In.** 53.59 **Ac-ft** 70,880

Peak discharge (base, 800 cfs).--Nov. 21 (4 a.m.) 1,460 cfs (13.63 ft); Nov. 22 (9 p.m.) 1,260 cfs (12.27 ft); Dec. 15 (11 a.m.) 1,400 cfs (13.17 ft); Jan. 29 (8:30 a.m.) 1,030 cfs (10.71 ft); Feb. 7 (1 a.m.) 912 cfs (9.87 ft).

* Discharge measurement made on this day.

310. Chehalis River at Porter, Wash.

Location.--Lat 46°56'20", long 123°18'45", on line between secs. 21 and 28, T.17 N., R.5 W., in upstream end of left bank pier of Chehalis River bridge at mouth of Porter Creek, 700 ft west of Porter.

Drainage area.--1,294 sq mi (revised).

Records available.--January 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 23.64 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--8 years, 4,262 cfs (3,086,000 acre-ft per year).

Extremes.--Maximum discharge during year, 28,300 cfs Nov. 23 (gage height, 20.71 ft); minimum, 298 cfs Aug. 14 (gage height, 2.76 ft).
1952-60: Maximum discharge, 34,600 cfs (revised) Jan. 7, 1954 (gage height, 22.27 ft); minimum, 164 cfs Oct. 17, 1952 (gage height, 2.25 ft).
Flood of December 1933 reached a stage of 23.13 ft, from river profile by Corps of Engineers.
Revisions.--Figures of maximum discharge for the water years 1954 and 1956 have been revised to 34,600 cfs Jan. 7, 1954 (gage height, 22.27 ft) and 33,700 cfs Dec. 23, 1955 (gage height, 22.04 ft), superseding those published in WSP 1346 and 1446.

Remarks.--Records excellent except those for period of no gage-height record, which are good. Cities of Centralia and Chehalis divert about 15 cfs from Newaukum River, a tributary, for municipal use. Other small diversions for irrigation and domestic use. No regulation. Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Revisions.--Revised figures of discharge, in cubic feet per second for high-water period in water year 1956, superseding those published in WSP 1446, are given herewith:

Dec. 23, 1955..... 33,100
Dec. 24, 1955..... 31,800

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
December 1955.....	498,910	33,100	6,940	16,090	12.4	14.34	989,600
Calendar year 1955.....	-	33,100	285	5,305	4.10	55.65	3,841,000
Water year 1955-56.....	-	33,100	225	5,942	4.59	62.50	4,314,000

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,090	1,710	5,040	3,380	13,000	2,980	12,100	3,780	2,710	860	370	468
2	970	1,610	*4,500	3,100	10,000	2,830	10,100	3,530	2,500	850	*379	444
3	885	1,600	4,260	2,900	10,300	2,760	8,250	3,300	2,300	820	376	420
4	815	1,660	4,040	*2,740	10,700	2,740	6,660	3,100	2,110	770	376	416
5	765	1,650	3,720	2,640	*9,930	2,880	5,650	2,920	1,960	730	373	432
6	730	1,450	3,480	2,640	9,650	3,630	4,920	2,770	1,820	710	361	464
7	700	1,360	3,420	2,720	13,200	*4,450	4,360	2,800	1,690	690	352	*512
8	725	1,290	3,360	2,660	18,200	5,680	3,950	2,830	1,610	660	340	464
9	770	1,220	3,150	2,550	19,100	8,850	3,640	2,610	1,520	640	331	416
10	1,460	1,140	3,130	2,430	18,200	10,600	3,400	2,420	1,440	640	313	388
11	1,800	1,110	4,200	2,360	14,500	10,600	*3,270	2,380	1,360	640	313	376
12	3,560	1,100	8,020	2,330	11,200	9,190	3,480	2,600	1,300	640	307	367
13	4,020	1,050	11,200	2,260	10,200	7,520	3,590	2,790	1,240	600	304	364
14	2,880	1,010	10,300	2,200	11,400	6,380	4,120	2,660	1,240	580	304	358
15	2,260	1,010	17,400	2,200	14,600	7,500	6,630	2,540	1,310	580	*319	352
16	1,860	975	22,700	2,250	17,600	11,900	9,220	*2,460	1,440	580	322	349
17	1,550	1,190	24,000	2,400	15,300	11,300	8,590	2,840	1,380	540	361	343
18	1,380	2,750	21,100	2,440	11,400	8,890	7,300	4,420	1,320	520	355	340
19	*1,260	6,330	14,000	2,350	8,730	7,420	6,990	4,900	1,220	490	337	340
20	1,490	10,300	9,740	2,340	7,130	6,380	8,970	5,770	*1,210	470	322	337
21	3,230	18,425	7,910	2,270	6,280	5,880	13,000	7,470	1,240	460	352	337
22	4,700	23,200	6,620	2,280	5,760	5,400	14,400	6,890	1,200	450	379	331
23	5,260	27,800	5,730	2,970	5,080	4,870	11,600	6,020	1,100	440	388	340
24	5,110	27,800	5,260	5,580	4,580	4,380	9,270	5,100	1,030	430	492	364
25	4,290	26,100	5,440	9,650	4,280	4,020	7,820	4,750	1,000	420	640	400
26	3,940	20,200	5,230	10,500	4,000	3,730	6,800	4,420	1,000	410	805	420
27	3,280	13,000	4,670	10,000	3,670	3,510	5,900	4,090	950	400	940	404
28	2,840	9,180	4,280	9,040	3,390	3,410	5,160	3,760	900	390	855	370
29	2,440	7,220	3,950	13,100	3,160	4,260	4,610	3,420	880	380	660	346
30	2,140	5,970	3,740	17,800	------	9,830	4,130	3,070	870	370	564	328
31	1,900	------	3,620	17,600	------	13,900	------	2,850	------	365	508	------
Total	70,100	220,410	237,210	151,680	294,540	197,670	207,880	115,260	42,850	17,525	13,398	11,590
Mean	2,261	7,347	7,652	4,893	10,160	6,376	6,929	3,718	1,428	565	432	386
Cfsm	1.75	5.68	5.91	3.78	7.85	4.93	5.35	2.87	1.10	0.437	0.334	0.297
In.	2.01	6.33	6.82	4.36	8.47	5.68	5.97	3.31	1.23	0.50	0.38	0.33
Ac-ft	139,000	437,200	470,500	300,900	584,200	392,100	412,300	228,600	84,990	34,760	26,570	22,990

Calendar year 1959: Max 27,800 Min 310 Mean 4,469 Cfsm 3.45 In. 46.88 Ac-ft 3,235,000
Water year 1959-60: Max 27,800 Min 304 Mean 4,317 Cfsm 3.34 In. 45.39 Ac-ft 3,134,000

Peak discharge (base, 20,000 cfs).--Nov. 23 (3 to 7 a.m.) 28,300 cfs (20.71 ft); Dec. 17 (5 p.m.) 24,200 cfs (19.58 ft).

* Discharge measurement made on this day.
Note.--No gage-height record June 21 to Aug. 1; discharge estimated on basis of recorded range in stage and records for station near Grand Mound.

325. Cloquallum River at Elma, Wash.

Location.--Lat 47°00'20", long 123°23'10", in S½NW¼ sec.36, T.18 N., R.6 W., on right bank 10 ft downstream from bridge, half a mile east of Elma, and 1.8 miles downstream from Wildcat Creek.

Drainage area.--65.8 sq mi.

Records available.--July 1942 to October 1943 (fragmentary), July 1944 to September 1960. Published as Cloquallum Creek at Elma 1942.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map). Prior to Aug. 7, 1944, staff gage at site 350 ft downstream at datum 0.42 ft lower. Aug. 7, 1944, to Sept. 1, 1953, water-stage recorder at site 200 ft upstream at same datum.

Average discharge.--16 years (1944-60), 269 cfs (194,700 acre-ft per year).

Extremes.--Maximum discharge during year, 4,150 cfs Dec. 15 (gage height, 10.6 ft, from high-water mark in well); minimum, 28 cfs Aug. 7, 8 (gage height, 1.81 ft).
1942-60: Maximum discharge, 4,470 cfs Feb. 9, 1951 (gage height, 11.04 ft); minimum, 6.8 cfs Sept. 15, 1945 (gage height, 1.43 ft).

Remarks.--Records excellent except those above 900 cfs and those for periods of no gage-height record, which are fair. Several small diversions on minor tributaries above station and some regulation by log pond on Wildcat Creek.

Revisions (water years).--WSP 1246: Drainage area. WSP 1566: 1957(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 18, Jan. 24-26, 29-31)

Oct. 1 to Nov. 21				Nov. 22 to Sept. 30			
1.9	41	4.0	545	1.8	26	5.0	840
2.4	107	6.0	1,330	2.2	71	6.0	1,230
3.0	235	9.0	2,970	2.6	131	8.0	2,330
				3.0	215	10.0	3,670
				4.0	485		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	133	470	312	716	220	650	235	161	59	37	34
2	50	127	450	298	702	208	600	*218	144	58	37	33
3	49	177	430	288	636	205	550	203	131	56	36	32
4	49	153	410	270	542	208	450	189	125	52	36	32
5	48	129	370	272	539	262	350	171	115	50	34	39
6	*48	*118	360	302	844	280	300	222	*108	48	32	37
7	51	109	350	325	1,710	278	260	210	103	47	31	34
8	69	107	340	315	1,180	410	240	171	102	47	30	32
9	77	101	340	285	952	449	220	153	97	47	31	30
10	76	94	500	280	784	521	210	151	92	47	31	30
11	326	93	700	285	646	479	210	161	96	47	33	29
12	263	94	950	272	716	410	210	196	86	47	33	29
13	179	90	700	265	772	360	210	260	82	45	31	29
14	145	87	1,000	288	1,360	358	*302	210	96	44	30	29
15	129	104	3,500	295	1,360	601	443	180	109	43	33	30
16	105	91	2,000	290	*916	476	392	187	120	41	33	30
17	94	256	*1,300	288	702	416	360	225	103	40	33	30
18	87	790	932	272	*580	355	352	213	92	39	33	31
19	83	758	768	265	488	318	419	267	88	39	*31	33
20	188	2,290	736	265	458	285	736	594	88	38	30	33
21	230	2,400	612	262	536	260	740	425	85	*38	39	32
22	603	2,100	545	302	422	235	552	338	79	38	51	*31
23	517	2,800	512	521	374	210	491	288	74	38	46	34
24	478	2,500	521	996	348	201	545	260	71	38	52	38
25	510	950	482	*1,110	322	*187	494	248	70	37	50	39
26	383	800	425	1,030	295	176	431	225	68	36	47	35
27	304	700	404	876	270	160	368	218	67	36	38	33
28	256	600	380	908	252	220	315	196	64	35	35	32
29	192	550	360	2,340	235	250	285	169	61	33	36	30
30	167	500	348	1,530	------	600	260	169	61	33	36	29
31	149	------	335	924	------	700	------	184	------	36	35	------
Total	5,944	19,801	21,530	16,531	19,657	10,318	11,945	7,136	2,838	1,332	1,120	969
Mean	192	660	695	533	678	333	398	230	94.6	43.0	36.1	32.3
Cfsm	2.92	10.0	10.6	8.10	10.3	5.06	6.05	3.50	1.44	0.653	0.549	0.491
In.	3.36	11.19	12.17	9.34	11.11	5.83	6.75	4.03	1.60	0.75	0.63	0.55
Ac-ft	11,790	39,270	42,700	32,790	38,990	20,470	23,690	14,150	5,630	2,640	2,220	1,920

Calendar year 1959: Max 3,500 Min 29 Mean 346 Cfsm 5.26 In. 71.49 Ac-ft 250,800
Water year 1959-60: Max 3,500 Min 29 Mean 325 Cfsm 4.94 In. 67.31 Ac-ft 236,300

Peak discharge (base, 1,500 cfs).--Probably Nov. 20 (time and discharge unknown); probably Nov. 23 (time and discharge unknown); Dec. 15 (time unknown) 4,150 cfs (10.6 ft); Jan. 29 (5 a.m.) 2,720 cfs (8.70 ft); Feb. 7 (1:30 a.m.) 2,180 cfs (7.74 ft); Feb. 14 (9 p.m.) 1,690 cfs (6.82 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 21 to Dec. 17, Mar. 27 to Apr. 13; discharge estimated on basis of high-water mark, recorded range in stage, 1 discharge measurement, and records for Satsop River near Satsop and East Fork Satsop River near Elma.

342. East Fork Satsop River near Elma, Wash.

Location.--Lat 47°07'40", long 123°25'00", in SW¼ sec.15, T.19 N., R.6 W., on right bank 1½ miles downstream from Bingham Creek, 4½ miles upstream from mouth, and 8½ miles north of Elma.

Drainage area.--65.9 sq mi (revised).

Records available.--February 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 205 ft (from topographic map).

Extremes.--Maximum discharge during year, 3,650 cfs Dec. 15 (gage height, 7.19 ft); minimum, 86 cfs Sept. 28, 29, 30 (gage height, 1.24 ft).
1957-60: Maximum discharge, that of Dec. 15, 1959; minimum, 63 cfs Oct. 10, 1957; minimum gage height, that of Sept. 28, 29, 30, 1960.

Remarks.--Records excellent. No regulation or diversion above station.

Revisions (water years).--WSP 1566: 1957.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 20				Nov. 21 to Sept. 30			
1.4	88	3.0	770	1.2	76	3.0	940
1.6	141	4.0	1,350	1.4	130	4.0	1,540
2.0	290	6.0	2,710	1.6	200	7.0	3,500
				2.0	370		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	108	198	538	410	1,020	395	790	400	330	182	121	104
2	108	191	515	390	958	380	772	385	308	178	121	101
3	108	244	495	375	904	380	700	365	296	174	118	101
4	108	236	465	365	808	370	598	350	284	174	118	101
5	106	213	445	355	778	405	532	340	276	170	118	107
6	106	198	435	370	1,070	425	485	390	264	167	116	101
7	103	187	435	380	1,920	430	455	385	260	163	116	98
8	*116	180	415	375	1,430	520	430	350	*256	160	113	96
9	119	*173	410	350	1,250	562	415	330	252	156	113	96
10	116	170	435	345	1,040	604	390	316	244	156	110	96
11	184	167	652	340	886	586	395	316	240	153	110	96
12	173	163	994	330	874	526	405	340	236	150	110	96
13	154	160	820	325	952	490	420	380	232	146	110	96
14	141	163	1,210	330	1,310	480	*475	345	236	146	110	94
15	135	177	3,210	340	1,500	700	515	325	240	143	110	94
16	127	173	2,090	345	1,130	634	485	316	252	140	110	94
17	127	261	*1,350	345	*946	562	465	330	236	140	110	94
18	124	635	1,100	335	*820	510	465	320	224	137	110	94
19	121	670	928	325	724	475	538	340	228	137	*107	96
20	154	*2,480	844	320	676	450	796	495	228	137	107	94
21	195	2,710	742	312	694	430	784	450	220	*137	116	*91
22	362	2,560	670	330	610	410	658	405	212	137	113	91
23	366	2,980	622	455	562	390	598	365	208	133	118	94
24	362	1,750	610	982	520	370	658	345	200	130	124	96
25	407	1,290	580	1,330	495	*360	640	340	200	130	127	94
26	344	1,070	520	*1,250	470	355	586	340	196	127	121	88
27	294	868	495	1,010	445	350	520	335	193	127	110	88
28	261	748	475	1,010	425	365	*480	316	191	124	107	88
29	236	670	455	2,400	410	520	445	304	185	124	110	88
30	221	598	440	1,770	---	766	425	320	185	121	107	86
31	205	---	425	1,230	---	844	---	360	---	121	107	---
Total	5,791	22,263	23,820	19,129	25,627	15,044	16,320	10,998	7,112	4,520	3,518	2,853
Mean	187	742	768	617	884	485	544	355	237	146	113	95.1
Cfsm	2.62	11.3	11.7	9.36	13.4	7.36	8.25	5.39	3.60	2.22	1.71	1.44
In.	3.27	12.56	13.44	10.80	14.46	8.49	9.21	6.21	4.01	2.55	1.99	1.61
Ac-ft	11,490	44,160	47,250	37,940	50,830	29,840	32,370	21,810	14,110	8,960	6,980	5,660

Calendar year 1959: Max 3,210 Min 88 Mean 425 Cfsm 6.45 In. 87.62 Ac-ft 308,000
Water year 1959-60: Max 3,210 Min 86 Mean 429 Cfsm 6.51 In. 88.60 Ac-ft 311,400

Peak discharge (base, 1,700 cfs).--Nov. 20 (6 p.m.) 3,560 cfs (7.08 ft); Nov. 23 (3:30 a.m.) 3,600 cfs (7.13 ft); Dec. 15 (1 p.m.) 3,650 cfs (7.19 ft); Jan. 29 (1:30 p.m.) 2,740 cfs (5.94 ft); Feb. 7 (3:30 a.m.) 2,210 cfs (5.12 ft).

* Discharge measurement made on this day.

350. Satsop River near Satsop, Wash.

Location.--Lat 47°00'05", long 123°29'40", in sec.36, T.18 N., R.7 W., in west pier of bridge on U. S. Highway 410, three-quarters of a mile west of Satsop and 2 miles upstream from mouth.

Drainage area.--299 sq mi (revised).

Records available.--March 1929 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Mar. 19, 1938, staff gage at site 60 ft upstream at datum 20.9 ft higher.

Average discharge.--31 years, 1,968 cfs (1,425,000 acre-ft per year).

Extremes.--Maximum discharge during year, 28,700 cfs Nov. 20 (elevation, 35.18 ft); minimum, 284 cfs Aug. 20, 21 (elevation, 23.73 ft).

1929-60: Maximum discharge, 46,600 cfs Jan. 22, 1935 (elevation, 38.9 ft, from floodmarks); minimum, 166 cfs Sept. 21, 1938; minimum elevation, 21.66 ft, present datum, Sept. 3-6, 1934.

Flood in November 1909 reached a stage of 37.1 ft (from high-water mark), at railroad bridge 300 ft downstream.

Remarks.--Records excellent except those for period Dec. 15 to Jan. 21, which are good. No regulation or diversion above station.

Revisions (water years).--WSP 1286: 1930-35(M), 1937(M).

Rating tables, water year 1959-60 (elevation, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 15				Dec. 16 to Sept. 30			
24.1	460	28.0	6,570	23.7	260	28.0	7,030
25.0	1,460	30.0	11,600	24.2	730	30.0	11,700
26.0	2,900	34.0	24,200	25.0	1,710	33.0	20,700
				26.0	3,230		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	700	1,080	2,340	1,520	5,380	1,400	4,780	1,700	1,710	550	349	403
2	660	984	2,200	1,410	5,440	1,310	4,480	1,570	1,480	540	340	367
3	622	1,280	2,110	1,360	5,380	1,300	4,110	1,450	1,340	530	340	349
4	595	1,340	1,940	1,270	4,470	1,270	3,280	1,350	1,230	510	332	340
5	568	1,130	1,790	1,250	4,390	1,410	2,730	1,260	1,120	500	324	412
6	*550	*1,060	1,760	1,300	6,150	1,700	2,340	1,570	1,060	480	324	421
7	541	972	1,790	1,380	12,800	1,740	2,050	1,750	986	490	324	394
8	613	905	1,630	1,380	7,890	2,780	1,860	1,470	*950	450	316	367
9	905	850	1,600	1,270	7,050	2,800	1,720	1,340	917	440	316	340
10	740	806	1,900	1,260	5,540	2,800	1,580	1,240	873	440	316	332
11	1,800	751	5,330	1,260	4,410	2,620	1,560	1,240	851	430	316	324
12	2,120	740	7,020	1,170	4,230	2,320	1,610	1,340	818	430	316	324
13	1,580	710	4,930	1,150	5,070	2,140	1,910	1,680	763	421	308	316
14	1,280	670	7,450	1,210	8,340	2,080	2,880	1,560	763	421	308	316
15	1,090	751	21,900	1,210	10,000	4,320	3,100	1,390	818	412	316	308
16	938	720	11,800	1,210	6,320	3,780	2,770	1,380	873	403	316	300
17	850	1,020	6,860	1,200	*4,690	3,050	2,500	1,480	818	394	308	300
18	762	4,780	5,300	1,180	3,780	2,620	2,480	1,470	752	395	*308	300
19	730	4,350	4,360	1,150	3,180	2,360	3,610	1,600	741	376	292	300
20	938	17,500	3,920	1,140	2,810	2,230	6,380	3,130	763	376	292	316
21	1,650	17,200	*3,340	*1,110	3,040	2,120	5,400	2,690	730	*376	324	300
22	3,370	15,200	2,960	1,190	2,590	1,920	3,920	2,220	700	376	376	292
23	3,330	20,900	2,670	2,000	2,290	1,720	3,200	1,880	650	376	367	*308
24	3,040	9,770	2,750	7,910	2,120	1,580	3,260	1,630	640	397	510	340
25	3,350	6,750	2,860	*9,980	1,960	*1,470	3,390	1,500	630	397	500	358
26	2,570	5,090	2,440	8,460	1,820	1,450	3,040	1,480	610	397	510	349
27	2,050	4,070	2,200	6,500	1,680	1,700	2,620	1,440	590	358	430	332
28	1,740	3,440	2,020	6,250	1,540	1,780	*2,290	1,390	570	358	385	324
29	1,470	3,040	1,860	17,800	1,450	3,900	2,050	1,260	560	349	403	316
30	1,300	2,640	1,750	12,300	------	6,170	1,860	1,350	560	340	403	316
31	1,180	------	1,630	7,140	------	5,400	------	1,980	------	349	394	------
Total	43,632	130,499	124,410	105,920	135,810	75,240	88,760	49,790	25,866	12,931	10,963	10,064
Mean	1,407	4,350	4,013	3,417	4,683	2,427	2,959	1,606	862	417	354	335
Cfsm	4.71	14.5	13.4	11.4	15.7	8.12	9.90	5.37	2.88	1.39	1.18	1.12
In.	5.43	16.23	15.47	14.17	16.89	9.36	11.04	6.19	3.22	1.61	1.36	1.25
Ac-ft	86,540	258,800	246,800	210,100	269,400	149,200	176,100	98,760	51,300	25,650	21,740	19,960

Calendar year 1959: Max 21,900 Min 258 Mean 2,303 Cfsm 7.70 In. 104.54 Ac-ft 1,667,000
Water year 1959-60: Max 21,900 Min 292 Mean 2,224 Cfsm 7.44 In. 101.22 Ac-ft 1,614,000

Peak discharge (base, 13,500 cfs).--Nov. 20 (7:30 p.m.) 28,700 cfs (35.18 ft); Nov. 23 (4:30 a.m.) 27,400 cfs (34.86 ft); Dec. 15 (2 p.m.) 24,200 cfs (34.00 ft); Jan. 29 (3:30 p.m.) 21,200 cfs (33.15 ft); Feb. 7 (4 a.m.) 16,500 cfs (31.71 ft).

* Discharge measurement made on this day.

360. Wynoochee River above Save Creek, near Aberdeen, Wash.

Location.--Lat 47°18', long 123°39', in NW¼ sec.24, T.21 N., R.8 W., on left bank 1 mile upstream from Save Creek, 3 miles downstream from Oxbow, and 22 miles northeast of Aberdeen.

Drainage area.--74.1 sq mi (revised).

Records available.--May 1925 to September 1960. Published as "at Oxbow, near Aberdeen" 1925-52, where drainage area was 70.7 sq mi (revised). Records published for both sites October 1951 to October 1952.

Gage.--Water-stage recorder at present site and datum since Oct. 5, 1951. Datum of gage is 401 ft above mean sea level (stadia traverse). Prior to Nov. 7, 1925, staff gage at site 1,200 ft downstream from Oxbow, 3 miles upstream from present site at different datum. Nov. 7, 1925, to Sept. 3, 1947, water-stage recorder at site 1 mile downstream from Oxbow at datum 444.0 ft above mean sea level (levels by city of Aberdeen). Sept. 4, 1947, to Oct. 13, 1952, water-stage recorder at Oxbow at datum 91 ft higher.

Average discharge.--35 years, 801 cfs (579,900 acre-ft per year).

Extremes.--Maximum discharge during year, 15,800 cfs Nov. 20 (gage height, 14.01 ft), from rating curve extended above 9,000 cfs; minimum, 125 cfs Aug. 20, 21 (gage height, 3.96 ft).

1925-60: Maximum discharge, 23,600 cfs Dec. 9, 1956 (gage height, 16.95 ft), from rating curve extended above 9,000 cfs; minimum, 64 cfs Jan. 27, 1949.

Remarks.--Records excellent except those for period of no gage-height record, which are good, and those for period Dec. 15 to Jan. 29, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 1346: 1952.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 19 to Jan. 29)

Oct. 1 to Nov. 20				Nov. 21 to Sept. 30			
4.8	230	8.0	3,640	4.0	115	7.0	2,500
5.2	480	10.0	6,890	4.5	300	8.0	3,710
6.0	1,130	12.0	10,800	5.0	600	11.0	8,850
7.0	2,250			6.0	1,450		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	417	487	1,110	586	1,980	482	1,400	750	878	311	165	208
2	392	459	1,100	551	2,360	458	1,580	710	806	290	165	190
3	356	652	1,040	518	1,890	440	1,440	656	766	290	162	175
4	344	550	964	494	1,570	434	1,220	607	718	285	156	193
5	320	480	902	482	1,880	512	1,090	579	649	276	152	338
6	296	445	886	482	3,010	593	991	1,020	593	276	149	256
7	*290	410	862	488	3,570	806	900	1,010	*551	266	146	217
8	550	386	814	470	2,470	1,010	850	766	524	266	143	197
9	716	362	806	440	2,160	*790	800	663	506	256	140	182
10	508	*338	1,570	422	1,680	694	720	702	512	247	138	175
11	1,510	326	*3,380	410	1,370	628	700	814	506	238	138	168
12	1,190	314	2,790	388	1,590	586	720	1,100	494	230	138	162
13	828	290	1,730	377	1,620	558	920	1,140	482	230	135	156
14	684	290	5,460	377	3,360	607	1,300	886	482	225	135	152
15	585	320	6,150	350	2,740	1,370	1,350	750	500	217	135	146
16	515	278	2,720	338	1,760	946	1,150	758	551	212	135	146
17	466	1,160	1,860	333	1,390	830	1,050	790	494	208	135	140
18	424	2,200	1,900	322	1,180	774	1,250	726	446	208	*132	138
19	404	1,890	1,500	311	1,020	*758	1,600	806	434	*201	130	152
20	790	10,100	1,400	306	955	822	2,600	1,240	434	201	125	143
21	1,180	4,120	1,210	300	982	894	2,050	910	394	193	175	135
22	1,750	6,560	1,050	*333	846	846	1,500	782	372	190	193	*135
23	1,300	6,190	1,030	871	766	758	1,300	678	377	186	212	146
24	1,600	3,100	1,410	3,360	710	710	1,300	628	388	182	295	175
25	1,440	2,440	1,220	3,300	656	726	1,350	600	366	178	256	178
26	1,050	1,910	991	2,410	607	*928	1,100	702	350	175	271	186
27	852	1,610	894	1,750	565	1,170	1,000	742	333	171	217	175
28	740	1,460	806	2,440	537	1,060	900	670	328	168	197	168
29	644	1,350	726	7,280	500	2,040	*814	614	322	165	204	135
30	578	1,210	678	4,140	------	1,970	766	971	316	165	201	135
31	529	------	628	2,210	------	1,580	------	1,150	------	165	230	------
Total	23,248	51,687	49,587	36,839	45,724	26,780	35,711	24,920	14,872	6,871	5,305	5,202
Mean	750	1,723	1,600	1,188	1,577	864	1,190	804	496	222	171	173
Cfsm	10.1	23.3	21.6	16.0	21.3	11.7	16.1	10.8	6.69	3.00	2.31	2.33
In.	11.67	25.94	24.89	18.49	22.95	13.44	17.92	12.51	7.46	3.45	2.66	2.61
Ac-ft	46,110	102,500	98,350	73,070	90,690	53,120	70,830	49,430	29,500	13,630	10,520	10,320

Calendar year 1959: Max 10,200 Min 112 Mean 970 Cfsm 13.1 In.177.72 Ac-ft 702,300
Water year 1959-60: Max 10,100 Min 125 Mean 893 Cfsm 12.1 In.163.99 Ac-ft 648,100

Peak discharge (base, 6,800 cfs).--Nov. 20 (5:30 a.m.) 15,800 cfs (14.01 ft); Nov. 22 (10:30 and 11:30 p.m.) 13,400 cfs (13.02 ft); Dec. 14 (8:30 p.m.) 11,900 cfs (12.43 ft); Jan. 29 (3:30 p.m.) 9,090 cfs (11.12 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Apr. 7-28; discharge estimated on basis of recorded range in stage, weather records, and records for station above Black Creek, near Montesano.

374. Wynoochee River above Black Creek, near Montesano, Wash.

Location.--Lat 47°00'40", long 123°39'35", in SE¼SE¼ sec.27, T.18 N., R.8 W., 2,000 ft upstream from mouth of Black Creek and 3½ miles northwest of Montesano.

Drainage area.--179 sq mi.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 40 ft (from topographic map).

Extremes.--Maximum discharge during year, 21,900 cfs Nov. 20 (gage height, 19.57 ft); minimum, 52 cfs Aug. 9 (gage height, 3.40 ft).
1956-60: Maximum discharge, 24,500 cfs Dec. 10, 1956 (gage height, 20.54 ft); minimum, 23 cfs Aug. 22, 23, 1958 (gage height, 3.11 ft).

Remarks.--Records excellent. City of Aberdeen diverts about 56 cfs for municipal supply at intake 2¼ miles upstream. Other small diversions for irrigation and domestic use. No regulation.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 29				Jan. 30 to Sept. 30			
4.4	300	10.0	5,350	3.3	43	5.0	640
5.0	580	14.0	10,700	3.5	75	6.0	1,290
6.0	1,260	17.0	16,100	3.9	170	10.0	5,350
				4.4	345	14.0	10,700

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	525	666	1,280	798	3,170	690	2,550	1,070	1,240	333	83	138
2	470	620	1,210	750	3,450	651	2,380	1,010	1,100	325	81	120
3	440	774	1,160	690	3,280	634	2,320	937	1,000	313	81	106
4	421	824	1,030	654	2,590	624	1,880	882	924	329	77	111
5	390	684	929	630	2,710	744	1,600	810	852	321	79	194
6	349	610	880	678	3,790	912	1,410	1,020	780	254	75	236
7	*328	565	908	726	7,620	944	1,260	1,470	*728	240	60	165
8	394	525	810	702	4,490	*1,560	1,180	1,120	678	230	55	140
9	786	490	786	648	4,110	1,440	1,120	944	629	216	54	120
10	630	*465	*1,110	630	3,090	1,380	986	882	602	210	54	104
11	1,460	435	4,290	625	2,410	1,270	930	1,010	596	*200	55	93
12	1,840	426	4,570	590	2,420	1,130	986	1,080	568	179	*55	87
13	1,270	390	2,870	570	2,850	1,040	1,170	1,480	546	176	58	77
14	971	380	4,710	600	4,920	1,010	1,780	1,220	552	167	72	72
15	810	450	15,000	590	6,020	2,230	1,880	1,040	580	156	79	68
16	696	403	5,760	580	3,470	1,940	1,650	1,010	634	151	77	65
17	615	613	3,510	575	2,540	1,510	1,470	1,130	612	148	87	61
18	565	3,210	2,950	555	2,010	1,310	1,470	1,080	530	143	85	60
19	530	2,650	2,480	530	1,660	1,180	2,160	1,190	500	138	72	60
20	654	13,400	2,230	525	1,470	1,140	3,770	2,170	505	*140	65	68
21	1,380	9,350	1,880	505	1,590	1,150	3,150	1,780	460	140	79	58
22	2,420	9,820	1,620	*530	1,340	1,130	2,260	1,420	421	133	120	*54
23	2,360	13,200	1,430	925	1,190	1,040	1,840	1,190	403	120	133	63
24	2,170	5,240	1,710	4,220	1,100	951	1,800	1,040	403	113	216	87
25	2,500	3,920	1,770	5,600	993	906	1,860	958	394	106	191	109
26	1,830	2,840	1,430	4,320	906	*924	1,670	958	369	102	194	95
27	1,420	2,310	1,260	3,260	840	1,390	1,460	1,020	353	97	173	77
28	1,160	1,950	1,130	3,060	786	1,270	1,320	972	337	97	136	66
29	950	1,720	1,020	11,900	734	2,200	*1,200	870	329	89	136	60
30	824	1,520	950	8,080	------	3,690	1,130	979	357	81	133	55
31	738	------	873	4,110	------	2,950	------	1,520	------	83	133	------
Total	31,896	80,450	73,546	59,156	77,549	40,940	51,642	35,262	17,982	5,530	3,048	2,869
Mean	1,029	2,682	2,372	1,908	2,674	1,321	1,721	1,137	599	178	98.3	95.6
Ac-ft	63,260	159,600	145,900	117,300	153,800	81,200	102,400	69,940	35,670	10,970	6,050	5,690

Calendar year 1959: Max 15,000 Min 44 Mean 1,403 Ac-ft 1,016,000
Water year 1959-60: Max 15,000 Min 54 Mean 1,311 Ac-ft 951,800

Peak discharge (base, 8,900 cfs).--Nov. 20 (5 p.m.) 21,900 cfs (19.57 ft); Nov. 23 (6:30 a.m.) 19,500 cfs (18.60 ft); Dec. 15 (6:30 a.m.) 18,300 cfs (18.08 ft); Jan. 29 (6:30 p.m.) 14,600 cfs (16.27 ft); Feb. 7 (4 a.m.) 10,600 cfs (13.90 ft).

* Discharge measurement made on this day.

390. Humptulips River near Humptulips, Wash.

Location.--Lat 47°13'45", long 123°56'25", in NE¼ sec.17, T.20 N., R.10 W., on right bank 1 mile southeast of Humptulips, 2.5 miles upstream from Stevens Creek, and 3½ miles downstream from confluence of East and West Forks. Prior to Oct. 1, 1959, at site 400 ft downstream.

Drainage area.--130 sq mi.

Records available.--May 1933 to January 1935, July 1942 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 120 ft (from topographic map). Prior to Jan. 14, 1935, and Mar. 1, 1950, to Jan. 15, 1953, water-stage recorder and July 1, 1942, to Feb. 28, 1950, and Jan. 17, 1953, to Sept. 30, 1959, staff gage; all at sites 400 ft downstream at different datums.

Average discharge.--19 years (1933-34, 1942-60), 1,320 cfs (955,600 acre-ft per year).

Extremes.--Maximum discharge during year, 21,500 cfs Nov. 20 (gage height, 13.17 ft, from high-water mark in well), from rating curve extended above 9,700 cfs; minimum, 138 cfs Aug. 20-21 (gage height, 2.31 ft).
1933-35, 1942-60: Maximum discharge, 33,000 cfs Jan. 22, 1935 (gage height, 12.7 ft, datum then in use, from floodmarks), from rating curve extended above 16,500 cfs; minimum observed, 82 cfs Sept. 11, 1944.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No diversion above station. Slight regulation by fish hatchery on West Fork for short periods at low flow. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1216: 1934-35, 1943-46, 1947(M), 1949(M). WSP 1246: Drainage area. WSP 1396: 1946(M), 1954(P).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-21, Oct. 26 to Nov. 17)

2.3	135	5.0	2,250
2.6	225	6.0	3,800
3.0	395	7.0	5,680
3.5	720	9.0	10,200
4.0	1,140	12.0	18,000

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	712	776	1,310	830	2,920	728	2,460	1,100	1,430	314	172	336
2	652	720	1,330	800	3,730	675	2,520	1,040	1,210	300	169	280
3	589	1,150	1,250	770	3,040	645	2,250	888	1,060	300	163	250
4	556	940	1,140	740	2,250	631	1,800	840	931	292	160	236
5	523	800	1,040	720	2,560	792	1,500	776	848	280	158	439
6	492	728	1,020	700	4,760	922	1,330	1,230	792	272	155	345
7	480	660	1,030	720	6,780	999	1,190	1,330	705	264	150	296
8	660	610	940	740	4,460	1,410	1,100	1,040	645	260	148	260
9	1,110	575	956	700	3,950	1,210	1,040	897	603	256	148	239
10	776	542	*1,800	660	2,900	1,180	922	897	568	253	148	225
11	2,390	516	5,160	630	2,220	1,120	906	922	556	*246	150	214
12	2,160	498	4,240	610	2,800	990	1,040	1,130	516	236	148	208
13	1,430	462	2,520	600	3,030	940	1,350	1,460	504	228	*145	204
14	1,120	462	8,450	590	*6,890	990	1,990	1,190	510	222	145	190
15	965	568	10,900	570	5,810	2,890	1,830	1,020	510	214	152	187
16	824	468	*5,040	550	3,480	1,930	1,640	1,120	624	214	155	*181
17	736	1,070	3,160	540	2,540	1,540	1,450	1,290	575	208	172	178
18	668	3,800	2,710	530	1,990	*1,330	1,490	1,250	510	200	158	172
19	624	2,940	2,170	520	1,680	1,220	2,400	1,330	510	197	145	197
20	1,180	17,000	2,000	510	1,520	1,210	4,600	2,280	542	194	138	208
21	1,870	*7,000	1,650	*510	1,730	1,170	3,350	1,740	498	190	190	178
22	2,950	11,200	1,430	596	1,410	1,060	*2,290	1,390	456	187	250	172
23	2,330	10,300	1,330	1,410	1,270	956	1,800	1,210	434	184	260	197
24	2,920	5,480	1,750	5,640	1,160	880	1,870	1,070	406	184	456	242
25	3,040	4,040	1,640	5,870	1,070	848	1,880	974	395	181	322	276
26	1,990	2,820	1,340	4,170	974	965	1,680	982	385	178	428	232
27	1,510	2,120	1,210	3,010	897	1,430	1,470	*1,020	365	178	318	214
28	1,260	1,870	1,080	3,640	840	1,360	1,320	965	345	175	264	197
29	1,070	1,670	974	12,000	776	3,220	1,210	872	336	169	300	184
30	*931	1,470	920	6,760	------	3,460	1,100	1,540	322	166	292	181
31	840	------	870	3,630	------	2,760	------	1,970	------	169	365	------
Total	39,358	83,255	72,360	60,266	79,437	41,461	52,778	36,763	18,091	6,911	6,524	6,918
Mean	1,270	2,775	2,334	1,944	2,739	1,337	1,759	1,186	603	223	210	231
Cfsm	9.77	21.3	18.0	15.0	21.1	10.3	13.5	9.12	4.64	1.72	1.62	1.78
In.	11.26	23.82	20.70	17.24	22.73	11.86	15.10	10.52	5.18	1.98	1.87	1.98
Ac-ft	78,060	165,100	143,500	119,500	157,600	82,240	104,700	72,920	35,880	13,710	12,940	13,720

Calendar year 1959: Max 17,000 Min 138 Mean 1,513 Cfsm 11.6 In. 158.03 Ac-ft 1,096,000
Water year 1959-60: Max 17,000 Min 138 Mean 1,377 Cfsm 10.6 In. 144.24 Ac-ft 999,900

Peak discharge (base, 12,000 cfs).--Nov. 20 (time unknown) 21,500 cfs (13.17 ft); Nov. 22 (11 p.m.) 18,300 cfs (12.11 ft); Dec. 14 (9 p.m.) 18,400 cfs (12.15 ft); Jan. 29 (12 m.) 14,500 cfs (10.74 ft); Feb. 6 (11 p.m.) 12,400 cfs (9.92 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 20, 21, Dec. 30 to Jan. 20; discharge estimated on basis of 1 discharge measurement, high-water mark in well, recorded range in stage, and records for nearby stations.

395. Quinault River at Quinault Lake, Wash.

Location.--Lat 47°27'30", long 123°53'30", in sec.25, T.23 N., R.10 W., on left bank at outlet of Quinault Lake, 50 ft downstream from Olympic Highway bridge on U. S. Highway 101 and 4 miles southwest of Quinault.

Drainage area.--264 sq mi.

Records available.--October 1911 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 184.60 ft above mean sea level (State Highway Department bench mark). Prior to Jan. 1, 1913, staff gage on south shore of Quinault Lake 3 miles northeast of present site and Jan. 1, 1913, to Sept. 30, 1916, staff gage at mouth of Canoe Creek 4 miles northeast of present site, at datum 1.06 ft higher. Oct. 1, 1916, to May 2, 1935, water-stage recorder at site 300 ft downstream from present site at datum 0.36 ft higher than present datum.

Average discharge.--49 years, 2,777 cfs (2,010,000 acre-ft per year).

Extremes.--Maximum discharge during year, 25,800 cfs Nov. 23 (gage height, 14.20 ft); minimum, 596 cfs Aug. 20, 21 (gage height, 2.41 ft).
1911-22, 1926-60: Maximum discharge, 50,200 cfs Nov. 4, 1955 (gage height, 20.51 ft); minimum, 276 cfs Sept. 12, 1944 (gage height, 1.96 ft).
Flood in November 1909 reached a stage of approximately 22 ft, present datum (discharge, 52,600 cfs).

Remarks.--Records excellent except those for periods of no gage-height record, which are fair. Natural regulation by Quinault Lake. No diversion above station. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 442: Drainage area. WSP 1286: 1915-16(M), 1934, 1936-39(M). WSP 1316: 1923, 1925, 1933. WSP 1636: 1916 (calendar year only), 1917.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

2.4	590	7.0	6,880
3.0	1,040	10.0	13,700
4.0	2,000	14.0	25,200
5.0	3,300		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,900	1,910	3,140	1,890	8,020	1,500	4,730	2,590	4,300	2,180	986	1,170
2	1,750	1,800	2,900	1,880	7,410	1,430	4,470	2,590	4,340	2,110	950	1,100
3	1,620	1,930	2,810	1,680	6,720	1,370	4,720	2,540	4,300	2,010	910	1,010
4	1,500	1,990	2,560	1,590	5,400	1,340	4,390	2,450	4,230	2,000	886	950
5	1,410	1,860	2,360	1,510	5,320	1,350	4,020	2,290	3,920	2,010	840	1,020
6	1,340	1,710	2,220	1,510	6,360	1,420	3,760	2,480	3,710	2,070	818	1,080
7	1,280	1,600	2,150	1,540	11,000	1,460	3,650	3,360	3,400	2,120	788	1,030
8	1,350	1,490	2,010	1,500	9,020	1,810	3,650	3,330	3,080	2,100	774	977
9	1,840	1,410	*1,940	1,450	7,600	1,950	3,620	3,010	2,900	2,000	767	894
10	1,830	1,360	2,230	1,390	6,080	1,960	3,280	2,970	2,900	*1,890	746	848
11	2,840	1,290	4,930	1,360	4,880	1,890	3,000	3,390	2,980	1,790	*732	788
12	4,060	1,250	6,760	1,300	4,440	1,780	2,860	3,870	2,980	1,700	718	774
13	3,570	1,190	5,530	1,280	4,790	1,690	2,950	4,350	2,980	1,640	697	767
14	2,980	1,140	7,580	1,300	*6,170	1,650	3,630	3,800	2,940	1,590	669	725
15	2,570	1,150	17,000	1,290	8,500	2,000	4,020	3,400	2,940	1,540	662	700
16	2,270	1,100	12,800	1,260	6,760	2,400	3,810	3,100	3,140	1,500	655	*676
17	2,000	1,440	8,350	1,200	5,150	*2,290	3,390	3,200	3,210	1,500	662	655
18	1,840	3,820	6,560	1,160	4,100	2,160	3,220	3,200	2,940	1,500	648	642
19	1,700	4,790	5,590	1,100	3,420	2,070	3,630	3,700	2,700	1,500	622	648
20	1,800	14,800	4,950	*1,080	2,970	2,100	5,020	4,000	2,540	1,470	603	655
21	2,500	14,500	4,250	1,050	2,880	2,300	5,300	3,500	2,350	1,390	648	642
22	5,000	14,200	3,660	1,040	2,650	2,480	*4,400	3,100	2,220	1,330	711	616
23	4,500	22,500	3,220	1,200	2,420	2,520	3,620	2,900	2,250	1,260	774	636
24	5,500	14,900	3,360	3,000	2,220	2,470	3,180	2,700	2,410	1,190	870	690
25	4,500	11,000	3,450	6,500	2,070	2,500	2,970	2,700	2,410	1,160	1,040	788
26	4,000	7,780	3,120	6,640	1,910	2,660	2,740	2,800	2,300	1,100	1,260	795
27	3,500	5,800	2,830	5,620	1,790	3,080	2,590	*2,860	2,240	1,080	1,280	753
28	3,000	4,700	2,560	4,910	1,680	3,180	2,480	2,840	2,240	1,070	1,180	725
29	2,700	4,060	2,350	13,800	1,590	3,870	2,500	2,740	2,280	1,050	1,140	676
30	*2,340	3,570	2,180	19,100	------	5,450	2,550	3,200	2,250	1,040	1,140	655
31	2,100	------	2,000	11,500	------	5,260	------	4,390	------	1,010	1,160	------
Total	81,090	152,040	137,350	102,630	143,320	71,390	108,150	97,350	89,380	48,900	26,336	24,085
Mean	2,616	5,068	4,431	3,311	4,942	2,303	3,605	3,140	2,979	1,577	850	803
Cfsm	9.91	19.2	16.8	12.5	18.7	8.72	13.7	11.9	11.3	5.97	3.22	3.04
In.	11.42	21.42	19.35	14.46	20.19	10.06	15.24	13.71	12.59	6.89	3.71	3.39
Ac-ft	160,800	301,600	272,400	203,600	284,300	141,600	214,500	193,100	177,300	96,990	52,240	47,770

Calendar year 1959: Max 26,200 Min 536 Mean 3,186 Cfsm 12.1 In. 163.82 Ac-ft 2,307,000
Water year 1959-60: Max 22,500 Min 603 Mean 2,956 Cfsm 11.2 In. 152.43 Ac-ft 2,146,000

Peak discharge (base, 12,000 cfs).--Nov. 20 (5 p.m.) 17,500 cfs (11.46 ft); Nov. 23 (4 a.m.) 25,800 cfs (14.20 ft); Dec. 15 (1:30 p.m.) 18,000 cfs (11.62 ft); Jan. 30 (2 a.m.) 22,400 cfs (13.13 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 21-29, Mar. 15, 16, May 14-26, Sept. 15; discharge estimated on basis of recorded range in stage and records for nearby stations.

410. Hoh River near Forks, Wash.

Location.--Lat 47°48'20", long 124°06'20", in SW¼NE¼ sec.34, T.27 N., R.11 W., on left bank 1 mile downstream from Maple Creek, 5 miles downstream from South Fork, and 16½ miles southeast of Forks.

Drainage area.--208 sq mi.

Records available.--August 1926 to September 1960. Prior to October 1958, published as "near Spruce."

Gage.--Water-stage recorder. Altitude of gage is 320 ft (from river-profile map).

Average discharge.--34 years, 2,012 cfs (1,457,000 acre-ft per year).

Extremes.--Maximum discharge during year, 23,200 cfs probably Nov. 22 (gage height, 15.5 ft, from high-water mark in well, 15.89 ft from crest-stage gage), from rating curve extended above 13,000 cfs as explained below; minimum, 512 cfs Sept. 30 (gage height, 0.73 ft).

1926-60: Maximum discharge, 38,700 cfs Nov. 26, 1949 (gage height, 22.2 ft, from high-water marks), from rating curve extended above 13,000 cfs on basis of slope-area measurement of peak flow; minimum, 247 cfs Nov. 14, 15, 1929; minimum gage height, 0.66 ft Oct. 6, 18, 1957.

Maximum stage known since at least 1891, that of Nov. 26, 1949.

Remarks.--Records excellent except those for period of no gage-height record, which are fair. No artificial regulation or diversion above station. Large diurnal fluctuation during summer months caused by melting glaciers at source.

Revisions (water years).--WSP 1182: 1935(M). WSP 1216: Drainage area. WSP 1286: 1934. WSP 1636: 1945(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 29				Jan. 30 to Sept. 30			
1.2	671	7.0	5,400	0.9	580	5.0	3,180
2.0	1,030	9.0	9,000	2.0	1,100	7.0	5,340
3.0	1,570	12.0	15,000	3.0	1,680	9.0	9,000
5.0	3,180						

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,280	1,330	1,600	1,160	3,650	985	2,370	1,740	2,790	1,720	1,330	1,040
2	1,240	1,220	2,000	1,100	3,740	930	2,640	1,810	3,100	1,500	1,130	870
3	1,200	1,750	1,800	1,040	3,100	915	2,650	1,730	2,980	1,560	1,080	791
4	1,120	1,340	1,700	992	2,610	870	2,360	1,560	2,750	1,700	1,040	910
5	1,030	1,160	1,500	963	2,910	1,070	2,240	1,460	2,470	1,820	970	1,560
6	954	1,070	1,500	982	5,250	1,160	2,150	2,420	2,460	2,050	975	1,050
7	894	992	1,500	977	6,650	1,360	2,230	2,650	2,060	2,080	1,080	845
8	1,670	935	*1,350	907	4,220	1,670	2,290	2,000	1,880	1,840	1,230	760
9	1,810	898	*1,350	866	3,410	1,440	2,230	1,740	1,930	*1,580	1,300	737
10	1,290	848	2,070	840	2,890	1,340	1,840	2,340	2,150	1,470	1,340	764
11	4,360	840	5,220	831	2,490	1,230	1,720	2,740	2,130	1,330	*1,230	850
12	3,380	826	4,300	787	3,230	1,130	1,830	3,030	2,120	1,420	1,030	965
13	2,280	752	2,860	809	*3,240	1,100	2,020	2,780	2,100	1,580	900	965
14	2,070	739	8,130	866	5,970	1,190	2,850	2,310	2,140	1,550	791	910
15	1,890	765	10,900	800	5,060	2,140	2,530	2,040	2,120	1,480	737	*791
16	1,530	700	5,670	774	3,530	1,710	2,160	2,150	2,700	1,620	865	674
17	1,360	2,290	3,960	752	2,820	*1,630	2,090	2,160	2,230	1,710	1,070	629
18	1,270	4,100	3,950	722	2,400	1,550	2,140	2,120	1,800	1,740	1,080	600
19	1,160	3,500	3,270	*679	2,090	1,580	2,540	2,360	1,880	1,680	955	920
20	1,920	9,200	3,060	663	1,940	1,860	3,910	3,280	1,750	1,490	800	832
21	2,320	5,000	2,500	650	1,920	2,050	*3,020	2,660	1,520	1,370	915	647
22	3,360	15,000	2,170	663	1,690	1,940	2,410	2,250	1,520	1,250	860	580
23	2,640	9,000	1,990	878	1,560	1,820	2,090	2,020	1,820	1,130	737	710
24	5,390	6,500	2,310	4,460	1,450	1,750	2,010	1,870	2,020	1,060	1,020	1,000
25	4,440	4,500	2,060	4,190	1,340	1,910	1,860	1,810	1,730	1,090	1,300	975
26	2,910	3,000	1,750	3,070	1,250	2,020	1,730	*1,940	1,650	1,230	1,450	742
27	2,270	2,500	1,650	2,300	1,160	2,110	1,660	2,010	1,700	1,400	985	665
28	1,930	2,200	1,520	3,710	1,090	2,040	1,690	1,840	1,830	1,510	845	620
29	*1,660	2,100	1,400	14,500	1,030	2,760	1,700	1,860	1,960	1,520	1,180	612
30	1,480	1,900	1,340	8,700	------	3,190	1,720	2,450	1,860	1,560	1,090	620
31	1,440	------	1,240	4,460	------	2,700	------	2,920	------	1,430	1,420	------
Total	63,548	86,955	87,620	65,091	83,690	51,150	66,680	68,050	63,150	47,470	32,735	24,634
Mean	2,050	2,899	2,826	2,100	2,886	1,650	2,223	2,195	2,105	1,531	1,056	821
Cfsm	9.86	13.9	13.6	10.1	13.9	7.93	10.7	10.6	10.1	7.36	5.08	3.95
In.	11.36	15.55	15.67	11.64	14.96	9.15	11.92	12.17	11.29	8.49	5.85	4.40
Ac-ft	126,000	172,500	173,800	129,100	166,000	101,500	132,300	135,000	125,300	94,160	64,930	48,860

Calendar year 1959: Max 15,000 Min 692 Mean 2,190 Cfsm 10.5 In. 142.89 Ac-ft 1,585,000
Water year 1959-60: Max 15,000 Min 580 Mean 2,024 Cfsm 9.73 In. 132.45 Ac-ft 1,469,000

Peak discharge (base, 10,000 cfs).--Probably Nov. 20 (time and discharge unknown); probably Nov. 22 (time unknown) 23,200 cfs (15.5 ft); Dec. 14 (7:30 p.m.) 15,900 cfs (12.45 ft); Jan. 29 (3:30 p.m.) 19,800 cfs (14.18 ft); Feb. 6 (10:30 p.m.) 12,400 cfs (10.70 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 18 to Dec. 8; discharge estimated on basis of high-water mark in well, 1 discharge measurement, and records for Soleduck River near Fairholm.

415. Soleduck River near Fairholm, Wash.

Location.--Lat 48°02'40", long 123°57'35", in lot 4, SW¼ sec.35, T.30 N., R.10 W., on right bank 300 ft downstream from South Fork, 2.5 miles southwest of Fairholm, and 17 miles east of Beaver.

Drainage area.--83.8 sq mi.

Records available.--October 1917 to September 1921, October 1933 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,060 ft (from topographic map). October 1917 to September 1921 water-stage recorder and Oct. 4 to Nov. 4, 1933, staff gage, at same site at datum 1.2 ft higher.

Average discharge.--31 years, 622 cfs (450,300 acre-ft per year).

Extremes.--Maximum discharge during year, 9,010 cfs Jan. 29 (gage height, 9.46 ft); minimum, 89 cfs Sept. 30 (gage height, 1.24 ft).
1917-21, 1933-60: Maximum discharge, 23,500 cfs Nov. 26, 1949 (gage height, 16.42 ft, from high-water mark in well), from rating curve extended above 13,000 cfs on basis of slope-area measurement of peak flow; minimum, 51 cfs Sept. 11, 12, 1944; minimum gage height, 0.79 ft Oct. 17-20, 1952.

Remarks.--Records excellent. No regulation or diversion above station.

Revisions (water years).--WSP 1182: 1918-19, 1920(M), 1921, 1934-39, 1940-(M), 1941-42, 1943(M), 1944-46, 1947-48(M). WSP 1216: Drainage area. WSP 1286: 1939, 1949.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22				Nov. 23 to Sept. 30			
1.7	164	4.0	1,400	1.2	83	4.0	1,360
2.0	245	6.0	3,670	2.0	244	6.0	3,670
3.0	670	7.0	5,100	3.0	655	8.0	6,670

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	251	375	565	378	1,160	302	854	782	946	438	176	194
2	236	350	694	367	1,090	289	1,110	848	1,030	395	171	156
3	219	527	640	344	904	286	1,080	758	995	399	167	142
4	208	417	600	333	770	279	988	655	830	424	161	137
5	194	358	510	326	824	336	939	600	764	447	154	222
6	186	335	519	330	1,820	333	884	960	728	452	150	192
7	182	312	510	308	2,690	403	967	974	605	438	146	154
8	450	294	*460	292	1,570	438	974	734	565	*391	142	142
9	525	280	447	276	1,210	374	890	655	585	354	140	133
10	366	267	695	270	981	351	682	991	650	336	138	129
11	1,680	254	1,960	264	794	322	625	1,000	645	312	*135	122
12	1,060	251	1,590	244	1,290	299	640	1,210	635	316	131	120
13	635	233	960	253	*1,200	286	734	1,050	640	322	129	119
14	530	230	4,280	258	2,440	312	988	830	650	308	127	114
15	480	242	4,080	241	2,080	542	794	710	635	295	135	*110
16	400	216	2,040	236	1,250	*420	694	716	806	302	133	106
17	358	781	1,320	228	939	420	682	710	645	295	129	104
18	320	1,470	1,420	214	764	420	688	710	550	296	124	102
19	294	1,200	1,110	*210	655	442	782	818	590	273	117	109
20	580	3,240	1,020	207	610	650	1,510	1,230	550	250	114	110
21	635	1,710	830	202	600	848	*1,020	918	470	239	142	102
22	787	4,490	710	202	528	824	776	758	465	230	148	98
23	650	3,230	660	262	478	794	699	677	555	220	138	103
24	1,720	2,350	710	1,530	452	818	672	630	560	212	165	131
25	1,320	1,610	630	1,360	416	995	635	610	483	204	428	126
26	804	1,080	555	974	378	1,000	605	*615	460	204	256	109
27	635	842	546	772	363	939	600	645	460	204	174	100
28	610	770	501	1,420	340	848	650	600	492	200	150	97
29	*489	722	465	6,570	322	1,240	694	610	496	194	194	93
30	440	630	447	3,320	------	1,290	734	916	474	192	185	90
31	400	------	416	1,580	------	1,000	------	960	------	185	264	------
Total	17,644	29,066	31,890	23,771	28,918	18,100	24,590	24,880	18,959	9,317	5,063	3,766
Mean	569	969	1,029	767	997	584	820	803	632	301	163	126
Cfsm	6.79	11.6	12.3	9.15	11.9	6.97	9.79	9.58	7.54	3.59	1.95	1.50
In.	7.83	12.90	14.15	10.55	12.83	8.03	10.91	11.04	8.41	4.13	2.25	1.67
Ac-ft	35,000	57,650	63,250	47,150	57,360	35,900	48,770	49,350	37,600	18,480	10,040	7,470

Calendar year 1959: Max 6,150 Min 92 Mean 669 Cfsm 7.98 In. 108.35 Ac-ft 484,300
Water year 1959-60: Max 6,570 Min 90 Mean 645 Cfsm 7.70 In. 104.70 Ac-ft 468,000

Peak discharge (base, 6,000 cfs).--Nov. 22 (8 p.m.) 8,430 cfs (9.10 ft); Dec. 14 (5 p.m.) 7,840 cfs (8.73 ft); Jan. 29 (2:30 p.m.) 9,010 cfs (9.46 ft).

* Discharge measurement made on this day.

450. Lake Mills at Glines Canyon, near Port Angeles, Wash.

Location.--Lat 48°00'05", long 123°36'00", on Elwha River, in SE¼ sec.17, T.29 N., R.7 W., at Glines Canyon Dam 2 miles upstream from Griff Creek, 4 miles south of Elwha, and 11 miles southwest of Port Angeles.

Drainage area.--245 sq mi.

Records available.--April 1927 to September 1960. Prior to October 1950 monthly change in contents, published in WSP 1316.

Gage.--Staff gage read twice daily. Datum of gage is 19.67 ft below mean sea level, datum of 1929, supplementary adjustment of 1947.

Extremes.--Maximum contents observed during year, 39,080 acre-ft July 4, 7, 9 (gage height, 611.0 ft); minimum observed, 35,440 acre-ft Nov. 26 (gage height, 602.4 ft).
1927-60: Maximum contents observed, 39,940 acre-ft Dec. 22, 1936 (gage height, 613.0 ft); minimum observed since reservoir first filled in May 1927, 24,290 acre-ft Nov. 14, 1929 (gage height, 574.4 ft).

Remarks.--Reservoir is formed by concrete dam, completed in 1927; storage began Apr. 1, 1927. Total capacity, 37,790 acre-ft at gage height 608 ft (top of gates). Figures given herein represent total contents. Water is used for power by Crown Zellerbach Corp.

Cooperation.--Gage-height record furnished by Crown Zellerbach Corp.

Month-end gage height and contents, water year October 1959 to September 1960

Date	Gage height (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	606.5	37,160	-
Oct. 31	608.2	37,880	+720
Nov. 30	610.9	39,040	+1,160
Dec. 31	610.4	38,820	-220
Calendar year 1959	-	-	-130
Jan. 31	609.5	38,440	-380
Feb. 29	609.2	38,310	-130
Mar. 31	610.2	38,740	+430
Apr. 30	608.1	37,830	-910
May 31	608.3	37,920	+90
June 30	608.5	38,000	+80
July 31	609.7	38,520	+520
Aug. 31	606.4	37,120	-1,400
Sept.30	606.9	37,330	+210
Water year 1959-60	-	-	+170

† Gage height at 12 p.m. based on twice-daily staff-gage readings.

455. Elwha River at McDonald Bridge, near Port Angeles, Wash.

Location.--Lat 48°03'20", long 123°34'55", in NE¼NW¼ sec.33, T.30 N., R.7 W., on right bank 300 ft upstream from site of McDonald Bridge (now removed), half a mile upstream from Little River, 7 miles upstream from mouth, and 8 miles southwest of Port Angeles.
Drainage area.--269 sq mi.
Records available.--October 1897 to December 1901, October 1918 to September 1960.
Gage.--Water-stage recorder. Datum of gage is 200.00 ft above mean sea level, datum of 1929. Oct. 1, 1897, to Dec. 31, 1901, wire-weight gage at McDonald Bridge at different datum. Dec. 9, 1918, to May 1, 1936, water-stage recorder under McDonald Bridge at datum 7.4 ft higher.
Average discharge.--46 years, 1,487 cfs (1,077,000 acre-ft per year), adjusted for storage since April 1927.
Extremes.--Maximum discharge during year, 22,900 cfs Nov. 22 (gage height, 21.51 ft); minimum, 260 cfs Sept. 4, 5 (gage height, 9.01 ft); minimum daily, 304 cfs Sept. 5.
1897-1901, 1918-60: Maximum discharge, 41,600 cfs Nov. 18, 1897 (gage height, 14.5 ft, from graph based on gage readings, site and datum then in use), from rating curve extended above 3,300 cfs on basis of two determinations of flow over dam at discharge 26,700 and 30,100 cfs, referred to 1897 datum; minimum daily, 10 cfs Oct. 3, 1938.
Remarks.--Records excellent. Water is diverted through Glines Canyon powerhouse and returned to river above gage. Flow partly regulated by Lake Mills (see preceding page). Records of chemical analyses for the water year 1960 are given in WSP 1744.
Revisions (water years).--WSP 1246: Drainage area. WSP 1286: 1898, 1899(M), 1900-1902, 1919, 1920-31(M), 1932, 1933(M). WSP 1566: 1957(m).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 17 to Jan. 28)

Oct. 1 to Nov. 19		Nov. 20 to Sept. 30			
9.0	410	9.0	255	12.0	3,060
10.0	1,100	9.5	555	14.0	6,280
11.0	2,100	10.0	925	17.0	12,400
12.0	3,400	11.0	1,840		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	590	865	1,620	1,040	3,840	1,130	1,630	1,770	2,860	1,950	893	683
2	590	767	*1,730	965	3,120	957	1,720	1,810	4,090	1,740	1,180	620
3	596	788	*1,510	893	1,450	933	1,920	1,820	3,360	1,650	1,140	614
4	590	925	1,600	981	1,990	1,030	1,930	1,780	3,140	1,670	973	432
5	538	746	1,550	1,140	2,310	1,080	1,950	1,810	2,660	2,040	829	304
6	454	669	1,170	997	3,180	989	1,980	1,740	3,020	2,080	781	338
7	454	642	1,010	965	5,900	933	2,240	2,280	2,460	*2,120	789	484
8	727	636	1,160	933	3,130	1,050	2,630	2,370	2,570	1,920	797	562
9	948	629	1,290	837	2,900	1,050	2,510	1,770	2,330	1,750	917	555
10	669	629	1,300	750	2,450	925	2,120	2,050	2,230	1,640	*853	490
11	1,050	669	2,950	720	2,350	861	1,900	3,060	2,630	1,560	829	413
12	1,390	616	2,180	765	*2,830	813	1,700	3,230	2,900	1,450	765	419
13	1,180	558	1,310	773	2,370	797	1,730	2,960	2,710	1,560	690	522
14	1,130	513	5,610	*781	3,360	781	1,980	2,350	2,630	1,560	574	*496
15	996	519	9,410	*813	2,830	989	1,730	2,120	2,530	1,470	627	490
16	837	519	4,910	705	2,540	*973	1,680	1,930	2,890	1,450	690	451
17	739	693	3,130	683	2,190	1,060	1,570	1,770	2,550	1,480	669	438
18	655	1,610	2,730	655	1,940	973	1,800	1,690	2,100	1,510	662	419
19	616	1,600	1,700	634	1,720	941	1,740	1,780	1,930	1,560	682	419
20	788	6,500	1,830	627	1,540	1,010	*1,910	1,960	1,780	1,400	594	464
21	1,170	3,170	1,940	627	1,450	1,090	1,410	1,920	1,710	1,270	496	464
22	1,280	10,400	1,860	581	1,270	1,140	1,500	1,780	1,620	1,250	568	444
23	1,190	9,050	1,780	627	1,360	1,200	1,370	1,750	1,940	1,240	712	401
24	2,230	6,060	1,530	797	1,270	1,370	1,360	1,420	2,120	1,110	845	516
25	1,900	4,540	1,570	1,470	1,160	1,870	1,230	*1,500	2,100	1,000	789	542
26	1,350	3,230	1,260	1,640	1,190	2,070	1,270	1,580	1,740	1,040	893	348
27	1,240	1,780	1,240	1,370	1,100	2,000	1,420	1,530	1,760	1,140	758	407
28	*1,150	1,780	1,290	1,860	917	1,650	1,500	1,640	2,350	1,180	477	407
29	1,040	1,440	1,120	11,300	925	1,950	1,430	1,630	2,150	1,180	673	407
30	902	1,530	1,110	6,770	-------	2,050	1,510	1,540	2,210	1,130	742	407
31	865	-------	1,060	3,740	-------	1,830	-------	2,080	-------	949	676	-------
Total	29,854	64,073	65,460	47,439	64,582	37,495	52,370	60,420	73,070	46,079	23,543	13,956
Mean	963	2,136	2,112	1,530	2,227	1,210	1,746	1,949	2,436	1,486	759	465
Ac-ft	59,210	127,100	129,800	94,090	128,100	74,370	103,900	119,800	144,900	91,400	46,700	27,680
(†)	+720	+1,160	-220	-380	-130	+430	-910	+90	+80	+520	-1,400	+210

Adjusted for change in contents in Lake Mills

Mean	975	2,156	2,108	1,524	2,225	1,217	1,731	1,950	2,437	1,495	737	469
Cfsm	3.62	8.01	7.84	5.67	8.27	4.52	6.43	7.25	9.06	5.56	2.74	1.74
In.	4.18	8.94	9.03	6.53	8.92	5.21	7.18	8.36	10.11	6.41	3.16	1.94
Ac-ft	59,930	128,300	129,600	93,710	128,000	74,800	103,000	119,900	145,000	91,920	45,300	27,890

Observed

Calendar year 1959: Max 10,400 Min 426 Mean 1,646 Ac-ft 1,191,000
Water year 1959-60: Max 11,300 Min 304 Mean 1,580 Ac-ft 1,147,000

Adjusted

Calendar year 1959: Mean 1,646 Cfsm 6.12 In. 83.05 Ac-ft 1,191,000
Water year 1959-60: Mean 1,580 Cfsm 5.87 In. 79.97 Ac-ft 1,147,000

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Lake Mills, furnished by Crown Zellerbach Corp.

475. Siebert Creek near Port Angeles, Wash.

Location.--Lat 48°05'00", long 123°16'52", in SW¼NE¼ sec.23, T.30 N., R.5 W., on right bank 300 ft downstream from Emery Creek, 3¼ miles upstream from mouth, and 6½ miles southeast of Port Angeles. Prior to Apr. 22, 1960, at site three-quarters of a mile downstream.

Drainage area.--15.5 sq mi. Area at site used prior to Apr. 22, 1960, 16.1 sq mi (revised).

Records available.--June 1952 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 280 ft (from topographic map). Prior to Apr. 22, 1960, at sites within three-quarters of a mile downstream at different datums.

Average discharge.--8 years, 20.6 cfs (14,910 acre-ft per year).

Extremes.--Maximum discharge during year, 924 cfs Jan. 29 (gage height, 14.49 ft, former site and datum, backwater from plugged culvert; 4.90 ft present site and datum; from outside high-water marks), result of slope-area measurement; minimum, 2.4 cfs Oct. 6-7, Sept. 14-19, 28-30.
1952-60: Maximum discharge, 1,620 cfs Nov. 3, 1955 (gage height, 10.26 ft, former datum), from rating curve extended above 260 cfs on basis of computations of peak flow through culvert; maximum gage height, that of Jan. 29, 1960; minimum discharge, 2.0 cfs Sept. 3-5, 1952, Aug. 19-26, 1958, Aug. 25, 26, 1959.

Remarks.--Records good except those for period of no gage-height record and those for period Feb. 10 to Apr. 21, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 1346: 1953(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 1 to Apr. 21)

Oct. 1 to Apr. 21				Apr. 22 to Sept. 30	
0.29	2.4	2.0	136	0.8	1.3
.5	9.5	2.5	214	1.0	5.2
.9	30	3.0	310	1.2	12
1.2	51	3.5	450	1.4	23
1.6	88				

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.6	3.7	6.7	11.5	135	19	20	10	10	4.6	3.0	3.0
2	2.6	3.7	*7.1	10.5	106	16.5	18	12	9.4	4.6	3.0	3.0
3	2.6	6.4	7.1	9.5	83	16.5	16	18	9.1	4.1	3.0	2.8
4	2.6	5.6	6.4	9.1	66	19.5	14	20	8.7	4.1	2.8	3.0
5	2.6	4.3	6.0	9.5	55	18.5	12.5	19	8.0	4.1	2.8	3.2
6	2.4	4.0	6.0	11.5	58	19	11.5	19	7.7	3.9	2.8	3.0
7	2.4	4.0	5.6	13	98	24	11	19	7.4	*3.6	2.8	3.0
8	3.4	3.7	5.6	14.5	70	35	10.5	15.5	7.1	3.6	2.8	2.8
9	4.6	4.0	5.3	13	56	32	9.9	14	6.5	3.6	2.8	2.8
10	3.7	4.0	5.3	12	*40	29	9.5	13	6.5	3.6	*2.6	2.6
11	6.0	4.0	17.5	11.5	*29	28	9.5	13	6.3	3.6	2.6	2.6
12	5.0	4.3	30	10.5	59	26	9.1	16.5	6.0	3.4	2.6	2.6
13	4.0	4.0	22	*9.5	85	25	9.1	16	5.7	3.4	2.6	2.6
14	4.0	4.0	100	*9.5	85	25	20	15.5	6.5	3.4	2.8	*2.6
15	3.7	4.6	253	9.1	91	*55	25	13.5	7.1	3.2	3.9	2.4
16	3.7	4.0	103	8.7	62	47	23	13	6.3	3.2	3.6	2.4
17	3.7	4.6	50	8.3	50	40	20	12	6.0	3.0	3.4	2.4
18	3.7	6.0	35	7.1	44	35	17	12.5	6.0	3.0	3.0	2.4
19	3.7	7.1	28	8.3	38	33	*15	13.5	6.3	3.0	2.8	2.6
20	4.0	24	29	7.9	34	34	*15	13.5	7.1	3.0	2.8	2.6
21	4.6	*64	26	7.1	35	40	14	14	6.0	3.0	3.0	2.6
22	4.6	54	22	6.4	31	37	14	13.5	5.5	3.0	3.0	2.6
23	4.6	53	19.5	6.7	28	31	13.5	13	5.2	3.0	3.6	2.6
24	7.0	28	18.5	11	27	28	15	13.5	5.2	3.0	6.5	3.2
25	11.5	19	17	21	26	26	15.5	*20	5.2	3.0	4.8	3.0
26	6.4	14	14.5	30	23	24	15	17	5.0	3.0	4.1	2.8
27	*5.0	11.5	13.5	27	22	21	14	15	5.0	3.0	3.9	2.8
28	4.6	9.5	13	39	18.5	18.5	13	14	4.8	2.8	3.4	2.6
29	*4.1	8.7	12.5	*a450	18.5	21	12	13	4.6	2.8	3.4	2.4
30	4.0	7.1	13.5	a320	------	31	11	12	4.6	2.8	3.2	2.4
31	3.7	------	14	a200	------	24	------	11	------	3.0	3.2	------
Total	131.1	378.8	912.6	1,322.7	1,573.0	878.5	432.6	454.5	194.8	104.4	100.6	81.4
Mean	4.23	12.6	29.4	42.7	54.2	28.3	14.4	14.7	6.49	3.37	3.25	2.71
Cfsm	0.263	0.783	1.83	2.65	3.37	1.76	0.906	0.948	0.419	0.217	0.210	0.175
In.	0.30	0.88	2.11	3.06	3.63	2.03	1.01	1.09	0.47	0.25	0.24	0.20
Ac-ft	260	751	1,810	2,620	3,120	1,740	858	901	386	207	200	161

Calendar year 1959: Max 253 Min 2.2 Mean 14.0 Cfsm 0.870 In. 11.80 Ac-ft 10,120
Water year 1959-60: Max 450 Min 2.4 Mean 17.9 Cfsm 1.13 In. 15.27 Ac-ft 13,010

Peak discharge (base, 300 cfs).--Dec. 15 (11 a.m.) 315 cfs (2.96 ft); Jan. 29 (time unknown) 924 cfs.

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of slope-area measurement and records for nearby stations.

480. Dungeness River near Sequim, Wash.

Location.--Lat 48°00'50", long 123°07'55", in NW¼NE¼ sec.13, T.29 N., R.4 W., on right bank three-quarters of a mile upstream from Canyon Creek, 4½ miles southwest of Sequim, and 11½ miles upstream from mouth.

Drainage area.--156 sq mi.

Records available.--June 1923 to September 1930, June 1937 to September 1960. July 1897 to July 1898 at site below Canyon Creek, published as "near Sequim," records not equivalent.

Gage.--Water-stage recorder. Datum of gage is 569.3 ft above mean sea level (river-profile survey). June 8, 1923, to Sept. 30, 1930, staff gage just above fish-hatchery diversion half a mile downstream at different datum. June 19 to Aug. 12, 1937, staff gage at present site and datum.

Average discharge.--30 years, 371 cfs (268,600 acre-ft per year).

Extremes.--Maximum discharge during year, 6,380 cfs Jan. 29 (gage height, 7.10 ft), from rating curve extended above 2,000 cfs as explained below; minimum, 104 cfs Sept. 30 (gage height, 2.59 ft).
1923-30, 1937-60: Maximum discharge, 6,820 cfs Nov. 27, 1949 (gage height, 7.3 ft), from rating curve extended above 2,000 cfs on basis of slope-area measurement of peak flow; minimum observed, 77 cfs Sept. 10, 1928.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation or diversion above station. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1316: 1924-25(M), 1927(M).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

2.6	106	4.5	1,100
3.0	211	5.0	1,670
3.5	410	6.0	3,410
4.0	690		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	159	159	302	260	864	228	331	415	912	638	305	173
2	153	153	298	250	776	218	331	455	1,190	571	300	161
3	153	164	*282	240	595	214	339	455	1,270	571	295	156
4	150	156	249	230	516	211	370	425	1,130	601	290	159
5	148	146	245	220	532	211	410	420	992	638	285	173
6	146	146	231	210	757	208	425	577	1,040	*990	280	159
7	143	138	*225	200	1,320	218	485	746	840	660	275	150
8	159	136	211	195	1,020	214	577	595	725	620	275	143
9	184	133	211	190	816	205	577	532	732	560	*271	138
10	156	130	208	180	*644	199	495	690	800	530	275	136
11	275	128	318	185	543	190	445	938	824	500	271	138
12	252	130	314	180	589	184	396	956	824	470	242	146
13	211	115	264	*175	577	181	378	824	872	470	225	148
14	202	124	700	173	583	181	388	684	880	460	214	*148
15	193	124	2,200	*170	625	*205	348	607	792	440	208	143
16	178	113	1,300	167	526	199	331	565	974	430	211	130
17	164	181	900	161	480	205	322	543	768	430	228	128
18	156	392	750	150	440	208	306	510	632	420	228	121
19	150	278	660	150	383	218	302	490	577	400	214	130
20	159	826	610	153	365	282	*310	526	532	380	202	130
21	161	718	570	150	339	370	294	516	490	360	205	119
22	205	1,260	540	150	318	401	282	495	516	350	193	136
23	202	1,820	500	153	298	383	286	465	625	340	184	136
24	274	1,060	550	235	290	392	286	455	725	330	205	121
25	331	768	480	286	278	465	282	*450	677	330	193	128
26	245	601	420	275	256	510	278	435	613	330	184	119
27	211	445	380	242	245	455	282	430	625	340	175	110
28	*199	392	350	363	238	392	314	425	644	330	170	108
29	181	348	330	3,300	235	415	344	470	690	320	178	106
30	167	331	300	1,980	------	425	396	589	664	315	173	106
31	167	------	280	1,040	------	370	------	848	------	310	178	------
Total	5,834	11,615	15,178	12,013	15,448	8,757	10,910	17,531	23,575	14,134	7,132	4,099
Mean	188	387	490	388	533	282	364	566	786	456	230	137
Cfsm	1.21	2.48	3.14	2.49	3.42	1.81	2.33	3.63	5.04	2.92	1.47	0.878
In.	1.39	2.77	3.62	2.86	3.68	2.09	2.60	4.18	5.62	3.37	1.70	0.98
Ac-ft	11,570	23,040	30,110	23,830	30,640	17,370	21,640	34,770	46,760	28,030	14,150	8,130

Calendar year 1959: Max 2,200 Min 113 Mean 403 Cfsm 2.58 In. 35.05 Ac-ft 291,500
Water year 1959-60: Max 3,300 Min 106 Mean 400 Cfsm 2.56 In. 34.86 Ac-ft 290,000

Peak discharge (base, 1,700 cfs).--Nov. 23 (1 and 1:30 a.m.) 2,960 cfs (5.78 ft); probably Dec. 15 (time unknown) 3,330 cfs (5.96 ft); Jan. 29 (1 p.m.) 6,380 cfs (7.10 ft); Feb. 6 (10 p.m.) 1,780 cfs (5.08 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 14 to Jan. 12, July 7 to Aug. 8; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations.

505. Snow Creek near Maynard, Wash.

Location.--Lat 47°56'30", long 122°53'05", in SE¼ sec.2, T.28 N., R.2 W., on left bank 600 ft upstream from Andrews Creek and 3¼ miles south of Maynard.

Drainage area.--13.2 sq mi.

Records available.--May 1952 to September 1960.

Gage.--Water-stage recorder and wooden control. Altitude of gage is 180 ft (from topographic map).

Average discharge.--8 years, 17.4 cfs (12,600 acre-ft per year).

Extremes.--Maximum discharge during year, 331 cfs Jan. 29 (gage height, 3.05 ft), from rating curve extended above 40 cfs on basis of slope-area measurement of peak flow; minimum, 1.4 cfs Aug. 11-15; minimum gage height, 1.23 ft Sept. 15-27.
1952-60: Maximum discharge, 733 cfs about Jan. 8, 1959 (gage height, 4.07 ft, from high-water mark), from rating curve extended above 40 cfs on basis of slope-area measurement of peak flow; minimum, 1.1 cfs Aug. 7-11, 1959.

Remarks.--Records good except those for period of no gage-height record and those above 60 cfs, which are poor. Some small diversion for irrigation. No regulation.

Revisions (water years).--WSP 1636: 1958.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 7-28)

Oct. 1 to Jan. 29				Jan. 29 to Sept. 30			
1.35	1.5	1.6	18.0	1.2	1.1	1.7	48
1.4	3.4	1.8	40	1.3	5.8	2.0	102
1.5	9.8	2.1	85	1.4	13.0	2.5	230
				1.5	23		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.9	2.6	*5.3	10.5	54	14	19.5	10	18.5	6.5	2.2	3.5
2	1.9	2.6	5.3	9.8	74	14.5	17.5	12	15.5	7.9	2.6	2.6
3	1.9	3.0	5.3	9.2	54	15.5	15.5	17.5	14.5	5.8	2.6	2.6
4	1.9	3.0	4.7	8.5	33	12	14.5	18.5	13	4.6	3.0	2.6
5	1.9	3.0	4.0	8.5	64	10	13	17.5	12	*4.6	3.0	3.5
6	1.9	3.0	4.0	8.5	61	10.5	12	15.5	11.5	4.6	2.2	3.5
7	1.9	3.0	4.0	8.5	68	17.5	11.5	18.5	11.5	4.6	2.2	3.0
8	1.9	3.0	4.0	8.5	81	16.5	10.5	19.5	10.5	4.0	1.8	2.6
9	2.3	3.4	4.0	7.9	*70	14.5	10	15.5	10	4.0	*1.8	2.6
10	2.6	3.4	4.0	7.9	60	14	9.3	14	9.3	3.5	1.8	2.6
11	4.0	3.4	8.2	7.2	48	13	10.5	14.5	8.6	4.0	1.4	2.6
12	6.0	3.4	32	*6.6	56	12	13	27	8.6	4.0	1.4	2.6
13	6.0	3.4	17	6.0	56	11.5	18	39	7.9	4.0	1.4	*2.6
14	3.4	3.4	14	6.6	48	11.5	35	40	7.9	4.0	1.4	2.6
15	3.4	11	73	6.0	48	*13	30	39	10	4.0	1.4	2.6
16	3.0	23	66	6.0	37	12	26	40	11.5	4.0	3.5	2.2
17	3.0	9.8	39	6.0	31	12	24	46	14	4.0	2.6	2.2
18	2.6	10.5	27	9.8	26	12	24	41	12	3.5	2.6	2.2
19	2.6	13	22	30	20	12	*22	37	14	3.0	2.6	2.2
20	2.6	19	39	a20	16.5	12	19.5	43	20	3.0	2.6	2.2
21	2.6	*54	34	a15	14	14	17.5	61	14.5	3.0	2.6	2.2
22	2.6	16.5	25	a20	11.5	14	16.5	52	12	3.0	3.0	2.2
23	2.6	16.5	22	a30	10.5	14	15.5	40	10.5	3.5	3.0	2.2
24	3.4	13	20	a60	9.3	14	17.5	*33	10	3.5	7.2	2.2
25	6.0	9.8	20	a45	8.6	14.5	16.5	56	10.5	3.5	5.2	2.2
26	4.0	7.9	16.5	a30	7.2	14.5	15.5	44	10	3.5	4.6	2.2
27	*3.4	6.6	14.5	21	5.8	14	14	37	7.2	3.0	3.5	3.0
28	3.0	6.0	14	57	6.5	12	12	32	7.2	2.6	3.0	3.0
29	3.0	5.3	13	212	14	24	11.5	26	7.2	2.2	3.0	3.0
30	3.0	6.0	13	138	------	28	10.5	23	6.5	2.8	2.6	3.0
31	2.6	------	12.5	79	------	22	------	20	------	2.2	3.0	------
Total	92.9	271.5	586.3	899.0	1,092.9	445.0	502.3	949.0	336.4	119.4	84.8	78.3
Mean	3.00	9.05	18.9	29.0	37.7	14.4	16.7	30.6	11.2	3.85	2.74	2.61
Cfsm	0.227	0.686	1.43	2.20	2.86	1.09	1.27	2.32	0.848	0.292	0.208	0.198
In.	0.26	0.76	1.65	2.53	3.08	1.25	1.42	2.67	0.95	0.34	0.24	0.22
Ac-ft	184	539	1,160	1,780	2,170	883	996	1,880	667	237	168	155

Calendar year 1959: Max 500 Min 1.1 Mean 20.9 Cfsm 1.58 In. 21.46 Ac-ft 15,100
Water year 1959-60: Max 212 Min 1.4 Mean 14.9 Cfsm 1.13 In. 15.37 Ac-ft 10,820

Peak discharge (base, 100 cfs).--Nov. 21 (4 a.m.) 143 cfs (2.38 ft); Dec. 15 (9:30 p.m.) 102 cfs (2.16 ft); probably Jan. 24 (time and discharge unknown); Jan. 29 (1:30 p.m.) 331 cfs (3.05 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.

540. Duckabush River near Brinnon, Wash.

Location.--Lat 47°41'00", long 123°00'40", in SW¼SW¼ sec.1, T.25 N., R.3 W., on left bank 4½ miles upstream from mouth and 5 miles west of Brinnon.

Drainage area.--66.5 sq mi.

Records available.--August to December 1910 (gage heights only), December 1910 to December 1911, June 1938 to September 1960. Published as "near Duckabush" 1910-11.

Gage.--Water-stage recorder. Datum of gage is 241.49 ft above mean sea level, datum of 1929. Aug. 19, 1910, to Dec. 31, 1911, staff gage at same site at different datum.

Average discharge.--22 years (1938-60), 409 cfs (296,100 acre-ft per year).

Extremes.--Maximum discharge during year, 6,500 cfs Jan. 29 (gage height, 8.72 ft); minimum, 68 cfs Sept. 30 (gage height, 1.52 ft).
1910-11, 1938-60: Maximum discharge, 8,960 cfs Nov. 26, 1949 (gage height, 10.06 ft), from rating curve extended above 1,800 cfs on basis of slope-area measurement of peak flow; minimum, 45 cfs Oct. 26, 28, 29, 1942; minimum gage height, 1.32 ft Sept. 30, 1939.

Remarks.--Records good. No regulation or diversion above station.

Revisions.--WSP 1216: Drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

1.5	62	2.5	282	5.0	1,840
1.7	88	3.0	485	6.0	2,880
2.1	164	4.0	1,040	8.0	5,490

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	172	164	*329	265	1,030	172	427	498	705	472	197	111
2	164	155	322	258	1,260	164	490	498	814	427	189	108
3	155	197	296	232	844	162	545	485	826	440	182	102
4	146	169	272	223	675	162	535	418	754	458	179	104
5	140	155	248	214	1,110	164	560	401	700	472	166	115
6	136	144	245	209	1,340	166	590	649	690	516	160	102
7	130	140	229	206	1,540	318	660	766	585	530	160	94
8	199	134	217	197	1,080	318	695	570	526	467	155	91
9	223	128	211	182	*910	255	635	498	565	418	*157	90
10	174	122	268	176	720	232	503	640	615	385	153	88
11	542	120	776	*176	595	214	431	754	630	352	149	88
12	406	118	640	166	650	197	406	856	625	*341	140	90
13	286	109	444	164	615	184	458	675	645	364	136	*88
14	242	108	1,260	162	700	179	605	570	635	348	132	85
15	217	108	2,760	155	736	258	508	508	610	333	128	81
16	189	104	1,230	153	560	226	427	472	685	341	124	80
17	174	258	790	146	472	217	410	427	560	345	128	78
18	162	655	730	138	397	226	436	406	480	345	126	77
19	151	458	680	136	356	255	*476	410	427	337	120	80
20	218	2,020	670	136	322	348	570	535	389	307	111	80
21	282	1,290	585	136	311	485	494	472	372	282	128	77
22	391	2,180	503	138	279	*498	406	406	393	265	132	74
23	318	2,210	508	214	255	449	368	376	494	248	146	77
24	414	1,330	635	980	245	458	368	*368	560	229	200	85
25	376	838	550	964	226	530	348	376	498	223	174	77
26	282	620	431	850	211	555	352	436	436	226	157	78
27	*239	512	393	620	195	565	360	414	458	232	134	75
28	217	454	360	*811	186	476	389	397	480	229	120	72
29	195	397	337	4,390	182	610	431	431	516	223	138	69
30	184	356	307	2,190	------	615	476	575	503	214	126	68
31	172	------	286	1,020	------	494	------	695	------	203	122	------
Total	7,296	15,753	17,512	16,007	18,002	10,152	14,359	15,982	17,176	10,572	4,569	2,584
Mean	235	525	565	516	621	327	479	516	573	341	147	86.1
Cfsm	3.53	7.89	8.50	7.76	9.34	4.92	7.20	7.76	8.62	5.13	2.21	1.29
In.	4.08	8.81	9.79	8.95	10.07	5.68	8.03	8.94	9.61	5.91	2.56	1.45
Ac-ft	14,470	31,250	34,730	31,750	35,710	20,140	28,480	31,700	34,070	20,970	9,060	5,130

Calendar year 1959: Max 3,210 Min 96 Mean 444 Cfsm 6.68 In. 90.71 Ac-ft 321,700
Water year 1959-60: Max 4,390 Min 68 Mean 410 Cfsm 6.17 In. 83.88 Ac-ft 297,500

Peak discharge (base, 2,500 cfs).--Nov. 20 (8 a.m.) 2,730 cfs (5.86 ft); Nov. 22 (10 p.m.) 4,690 cfs (7.43 ft); Dec. 15 (10 a.m.) 3,500 cfs (6.52 ft); Jan. 29 (4 p.m.) 6,500 cfs (8.72 ft).
* Discharge measurement made on this day.

545. Hamma Hamma River near Eldon, Wash.

Location.--Lat 47°35'20", long 123°07'00", in NW¼ sec.7, T.24 N., R.3 W., on left bank a quarter of a mile downstream from Watson Creek, 4½ miles northwest of Eldon, and 6 miles upstream from mouth.

Drainage area.--51.3 sq mi.

Records available.--June 1951 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 510 ft (from topographic map).

Average discharge.--9 years, 370 cfs (267,900 acre-ft per year).

Extremes.--Maximum discharge during year, 4,670 cfs Jan. 29 (gage height, 6.32 ft, from high-water mark in well), from rating curve extended above 1,800 cfs; minimum, 55 cfs Sept. 29-30 (gage height, 0.38 ft).
1951-60: Maximum discharge, 4,980 cfs Nov. 3, 1955 (gage height, 6.58 f:), from rating curve extended above 1,100 cfs; minimum, 42 cfs Oct. 21-23, Nov. 9, 1952; minimum gage height, 0.33 ft Sept. 15, 16, 1958.

Revisions.--The figures of maximum discharge for some water years have been revised as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Water year	Date	Discharge (cfs)	Gage height (feet)
1446	1956	Nov. 3, 1955	5,810	6.58
1566	1958	Feb. 24, 1958	4,440	5.67
1636	1959	Jan. 8, 1959	4,030	5.38

Remarks.--Records excellent except those for periods of no gage-height record, which are fair. No regulation or diversion above station.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 29				Jan. 30 to Sept. 30			
0.6	87	2.0	720	0.3	43	1.5	455
1.0	204	3.0	1,470	.5	77	2.0	740
1.5	423	6.0	4,320	.7	126	3.0	1,470
				1.0	225	4.0	2,320

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	179	152	*323	239	933	190	439	413	543	308	129	77
2	168	146	301	224	1,220	190	445	403	614	282	123	75
3	162	160	280	208	884	190	494	393	626	282	121	73
4	152	150	259	193	704	190	488	364	592	286	118	71
5	146	140	243	186	1,050	180	482	340	560	291	113	73
6	136	140	231	172	1,210	210	482	505	543	304	110	73
7	131	130	220	168	1,500	380	516	598	477	313	108	71
8	158	130	204	158	*1,000	350	543	472	429	296	*105	68
9	175	125	193	152	870	300	504	429	434	274	103	68
10	158	120	243	149	686	270	429	504	455	261	100	66
11	324	120	678	142	565	240	393	576	466	245	98	64
12	306	120	662	*136	560	220	369	632	460	*229	95	*64
13	259	120	481	136	548	210	398	554	477	233	93	64
14	227	120	958	133	620	200	538	488	477	221	88	64
15	200	120	1,910	128	692	270	482	439	455	214	88	64
16	182	115	1,110	122	538	250	419	413	466	211	86	64
17	172	260	741	117	450	230	388	388	419	211	82	62
18	158	530	655	114	393	250	*403	364	378	207	79	62
19	149	450	583	112	349	280	439	359	340	203	79	60
20	179	*1,730	547	109	320	320	516	424	313	196	77	60
21	220	1,270	489	107	300	390	466	383	295	186	84	58
22	276	1,720	439	109	280	*393	388	349	295	179	88	58
23	268	1,750	418	171	260	383	349	*331	326	169	93	58
24	280	1,200	547	905	250	374	340	317	349	159	118	58
25	272	880	500	1,090	230	403	331	317	331	153	103	58
26	*243	640	418	923	220	393	331	354	299	147	98	58
27	220	540	364	637	210	477	340	345	299	144	91	58
28	200	450	332	771	200	419	369	336	299	144	86	56
29	182	390	301	3,370	200	532	398	349	317	138	84	56
30	172	350	276	2,130	------	604	413	413	322	138	82	55
31	162	------	255	1,040	------	504	------	482	------	132	79	------
Total	6,216	14,268	15,121	14,351	17,242	9,792	12,892	13,034	12,656	6,755	3,001	1,916
Mean	201	476	488	463	595	316	430	420	422	218	96.8	63.9
Cfsm	3.92	9.28	9.51	9.03	11.6	6.16	8.38	8.19	8.23	4.25	1.89	1.25
In.	4.51	10.34	10.96	10.40	12.50	7.10	9.35	9.45	9.17	4.90	2.18	1.39
Ac-ft	12,330	28,300	29,990	28,460	34,200	19,420	25,570	25,850	25,100	13,400	5,950	3,800

Calendar year 1959: Max 2,750 Min 70 Mean 360 Cfsm 7.02 In. 95.31 Ac-ft 260,800
Water year 1959-60: Max 3,370 Min 55 Mean 348 Cfsm 6.78 In. 92.25 Ac-ft 252,400

Peak discharge (base, 1,700 cfs).--Nov. 20 (about 8 a.m.) 1,920 cfs (3.56 ft); Nov. 22 (about 9 p.m.) 2,760 cfs (4.49 ft); Dec. 15 (10 a.m.) 2,320 cfs (4.00 ft); Jan. 29 (about 3 p.m.) 4,670 cfs (6.32 ft); Feb. 6 (11 p.m.) 2,110 cfs (3.77 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 3-19, 23-30, Feb. 20 to Mar. 21; discharge estimated on basis of recorded range in stage and records for nearby stations.

546. Jefferson Creek near Eldon, Wash.

Location.--Lat 47°35'00", long 123°06'15", in SE¼ sec.7, T.24 N., R.3 W., on right bank a quarter of a mile upstream from mouth and 4 miles northwest of Eldon.

Drainage area.--21.6 sq mi.

Records available.--October 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 500 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,190 cfs Jan. 29 (gage height, 7.74 ft); minimum, 9.7 cfs Sept. 27-30 (gage height, 2.78 ft).
1957-60: Maximum discharge, 2,660 cfs Jan. 8, 1959 (gage height, 8.32 ft), from rating curve extended above 1,600 cfs on basis of slope-area measurement at gage height 7.84 ft; minimum, that of Sept. 27-30, 1960.

Remarks.--Records good. No regulation or diversion above station.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 19		Nov. 20 to Sept. 30			
3.1	24	2.7	6.5	4.5	228
3.5	54	3.0	20	5.0	405
4.0	122	3.5	60	6.0	970
4.5	235	4.0	125	7.0	1,670

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	56	160	99	446	67	231	134	86	55	26	20
2	67	50	147	90	748	63	223	127	91	54	26	19.5
3	56	48	134	82	475	61	226	120	97	54	25	19
4	50	46	118	76	382	58	201	114	102	53	25	18.5
5	47	43	103	72	560	58	180	109	104	52	25	18
6	45	41	93	69	702	60	162	149	106	51	24	18
7	41	38	86	67	732	187	153	170	106	50	23	18
8	47	37	78	64	*544	228	146	151	100	50	*23	17
9	54	35	73	60	566	149	139	139	99	50	22	16
10	49	34	105	57	387	119	128	137	95	50	21	15.5
11	106	32	605	55	302	103	124	135	92	49	20	15
12	108	31	620	*51	316	93	127	149	90	*48	20	*14.5
13	89	31	267	48	324	88	166	146	87	47	20	*14
14	80	30	592	47	465	83	328	140	87	46	19.5	14
15	74	29	1,050	44	456	146	258	134	86	45	19.5	13
16	68	29	444	42	296	134	203	127	86	43	19	13
17	62	42	292	41	244	114	182	119	83	42	18.5	13
18	52	190	279	40	213	116	*242	113	82	42	18.5	13
19	47	185	255	38	192	122	328	110	79	40	18	12.5
20	52	1,200	242	38	174	164	405	150	76	39	17	12
21	63	753	226	37	164	196	279	125	72	38	18	12
22	83	919	201	39	147	*176	198	116	70	38	19.5	11.5
23	104	605	194	124	132	158	170	*107	67	36	24	11.5
24	110	360	370	1,110	118	146	166	102	64	35	40	11.5
25	99	285	306	800	106	142	170	97	62	34	29	11.5
26	*87	250	220	588	93	152	168	96	61	31	26	11
27	80	223	180	356	83	196	158	91	60	31	25	10
28	74	206	155	498	76	176	153	87	58	29	24	9.7
29	71	189	137	1,670	71	448	149	84	57	29	23	9.7
30	66	*174	120	831	------	462	140	82	56	27	22	9.7
31	62	------	110	460	------	276	------	84	------	27	20	------
Total	2,166	6,191	7,962	7,693	9,514	4,741	5,903	3,724	2,461	1,315	700.5	421.6
Mean	69.9	206	257	248	328	153	197	120	82.0	42.4	22.6	14.1
Cfsm	3.24	9.54	11.9	11.5	15.2	7.08	9.12	5.56	3.80	1.96	1.05	0.653
In.	3.73	10.66	13.71	13.25	16.38	8.16	10.16	6.41	4.24	2.26	1.21	0.73
Ac-ft	4,300	12,280	15,790	15,260	18,870	9,400	11,710	7,390	4,880	2,610	1,390	836

Calendar year 1959: Max 1,870 Min 16.5 Mean 156 Cfsm 7.22 In. 97.83 Ac-ft 112,800
Water year 1959-60: Max 1,670 Min 9.7 Mean 144 Cfsm 6.67 In. 90.90 Ac-ft 104,700

Peak discharge (base, 1,400 cfs).--Nov. 20 (7:30 a.m.) 1,630 cfs (6.94 ft); Jan. 24 (4:30 p.m.) 1,570 cfs (6.86 ft); Jan. 29 (9 a.m.) 2,190 cfs (7.74 ft).

* Discharge measurement made on this day.

565. North Fork Skokomish River below Staircase Rapids, near Hoodsport, Wash.

Location.--Lat 47°30'55", long 123°19'45", in NW¼ sec.4, T.23 N., R.5 W., on left bank 1¼ miles upstream from Lake Cushman, 2 miles upstream from Dry Creek, and 11½ miles northwest of Hoodsport.

Drainage area.--58.1 sq mi.

Records available.--July 1924 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 762.26 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Nov. 1, 1934, water-stage recorder and Nov. 1, 1934, to Nov. 10, 1941, staff gages, on right bank at same datum.

Average discharge.--36 years, 489 cfs (354,000 acre-ft per year).

Extremes.--Maximum discharge during year, 8,850 cfs Jan. 29 (gage height, 8.54 ft); minimum, 64 cfs Sept. 30 (gage height, 1.55 ft).
1924-60: Maximum discharge, 27,000 cfs Nov. 5, 1934 (gage height, 14.4 ft, from high-water mark), from rating curve extended above 9,800 cfs on basis of slope-area measurement at gage height 12.2 ft; minimum recorded, 16 cfs Sept. 23, 1930 (gage height, 1.12 ft).

Remarks.--Records excellent except those for periods Nov. 24 to Dec. 13, Dec. 17 to Jan. 28, which are good. No regulation or diversion above station.

Revisions (water years).--WSP 1246: Drainage area. WSP 1286: 1932, 1935, 1937(M), 1942(M), 1945(M), 1947(P), 1948(M). WSP 1636: 1940(M).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

1.5	55	3.0	520	6.0	3,520
2.0	161	4.0	1,180	7.0	5,250
2.5	312	5.0	2,180	8.0	7,450

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*207	227	457	342	1,400	245	598	636	*877	457	184	110
2	193	215	448	335	1,640	233	740	603	1,000	426	174	103
3	184	271	414	308	1,180	227	794	555	1,050	426	164	99
4	177	*221	378	298	1,000	221	782	498	926	448	159	114
5	169	204	358	288	1,500	245	800	480	863	422	151	154
6	164	193	358	284	2,090	242	800	1,020	800	498	147	112
7	161	182	335	274	2,000	375	884	919	674	484	144	101
8	346	179	312	264	1,330	382	912	664	625	426	144	94
9	308	174	312	251	1,120	320	764	608	680	394	137	90
10	245	169	643	245	912	288	614	849	752	358	135	88
11	825	164	1,710	242	746	264	545	926	770	331	130	88
12	502	159	1,140	230	776	248	520	1,160	764	320	128	88
13	362	154	698	230	734	242	614	877	770	323	123	88
14	308	151	1,970	227	1,130	236	788	704	746	308	119	86
15	277	156	3,100	215	1,070	346	636	630	722	294	114	78
16	248	142	1,380	212	746	291	535	586	776	294	112	74
17	233	396	948	204	620	288	498	540	625	298	*114	72
18	215	794	1,020	193	520	294	516	493	545	*291	114	70
19	204	846	870	187	466	331	581	520	502	277	112	76
20	393	3,200	776	187	*439	457	722	692	457	255	105	*72
21	470	1,620	658	184	414	636	608	550	430	242	161	67
22	722	3,650	*581	198	378	625	493	480	452	233	151	67
23	516	2,670	630	312	350	*581	457	448	560	215	183	84
24	614	1,570	849	1,860	335	592	452	448	614	209	182	110
25	530	1,070	674	1,780	312	680	444	484	511	209	161	92
26	410	794	565	1,350	291	782	452	608	462	209	159	74
27	354	669	511	856	277	794	*466	581	475	215	130	72
28	316	614	466	1,560	261	664	520	530	498	209	119	69
29	280	555	430	4,430	251	884	581	576	530	207	132	67
30	258	498	406	2,570	------	877	625	782	506	198	144	65
31	242	------	374	1,390	------	692	------	828	------	187	119	------
Total	10,433	21,907	23,771	23,506	24,288	13,582	18,741	20,275	19,962	9,663	4,351	2,624
Mean	377	730	767	758	838	438	625	654	665	312	140	87.5
Cfsm	5.80	12.6	13.2	13.0	14.4	7.54	10.8	11.3	11.4	5.37	2.41	1.51
In.	6.68	14.02	15.22	15.05	15.55	8.69	12.00	12.98	12.78	6.19	2.79	1.68
Ac-ft	20,690	43,450	47,150	46,620	48,170	26,940	37,170	40,210	39,590	19,170	8,630	5,200

Calendar year 1959: Max 4,000 Min 81 Mean 531 Cfsm 9.14 In. 123.97 Ac-ft 384,100
Water year 1959-60: Max 6,430 Min 65 Mean 528 Cfsm 9.09 In. 123.63 Ac-ft 383,000

Peak discharge (base, 3,000 cfs).--Nov. 20 (2 a.m.) 4,240 cfs (6.45 ft); Nov. 22 (9 p.m.) 8,260 cfs (8.32 ft); Dec. 15 (8 a.m.) 4,330 cfs (6.50 ft); Jan. 29 (3 p.m.) 8,850 cfs (8.54 ft); Feb. 6 (8:30 p.m.) 4,020 cfs (6.32 ft).

* Discharge measurement made on this day.

575. North Fork Skokomish River near Hoodsport, Wash.

Location.--Lat 47°25'20", long 123°13'10", in SW¼ sec.5, T.22 N., R.4 W., at city of Tacoma dam, 4 miles northwest of Hoodsport.

Drainage area.--93.7 sq mi.

Records available.--August 1910 to September 1911 (fragmentary) and February 1913 to September 1960 (monthly discharge only) in reports of Geological Survey. October 1911 to September 1953 (monthly discharge only) in State Water-Supply Bulletin 6.

Gage.--Discharge determined from record of power output and Lake Cushman elevations, plus spillway discharge when present. Prior to Sept. 23, 1911, staff gage and February 1913 to September 1923 water-stage recorder, at approximately same site. At datum 486.4 ft above mean sea level (levels by city of Tacoma) prior to Sept. 2, 1918, and at datum 5.00 ft higher Sept. 2, 1918, to September 1923. October 1923 to September 1930 water-stage recorder 1 mile downstream at different datum.

Average discharge.--49 years (1911-60), 741 cfs (536,500 acre-ft per year), adjusted for storage.

Extremes.--Not determined since regulation began in Lake Cushman.

Remarks.--Records fair. No diversion of consequence. Flow regulated in Lake Cushman since October 1925 for power by city of Tacoma.

Cooperation.--Records of power output and elevations of Lake Cushman furnished by city of Tacoma.

Revisions.--WSP 1216: Drainage area.

Monthly discharge, water year October 1959 to September 1960

Month	Observed				Change in contents in Lake Cushman (acre-feet)	Adjusted for change in reservoir contents			
	Maximum (cfs)	Minimum (cfs)	Mean (cfs)	Runoff in acre-feet		Mean (cfs)	Per square mile	Runoff in inches	Runoff in acre-feet
October	1,230	0	497	30,570	-1,720	469	5.01	5.77	28,850
November	3,180	66	1,137	67,660	0	1,137	12.1	13.54	67,660
December	3,020	298	1,277	78,550	-5,200	1,193	12.7	14.68	73,350
Calendar year 1959	4,010	0	808	584,800	-9,710	794	8.47	115.08	575,100
January	1,730	616	1,436	88,290	-15,830	1,178	12.6	14.50	72,460
February	1,870	408	1,438	82,720	-4,130	1,366	14.6	15.73	78,590
March	1,590	0	799	49,150	+270	804	8.58	9.89	49,420
April	1,050	0	544	32,350	+29,030	1,032	11.0	12.28	61,380
May	1,080	0	668	41,100	+12,380	870	9.28	10.70	53,480
June	1,000	0	716	42,580	+2,350	755	8.06	8.99	44,930
July	769	0	295	18,140	+3,410	350	3.74	4.31	21,550
August	948	0	355	21,830	-11,750	164	1.75	2.02	10,080
September	942	0	334	19,860	-12,370	126	1.34	1.50	7,490
Water year 1959-60	3,180	0	789	572,800	-3,560	784	8.37	113.91	569,200

580. Deer Meadow Creek near Hoodsport, Wash.

Location.--Lat 47°25'00", long 123°13'30", in NW¼ sec.8, T.22 N., R.4 W., on left bank a quarter of a mile upstream from mouth and 4 miles west of Hoodsport.

Records available.--August 1950 to August 1951, October 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 688.28 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by city of Tacoma). Prior to Oct. 1, 1952, at datum 0.48 ft higher.

Average discharge.--8 years, 7.28 cfs (5,270 acre-ft per year).

Extremes.--Maximum discharge during year, 108 cfs Nov. 20, Jan. 29 (gage height, 1.94 ft); minimum, 0.4 cfs Sept. 25, 27, 28, 29, 30; minimum gage height, 0.60 ft Sept. 29.
1950-51, 1952-60: Maximum discharge, 355 cfs Nov. 3, 1955 (gage height, 2.98 ft); minimum, 0.2 cfs Oct. 8-11, 1952, Oct. 2, 4, 6, 7, 1958.

Remarks.--Records good. Since October 1953, records include large part of flow of McTaggart Creek, from which water is diverted at city of Tacoma diversion dam in N½ sec.7, T.22 N., R.4 W. When flow of McTaggart Creek exceeds about 80 cfs, there is undiverted spill over dam. For discharges less than about 80 cfs the city allows up to 2 cfs to flow through pipe in dam and continue in McTaggart Creek, not to exceed the natural flow of stream. No regulation.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

0.6	0.4	1.0	12
.7	1.9	1.2	25
.8	4.2	1.5	52
.9	7.2	2.0	117

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*1.0	1.5	8.4	5.3	33	5.3	17	8.4	2.5	1.5	0.9	1.0
2	1.0	1.5	7.6	5.3	31	4.7	15	7.6	*2.3	1.7	.9	1.0
3	1.0	1.9	6.8	4.7	28	5.0	13	7.2	2.3	1.7	.7	1.0
4	.9	1.5	6.2	4.4	24	4.4	11	6.5	2.3	1.5	.7	1.4
5	.7	*1.5	5.9	4.2	25	5.3	10	5.9	2.1	1.5	.9	1.4
6	.9	1.5	5.3	4.2	44	5.0	8.8	8.0	2.1	1.5	.9	1.4
7	1.0	1.4	5.0	4.4	54	6.2	8.4	6.5	1.9	1.4	.7	1.2
8	1.5	1.4	4.4	4.0	44	8.4	7.6	5.9	2.3	1.5	.9	1.2
9	1.0	1.2	4.4	3.7	39	7.6	6.8	5.6	2.1	1.4	.9	1.2
10	1.4	1.2	10	3.7	31	7.6	6.8	5.3	1.9	1.4	.9	1.0
11	2.1	1.2	22	3.4	25	6.5	6.5	5.3	1.9	1.5	.9	1.0
12	1.5	1.2	27	3.4	24	6.2	7.2	5.6	1.9	1.4	.7	.9
13	1.4	1.2	16	3.4	19.5	5.9	8.4	5.3	1.9	1.4	.9	.7
14	1.2	1.9	35	3.4	31	*6.8	10.5	5.0	2.3	1.4	.9	.7
15	1.0	1.7	68	3.2	33	11	11	4.4	2.3	1.5	.9	.7
16	1.0	1.4	45	3.0	25	9.6	10	4.0	2.1	1.5	.7	.9
17	1.0	2.7	29	3.0	21	9.2	9.6	3.7	2.1	1.5	*1.0	.7
18	1.4	3.7	23	3.0	17.5	8.4	11	3.7	2.1	*1.4	.9	.7
19	1.4	5.4	18	2.7	14.5	7.6	17.5	4.2	2.1	1.2	.9	.9
20	1.5	76	15.5	2.7	13	7.2	33	4.2	2.1	1.2	.9	*.7
21	1.9	48	13	2.3	11	6.8	25	3.7	1.7	1.2	1.5	.7
22	4.4	53	*11	3.2	9.6	6.2	18.5	3.7	1.9	1.0	1.4	.6
23	1.9	53	9.6	5.0	8.8	5.9	15.5	3.4	1.9	1.0	1.5	.7
24	1.9	*35	10	26	8.4	5.6	14	3.4	1.9	1.4	1.5	.7
25	1.9	22	9.2	39	7.2	5.6	13	3.7	1.5	1.4	1.2	.6
26	1.9	17	8.4	30	6.8	5.6	12	3.4	1.7	1.0	1.0	.6
27	1.7	14	7.6	20	6.2	5.6	*10.5	3.2	1.7	1.2	1.0	.6
28	1.9	12.5	7.2	32	5.9	5.9	9.6	3.2	1.9	1.0	1.0	.4
29	1.7	10.5	6.8	*92	5.6	16.5	9.2	2.7	1.5	1.2	1.0	.4
30	1.5	9.2	6.5	63	------	21	8.8	3.0	1.7	1.0	1.0	.4
31	1.5	-------	5.9	42	-------	20	-------	2.7	-------	1.0	1.0	-------
Total	46.1	385.2	457.7	429.6	646.0	242.6	365.2	148.4	60.0	41.5	30.2	25.4
Mean	1.49	12.8	14.8	13.9	22.3	7.83	12.2	4.79	2.00	1.34	0.97	0.85
Ac-ft	91	764	908	852	1,280	481	724	294	119	82	60	50

Calendar year 1959: Max 76 Min 0.6 Mean 7.62 Ac-ft 5,520
Water year 1959-60: Max 92 Min 0.4 Mean 7.86 Ac-ft 5,700

* Discharge measurement made on this day.

595. North Fork Skokomish River near Potlatch, Wash.

Location.--Lat 47°19'40", long 123°14'30", in NE¼NW¼ sec.7, T.21 N., R.4 W., on left bank 1 mile upstream from mouth, 6 miles southwest of Potlatch, and 7 miles downstream from city of Tacoma's Cushman Dam No. 2.

Drainage area.--117 sq mi, includes 99 sq mi above Cushman Dam No. 2 which is normally non-contributing.

Records available.--March 1944 to December 1949, February 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 63.49 ft above mean sea level (levels by city of Tacoma). Prior to Nov. 27, 1949 (destroyed by flood of Nov. 27, 1949), and Mar. 18 to May 9, 1950, water-stage recorder at site 200 ft downstream at present datum.

Extremes.--Maximum discharge during year, 2,680 cfs Nov. 20 (gage height, 6.63 ft); minimum, 6.2 cfs Sept. 9 (gage height, 2.28 ft).
1944-60: Maximum discharge, 7,740 cfs Nov. 4, 1955 (gage height, 10.45 ft); minimum recorded, 1.3 cfs Sept. 5, 14, 16, 1951 (gage height, 2.02 ft).

Remarks.--Records good. Entire flow of river normally diverted at Cushman Dam No. 2 to supply powerplant which discharges directly into sea (Hood Canal). Main portion of McTaggart Creek is diverted into Cushman Reservoir No. 2 and may bypass this station. Flow regulated by Lake Cushman (see p. 46) and by pondage in Cushman Reservoir No. 2, from which spill and releases are infrequent.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second

2.3	7.0	4.0	565
2.6	44	5.0	1,210
2.9	110	6.0	2,060
3.3	237		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*15	30	95	88	265	67	237	88	40	23	14	9.0
2	14	29	88	78	273	63	200	81	38	72	16	8.0
3	13	41	85	72	249	63	158	76	36	22	16	8.0
4	13	*34	74	65	230	74	152	74	35	21	15	8.0
5	13	30	67	74	253	110	137	65	34	21	15	11
6	13	29	67	90	492	105	126	92	32	19.5	15	9.0
7	13	29	65	95	565	100	115	83	32	18	13	8.0
8	21	28	61	74	420	134	113	72	32	18	27	7.0
9	24	52	61	63	329	137	95	65	30	18	21	7.0
10	24	38	81	61	249	137	81	63	30	18	15	8.0
11	65	29	250	59	193	132	85	63	32	19.5	14	8.0
12	72	28	370	55	207	118	90	67	32	18	12	9.0
13	63	27	230	54	204	110	100	65	30	*17	11	9.0
14	55	27	462	57	410	113	143	61	32	17	11	10
15	34	29	*1,360	55	401	193	161	57	32	17	*12	9.0
16	28	28	1,300	54	273	161	137	55	30	16	11	8.0
17	28	48	329	52	207	134	129	54	29	16	11	14
18	24	132	241	54	174	118	140	50	30	16	11	19.5
19	24	186	190	50	*152	105	184	54	29	16	10	*14
20	32	1,640	167	48	137	95	356	65	28	16	10	9.0
21	38	805	143	48	134	*90	277	55	28	16	15	9.0
22	133	980	132	54	115	81	200	50	27	17	16	8.0
23	132	*1,690	129	136	110	72	158	46	27	17	15	8.0
24	70	*746	137	516	100	67	158	46	25	17	18	10
25	59	269	134	692	92	63	*152	46	25	17	16	15
26	59	184	124	516	88	67	137	44	24	17	14	29
27	67	149	113	356	81	65	124	42	24	16	12	17
28	46	132	124	*386	74	76	110	41	23	16	11	12
29	38	118	102	1,040	72	202	100	40	23	15	11	10
30	34	105	92	577	-------	286	90	42	23	15	10	7.0
31	30	-------	92	347	-------	286	-------	*42	-------	14	10	-------
Total	1,294	7,692	6,965	5,966	6,549	3,624	4,445	1,844	892	546.0	428	317.5
Mean	41.7	256	225	192	226	117	148	59.5	29.7	17.6	13.8	10.6
Ac-ft	2,570	15,260	13,810	11,830	12,990	7,190	8,820	3,660	1,770	1,080	849	630

Calendar year 1959: Max 2,990 Min 7.0 Mean 140 Ac-ft 101,600
Water year 1959-60: Max 1,690 Min 7.0 Mean 111 Ac-ft 80,460

* Discharge measurement made on this day.

600. South Fork Skokomish River near Potlatch, Wash.

Location.--Lat 47°23'10", long 123°18'30", in NW¼ sec.22, T.22 N., R.5 W., on right bank at head of canyon, 1 mile upstream from Rock Creek, 3 miles downstream from Brown Creek, and 7½ miles west of Potlatch.

Drainage area.--65.6 sq mi.

Records available.--October 1923 to September 1932, September 1946 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 456 ft (by barometer).

Average discharge.--23 years, 597 cfs (432,200 acre-ft per year).

Extremes.--Maximum discharge during year, 11,300 cfs Nov. 20 (gage height, 12.15 ft); minimum, 82 cfs Sept. 30 (gage height, 0.92 ft).
1923-32, 1946-60: Maximum discharge, 19,300 cfs Nov. 26, 1949 (gage height, 17.75 ft), from rating curve extended above 5,600 cfs on basis of logarithmic plotting; minimum, 38 cfs Sept. 15, 1926; minimum gage height, 0.51 ft Sept. 2, 3, 1959.

Remarks.--Records excellent. No regulation or diversion above station. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1216: Drainage area. WSP 1286: 1950(P). WSP 1546: 1952.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 19				Nov. 20 to Sept. 30			
1.2	169	3.0	625	0.9	78	5.0	1,850
1.5	221	5.0	1,850	1.4	178	7.0	3,600
2.0	326			2.0	325	10.0	7,600
				3.0	650		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	234	299	508	418	1,430	347	1,050	701	599	228	115	117
2	221	283	478	385	2,040	325	1,160	654	*595	218	113	107
3	212	351	449	359	1,560	322	1,170	606	584	212	113	106
4	201	312	412	342	1,290	303	1,000	560	549	207	111	111
5	191	*281	379	325	1,730	350	920	522	508	205	109	176
6	183	262	368	328	2,570	412	845	843	475	205	106	141
7	179	246	350	328	2,770	699	810	855	427	205	104	123
8	351	236	331	314	1,810	*860	790	681	397	198	102	117
9	416	223	325	293	1,690	658	726	602	388	189	100	107
10	319	217	718	285	1,280	566	628	650	394	180	98	106
11	851	210	2,190	270	1,030	498	599	710	397	174	98	104
12	675	203	2,140	257	1,080	446	632	870	385	167	98	102
13	490	200	1,120	252	1,130	421	824	835	379	163	98	100
14	406	194	2,890	254	2,160	434	1,300	697	376	*160	96	98
15	349	201	4,410	240	2,010	880	1,070	617	373	*156	98	96
16	312	184	1,760	225	1,270	670	885	577	424	152	*94	94
17	283	448	1,170	218	1,000	599	790	552	362	150	94	92
18	260	1,240	*1,120	214	845	581	865	511	325	148	92	91
19	244	1,310	975	205	735	588	1,150	528	314	143	91	91
20	432	7,240	905	202	685	718	1,640	750	301	141	91	*91
21	638	2,590	790	193	685	855	1,230	632	282	137	107	89
22	948	3,990	697	216	613	800	945	552	272	135	127	89
23	780	3,410	697	540	602	726	820	505	280	133	143	92
24	855	1,690	1,010	2,700	528	*681	810	472	290	129	180	96
25	805	1,190	925	2,820	488	673	830	472	275	125	143	98
26	609	920	750	2,110	449	770	*800	542	252	121	146	92
27	496	775	650	*1,430	418	935	755	546	245	119	123	89
28	429	681	581	2,190	391	850	755	505	240	117	113	87
29	383	624	532	7,020	370	1,520	755	485	242	115	117	85
30	347	563	495	3,260	------	1,600	726	609	240	115	115	83
31	319	------	456	1,520	------	1,230	------	693	------	115	121	------
Total	13,418	30,573	30,581	29,713	34,659	21,317	27,280	19,334	11,170	4,962	3,456	3,070
Mean	433	1,019	986	958	1,195	688	909	624	372	160	111	102
Cfsm	6.60	15.5	15.0	14.6	18.2	10.5	13.9	9.51	5.67	2.44	1.69	1.55
In.	7.61	17.33	17.34	16.84	19.65	12.09	15.47	10.96	6.33	2.81	1.96	1.74
Ac-ft	26,610	60,640	60,660	58,930	68,750	42,280	54,110	38,350	22,160	9,840	6,850	6,090

Calendar year 1959: Max 7,240 Min 84 Mean 639 Cfsm 9.74 In. 132.12 Ac-ft 462,200
Water year 1959-60: Max 7,240 Min 83 Mean 627 Cfsm 9.56 In. 130.13 Ac-ft 455,300

Peak discharge (base, 3,800 cfs).--Nov. 20 (4:30 a.m.) 11,300 cfs (12.15 ft); Nov. 22 (11 p.m.) 8,630 cfs (10.65 ft); Dec. 14 (9:30 p.m.) 6,720 cfs (9.41 ft); Jan. 29 (3:30 p.m.) 8,430 cfs (10.56 ft); Feb. 6 (9 p.m.) 5,200 cfs (8.34 ft).

* Discharge measurement made on this day.

605. South Fork Skokomish River near Union, Wash.

Location.--Lat 47°20'30", long 123°16'30", in NE¼ sec.2, T.21 N., R.5 W., on right bank 3¼ miles upstream from confluence with North Fork and Vance Creek and 8 miles west of Union.

Drainage area.--79.6 sq mi.

Records available.--August 1931 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 110 ft (by barometer). Prior to Sept. 19, 1931, staff gage at same site at datum 2.32 ft higher.

Average discharge.--29 years, 712 cfs (515,500 acre-ft per year).

Extremes.--Maximum discharge during year, 16,100 cfs Nov. 20 (gage height, 7.15 ft, from recorded range in stage), from rating curve extended above 8,900 cfs on basis of logarithmic plotting; minimum, 86 cfs Sept. 29-30 (gage height, 1.38 ft).
1931-60: Maximum discharge, 21,600 cfs Jan. 22, 1935, Nov. 26, 1949 (gage height, 11.0 ft), from rating curve extended above 11,000 cfs; minimum, 62 cfs Sept. 18, 1938; minimum gage height, that of Sept. 29-30, 1960.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 1216: 1950, drainage area. WSP 1316: 1934(M), 1938(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 24 to Dec. 13)

Oct. 1 to Nov. 19		Nov. 20 to Sept. 30			
1.9	128	1.3	68	3.5	1,920
2.2	284	1.6	145	4.0	2,830
2.5	503	2.0	318	5.0	5,700
3.0	990	2.5	668	6.0	9,750
3.5	1,690	3.0	1,200	7.0	15,100

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	266	337	626	475	2,020	394	1,110	751	602	243	130	127
2	*249	317	585	447	2,800	375	1,260	686	*593	229	127	115
3	237	394	548	427	2,110	369	1,280	635	585	220	124	112
4	225	350	510	401	1,700	358	1,090	578	555	216	121	115
5	215	*304	475	382	2,310	408	950	540	510	212	118	176
6	*204	305	454	388	3,650	468	880	893	489	212	115	148
7	193	280	440	388	4,110	*781	840	954	440	212	115	133
8	341	265	420	369	2,540	1,080	800	723	414	208	112	118
9	463	255	414	346	2,250	799	750	626	394	200	110	115
10	337	245	806	341	1,640	660	680	668	401	188	110	110
11	930	235	2,720	318	1,290	562	600	742	408	184	110	105
12	790	230	2,910	312	1,390	510	740	901	388	176	108	105
13	591	225	1,400	308	1,410	475	1,220	890	388	173	108	102
14	471	220	3,670	312	3,120	489	1,650	742	375	173	108	100
15	394	230	6,870	302	2,800	1,100	1,200	643	375	*170	108	98
16	343	210	2,630	287	1,670	819	1,030	585	420	166	*105	95
17	310	580	1,620	276	1,280	686	910	570	369	166	105	95
18	291	1,400	*1,500	266	1,030	660	1,000	525	329	162	102	92
19	272	1,500	1,250	261	879	660	1,490	548	318	162	102	92
20	439	*9,930	1,140	261	809	730	2,000	799	308	159	100	92
21	710	4,570	965	257	809	900	1,600	668	292	156	127	*90
22	1,110	5,570	848	282	696	830	1,230	578	276	152	145	90
23	946	*5,390	819	643	626	740	1,000	518	282	148	145	92
24	979	*2,230	1,210	3,800	585	*705	920	496	297	145	200	100
25	979	1,660	1,140	3,950	540	714	920	496	276	142	162	102
26	730	1,260	912	2,840	503	880	*890	548	261	139	162	92
27	590	1,020	780	*1,840	468	990	848	570	257	136	142	90
28	503	869	677	2,860	440	920	838	510	252	133	124	88
29	439	770	618	9,260	420	1,780	829	503	248	133	130	86
30	394	686	570	4,970	------	1,900	780	602	248	130	124	86
31	357	------	518	2,360	------	1,430	------	732	------	130	130	------
Total	15,298	41,837	40,045	39,929	45,895	24,172	31,335	20,220	11,350	5,375	3,829	3,161
Mean	493	1,395	1,292	1,288	1,583	780	1,045	652	378	173	124	105
Cfsm	6.19	17.5	16.2	16.2	19.9	9.80	13.1	8.19	4.75	2.17	1.56	1.32
In.	7.15	19.55	18.71	18.66	21.44	11.29	14.64	9.45	5.30	2.51	1.79	1.48
Ac-ft	30,340	82,980	79,430	79,200	91,030	47,940	62,150	40,110	22,510	10,660	7,590	6,270

Calendar year 1959: Max 9,930 Min 84 Mean 787 Cfsm 9.89 In. 134.16 Ac-ft 569,500
Water year 1959-60: Max 9,930 Min 86 Mean 772 Cfsm 9.70 In. 131.87 Ac-ft 560,200

Peak discharge (base, 6,000 cfs).--Nov. 20 (time unknown) 16,100 cfs (7.15 ft); Nov. 22 (11:30 p.m.) 11,100 cfs (6.29 ft); Dec. 14 (10:30 p.m.) 8,990 cfs (5.83 ft); Jan. 29 (11:30 a.m.) 11,400 cfs (6.34 ft); Feb. 6 (10:30 p.m.) 8,010 cfs (5.60 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 6-19, Mar. 18-23, Mar. 26 to Apr. 25; discharge estimated on basis of recorded range in stage and records for nearby stations.

615. Skokomish River near Potlatch, Wash.

Location.--Lat 47°19'00", long 123°11'05", in NW¼NW¼ sec.15, T.21 N., R.4 W., on right bank half a mile upstream from U. S. Highway 101, 2.8 miles downstream from confluence of North and South Forks, 4.7 miles southwest of Potlatch, and 5.5 miles upstream from mouth.

Drainage area.--230 sq mi.

Records available.--July 1943 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 16.47 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 24, 1956, water-stage recorders or staff gages at about present site at datum 2.88 ft higher except Oct. 1, 1947, to Apr. 18, 1951, at present datum. Mar. 24, 1956, to July 21, 1958, at site 200 ft downstream at datum 2.88 ft higher.

Extremes.--Maximum discharge during year, 22,100 cfs Nov. 20 (gage height, 14.65 ft); minimum daily, 180 cfs Sept. 30.

1943-60: Maximum discharge, 27,000 cfs (revised) Nov. 3, 1955 (gage height, 15.5 ft, present datum); minimum, 125 cfs Sept. 14-17, 1944 (gage height, -0.01 ft, datum then in use).

Revisions.--The figures of maximum discharge for the water years 1950 and 1956 have been revised to 21,400 cfs Nov. 27, 1949 (gage height, 14.51 ft), and 27,000 cfs Nov. 3, 1955 (gage height, 15.5 ft, present datum), superseding those published in WSP 1182 and 1446, respectively.

Remarks.--Records good except those for periods of doubtful gage-height record, which are fair. Flow partly regulated by Lake Cushman and Cushman Reservoir No. 2. In normal years practically entire flow of North Fork is diverted at dam No. 2 and returned to sea through Cushman powerplant No. 2. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions.--WSP 1216: Drainage area. Revised figures of discharge, in cubic feet per second, for high-water period in the water year 1956, superseding those published in WSP 1446, are given herewith:

Nov. 3, 1955..... 24,200
Nov. 4, 1955..... 18,900

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
November 1955	113,642	24,200	844	3,788	225,400
Calendar year 1955	-	24,200	159	1,237	895,700
Water year 1955-56	-	24,200	196	1,502	1,090,000

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	426	553	1,110	804	2,590	841	2,270	1,120	940	399	260	265
2	410	535	1,060	755	3,200	810	2,230	1,080	895	386	270	250
3	385	*613	1,030	700	2,700	810	2,220	1,020	*854	377	265	240
4	375	683	978	674	2,160	800	1,860	975	823	367	259	230
5	*360	535	946	649	2,560	868	1,640	922	769	364	256	330
6	345	499	916	643	3,760	965	1,460	1,120	728	361	251	300
7	340	481	895	655	5,820	1,150	1,340	1,300	692	355	243	250
8	420	458	881	625	3,740	1,680	1,260	1,860	656	349	250	240
9	595	464	860	595	3,350	1,430	1,190	1,020	636	343	260	225
10	499	448	1,090	583	2,410	1,310	1,080	1,000	636	337	245	220
11	1,040	431	3,100	571	1,870	1,180	1,040	1,050	632	325	230	210
12	1,100	415	4,250	549	1,840	1,090	1,050	1,140	620	319	220	205
13	797	405	2,420	529	1,970	1,030	1,180	1,220	608	*316	220	210
14	668	395	4,130	535	3,980	1,040	2,040	1,090	600	313	221	205
15	577	415	*10,600	517	4,690	1,850	1,900	990	612	313	*211	200
16	517	395	5,420	505	2,820	1,520	1,560	922	652	310	214	190
17	493	541	2,870	487	2,080	1,320	1,390	895	612	307	*214	190
18	464	2,130	2,330	*475	1,720	1,220	1,410	841	564	307	209	200
19	448	1,970	1,990	464	1,490	1,180	2,000	859	546	310	204	*202
20	547	*14,700	1,800	453	*1,360	1,240	3,530	1,110	522	313	204	202
21	860	6,800	1,600	442	1,350	1,360	2,750	1,020	504	316	240	197
22	1,490	6,880	1,400	453	1,230	1,320	2,030	945	490	310	270	194
23	1,420	9,410	1,290	739	1,150	*1,220	1,650	890	483	304	280	200
24	1,380	4,130	1,520	4,230	1,080	1,150	1,570	841	494	295	380	209
25	1,430	2,580	1,530	5,440	1,020	1,120	1,560	818	476	290	300	220
26	1,090	2,020	1,300	4,060	970	1,150	1,470	859	466	290	300	250
27	881	1,660	1,150	2,780	926	1,370	*1,360	890	448	280	270	224
28	762	1,460	1,070	3,140	890	1,320	1,300	854	438	270	250	200
29	681	1,330	986	11,600	864	2,600	1,250	828	424	265	240	190
30	631	1,200	916	6,900	------	3,480	1,180	908	411	260	250	180
31	595	------	853	3,430	------	2,710	------	1,070	------	260	262	------
Total	22,026	64,536	62,291	54,982	65,590	42,134	49,770	31,457	18,231	9,911	7,748	6,628
Mean	711	2,151	2,009	1,774	2,262	1,359	1,659	1,015	608	320	250	221
Ac-ft	43,690	128,000	123,600	109,100	130,100	83,570	98,720	62,390	36,160	19,660	15,370	13,150

Calendar year 1959: Max 14,700 Min 204 Mean 1,276 Ac-ft 924,000
Water year 1959-60: Max 14,700 Min 180 Mean 1,189 Ac-ft 863,500

Peak discharge (base, 8,400 cfs).--Nov. 20 (10 a.m.) 22,100 cfs (14.65 ft); Nov. 23 (2 a.m.) 16,200 cfs (13.33 ft); Dec. 15 (2 p.m.) 12,400 cfs (12.07 ft); Jan. 29 (2 p.m.) 14,400 cfs (12.81 ft); Feb. 7 (1 a.m.) 8,800 cfs (10.60 ft).

* Discharge measurement made on this day.

Note.--Doubtful gage-height record July 24 to Aug. 1, Aug. 8-13, 21-26, 28-30, Sept. 2-17, 25, 26, 28-30; discharge computed on basis of records for nearby stations.

625. Purdy Creek near Union, Wash.

Location.--Lat 47°18'05", long 123°10'50", in NW¼NW¼ sec.22, T.21 N., R.4 W., on left bank immediately downstream from county road bridge, 1 mile upstream from Weaver Creek and 5½ miles southwest of Union.

Drainage area.--1.43 sq mi.

Records available.--September 1954 to July 1960 (discontinued).

Gage.--Water-stage recorder. Datum of gage is 28.76 ft above mean sea level (State Fisheries Department reference mark).

Average discharge.--5 years, 23.5 cfs (17,010 acre-ft per year).

Extremes.--Maximum discharge during period October 1959 to July 1960, 111 cfs Dec. 15; maximum gage height, 2.21 ft Apr. 22; minimum daily discharge, 5.9 cfs Dec. 9.
1954-60: Maximum discharge, that of Dec. 15, 1959; maximum gage height, that of Apr. 22, 1960; minimum daily discharge, that of Dec. 9, 1959.

Remarks.--Records poor. Flow affected by springs. Regulation resulting from construction of fish hatchery began October 1959. Records of water temperatures for the water year 1960 are given in WSP 1744.

Discharge, in cubic feet per second, October 1959 to July 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a14	12	9.6	15	43	31	35	39	*28	23		
2	*14	13	9.0	14	39	31	36	38	27	23		
3	14	*14.5	8.3	13.5	36	32	35	40	29	22		
4	14	13	7.8	13.5	34	32	38	38	30	22		
5	14	12	7.3	15	33	33	38	39	25	22		
6	14	12	6.8	18	35	32	36	43	25	21		
7	14	12	6.4	26	43	33	34	40	24	20		
8	17	11.5	6.4	22	58	35	34	39	25	21		
9	14	11.5	5.9	21	55	36	34	36	25	21		
10	16	11	6.4	21	49	36	33	36	25	21		
11	17	11.5	9.6	21	45	34	33	36	25	21		
12	15	11.5	13.5	21	46	33	32	39	25	21		
13	14	11.5	12	21	44	33	*33	39	25	21		
14	14	12	27	23	54	38	35	36	26	20		
15	14	13.5	75	23	50	38	34	35	27	*20		
16	14	13.5	91	23	51	34	25	35	26	19		
17	14	20	56	23	46	34	30	35	25	19		
18	14	17	44	*22	44	33	33	35	25	19		
19	14	16.5	38	21	*40	33	43	39	25	19		
20	18	34	34	21	40	33	48	38	25	18		
21	19	27	30	21	38	32	43	36	25	18		
22	17.5	56	*28	23	35	31	52	35	25	18		
23	15.5	80	25	26	35	30	68	35	25	a18		
24	16.5	*56	23	30	35	*30	61	35	25	a18		
25	18	28	18	33	35	28	*54	35	24	a17		
26	15	21	16	34	34	30	36	35	24	a17		
27	13	16	16	35	33	30	33	34	23	a17		
28	13	14	15	38	32	31	33	33	23	a17		
29	13	13	15	49	32	38	38	32	23	a16		
30	13	11	16	42	-------	38	39	38	23	a16		
31	12	-------	16	48	-------	38	-------	35	-------	a16		-------
Total	458.5	605.5	692.0	777.0	1,194	1,028	1,156	1,138	757	601		
Mean	14.8	20.2	22.3	25.1	41.2	33.2	38.5	36.7	25.2	19.4		
Ac-ft	909	1,200	1,370	1,540	2,370	2,040	2,290	2,260	1,500	1,190		

Calendar year 1959: Max 91 Min 5.9 Mean 23.6 Ac-ft 17,100
Water year 1959-60: Max - Min - Mean - Ac-ft -

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.

655. Gold Creek near Bremerton, Wash.

Location.--Lat 47°33'20", long 122°48'35", in NE¼SW¼ sec.21, T.24 N., R.1 W., on right bank 1¼ miles upstream from mouth and 8 miles west of Bremerton.

Drainage area.--1.54 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 750.9 ft above mean sea level (closed stadia traverse).

Average discharge.--15 years, 5.39 cfs (3,900 acre-ft per year).

Extremes.--Maximum discharge during year, 138 cfs Nov. 20 (gage height, 2.73 ft); minimum, 0.4 cfs Aug. 10, Sept. 19; minimum gage height, 0.95 ft Aug. 10.
1945-60: Maximum discharge, 203 cfs Feb. 22, 1949 (gage height, 3.27 ft); minimum, 0.1 cfs July 29, Sept. 9, 1958; minimum gage height, 0.72 ft Sept. 9, 1958.

Remarks.--Records good. No regulation or diversion above station.

Revisions (water years).--WSP 1216: Drainage area. WSP 1286: 1947-49(M), 1950(P).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 17-30)

0.9	0.3	1.5	10
1.0	.6	1.7	20
1.1	1.2	2.0	43
1.3	4.0	2.4	88

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.9	1.9	5.4	6.3	17.5	5.0	19.5	5.2	3.0	1.0	0.7	0.6
2	*.8	*1.9	5.2	6.0	16.5	5.0	14.5	5.2	2.9	1.0	.8	.7
3	.8	2.4	5.0	5.4	15	4.7	11	5.0	2.9	1.0	.8	.7
4	1.0	2.0	4.7	5.2	13.5	5.0	9.6	5.2	2.7	1.0	.9	1.0
5	1.0	1.9	4.2	5.0	13.5	5.4	8.6	4.4	2.6	1.0	.7	1.0
6	.8	1.8	4.2	5.0	23	5.7	7.8	6.0	2.3	1.0	.6	.9
7	.9	1.8	4.2	5.4	35	5.7	7.2	5.7	2.4	1.0	.6	.8
8	1.4	1.8	4.0	5.2	*27	8.2	6.6	5.2	2.3	1.0	.6	.8
9	1.3	1.8	4.0	4.7	21	9.2	6.0	4.7	2.9	1.0	.6	.7
10	1.3	1.6	5.0	4.7	16.5	11	5.7	4.7	2.2	.9	.6	.8
11	2.3	1.7	9.2	4.4	13.5	11	5.7	5.0	2.0	.9	.6	.7
12	1.7	1.7	19.5	4.2	13	10.5	6.0	5.2	2.0	.8	.6	.6
13	1.6	1.7	15	4.0	11.5	9.2	6.6	4.7	1.9	*.9	.6	.6
14	1.6	1.7	18	4.2	16.5	9.2	7.8	4.4	1.7	.9	.6	.7
15	1.4	1.7	66	4.2	24	*12.5	9.2	4.2	2.3	.8	.7	.7
16	1.4	1.7	31	4.0	18	12	9.6	3.8	2.0	.8	.6	.6
17	1.3	2.6	17.5	4.0	14	11	9.2	3.8	1.9	.8	.6	.6
18	1.2	4.4	*14	4.0	12	9.2	8.9	4.0	1.8	.8	.6	.5
19	1.2	7.0	11	*3.8	10.5	8.2	11	4.2	1.8	.8	.7	.5
20	1.5	86	11	3.8	9.2	7.5	26	5.7	1.6	.8	.6	.6
21	1.8	58	10	3.8	8.9	6.9	20	4.7	1.5	.7	1.0	.5
22	2.6	31	9.2	4.0	7.8	6.6	*14	5.0	1.3	.7	.8	.5
23	2.0	22	9.2	7.2	7.5	6.0	11.5	4.4	1.3	.7	*1.2	.6
24	2.4	15.5	10.5	34	6.9	5.7	9.6	4.4	1.3	.7	1.2	.6
25	2.2	11	10.5	43	6.6	5.2	8.6	4.4	1.3	.7	1.1	.6
26	2.0	9.2	10	31	5.7	5.2	7.8	4.2	1.2	.7	.9	.5
27	2.3	7.8	9.2	20	5.7	5.2	6.9	*3.6	1.2	.7	.8	.6
28	2.6	7.2	8.6	21	5.2	5.7	6.6	3.6	1.1	.7	.8	.6
29	2.3	6.6	7.8	73	5.0	14	6.0	3.4	1.2	.6	.7	.6
30	1.8	6.0	7.5	39	------	25	5.7	3.4	1.1	.7	.7	.6
31	1.9	------	6.9	22	------	25	------	3.2	------	.7	.8	------
Total	49.4	303.4	357.5	391.5	400.0	275.7	293.2	140.6	57.7	25.8	23.1	19.8
Mean	1.59	10.1	11.5	12.6	13.8	8.89	9.77	4.54	1.92	0.83	0.75	0.66
Cfsm	1.03	6.56	7.47	8.18	8.96	5.77	6.34	2.95	1.25	0.539	0.487	0.429
In.	1.19	7.33	8.63	9.45	9.66	6.66	7.08	3.40	1.39	0.62	0.56	0.48
Ac-ft	98	602	709	777	793	547	582	279	114	51	46	39

Calendar year 1959: Max 86 Min 0.4 Mean 5.71 Cfsm 3.71 In. 50.29 Ac-ft 4,130
Water year 1959-60: Max 86 Min 0.5 Mean 6.39 Cfsm 4.15 In. 56.45 Ac-ft 4,640

Peak discharge (base, 100 cfs).--Nov. 20 (10 a.m.) 138 cfs (2.73 ft).

* Discharge measurement made on this day.

685. Dewatto Creek near Dewatto, Wash.

Location.--Lat 47°28'10", long 123°01'30", in SE¼ sec.23, T.23 N., R.3 W., on right bank at county road bridge, 1½ miles upstream from mouth and 2 miles northeast of Dewatto.
Drainage area.--17.5 sq mi.
Records available.--July 1947 to October 1954, May 1958 to September 1960. Annual maximum discharge only, water years 1955-57.
Gage.--Water-stage recorder. Altitude of gage is 55 ft (from topographic map). July 1947 to October 1954, water-stage recorder; August 1955 to May 1958, crest-stage gage only, at same site and datum; May to September 1958, water-stage recorder at datum 0.92 ft higher.
Average discharge.--9 years, 69.6 cfs (50,390 acre-ft per year).
Extremes.--Maximum discharge during year, 1,060 cfs Nov. 20 (gage height, 5.44 ft); minimum, 14 cfs Sept. 8 (gage height, 2.17 ft).
1947-60: Maximum discharge, 2,110 cfs Nov. 3, 1955 (gage height, 7.42 ft, datum then in use).
1947-54, 1958-60: Minimum discharge, 9.6 cfs Sept. 22, 1950, Sept. 11, 12, 14, 15, 1959; minimum gage height, 1.57 ft Sept. 20, 21, 22, 1951.
Revisions.--The minimum discharge for the water year 1959 has been revised to 9.6 cfs Sept. 11, 12, 14, 15, 1959; minimum gage height, 1.98 ft Oct. 1, 2, 1958, superseding figure published in WSP 1636.
Remarks.--Records good prior to Jan. 1 and excellent thereafter. No regulation or diversion above station.
Revisions.--WSP 1246: Drainage area. Revised figures of discharge, in cubic feet per second, for the water year 1959, superseding those published in WSP 1636, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1959		1959-Con.		1959-Con.		1959-Con.		1959-Con.	
Sept. 7	15	Sept.12	10	Sept.17	10	Sept.22	21	Sept.27	15
8	14	13	10	18	13.5	23	16.5	28	14
9	12.5	14	10	19	22	24	14.5	29	13.5
10	10.	15	10	20	29	25	14	30	15
11	9.6	16	11	21	22	26	14.5		

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
September 1959.....	470.6	30	9.6	15.7	0.897	1.00	933
Water year 1958-59.....	-	556	9.6	63.9	3.65	49.52	46,220

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15.5	16	49	53	192	52	185	62	36	24	17.5	17
2	*15.5	15.5	46	49	194	49	135	60	35	23	17.5	17
3	15.5	*19.5	45	46	166	51	102	56	35	22	17.5	16
4	15.5	19	41	43	144	52	87	54	35	22	17.5	17.5
5	15.5	17	38	42	162	63	76	51	33	21	17.5	19
6	15.5	17	37	43	260	66	69	69	32	21	17	17.5
7	16	16	36	49	486	74	63	63	32	20	16	17
8	23	16	35	47	332	117	61	56	31	20	15.5	16
9	22	16	35	43	295	133	57	52	30	19.5	15	15.5
10	19.5	16	52	42	202	135	57	49	29	19.5	15	15.5
11	33	16	132	42	144	127	58	49	30	19.5	15.5	15.5
12	25	16	316	41	*142	106	65	57	29	19	15.5	15.5
13	21	16	187	39	144	91	75	52	28	*19	15.5	15.5
14	19.5	16	214	45	232	86	104	49	29	19	16	15.5
15	19	17	572	47	301	*127	117	46	31	18.5	17.5	15.5
16	18.5	17	347	45	197	104	95	43	29	18.5	17	15.5
17	17	29	*182	42	142	89	87	42	28	18.5	17	15.5
18	17	51	144	41	117	78	91	42	28	19.5	16	15.5
19	16	62	119	40	101	72	119	45	28	18.5	17	15.5
20	20	816	115	40	91	66	291	56	26	17.5	16	15.5
21	23	*717	108	*39	91	62	226	48	26	17.5	20	15.5
22	29	450	94	43	78	58	*144	45	26	17.5	19	15.5
23	27	370	86	81	72	56	113	42	25	17.5	*22	16
24	28	209	104	353	68	53	108	43	25	17.5	23	16
25	23	137	111	498	63	52	94	45	25	17	20	15.5
26	21	108	94	370	60	54	86	43	25	17	19	15
27	20	86	80	222	57	54	76	*41	24	17	19	15
28	20	74	70	227	54	56	69	39	24	17	18.5	15
29	19.5	63	65	827	53	154	65	38	23	16	17.5	15
30	19	56	62	478	------	272	62	38	24	16	17.5	15
31	17.5	------	58	252	------	239	------	38	------	17	17	------
Total	626.5	3,494.0	3,674	4,269	4,640	2,848	3,037	1,513	861	586.5	541.5	476.5
Mean	20.2	116	119	138	160	91.9	101	48.8	28.7	18.9	17.5	15.9
Cfsm	1.15	6.63	6.80	7.89	9.14	5.25	5.77	2.79	1.64	1.08	1.00	0.909
In.	1.33	7.43	7.81	9.07	9.86	6.05	6.45	3.22	1.83	1.25	1.15	1.01
Ac-ft	1,240	6,930	7,290	8,470	9,200	5,650	6,020	3,000	1,710	1,160	1,070	945

Calendar year 1959: Max 816 Min 9.6 Mean 68.2 Cfsm 3.90 In. 52.90 Ac-ft 49,370
Water year 1959-60: Max 827 Min 15 Mean 72.6 Cfsm 4.15 In. 56.46 Ac-ft 52,680

Peak discharge (base, 350 cfs).--Nov. 20 (3:30 p.m.) 1,060 cfs (5.44 ft); Dec. 12 (9:30 a.m.) 356 cfs (3.88 ft); Dec. 15 (1 p.m.) 665 cfs (4.71 ft); Jan. 25 (4:30 a.m.) 538 cfs (4.42 ft); Jan. 29 (1 p.m.) 1,020 cfs (5.37 ft); Feb. 7 (4 a.m.) 582 cfs (4.53 ft).

* Discharge measurement made on this day.

700. Dogfish Creek near Poulsbo, Wash.

Location.--Lat 47°45'10", long 122°38'30", in SW¼ sec.11, T.26 N., R.1 E., on left bank half a mile upstream from mouth and 1 mile north of Poulsbo.

Drainage area.--6.77 sq mi.

Records available.--July 1947 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map). Prior to Nov. 2, 1950, at site 200 ft downstream at datum 1.75 ft lower.

Average discharge.--13 years, 8.85 cfs (6,410 acre-ft per year).

Extremes.--Maximum discharge during year, 193 cfs Jan. 29 (gage height, 5.99 ft), from rating curve extended above 50 cfs as explained below; minimum, 2.6 cfs July 17, 27, 29 (gage height, 1.07 ft).
1947-60: Maximum discharge, 333 cfs Feb. 22, 1949 (gage height, 8.07 ft, present datum, from high-water mark on gage house), from rating curve extended above 50 cfs on basis of contracted-opening measurement of peak flow; minimum, 0.7 cfs Aug. 6, 1959.

Remarks.--Records good except those for period of no gage-height record, which are fair. Small diversions for irrigation. Slight regulation at times from unknown source.

Revisions (water years).--WSP 1122: 1947(M). WSP 1346: 1948-50(P), 1953(M). WSP 1396: 1950(P). WSP 1636: 1951-54, 1955(M), 1956-57, 1958(P).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 20, Jan. 29)

Oct. 1 to Nov. 20		Nov. 20 to Sept. 30			
1.3	3.6	1.1	3.0	2.4	44
1.6	15	1.4	9.2	3.0	71
2.2	42	1.8	20	4.0	125

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.2	5.5	8.8	7.7	28	8.3	14	7.2	5.6	4.3	3.8	5.3
2	*4.0	5.5	9.0	7.7	26	8.1	11.5	7.2	5.3	4.1	4.0	4.9
3	3.6	*6.0	9.0	7.4	19.5	8.5	11	7.4	5.3	4.0	4.1	4.9
4	3.6	5.6	8.8	7.2	17	9.7	10	7.9	5.1	3.8	4.1	5.7
5	4.0	5.3	8.5	7.2	25	17	9.2	7.4	4.9	3.6	4.0	5.1
6	4.2	5.0	8.5	7.4	*42	13.5	8.8	10.5	4.9	3.6	3.6	4.9
7	4.5	5.0	8.5	8.1	35	14	8.3	8.3	4.7	3.4	3.6	4.7
8	5	5.0	8.5	7.9	34	17	8.1	7.2	4.7	3.4	3.4	4.3
9	5	5.0	9.0	7.4	26	12.5	8.1	6.8	4.5	3.6	3.4	4.3
10	7	5.0	9.4	7.2	19	12.5	7.9	7.0	4.1	3.8	3.4	4.5
11	13	5.3	22	7.2	15.5	11	8.8	7.9	4.3	3.6	3.6	4.5
12	10	5.3	24	7.2	*17	10	11	8.5	4.1	3.4	3.6	4.7
13	7	5.3	11.5	7.2	15	9.2	12.5	7.2	4.0	*3.8	4.1	4.9
14	6	6.0	12.5	7.7	17.5	9.4	15	6.8	5.1	3.6	4.7	4.9
15	6	6.4	*47	7.7	16.5	*11	15	6.2	6.0	3.4	5.3	4.9
16	6	6.4	21	7.2	13	9.4	11	6.8	5.7	3.2	5.6	4.9
17	6	8.6	*13.5	7.0	12	9.2	10.5	9.6	5.3	3.2	5.3	5.1
18	5.5	9.8	14	6.4	11.5	8.8	12	9.0	5.1	3.2	4.9	5.1
19	5.5	13	11	6.2	10.5	8.5	14	7.9	5.6	3.2	4.9	5.3
20	5.5	40	22	6.4	10.5	8.3	24	8.3	6.0	3.2	4.7	5.3
21	7	*35	13.5	*6.8	10.5	8.1	13	8.5	5.1	3.4	5.7	5.1
22	11	17	11	7.4	10	7.9	*11	7.7	4.9	3.4	5.1	5.3
23	8	13	11.5	15.5	9.2	7.7	10.5	6.6	4.5	3.4	*6.6	5.7
24	7	11	19.5	46	9.2	7.4	10	7.0	4.7	3.4	6.2	5.6
25	7	10	16.5	33	9.2	7.4	9.4	7.0	4.7	3.2	5.6	5.3
26	6	9.2	11.5	24	8.8	7.4	8.8	6.6	4.5	3.2	9.2	5.1
27	6	9.0	10	15.5	8.8	7.7	8.3	*6.2	4.5	3.0	6.0	4.9
28	5.5	9.2	9.2	43	8.5	8.5	7.7	6.0	4.3	3.2	5.6	4.7
29	5.5	8.8	8.5	*121	8.5	*32	7.7	5.7	4.1	3.0	5.6	4.5
30	5.5	8.8	8.5	44	------	19	7.7	5.7	4.3	3.2	5.3	4.5
31	5.5	------	8.1	26	------	18	------	5.7	------	3.4	5.6	------
Total	189.6	290.0	414.3	527.6	493.2	347.0	324.8	227.8	145.9	107.2	150.6	148.9
Mean	6.12	9.67	13.4	17.0	17.0	11.2	10.8	7.35	4.86	3.46	4.86	4.96
Cfsm	0.904	1.43	1.98	2.51	2.51	1.65	1.60	1.09	0.718	0.511	C.718	0.733
In.	1.04	1.59	2.28	2.90	2.71	1.91	1.78	1.25	0.80	0.59	0.83	0.82
Ac-ft	376	575	822	1,050	978	688	644	452	289	213	299	295

Calendar year 1959: Max 50 Min 1.2 Mean 8.35 Cfsm 1.23 In. 16.73 Ac-ft 6,040
Water year 1959-60: Max 121 Min 3.0 Mean 9.20 Cfsm 1.36 In. 18.50 Ac-ft 6,680

Peak discharge (base, 70 cfs).--Nov. 21 (1:30 a.m.) 84 cfs (3.40 ft); Dec. 15 (10 a.m.) 78 cfs (3.13 ft); Jan. 29 (7:30 a.m.) 193 cfs (5.99 ft); Feb. 6 (7 p.m.) 77 cfs (3.12 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 7 to Nov. 2; discharge estimated on basis of recorded range in stage and records for nearby stations.

728. Purdy Creek at Purdy, Wash.

Location.--Lat 47°23'18", long 122°37'30", in NW¼ sec.24, T.22 N., R.1 E., on left bank at downstream side of culvert, 400 ft upstream from mouth at Purdy and 2 miles south of Burley.

Drainage area.--3.44 sq mi.

Records available.--November 1959 to September 1960.

Gage.--Staff gage read once daily. Altitude of gage is about 10 ft above mean sea level.

Extremes.--Maximum discharge during period, 113 cfs Dec. 15 (gage height, 1.6 ft, from graph based on gage readings); minimum observed, 1.5 cfs Aug. 10 (gage height, 0.20 ft).

Remarks.--Records poor. No regulation or diversion above station.

Rating tables, Nov. 23, 1959, to Sept. 30, 1960 (gage height, in feet, and discharge, in cubic feet per second)

Nov. 23 to Dec. 15				Dec. 16 to Sept. 30			
0.6	3.8	1.1	33	0.2	1.5	0.7	22
.7	6.5	1.4	75	.3	3.7	.9	36
.9	15.5			.5	10.5	1.3	78

Discharge, in cubic feet per second, November 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-	4.7	5.6	25	5.6	9.8	7.4	6.4	3.2	2.3	2.5
2		-	4.4	5.6	18	5.6	8.2	9.0	5.0	a3.0	2.5	a2.6
3		-	5.0	5.4	15	a6	a7	a8.5	5.0	a2.8	2.5	2.7
4		-	5.0	4.8	11.0	7.0	6.7	8.2	5.0	a2.6	2.5	2.7
5		-	5.0	4.4	11.0	8.6	6.4	6.7	4.4	2.5	2.5	3.7
6		-	5.0	5.4	12.5	10.0	6.0	15.5	5.0	*2.5	2.5	a3.3
7		-	5.3	8.2	14.5	9.8	5.4	6.4	5.0	2.3	2.5	a2.7
8		-	5.0	6.0	23	13.5	5.4	6.4	4.2	2.3	a2.0	2.3
9		-	5.0	4.8	14.5	9.8	5.4	6.4	3.7	2.7	2.1	a2.2
10		-	*8.8	4.8	11.5	12.5	a7	a7	3.7	2.3	1.5	a2.2
11		-	17.5	*6.7	*9.8	9.0	9.8	a8	3.7	2.7	2.1	2.1
12		-	23	6.0	12.5	7.4	11.5	9.0	a3.7	2.3	a2.3	2.5
13		-	8.6	4.8	15.5	7.4	*7.0	9.0	3.7	2.5	a2.4	2.5
14		-	21	6.4	18.0	*6.0	11.5	9.0	3.7	2.5	a2.4	2.7
15		-	*75	7.4	17.0	9.0	8.6	9.4	4.8	2.5	2.5	2.3
16		-	30	7.8	12.5	9.0	7.8	6.4	4.8	2.3	2.5	2.7
17		-	14.5	6.7	11.5	6.7	10.0	6.0	3.0	2.3	2.3	2.5
18		-	*13.5	5.0	10.0	6.7	10.5	5.6	4.0	2.3	2.5	2.5
19		-	14.0	5.4	9.4	6.7	9.8	6.4	4.8	2.3	2.5	3.0
20		-	19.0	5.4	8.6	6.7	19.0	*8.8	3.4	2.5	2.5	2.7
21		-	11.0	6.0	a8.6	6.0	*11.0	a7	3.4	2.3	a2.3	2.7
22		-	7.8	5.6	8.6	6.0	9.8	5.6	3.7	2.3	*3.0	3.0
23		*13.0	8.6	11.0	7.8	6.0	11.0	5.6	3.0	1.9	3.0	2.5
24		9.0	28	31	6.7	5.4	12.5	6.4	3.2	2.7	3.2	3.0
25		6.8	11.5	34	6.7	5.4	10.5	6.4	3.4	2.7	3.2	2.7
26		6.2	8.6	27	6.7	5.6	a10	7.0	a3.4	2.3	3.4	2.5
27		5.3	7.0	28	6.0	5.6	9.8	6.0	3.4	2.5	a3.1	2.5
28		5.9	6.0	31	6.7	6.0	7.4	6.4	3.4	2.3	a2.8	a2.5
29		5.9	11.5	*78	6.0	13.5	7.4	6.4	3.2	1.9	2.7	2.5
30		5.0	6.4	45	------	13.5	6.7	7.8	3.4	1.9	2.5	2.1
31		------	5.6	a35	------	15.5	------	12.5	------	a2.0	2.7	------
Total		-	401.1	448.2	344.6	251.5	268.9	236.0	120.5	75.2	78.8	78.4
Mean		-	12.9	14.5	11.9	8.11	8.96	7.61	4.02	2.43	2.54	2.61
Cfsm		-	3.75	4.22	3.46	2.36	2.60	2.21	1.17	0.706	0.738	0.759
In.		-	4.34	4.85	3.73	2.72	2.91	2.55	1.30	0.81	0.85	0.85
Ac-ft		-	796	889	684	499	533	468	239	149	156	156

Calendar year	: Max	Min	Mean	Cfsm	In.	Ac-ft
Water year	: Max	Min	Mean	Cfsm	In.	Ac-ft

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.

730. Burley Creek at Burley, Wash.

Location (revised).--Lat 47°24'55", long 122°37'50", in NE¼ sec.11, T.22 N., R.1 E., on left bank at county road bridge, 0.1 mile west of Burley and 0.3 mile upstream from mouth.

Drainage area.--10.0 sq mi.

Records available.--July 1947 to September 1950, November 1959 to September 1960.

Gage.--Staff gage read once daily. Altitude of gage is 10 ft (from topographic map). July 1947 to September 1950 water-stage recorder at same site at different datum.

Extremes.--Maximum discharge during period November 1959 to September 1960, 290 cfs Dec. 15 (gage height, 4.5 ft, from graph based on gage readings); minimum, 12 cfs July 28, 29, Aug. 7, 10 (gage height, 1.00 ft).
1947-50, 1959-60: Maximum discharge, 291 cfs Mar. 3, 1950 (gage height, 4.53 ft, datum then in use); minimum, 11 cfs July 19-21, 1947.

Remarks.--Records fair. Several small diversions for domestic use above station. No regulation.

Rating tables, Nov. 23, 1959, to Sept. 30, 1960 (gage height, in feet, and discharge, in cubic feet per second)

Nov. 23 to Dec. 14		Dec. 15 to Sept. 30	
1.3	22	1.0	12
1.8	49	2.0	74
2.3	84	3.0	149
		4.0	240

Discharge, in cubic feet per second, November 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-	27	25	52	29	44	28	25	21	17.5	18
2		-	26	25	48	29	40	29	22	a20	17.5	a18
3		-	26	24	47	a31	a37	a35	24	a18	17.5	18
4		-	27	24	37	32	34	28	23	a17	17.5	20
5		-	26	25	42	35	32	26	22	16	17.5	22
6		-	26	28	35	34	31	67	22	*15.5	15	a20
7		-	27	38	37	38	31	34	21	14.5	12	a18
8		-	26	29	70	60	29	28	21	14.5	a13	17
9		-	29	25	46	47	29	26	18	18	14.5	a16
10		-	*35	25	40	58	a36	a30	21	18	12	a15
11		-	45	*30	36	40	43	a35	19.5	17	15	14.5
12		-	68	29	*43	35	34	39	a20	14.5	a16	17
13		-	33	26	46	32	*35	35	20	18	a17	16
14		-	78	29	43	*31	53	34	20	18	a18	17
15		-	*208	33	52	48	41	35	23	17	18	17.5
16		-	56	30	39	37	38	28	23	15.5	17.5	18
17		-	38	29	36	37	38	27	20	18	16	18.5
18		-	47	24	35	34	42	28	22	18	16	17.5
19		-	34	23	34	33	41	30	22	17	17	20
20		-	58	23	32	32	70	*36	21	17	14.5	18.5
21		-	35	24	a32	31	*41	a30	20	13	a16	18
22		-	30	27	32	30	37	25	19.5	15.5	*19.5	18
23		*39	32	35	32	30	37	26	19.5	13	21	18.5
24		35	64	73	32	30	36	29	22	17	24	18.5
25		32	38	61	31	29	40	26	21	17	22	18.5
26		30	31	54	30	32	a38	30	a20	15	26	17.5
27		28	28	54	31	31	37	28	21	15.5	a22	17.5
28		29	26	64	30	32	31	26	21	12	a21	a17.5
29		30	26	99	29	80	29	25	21	12	20	17.5
30		28	28	70	------	72	28	28	21	16	19.5	17.5
31		------	26	a60	------	73	------	31	------	a17	18.5	------
Total		-	1,302	1,165	1,129	1,222	1,132	962	635.5	505.5	548.5	535.5
Mean		-	42.0	37.6	38.9	39.4	37.7	31.0	21.2	16.3	17.7	17.9
Cfsm		-	4.20	3.76	3.89	3.94	3.77	3.10	2.12	1.63	1.77	1.79
In.		-	4.84	4.33	4.20	4.54	4.21	3.58	2.36	1.88	2.04	1.99
Ac-ft		-	2,580	2,310	2,240	2,420	2,250	1,910	1,260	1,000	1,090	1,060

Calendar year : Max	Min	Mean	Cfsm	In.	Ac-ft
Water year : Max	Min	Mean	Cfsm	In.	Ac-ft

Peak discharge (base, 100 cfs).--Dec. 15 (time unknown) 290 cfs (4.5 ft); Jan. 29 (time unknown) about 115 cfs.

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.

735. Huge Creek near Wauna, Wash.

Location.--Lat 47°23'20", long 122°41'50", at north line of sec.20, T.22 N., R.1 E., on right bank at downstream side of bridge, an eighth of a mile upstream from mouth and 2½ miles west of Wauna.
Drainage area.--5.51 sq mi.
Records available.--July 1947 to September 1960.
Gage.--Water-stage recorder. Altitude of gage is 100 ft (from topographic map). Prior to June 26, 1951, at same site at datum 0.86 ft higher.
Average discharge.--13 years, 11.8 cfs (8,540 acre-ft per year).
Extremes.--Maximum discharge during year, 212 cfs Dec. 15 (gage height, 2.34 ft); minimum, 4.6 cfs Aug. 8, 9 (gage height, 0.69 ft), but may have been less sometime in September. 1947-60: Maximum discharge, 391 cfs Feb. 9, 1951 (gage height, 3.64 ft); minimum, 3.2 cfs Sept. 1, 1950; minimum gage height, 0.49 ft May 18, 20, 21, 1956.
Remarks.--Records good except those for period of no gage-height record, which are fair. No regulation or diversion above station.
Revisions (water years).--WSP 1216: Drainage area. WSP 1636: 1953-54, 1956, 1957(M).

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*5.1	5.1	8.9	10	36	11.5	28	10.5	8.3	6.6	5.8	5.2
2	5.1	*5.1	8.6	10	32	11	22	10	8.0	6.3	5.6	5.0
3	5.1	7.2	8.6	9.6	27	11.5	18	10.5	8.0	6.3	5.8	4.8
4	5.1	5.9	8.3	9.3	22	11.5	15	10.5	7.7	6.3	5.8	5.0
5	4.9	5.4	8.0	9.3	21	14	13.5	10	7.7	6.0	5.6	5.5
6	4.9	5.4	8.0	9.3	38	14	12.5	14	7.7	*5.9	5.3	5.3
7	5.1	5.4	8.0	10.5	59	14.5	11.5	11.5	7.7	6.0	5.1	5.1
8	5.9	5.4	7.8	9.6	*53	20	11	10.5	7.4	5.8	5.1	
9	5.6	5.4	8.0	9.0	40	19.5	10.5	9.6	7.4	5.8	4.9	
10	5.6	5.4	*8.9	9.0	29	21	10.5	9.3	7.4	5.8	4.9	
11	8.3	5.4	11.5	*9.0	22	18	12.5	10	7.4	5.8	5.1	
12	6.2	5.4	16.5	8.6	24	15	12.5	11.5	7.1	5.8	4.9	
13	5.6	5.1	13.5	8.3	24	13.5	12.5	10.5	7.1	5.8	5.1	
14	5.6	5.4	24	9.0	36	*12.5	17	9.3	7.7	5.8	5.1	
15	5.6	5.4	162	9.3	38	26	17.5	9.0	8.0	5.6	5.3	5.0
16	5.4	5.4	79	9.0	27	19	14	9.0	7.7	5.6	5.1	
17	5.4	7.2	38	8.3	22	17.5	13.5	9.0	7.1	5.6	4.9	
18	5.6	11	31	7.7	19.5	15.5	13.5	9.0	7.1	5.6	4.9	
19	5.1	9.2	24	7.7	17	14.5	16	9.3	7.1	5.6	4.9	
20	5.9	*36	25	7.4	18.5	13.5	29	*11	7.1	5.6	4.9	
21	6.4	43	20	7.4	21	12.5	*24	9.6	7.1	5.6	5.3	
22	7.8	42	17	8.0	16.5	12.5	18.5	9.0	6.8	5.6	*5.6	
23	6.4	34	16	14	14.5	11.5	17	8.6	6.6	5.6	6.6	5.2
24	6.7	22	26	29	14	11	18	9.0	6.8	5.6	6.0	5.0
25	6.2	16.5	22	49	13	11	16.5	9.0	6.6	5.3	5.6	4.9
26	5.6	13	16.5	45	13	11	15	9.0	6.8	5.3	5.5	4.8
27	5.4	12	14.5	31	12.5	11	13.5	8.6	6.6	5.3	5.5	4.8
28	5.4	11	12.5	37	11.5	12	12	8.3	6.3	5.3	5.3	4.8
29	5.1	10	12.5	152	11.5	23	11	8.3	6.6	5.3	5.2	4.8
30	5.1	9.6	12	80	-------	32	10.5	10	6.6	5.6	5.2	4.8
31	5.1	-------	11	43	-------	35	-------	9.3	-------	5.6	5.2	-------
Total	176.3	364.3	687.6	675.3	732.5	496.0	466.5	302.7	217.5	177.7	165.1	150.0
Mean	5.69	12.1	22.2	21.8	25.3	16.0	15.6	9.76	7.25	5.73	5.33	5.00
Cfsm	1.03	2.20	4.03	3.96	4.59	2.90	2.83	1.77	1.32	1.04	0.967	0.907
In.	1.19	2.46	4.64	4.56	4.94	3.35	3.15	2.04	1.47	1.20	1.11	1.01
Ac-ft	350	723	1,360	1,340	1,450	984	925	600	431	352	327	298

Calendar year 1959: Max 162 Min 4.5 Mean 12.9 Cfsm 2.34 In. 31.86 Ac-ft 9,360
Water year 1959-60: Max 162 Min 4.8 Mean 12.6 Cfsm 2.29 In. 31.12 Ac-ft 9,140

Peak discharge (base, 50 cfs).--Nov. 21 (2:30 a.m.) 55 cfs (1.68 ft); Dec. 15 (9 a.m.) 212 cfs (2.34 ft); Jan. 25 (1 p.m.) 51 cfs (1.51 ft); Jan. 29 (2 p.m.) 180 cfs (2.23 ft); Feb. 6 (10 p.m.) 76 cfs (1.71 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Aug. 26 to Sept. 30; discharge estimated on basis of recorded range in stage and records for nearby stations.

SHERWOOD CREEK BASIN

745. Mason Lake near Union, Wash.

Location.--Lat 47°19'15", long 122°57'15", in SE¼ sec.8, T.21 N., R.2 W., on right shore 7½ miles southeast of Union.
Drainage area.--20.2 sq mi.
Records available.--July 1951 to September 1960 (fragmentary).
Gage.--Staff gage read once daily at various times. Altitude of gage is 190 ft (from topographic map).
Extremes.--1951-60: Maximum gage height observed, 5.02 ft Feb. 2, 1953; minimum observed, 0.85 ft July 28, 1959.
High water during period Mar. 25 to Apr. 1, 1951, reached a stage of 7.5 ft, from high-water marks.
Remarks.--No diversion above station. Beaver dams at outlet cause some change in lake elevation.

Gage height, in feet, water year October 1959 to September 1960

Oct. 1	1.01	Feb. 12	2.77
Nov. 2	1.07	Apr. 21	1.89

765. Goldsborough Creek near Shelton, Wash.

Location.--Lat 47°12'50", long 123°10'50", in SW¼ sec.15, T.20 N., R.4 W., on right bank 3½ miles west of Shelton and 5½ miles upstream from mouth.

Drainage area.--42 sq mi, approximately.

Records available.--June 1951 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 205 ft (from topographic map).

Average discharge.--9 years, 117 cfs (84,700 acre-ft per year).

Extremes.--Maximum discharge during year, 1,390 cfs Dec. 15 (gage height, 7.42 ft); minimum, 23 cfs sometime during period of no gage-height record Oct. 1-7; minimum gage height, 2.12 ft Sept. 29, 30.
1951-60: Maximum discharge, that of Dec. 15, 1959; maximum gage height, 8.51 ft Dec. 10, 1956; minimum discharge, 16 cfs Sept. 23, 1951, Sept. 22-25, 1952, Aug. 25, 27, Sept. 8, 9, 12-14, 1958.

Remarks.--Records good except those above 1,000 cfs and those for period of no gage-height record, which are fair. No regulation or diversion above station.

Revisions.--WSP 1246: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 20		Nov. 20 to Sept. 30			
2.4	25	2.1	22	4.0	343
3.0	79	2.5	60	5.0	600
4.0	200	3.0	134	7.0	1,240
6.0	480				

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	45	139	124	367	143	293	131	89	43	28	30
2	26	*45	132	120	334	138	273	124	80	42	28	29
3	26	69	131	114	325	134	236	119	76	41	29	28
4	26	61	124	111	290	136	197	115	72	40	29	28
5	26	49	115	107	282	156	175	109	69	39	28	31
6	26	45	114	114	346	165	162	126	66	38	27	29
7	26	42	122	120	738	167	150	136	64	36	27	27
8	30	40	114	119	588	213	143	111	*63	35	26	27
9	30	40	114	107	502	224	136	101	62	34	26	26
10	30	38	131	103	422	245	129	96	61	34	26	26
11	50	37	201	104	355	228	136	100	60	34	26	26
12	45	37	284	103	329	197	138	111	58	34	25	25
13	40	36	268	100	345	179	143	129	56	33	25	25
14	40	36	*319	101	398	175	177	109	58	33	25	25
15	35	52	1,100	106	482	245	203	98	66	32	26	25
16	35	42	*816	107	420	211	165	95	71	32	26	25
17	33	69	465	106	357	187	156	100	63	31	*26	25
18	33	161	350	101	308	171	162	98	57	30	26	25
19	33	158	279	98	*275	*160	203	96	58	*30	26	26
20	40	485	245	96	249	152	273	158	67	30	26	27
21	50	1,070	207	96	268	145	295	122	57	30	30	*25
22	90	825	185	111	238	138	249	109	55	30	33	25
23	95	942	177	178	207	131	205	101	51	30	34	26
24	95	*535	187	345	195	126	217	96	49	30	38	27
25	105	379	181	480	183	122	213	96	48	29	42	28
26	80	282	160	*460	183	119	193	96	47	28	42	26
27	70	207	150	365	165	119	169	96	47	28	35	25
28	60	177	145	336	163	127	*154	94	45	27	32	24
29	55	165	138	867	148	187	145	85	44	27	33	24
30	50	150	136	720	------	257	138	94	44	26	32	24
31	45	------	134	460	------	299	------	111	------	28	32	------
Total	1,451	6,319	7,363	6,579	9,462	5,396	5,628	3,362	1,803	1,014	914	789
Mean	46.8	211	238	212	326	174	188	108	60.1	32.7	29.5	26.3
Cfsm	1.11	5.02	5.67	5.05	7.76	4.14	4.48	2.57	1.43	0.779	0.702	0.626
In.	1.28	5.60	6.52	5.83	8.38	4.78	4.98	2.98	1.60	0.90	0.81	0.70
Ac-ft	2,880	12,530	14,600	13,050	18,770	10,700	11,160	6,670	3,580	2,010	1,810	1,560

Calendar year 1959: Max 1,100 Min 22 Mean 133 Cfsm 3.17 In. 43.15 Ac-ft 96,630
Water year 1959-60: Max 1,100 Min 24 Mean 137 Cfsm 3.26 In. 44.36 Ac-ft 99,320

Peak discharge (base, 400 cfs).--Nov. 21 (3 a.m.) 1,260 cfs (7.05 ft); Nov. 23 (3:30 a.m.) 1,160 cfs (6.78 ft); Dec. 15 (5 p.m.) 1,390 cfs (7.42 ft); Jan. 25 (8:30 p.m.) 498 cfs (4.63 ft); Jan. 29 (6 p.m.) 1,080 cfs (6.53 ft); Feb. 7 (10 a.m.) 819 cfs (5.73 ft); Feb. 15 (11:30 a.m.) 492 cfs (4.61 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 1 to Nov. 2; discharge estimated on basis of recorded range in stage, 1 discharge measurement, and records for nearby stations.

784. Kennedy Creek near Kamilche, Wash.

Location.--Lat 47°04'40", long 123°07'35", in SW¼NE¼ sec.1, T.18 N., R.4 W., on left bank 100 ft upstream from Kennedy Falls, 2 miles upstream from mouth at Oyster Bay, and 4 miles south of Kamilche.

Drainage area.--15.3 sq mi.

Records available.--February to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 110 ft (from topographic map).

Extremes.--Maximum daily discharge during period, 550 cfs Feb. 7; minimum discharge, 2.8 cfs Aug. 10, 13 (gage height, 0.32 ft).

Remarks.--Records good except those for periods of no gage-height record and those for period Aug. 19 to Sept. 30, which are fair. No regulation or diversion above station.

Rating table, Feb. 1 to Sept. 30, 1960 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 19 to Sept. 30)

0.34	3.0	1.5	50
.5	4.9	2.0	124
.8	11	2.5	250
1.1	22	3.0	440

Discharge, in cubic feet per second, February to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					220	42	170	54	32	8.6	4.1	3.6
2					200	40	139	*49	29	9.3	4.1	3.5
3					170	40	112	45	26	14.5	4.1	3.5
4					150	41	94	43	25	12.0	3.9	3.7
5					150	48	84	39	22	8.4	3.7	4.0
6					300	57	74	42	*21	6.8	3.5	4.0
7					550	*67	66	39	20	5.9	3.4	3.6
8					350	132	61	36	20	5.6	3.2	3.4
9					250	141	57	33	18.0	11.5	3.1	3.2
10					200	162	49	32	17.0	6.6	3.0	3.2
11					190	137	47	33	16.5	5.9	3.1	3.0
12					180	96	45	38	16.0	10.0	3.1	3.0
13					300	84	49	40	14.5	5.9	3.0	3.0
14					340	82	79	36	16.0	6.3	3.1	3.1
15					344	179	139	33	19.0	4.9	3.3	3.1
16					254	139	110	33	20	4.6	3.3	3.0
17					202	112	101	38	17.0	6.4	3.3	3.0
18					160	*94	102	37	15.5	6.4	3.4	3.1
19					126	82	122	39	15.0	4.5	*5.7	3.1
20					108	71	246	77	16.0	*4.5	3.1	3.1
21					112	64	226	61	14.0	5.1	4.0	3.0
22					91	58	185	55	13.5	4.5	4.2	3.0
23					80	53	148	49	14.5	4.5	4.2	*3.2
24					71	48	128	47	12.5	4.5	5.4	3.4
25					66	44	110	46	11.5	4.2	4.8	3.5
26					59	42	94	42	11.5	3.7	4.5	3.4
27					54	41	82	39	11.0	4.0	4.1	3.3
28					49	43	71	38	10.5	3.7	3.7	3.2
29					45	108	64	34	9.3	3.6	3.7	3.1
30					------	175	58	34	9.3	5.5	3.7	3.0
31		------			------	195	------	35	------	4.5	3.7	------
Total					5,371	2,717	3,112	1,296	513.1	196.4	116.5	98.3
Mean					185	87.6	104	41.8	17.1	6.34	3.76	3.28
Cfsm					12.1	5.73	6.80	2.73	1.12	0.414	0.246	0.214
In.					13.06	6.60	7.56	3.15	1.25	0.48	0.28	0.24
Ac-ft					10,650	5,390	6,170	2,570	1,020	390	231	195

Calendar year	: Max	Min	Mean	Cfsm	In.	Ac-ft
Water year	: Max	Min	Mean	Cfsm	In.	Ac-ft

* Discharge measurement made on this day.
Note.--No gage-height record Feb. 1-14, May 1; discharge estimated on basis of records for nearby stations.

790. Deschutes River near Rainier, Wash.

Location.--Lat 46°51'10", long 122°40'00", in SW¼ sec.22, T.16 N., R.1 E., on right bank 75 ft upstream from county road crossing, half a mile downstream from outlet of Reichel Lake, and 2½ miles southeast of Rainier.

Drainage area.--89.8 sq mi.

Records available.--June 1949 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 350 ft (from topographic map).

Average discharge.--11 years, 275 cfs (199,100 acre-ft per year).

Extremes.--Maximum discharge during year, 3,360 cfs Nov. 21 (gage height, 10.15 ft); minimum, 33 cfs Sept. 30 (gage height, 2.79 ft).
1949-60: Maximum discharge, 5,620 cfs Dec. 12, 1955 (gage height, 13.06 ft); minimum, 21 cfs Sept. 20, 1952; minimum gage height, 2.64 ft Sept. 20, Oct. 17, 1952.

Remarks.--Records good. Probably some small diversion for irrigation and domestic use. No regulation. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions.--WSP 1246: Drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

2.7	24	4.0	276
3.0	59	5.0	600
3.3	107	7.0	1,500
3.6	170	9.0	2,600

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74	104	208	145	425	165	672	240	165	71	45	49
2	70	95	192	134	509	156	530	229	152	70	45	46
3	64	105	188	126	628	152	453	213	145	66	45	46
4	60	107	172	122	502	152	383	203	136	64	42	56
5	58	95	158	118	442	163	335	190	128	62	41	65
6	58	90	152	130	425	211	302	*185	120	60	41	66
7	58	87	149	134	1,410	213	273	243	115	59	40	55
8	60	80	141	130	1,110	432	251	234	*109	59	39	50
9	149	77	139	122	952	502	240	203	105	58	38	47
10	126	74	143	116	752	419	211	188	102	58	*36	46
11	339	72	299	118	596	365	213	195	100	56	38	45
12	422	71	825	111	523	320	224	221	98	56	38	44
13	268	*65	572	105	692	290	234	232	95	55	38	44
14	185	65	446	102	828	293	502	221	98	54	39	42
15	*143	66	1,540	102	1,460	874	744	200	109	54	46	41
16	116	64	*1,290	104	876	632	562	208	105	54	47	41
17	98	74	700	104	608	456	450	279	104	52	45	40
18	87	270	478	97	474	395	407	732	95	51	40	38
19	80	407	365	97	380	371	523	676	95	51	39	38
20	171	828	314	97	326	407	1,420	568	105	50	38	38
21	347	2,430	273	*93	323	474	1,160	600	95	47	38	36
22	311	1,220	240	95	279	456	716	456	92	46	42	35
23	350	1,420	208	128	248	401	526	368	88	46	46	38
24	276	1,350	234	470	*232	356	442	311	85	45	70	40
25	335	668	296	481	226	317	374	265	84	45	87	41
26	268	506	254	484	208	296	350	245	82	45	111	39
27	208	395	218	460	192	273	314	229	77	45	102	38
28	170	326	192	401	180	282	296	216	74	44	72	35
29	147	276	172	1,190	172	*787	273	198	72	44	60	34
30	124	234	*168	944	------	1,400	256	182	71	45	56	33
31	113	------	161	579	------	848	------	178	------	45	*52	------
Total	5,335	11,721	10,887	7,639	15,978	12,858	13,636	8,908	3,101	1,657	1,556	1,306
Mean	172	391	351	246	551	415	455	287	103	53.5	50.2	43.5
Cfsm	1.92	4.35	3.91	2.74	6.14	4.62	5.07	3.20	1.15	0.596	0.559	0.484
In.	2.21	4.85	4.51	3.16	6.62	5.33	5.65	3.69	1.28	0.69	0.64	0.54
Ac-ft	10,580	23,250	21,590	15,150	31,690	25,500	27,050	17,670	6,150	3,290	3,090	2,590

Calendar year 1959: Max 2,430 Min 36 Mean 257 Cfsm 2.86 In. 38.86 Ac-ft 186,100
Water year 1959-60: Max 2,430 Min 33 Mean 258 Cfsm 2.87 In. 39.17 Ac-ft 187,600

Peak discharge (base, 2,000 cfs).--Nov. 21 (5:30 a.m.) 3,360 cfs (10.15 ft); Dec. 15 (9 p.m.) 2,000 cfs (8.00 ft).

* Discharge measurement made on this day.

800. Deschutes River near Olympia, Wash.

Location.--Lat 47°00'05", long 122°53'40", in NW¼SE¼ sec.35, T.18 N., R.2 W., on left bank 1½ miles upstream from mouth and 2½ miles south of Olympia.

Drainage area.--160 sq mi.

Records available.--April 1945 to November 1954, June 1957 to September 1960. Annual maximum discharge only, water years 1955-57.

Gage.--Water-stage recorder and crest-stage gage. Altitude of gage is 95 ft (from topographic map). Prior to Oct. 14, 1947, water-stage recorder on right bank at same datum. November 1954 to June 1957, crest-stage gage only at same site and datum.

Average discharge.--12 years, 409 cfs (296,100 acre-ft per year).

Extremes.--Maximum discharge during year, 3,340 cfs Nov. 21 (gage height, 7.50 ft); minimum, 105 cfs Sept. 29, 30 (gage height, 1.99 ft).
1945-60: Maximum discharge, 6,080 cfs Dec. 13, 1955 (gage height, 8.46 ft).
1945-54, 1957-60: Minimum discharge, 66 cfs Oct. 11, 1945; minimum gage height, 1.90 ft Oct. 18, Nov. 11, 1952.
Revisions.--The figures of maximum discharge for some water years have been revised as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Water year	Date	Discharge (cfs)	Gage height (feet)
1062, 1316	1946	Dec. 29, 1945	3,270	7.32
1092, 1316	1947	Jan. 26, 1947	4,750	7.95
1152, 1316	1949	Feb. 18, 1949	4,750	8.00

Remarks.--Records excellent except those above 1,000 cfs or those for periods of no gage-height record, which are fair. Small diversions above station for irrigation. No regulation.

Revisions.--WSP 1246: Drainage area. Revised figures of discharge, in cubic feet per second, for the water years 1946-49, superseding those published in WSP 1062, 1092, 1122, 1152, and 1316, are given herewith:

1945		1946		1947	
Nov. 27	2,320	Jan. 5	2,720	Jan. 26	3,780
Dec. 29	2,820	Dec. 12	2,920		

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
November 1945	14,679	2,320	99	489	3.06	3.41	29,120
December	19,710	2,820	224	636	3.98	4.58	39,090
January 1946	26,515	2,720	338	855	5.34	6.16	52,590
Water year 1945-46	-	2,820	70	393	2.46	33.36	284,800
December 1946	29,859	2,920	352	963	6.02	6.94	59,220
Calendar year 1946	-	2,920	85	428	2.68	36.31	309,900
January 1947	19,811	3,780	279	639	3.99	4.60	39,290
Water year 1946-47	-	3,780	78	355	2.22	30.07	256,700
Calendar year 1947	-	3,780	78	329	2.06	27.90	238,200

Revised peak discharge.--1945-46: Nov. 27 (2:30 p.m.) 2,910 cfs; Dec. 29 (2:15 to 3:45 p.m.) 3,270 cfs; Jan. 5 (9 to 10 a.m.) 3,030 cfs; Feb. 6 (8:45 p.m.) 2,950 cfs.
1946-47: Dec. 12 (8 to 9 a.m.) 3,400 cfs; Jan. 26 (4 p.m.) 4,750 cfs.
1948-49: Feb. 18 (5 a.m.) 4,750 cfs; Feb. 23 (5 a.m.) 3,780 cfs.

800. Deschutes River near Olympia, Wash.--Continued

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 21				Nov. 22 to Sept. 30			
2.1	107	5.0	1,270	2.0	107	4.0	800
2.5	190	6.0	1,920	2.5	213	5.0	1,370
3.0	342	7.0	2,780	3.0	370	6.0	2,090
4.0	750						

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	143	181	500	346	710	360	960	426	305	170	133	118
2	135	167	450	328	682	349	800	411	289	170	133	*118
3	131	169	420	318	910	349	710	392	276	170	133	120
4	127	178	380	305	780	346	*624	377	267	168	133	121
5	123	167	360	296	692	360	548	356	245	166	122	131
6	121	160	340	292	687	411	501	352	243	162	120	135
7	121	160	330	302	1,360	422	457	*388	235	160	118	129
8	123	152	320	292	1,450	554	430	400	*224	158	118	125
9	162	145	310	286	1,290	775	418	370	216	153	120	120
10	200	141	310	280	1,050	718	385	352	210	156	*116	118
11	258	135	350	280	878	651	381	360	206	156	116	116
12	503	131	1,000	276	755	579	392	370	203	149	116	116
13	370	*129	850	255	927	525	400	388	198	151	114	116
14	277	127	700	252	1,000	517	579	377	198	149	112	116
15	*232	129	1,500	252	1,630	916	922	356	213	149	116	116
16	202	127	1,700	252	1,300	1,020	825	346	208	145	123	114
17	181	141	1,100	255	944	746	678	396	206	145	125	114
18	169	258	900	252	775	651	628	501	198	143	123	112
19	158	459	700	237	678	606	687	489	196	141	114	112
20	176	655	600	*235	597	606	1,290	620	203	139	112	111
21	381	2,390	520	224	574	678	1,760	805	200	139	116	111
22	360	2,010	460	226	521	687	1,110	651	190	137	116	111
23	427	1,970	*453	261	481	633	835	543	186	137	121	114
24	366	1,500	461	544	457	570	732	485	184	137	131	116
25	388	1,200	521	696	*453	521	651	445	179	135	149	116
26	360	1,000	489	692	430	493	597	415	179	135	162	114
27	297	800	445	705	407	465	534	381	179	135	181	111
28	252	700	415	628	388	453	509	363	177	133	153	109
29	235	600	388	1,200	374	583	477	346	175	131	141	107
30	205	550	374	1,310	------	1,660	449	328	168	129	127	107
31	190	------	366	922	------	1,210	------	318	------	133	123	------
Total	7,373	16,631	18,012	12,999	23,180	19,414	20,269	13,107	6,356	4,581	3,937	3,494
Mean	238	554	581	419	799	626	676	423	212	148	127	116
Cfsm	1.49	3.46	3.63	2.62	4.99	3.91	4.23	2.64	1.33	0.925	0.794	0.725
In.	1.71	3.87	4.19	3.02	5.39	4.51	4.71	3.05	1.48	1.06	0.92	0.81
Ac-ft	14,620	32,990	35,730	25,780	45,980	38,510	40,200	26,000	12,610	9,090	7,810	6,930

Calendar year 1959: **Max** 2,390 **Min** 99 **Mean** 407 **Cfsm** 2.54 **In.** 34.55 **Ac-ft** 294,800
Water year 1959-60: **Max** 2,390 **Min** 107 **Mean** 408 **Cfsm** 2.55 **In.** 34.72 **Ac-ft** 296,200

Peak discharge (base, 2,000 cfs).--Nov. 21 (about 9 p.m.) 3,340 cfs (7.50 ft); probably Dec. 16 (time unknown) 2,410 cfs (6.40 ft); probably Apr. 20 (about 11 p.m.) 2,140 cfs (6.03 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 24 to Dec. 22, Aug. 5-7; discharge estimated on basis of crest-stage-gage readings and records for station near Rainier.

810. Woodland Creek near Olympia, Wash.

Location.--Lat 47°04'20", long 122°49'00", in SW¼ sec.4, T.18 N., R.1 W., on left bank 1½ miles upstream from mouth and 4.4 miles northeast of Olympia. Prior to Nov. 3, 1959, at site 15 ft upstream.

Drainage area.--24.3 sq mi.

Records available.--June 1949 to April 1959, May to October 1959 (monthly discharge only), November 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 25 ft (from topographic map). June 29, 1949, to Apr. 28, 1959, at site 15 ft upstream at datum 0.75 ft higher.

Average discharge.--11 years, 27.7 cfs (20,050 acre-ft per year).

Extremes.--Maximum discharge during year, 101 cfs Dec. 15 (gage height, 3.22 ft), from rating curve extended above 40 cfs by logarithmic plotting; minimum recorded, 8.3 cfs Nov. 11, 13, 14, 15, 16 (gage height, 1.24 ft).

1949-60: Maximum discharge, 204 cfs Feb. 9, 1951 (gage height, 4.46 ft, datum then in use); minimum recorded, 8.0 cfs Dec. 17-21, 1952, Sept. 29, Oct. 4, 5, 1958; minimum gage height recorded, 1.07 ft Sept. 29, Oct. 4, 5, 1958, datum then in use.

Remarks.--Records good except those for periods of no gage-height record and those above 50 cfs, which are fair. Some diversion for irrigation and domestic use. No regulation.

Revisions.--WSP 1216: Drainage area.

Rating tables, Nov. 1, 1959, to Sept. 30, 1960 (gage height, in feet, and discharge, in cubic feet per second)

Nov. 1 to Mar. 29		Mar. 30 to Sept. 30	
1.24	8.3	1.3	14
1.3	9.7	1.7	24
1.6	18	2.1	37
2.1	36	2.5	56
2.7	68		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		10	18	25	41	34	46	35	29	20	18	16.5
2		9.5	17.5	24	44	34	43	35	28	19.5	18	*16.5
3		9.2	17.5	24	46	34	41	34	28	19.5	17.5	16.5
4		8.8	17.5	23	42	34	*39	34	28	20	17.5	17
5		8.8	17	23	40	34	39	33	27	19.5	17.5	16.5
6		8.8	17	23	46	35	37	35	27	19.5	17.5	16.5
7		8.8	17	23	56	36	37	*34	26	19.5	17	16
8		8.8	16	22	55	38	37	33	*26	19	17	16
9		8.5	16	22	53	39	36	32	26	19.5	17	16
10		8.5	17	22	48	40	35	33	26	19	*17	16
11		8.3	21	22	46	37	36	34	26	19	17	15
12		8.5	27	21	46	36	35	34	25	19	17	15
13		*8.3	22	21	46	36	35	33	24	19	17	14.5
14		8.3	27	20	54	38	41	32	25	19	17	14.5
15	†9.5	8.3	66	21	54	42	49	31	25	18.5	17	14.5
16		8.3	48	21	48	48	41	31	24	18.5	17	15
17		11	37	21	46	46	39	31	24	18.5	17	15
18		13	34	21	44	42	39	30	23	18.5	16	15
19		13.5	32	21	42	38	41	31	23	18	16.5	14.5
20		32	33	*21	42	37	48	33	23	18	16	14.5
21		*48	31	21	42	39	45	31	23	18.5	17.5	14.5
22		37	30	21	41	40	42	31	22	18.5	17	14.5
23		36	*29	27	41	39	40	30	22	18	17.5	15
24		23	31	34	*40	37	39	31	22	18	17.5	15
25		19	30	43	38	36	39	31	21	18	17.5	15
26		19	28	37	37	35	39	31	21	18	17.5	14.5
27		19	28	33	36	35	38	30	20	18	17	14
28		18.5	27	34	35	37	37	30	20	18	17	14.5
29		19	26	63	34	44	37	29	20	18	17	15
30		18.5	26	50	------	52	36	30	20	18	17	14.5
31		------	26	42	------	50	------	30	------	18	16.5	------
Total	—	466.2	829.5	846	1,283	1,202	1,186	992	724	530.0	530.5	457.5
Mean	21	15.5	26.8	27.3	44.2	38.8	39.5	32.0	24.1	18.7	17.1	15.3
Cfsm	0.864	0.638	1.10	1.12	1.82	1.60	1.63	1.32	0.992	0.770	0.704	0.630
In.	1.00	0.71	1.27	1.29	1.96	1.84	1.82	1.52	1.11	0.89	0.81	0.70
Ac-ft	1,290	925	1,650	1,680	2,540	2,380	2,350	1,970	1,440	1,150	1,050	907

Calendar year 1959: Max 66 Min - Mean 24.5 Cfsm 1.01 In. 13.69 Ac-ft 17,750
Water year 1959-60: Max 66 Min 8.3 Mean 26.6 Cfsm 1.09 In. 14.92 Ac-ft 19,330

* Discharge measurement made on this day.
† Result of discharge measurement.
Note.--No gage-height record Oct. 1 to Nov. 2, Jan. 14-19, Feb. 23 to Apr. 3; discharge estimated on basis of 2 discharge measurements, recorded range in stage, and records for Deschutes River near Olympia.

815. McAllister Springs near Olympia, Wash.

Location.--Lat 47°01'45", long 122°43'25", in SE¼ sec.19, T.18 N., R.1 E., on right side of stilling pool just above city of Olympia control gates, 8 miles east of Olympia.

Records available.--March 1951 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is about mean sea level. Auxiliary water-stage recorder 30 ft downstream from base gage.

Average discharge.--9 years, 24.0 cfs (17,380 acre-ft per year), unadjusted.

Extremes.--Maximum daily discharge during year, 29 cfs Mar. 16; minimum daily, 12.5 cfs Aug. 9.
1951-60: Maximum daily discharge, 46 cfs Jan. 26, 1956; minimum daily, that of Aug. 9, 1960.

Remarks.--Records fair. City of Olympia diverts 1.2 to 11.6 cfs daily, an average of 4.3 cfs per day, just above station. Gage pool regulated by low dam and flashboards. Backwater from tides occurs daily.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17.5	19	20	21	20	25	25	26	24	23	19.5	16
2	18	18	20	22	20	25	25	26	24	21	18.5	*16.5
3	17	16.5	20	22	21	25	26	25	24	21	18	17
4	16.5	18.5	20	22	22	25	26	25	24	21	18	15.5
5	16.5	19	20	22	23	26	*26	24	23	19	17.5	15.5
6	16.5	20	19	23	23	26	25	25	22	17.5	16	15.5
7	17.5	20	*17.5	22	23	26	25	25	21	16.5	15.5	16
8	17.5	20	18	23	20	27	26	24	20	17	14	16.5
9	18	20	18	24	20	25	25	24	18.5	16.5	12.5	16.5
10	19	20	18	22	21	26	24	23	18	17.5	13.5	17.5
11	18.5	20	18	*22	23	26	28	22	21	17	16	17
12	18.5	20	18	25	22	25	28	21	20	16.5	17.5	18.5
13	18	20	18	21	23	24	23	22	20	18	18	18.5
14	18	20	18.5	21	22	24	22	23	22	18.5	18.5	19
15	17.5	19	19.5	19	23	24	23	24	22	*17.5	18.5	18.5
16	18.5	19.5	22	22	23	29	24	24	22	18.5	19.5	18.5
17	18	19	21	22	24	28	26	24	22	19	19	18.5
18	17.5	18.5	21	22	23	27	25	24	22	19	18.5	18.5
19	18	20	21	22	25	25	24	24	23	18	17.5	18
20	18.5	18.5	22	22	25	26	23	25	23	18.5	17	16.5
21	19	18.5	22	22	25	25	24	24	23	17.5	18.5	16.5
22	19	18	21	21	26	25	24	24	22	18	17	16.5
23	20	20	22	21	25	25	23	24	*21	19	17.5	16.5
24	19.5	20	21	21	24	25	24	23	21	18.5	17.5	16.5
25	19.5	20	23	20	24	25	24	23	21	17	17	17
26	19	20	22	20	*24	24	23	23	21	16.5	18.5	17.5
27	*19.5	20	22	19	24	23	23	23	20	16.5	17.5	18
28	19	20	20	18.5	25	24	24	25	20	17	18	18.5
29	19	20	21	17	25	23	24	24	20	16.5	18.5	17.5
30	19	20	20	18	-------	22	25	24	20	18	18.5	17.5
31	18.5	-------	19.5	20	-------	24	-------	24	-------	18	17.5	-------
Total	566.0	582.0	623.0	658.5	668	779	737	741	644.5	563.0	539.0	516.0
Mean	18.3	19.4	20.1	21.2	23.0	25.1	24.6	23.9	21.5	18.2	17.4	17.2
Ac-ft	1,120	1,150	1,240	1,310	1,320	1,550	1,460	1,470	1,280	1,120	1,070	1,020

Adjusted for diversion by city of Olympia

Mean Cfsm In. Ac-ft	22.0	22.9	23.6	24.8	26.5	28.7	28.3	27.6	26.4	26.0	22.9	21.2

Observed

Calendar year 1959: Max 28 Min 14 Mean 20.7 Ac-ft 14,990
Water year 1959-60: Max 29 Min 12.5 Mean 20.8 Ac-ft 15,110

Adjusted

Calendar year 1959: Mean 24.7 Cfsm In. Ac-ft
Water year 1959-60: Mean 25.1 Cfsm In. Ac-ft

* Discharge measurement made on this day.
Note.--No auxiliary gage-height record Nov. 25 to Dec. 13, Jan. 24-27; discharge estimated.

825. Nisqually River near National, Wash.

Location.--Lat 46°45'10", long 122°05'00", in SW¼SW¼ sec.29, T.15 N., R.6 E., on right bank 100 ft downstream from railroad bridge, 1 mile west of National, 2½ miles west of Ashford, and 3 miles upstream from Mineral Creek.

Drainage area.--133 sq mi.

Records available.--May 1942 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,450 ft (from river-profile map).

Average discharge.--18 years, 775 cfs (561,100 acre-ft per year).

Extremes.--Maximum discharge during year, 10,900 cfs Nov. 23 (gage height, 11.77 ft), from rating curve extended above 5,900 cfs on basis of slope-area measurement at gage height 11.86 ft; minimum, 243 cfs Jan. 18 (gage height, 3.40 ft).

1942-60: Maximum discharge, that of Nov. 23, 1959; minimum, 108 cfs Dec. 1, 3, 1952 (gage height, 2.76 ft).

Revisions.--The figures of maximum discharge for some water years have been revised as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Water year	Date	Discharge (cfs)	Gage height (feet)
982, 1316	1943	Nov. 23, 1942	7,500	9.93
1316	1947	Dec. 11, 1946	8,100	10.34
1316	1950	Nov. 27, 1949	7,310	9.60
1216	1951	Feb. 11, 1951	6,050	8.75
1446	1956	Dec. 12, 1955	7,470	9.77

Remarks.--Records good except those for periods of no gage-height record, which are fair. Small diversion for domestic use. Slight regulation at low water by powerplant of Mount Rainier National Park on Paradise River. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1286: 1947(P), 1950(M). Revised figures of discharge, in cubic feet per second, for the water years 1947, 1950-52, superseding those published in WSP 1092, 1182, 1216, 1246, and 1316, are given herewith:

1949
Nov. 27..... 5,000

1951
Feb. 9..... 4,490

1951-Con.
Feb. 10..... 4,780
11..... 5,450

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
November 1949.....	29,368	5,000	299	979	7.36	8.21	58,250
Calendar year 1949.....	-	5,000	210	788	5.92	80.41	570,400
Water year 1949-50.....	-	5,000	270	913	6.86	93.19	661,000
February 1951.....	37,910	5,450	408	1,354	10.2	10.60	75,190
Water year 1950-51.....	-	5,450	255	853	6.41	87.05	617,400
Calendar year 1951.....	-	5,450	255	728	5.47	74.27	526,800

Revised peak discharge.--1946-47: Oct. 25 (10:30 a.m.) 5,100 cfs; Dec. 11 (1 p.m.) 8,100 cfs.

825. Nisqually River near National, Wash.--Continued

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22				Nov. 22 to Sept. 30			
4.0	430	6.0	1,960	3.4	250	7.0	3,650
4.5	680	7.0	3,250	4.0	535	8.0	5,150
5.0	1,010	8.0	4,800	5.0	1,250	10.0	8,150
				6.0	2,300		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	630	856	695	366	895	308	1,020	865	1,430	808	663	420
2	600	821	682	362	880	290	1,000	902	1,590	696	574	385
3	575	842	602	348	780	282	1,030	865	1,730	760	535	395
4	550	884	540	344	689	290	1,060	815	1,660	787	524	584
5	515	877	502	340	728	308	1,170	760	1,440	872	562	574
6	475	849	496	*371	992	335	1,260	902	1,390	978	590	530
7	457	828	491	358	2,320	335	1,380	1,460	1,150	1,080	638	470
8	654	814	450	340	1,680	376	1,480	1,230	1,010	1,020	748	440
9	*1,110	807	435	326	1,330	335	1,380	1,060	992	858	696	420
10	912	776	445	317	1,080	322	1,090	1,140	1,020	780	670	440
11	2,240	764	590	317	918	308	978	1,440	1,050	728	638	420
12	*1,880	758	748	308	858	304	888	1,740	1,030	722	568	470
13	1,430	752	632	299	787	308	836	1,380	1,050	829	530	500
14	1,130	734	1,200	294	850	304	880	1,150	1,210	829	465	560
15	989	734	*3,860	290	925	371	815	992	1,320	808	*420	500
16	814	734	2,600	294	801	362	722	1,020	1,570	808	435	450
17	716	740	1,650	282	696	344	715	*1,020	1,220	918	530	420
18	652	*849	1,240	270	596	395	650	1,020	940	1,030	620	400
19	610	1,020	992	274	546	415	689	1,080	880	1,010	596	450
20	800	2,790	843	274	513	562	962	2,160	*836	888	518	*435
21	849	4,540	734	266	496	829	910	1,850	760	760	491	405
22	*4,120	5,940	632	266	455	1,010	787	1,410	722	670	390	362
23	*2,870	*7,220	584	308	430	1,060	734	1,140	794	602	415	425
24	2,140	*4,140	574	410	415	1,040	682	1,030	902	574	470	550
25	1,870	2,960	546	405	395	1,090	614	955	880	590	425	715
26	1,310	1,930	502	*475	362	1,200	596	992	801	676	568	535
27	1,070	1,360	470	430	*344	1,190	632	1,130	822	836	535	480
28	1,040	1,080	450	567	322	1,110	722	1,060	843	780	445	486
29	968	850	430	1,610	312	1,270	767	1,060	858	734	415	455
30	926	*760	425	1,340	------	*1,370	815	1,320	850	748	405	435
31	891	------	400	1,030	------	1,160	------	1,600	------	734	415	------
Total	35,793	49,009	25,440	13,481	22,395	19,183	27,264	36,548	32,750	24,913	16,494	14,111
Mean	1,155	1,634	821	435	772	619	909	1,179	1,092	804	532	470
Cfsm	8.68	12.3	6.17	3.27	5.80	4.65	6.83	8.86	8.21	6.05	4.00	3.53
In.	10.01	13.70	7.11	3.77	6.26	5.36	7.62	10.22	9.16	6.97	4.61	3.95
Ac-ft	70,990	97,210	50,460	26,740	44,420	38,050	54,080	72,490	64,960	49,410	32,720	27,990

Calendar year 1959: Max 7,220 Min 345 Mean 881 Cfsm 6.62 In. 89.88 Ac-ft 637,600
Water year 1959-60: Max 7,220 Min 266 Mean 867 Cfsm 6.52 In. 88.74 Ac-ft 629,500

Peak discharge (base, 2,600 cfs).--Oct. 11 (8 a.m.) 3,170 cfs (6.94 ft); Oct. 22 (3:30 p.m.) 6,900 cfs (9.16 ft); Nov. 21 (12:30 a.m.) 6,110 cfs (8.74 ft); Nov. 23 (2 a.m.) 10,900 cfs (11.77 ft); Dec. 15 (6:30 p.m.) 4,540 cfs (7.57 ft); Feb. 7 (2 to 3 a.m.) 2,930 cfs (6.50 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 27 to Dec. 1, Sept. 6-19; discharge estimated on basis of recorded range in stage, 1 discharge measurement, and records for nearby stations.

830. Mineral Creek near Mineral, Wash.

Location.--Lat 46°44'20", long 122°08'40", in SW¼ sec.35, T.15 N., R.5 E., on right bank three-eighths of a mile downstream from railroad bridge, 1 mile upstream from mouth, and 2½ miles northeast of Mineral.

Drainage area.--74.3 sq mi.

Records available.--June 1942 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,340 ft (from topographic map).

Average discharge.--18 years, 378 cfs (273,700 acre-ft per year).

Extremes.--Maximum discharge during year, 4,880 cfs Nov. 20 (gage height, 7.60 ft); minimum, 24 cfs Aug. 9, 10; minimum gage height, 2.64 ft Oct. 6, 8.
1942-60: Maximum discharge, 7,600 cfs Dec. 9, 1953 (gage height, 9.02 ft), from rating curve extended above 3,400 cfs; minimum, 19.5 cfs Sept. 22, 23, Oct. 6-10, 13, 14, 1952; minimum gage height, 1.40 ft Sept. 22, 23, 1950.

Remarks.--Records good except those for periods of shifting-control, which are fair, and those for period of doubtful gage-height record, which are poor. No regulation or diversion above station.

Revisions.--WSP 1246: Drainage area.

Rating tables, water year 1959-60, except periods of doubtful gage-height record or shifting control (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 20				Nov. 21 to Sept. 30			
2.6	107	4.0	650	3.15	24	4.4	700
3.0	215	5.0	1,330	3.3	62	5.0	1,240
3.5	405	6.0	2,340	3.5	134	6.0	2,390
				3.9	342	7.0	3,820

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	173	245	d360	193	582	183	888	495	366	126	39	107
2	155	227	d340	188	626	179	789	495	348	118	39	96
3	140	312	d320	183	568	174	716	480	336	110	37	88
4	130	276	d290	179	473	174	668	473	312	103	37	126
5	123	245	d270	164	509	193	636	447	289	92	34	183
6	121	224	d250	*169	941	228	598	531	272	88	32	152
7	125	212	d250	160	2,300	243	590	780	254	84	30	126
8	252	197	d240	156	1,570	283	560	644	238	82	28	110
9	*610	185	d220	152	1,130	249	487	538	223	78	26	92
10	430	173	d270	156	870	233	414	509	213	78	24	88
11	977	161	d390	156	636	223	393	509	203	74	26	84
12	*914	152	676	156	590	223	366	516	188	71	26	78
13	645	142	379	156	590	223	372	487	179	68	26	74
14	500	138	619	160	884	228	466	453	193	65	30	71
15	405	140	3,420	160	1,160	379	453	414	160	62	*50	62
16	324	130	2,240	160	756	312	400	453	243	59	47	59
17	280	203	1,210	156	531	318	407	*495	213	59	53	56
18	245	*590	798	152	420	318	414	523	188	56	44	53
19	221	782	560	156	354	348	487	545	193	56	42	53
20	458	2,050	447	160	330	473	1,210	1,380	*223	53	37	*53
21	505	3,340	354	164	312	644	978	1,200	198	50	42	47
22	785	2,660	301	169	289	724	628	870	179	47	59	47
23	830	3,080	289	218	266	692	480	620	174	47	84	56
24	710	d2,000	301	386	254	644	466	516	169	47	193	62
25	635	d1,600	283	379	243	660	487	466	160	44	223	62
26	535	d1,100	249	*582	233	692	473	440	156	44	289	53
27	460	d800	238	460	*213	628	480	460	142	47	223	44
28	414	d600	233	569	198	620	495	427	138	44	169	42
29	360	d500	223	1,540	188	1,020	495	400	134	42	134	39
30	308	d420	213	1,070	------	*1,370	487	393	130	42	126	39
31	273	------	203	732	------	1,070	------	400	------	44	110	------
Total	13,043	22,884	16,436	9,541	18,018	13,948	16,783	17,359	6,414	2,080	2,359	2,302
Mean	421	763	530	308	621	450	559	560	214	67.1	76.1	76.7
Cfsm	5.67	10.3	7.13	4.15	8.36	6.06	7.52	7.54	2.88	0.903	1.02	1.03
In.	6.53	11.45	8.23	4.78	9.02	6.98	8.40	8.69	3.21	1.04	1.18	1.15
Ac-ft	25,870	45,390	32,600	18,920	35,740	27,670	33,290	34,430	12,720	4,130	4,680	4,570

Calendar year 1959: Max 3,450 Min 30 Mean 413 Cfsm 5.56 In. 75.53 Ac-ft 299,300
Water year 1959-60: Max 3,420 Min 24 Mean 386 Cfsm 5.20 In. 70.66 Ac-ft 280,000

Peak discharge (base, 2,700 cfs).--Nov. 20 (9:30 p.m.) 4,880 cfs (7.60 ft); Nov. 23 (4:30 a.m.) 3,770 cfs (6.97 ft); Dec. 15 (5 p.m.) 3,880 cfs (6.99 ft); Feb. 7 (1 a.m.) 2,830 cfs (6.18 ft).

* Discharge measurement made on this day.
d Doubtful gage-height record; discharge estimated on basis of records for nearby stations.
Note.--Shifting-control method used Dec. 15 to Feb. 9, Apr. 20 to May 20.

850. Alder Reservoir at Alder, Wash.

Location.--Lat 46°48'05", long 122°18'30", in NW¼ sec.9, T.15 N., R.4 E., near left end of Alder Dam on Nisqually River, 1 mile west of Alder and 4½ miles upstream from Mashel River.

Drainage area.--286 sq mi.

Records available.--November 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 7.61 ft below mean sea level, datum of 1929 (levels by city of Tacoma). Prior to July 8, 1946, staff gage at same site and datum.

Extremes.--Maximum contents during year, 232,700 acre-ft Aug. 1, 2; maximum gage height, 1,207.30 ft Aug. 1; minimum contents, 132,900 acre-ft Mar. 20 (gage height, 1,168.63 ft). 1944-60: Maximum contents, that of Aug. 1, 2, 1960; minimum observed since reservoir first filled, 93,990 acre-ft Feb. 16, 1949 (gage height, 1,147.61 ft).

Remarks.--Reservoir is formed by concrete-arch dam; storage began Nov. 7, 1944; dam completed in 1945. Capacity, 99,170 acre-ft between gage heights 1,114 (lower limit of operating range) and 1,177 ft (gage height of spillway). Water can be controlled by spillway gates to gage height 1,207 ft, usable capacity, 179,600 acre-ft. Dead storage, 52,100 acre-ft. Figures given herein represent total contents. Water is used by city of Tacoma for power production.

Capacity table, water year 1959-60 (gage height, in feet, and contents, in acre-feet)
(Prepared by city of Tacoma from project surveys and maps)

1,170	135,800	1,200	210,800
1,180	158,300	1,207.2	232,400
1,190	183,300		

Contents, in acre-feet, at 12 p.m., water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	213,700	221,400	216,400	200,400	160,400	168,500	169,700	193,900	226,800	223,500	232,400	209,700
2	212,600	219,600	214,900	198,100	161,300	166,000	171,800	193,900	227,100	222,900	231,700	209,100
3	211,400	219,000	213,700	195,200	161,800	163,000	174,300	193,600	227,400	223,200	231,100	208,500
4	210,600	217,800	211,400	192,100	161,600	160,600	175,900	193,400	227,700	223,500	230,500	208,500
5	209,100	216,600	209,400	189,700	161,600	158,500	177,400	192,600	227,400	224,100	229,300	209,100
6	207,100	214,300	208,200	187,600	164,200	156,400	178,900	192,900	226,800	225,000	227,400	208,800
7	205,000	212,300	206,200	185,800	175,100	154,500	180,700	195,200	226,200	226,200	226,500	208,200
8	203,900	210,300	204,200	183,500	180,700	153,100	182,500	197,200	225,300	227,100	226,500	207,600
9	205,000	208,200	202,100	181,500	184,300	150,800	183,500	197,800	224,400	227,400	226,200	206,800
10	205,300	206,200	200,100	178,700	186,600	149,000	184,300	198,600	224,100	227,700	225,900	206,500
11	210,800	204,200	200,700	176,400	187,600	146,200	184,300	199,800	225,000	228,000	225,900	206,200
12	214,900	202,100	203,900	173,600	187,900	143,700	183,800	202,100	225,900	228,600	225,000	205,600
13	216,400	198,900	205,300	170,800	189,700	141,800	183,300	204,200	225,900	229,000	223,800	205,000
14	216,900	196,300	205,600	168,000	192,600	139,600	183,800	205,900	225,900	229,600	222,000	204,400
15	216,900	194,200	214,300	165,500	195,200	138,500	183,800	207,400	226,200	230,200	219,600	202,100
16	216,100	191,300	215,200	163,000	195,800	137,000	183,800	207,900	227,400	230,500	217,500	201,600
17	215,500	189,400	215,500	160,400	195,500	135,800	183,800	209,400	227,700	230,800	215,500	200,700
18	214,600	190,000	216,600	157,100	194,700	134,100	183,800	210,600	228,300	231,700	213,700	200,100
19	213,200	191,500	216,900	154,500	193,600	133,100	184,300	211,700	229,000	231,700	213,400	199,500
20	212,900	201,800	217,500	152,200	192,300	133,500	188,100	218,100	227,700	231,400	212,600	198,600
21	212,900	217,800	216,600	149,400	190,700	135,000	190,500	223,200	227,100	231,400	211,700	197,500
22	219,300	224,100	215,500	147,200	189,200	136,600	191,000	226,200	226,200	231,100	211,100	196,600
23	224,700	225,600	214,000	145,600	187,100	138,300	191,500	226,800	225,900	231,700	210,600	196,000
24	226,200	222,600	213,200	146,500	184,800	140,200	191,500	227,100	225,600	230,800	210,600	196,900
25	224,700	221,400	212,900	146,000	182,200	142,600	191,300	226,800	225,900	230,500	210,800	197,800
26	225,000	224,400	211,700	146,200	179,700	146,000	190,700	226,500	225,300	230,800	211,400	197,800
27	225,000	222,300	210,300	146,200	176,900	149,400	190,000	227,100	225,000	231,400	211,400	197,500
28	224,700	219,300	208,500	146,700	174,600	152,200	190,200	227,100	224,700	231,400	211,400	195,500
29	224,100	219,000	206,500	153,400	171,300	157,800	190,500	226,500	224,400	231,700	210,800	193,400
30	222,900	217,500	204,700	157,600	-------	163,500	192,100	226,500	223,800	232,000	210,600	191,300
31	222,300	-------	203,000	159,900	-------	167,500	-------	226,800	-------	232,400	210,300	-------
(†)	1,203.87	1,202.31	1,197.31	1,180.69	1,185.29	1,183.78	1,193.43	1,205.40	1,204.39	1,207.17	1,199.82	1,193.10
(‡)	+7,400	-4,800	-14,500	-43,100	+11,400	-3,800	+24,600	+34,700	-3,000	+8,600	-22,100	-19,000

Calendar year 1959..... ‡ -25,600
Water year 1959-60..... ‡ -23,600

† Gage height, in feet, at end of month.
‡ Change in contents, in acre-feet.

855. La Grande Reservoir at La Grande, Wash.

Location.--Lat 46°49'20", long 122°18'10", in SE¼ sec.33, T.16 N., R.4 E., at left end of gate control structure, 1 mile southeast of La Grande and 1½ miles downstream from Alder Dam.

Drainage area.--289 sq mi.

Records available.--January 1945 to September 1960. January 1945 to September 1951 included in combined adjustment to monthly flow of Nisqually River at La Grande. Month-end contents January 1945 to September 1950, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 7.61 ft below mean sea level, datum of 1929 (levels by city of Tacoma). Prior to June 12, 1947, month-end gage heights furnished by city of Tacoma from temporary gages in pool above dam.

Extremes.--Maximum contents during year, 2,666 acre-ft July 29 (gage height, 934.7 ft); minimum, 1,906 acre-ft June 17 (gage height, 918.4 ft).
1947-60: Maximum contents, 2,760 acre-ft May 14, 1950 (gage height, 936.4 ft); minimum observed (since reservoir first filled), 1,370 acre-ft Aug. 24, 1956 (gage height, 900.0 ft).

Remarks.--Reservoir is formed by concrete arch dam completed in 1944; storage began in February 1945. Usable storage, 1,050 acre-ft between gage heights 910 (minimum practical head) and 935 ft (normal reservoir level). Dead storage, 1,630 acre-ft. Figures given herein represent total contents. Water used by city of Tacoma for power production.

Month-end gage height and contents, water year October 1959 to September 1960

Date	Gage height (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	931.2	2,478	-
Oct. 31	932.5	2,546	+68
Nov. 30	928.3	2,333	-213
Dec. 31	931.7	2,504	+171
Calendar year 1959	-	-	+281
Jan. 31	928.4	2,338	-166
Feb. 29	933.3	2,589	+251
Mar. 31	931.2	2,478	-111
Apr. 30	929.0	2,367	-111
May 31	929.3	2,382	+15
June 30	931.2	2,478	+96
July 31	934.3	2,644	+166
Aug. 31	929.9	2,412	-232
Sept.30	932.9	2,568	+156
Water year 1959-60	-	-	+90

† Gage height at 12 p.m.

865. Nisqually River at La Grande, Wash.

Location.--Lat 46°50'30", long 122°19'35", in SE¼ sec.29, T.16 N., R.4 E., on right bank half a mile downstream from city of Tacoma powerplant, half a mile northwest of La Grande, and three-quarters of a mile upstream from Mashel River.

Drainage area.--292 sq mi.

Records available.--September 1906 to October 1911, November and December 1911 (gage heights only), October 1919 to September 1931, October 1943 to September 1960. Monthly discharge only for some periods, published in WSP 1316. Published as "below Little Nisqually River, near La Grande" 1906-10, and as "near La Grande" 1912, 1919-31.

Gage.--Water-stage recorder. Altitude of gage is 490 ft (from river-profile map). Sept. 5, 1906, to Sept. 8, 1910, staff gage just below site of diversion dam 4 miles upstream at different datum. January 1910 to December 1911 staff gage at La Grande powerhouse site; datum at mean sea level (levels by city of Tacoma). January 1920 to September 1931 water-stage recorder at approximately same site as that of first staff gage at datum 921.17 ft above mean sea level (levels by city of Tacoma). Dec. 7, 1943, to Feb. 8, 1945, water-stage recorder 600 ft downstream from La Grande powerhouse at different datum.

Average discharge.--34 years, 1,395 cfs (1,010,000 acre-ft per year), adjusted for storage.

Extremes.--Maximum discharge during year, 20,700 cfs Nov. 23 (gage height, 9.68 ft); minimum, 408 cfs Oct. 24; minimum gage height, 2.86 ft July 26; minimum daily, 540 cfs Sept. 25.

1906-11, 1919-31, 1943-60: Maximum discharge, that of Nov. 23, 1959; practically no flow on many occasions at site near La Grande as result of regulation.

Remarks.--Records good except those below 600 cfs, which are fair. Flow regulated by city of Tacoma powerplant at La Grande since December 1943, by Alder Reservoir (see p. 69) since November 1944, and by La Grande Reservoir (see preceding page) since February 1945. All diversions returned to river above gage.

Revisions (water years).--WSP 1216: Drainage area. WSP 1316: 1927-28(M), 1949-50.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,510	1,590	1,910	1,910	1,690	1,890	1,470	936	2,050	1,180	894	848
2	1,520	1,850	1,960	1,860	1,750	1,820	1,480	1,660	2,040	1,140	920	992
3	1,340	1,780	1,970	2,000	1,720	1,890	1,160	*1,720	2,050	1,010	964	815
4	1,270	1,770	2,000	2,120	1,800	1,800	1,440	1,750	2,050	666	994	919
5	*1,490	1,830	1,920	1,930	1,710	1,710	1,610	1,740	2,050	830	1,380	672
6	1,740	1,970	1,600	1,780	1,320	1,770	1,440	1,670	*2,050	817	1,440	862
7	1,680	2,000	1,910	1,760	966	1,810	1,460	1,580	1,900	660	1,240	919
8	1,650	1,880	1,830	1,730	1,680	1,740	1,570	1,450	1,860	690	882	890
9	1,630	1,800	1,830	1,650	1,640	1,910	1,600	1,620	1,780	970	991	961
10	1,520	*1,820	1,900	1,770	1,710	1,930	1,440	1,630	1,410	808	1,040	881
11	1,430	1,790	1,340	1,820	1,770	1,880	1,640	1,600	1,040	691	879	816
12	1,710	1,830	1,260	1,810	1,910	1,840	1,740	1,610	882	698	1,200	1,010
13	1,750	2,150	1,420	1,750	1,380	1,670	1,690	1,260	1,360	719	1,310	988
14	1,780	1,870	2,380	1,790	1,280	1,840	1,750	1,000	1,620	738	1,390	1,100
15	1,620	1,950	5,130	1,700	1,920	1,900	1,820	1,060	1,390	692	1,650	1,560
16	1,790	2,100	5,740	1,750	2,090	1,870	1,600	1,380	1,490	824	1,570	1,080
17	1,610	1,900	3,540	1,730	2,040	1,720	1,600	1,400	1,300	824	1,510	920
18	1,480	1,850	2,160	1,940	1,890	1,800	1,580	1,370	952	792	1,590	883
19	1,790	1,860	1,860	1,730	1,900	1,710	1,590	1,620	1,050	1,140	1,020	904
20	1,780	1,850	1,680	1,670	1,900	1,360	1,710	1,650	1,720	1,140	1,080	983
21	1,730	2,960	*2,030	1,570	1,870	1,560	1,740	1,550	1,480	924	1,140	996
22	1,770	7,310	2,050	1,600	1,860	1,680	1,730	1,560	1,340	1,010	868	932
23	1,760	14,000	1,990	1,420	*1,950	1,670	1,610	2,050	1,240	706	830	834
24	2,670	*9,490	1,830	1,010	1,980	1,280	1,540	2,080	1,320	872	810	546
25	4,320	6,530	1,420	1,610	2,010	*1,290	1,610	2,050	1,100	859	801	540
26	2,190	2,120	1,740	1,610	2,090	1,020	1,690	2,100	1,160	743	840	726
27	1,940	3,630	1,770	1,610	2,060	790	1,690	1,560	1,340	745	830	792
28	1,900	3,720	1,760	1,640	1,730	1,030	1,380	2,050	1,160	880	830	1,540
29	1,940	2,120	1,790	1,680	2,010	1,060	1,620	2,040	1,240	800	860	1,560
30	1,770	2,090	1,770	1,340	-------	1,340	885	2,050	1,280	742	*793	1,600
31	1,610	-------	1,740	1,340	-------	1,370	-------	2,070	-------	737	834	-------
Total	55,690	91,410	65,230	52,630	51,626	49,950	46,885	50,866	44,704	26,047	33,380	29,089
Mean	1,796	3,047	2,104	1,698	1,780	1,611	1,563	1,641	1,490	840	1,077	970
Ac-ft	110,500	181,300	129,400	104,400	102,400	99,070	93,000	100,900	88,670	51,660	66,210	57,700
(†)	+7,470	-5,010	-14,330	-43,270	+11,650	-3,910	+24,490	+34,720	-2,900	+8,770	-22,330	-18,840

Adjusted for change in reservoir contents

Mean	1,919	2,963	1,872	994	1,982	1,548	1,975	2,205	1,441	983	714	653
Cfsm	6.57	10.1	6.41	3.40	6.79	5.30	6.76	7.55	4.93	3.37	2.45	2.24
In.	7.58	11.32	7.39	3.93	7.32	6.11	7.54	8.71	5.51	3.88	2.82	2.50
Ac-ft	118,000	176,300	115,100	61,130	114,000	95,160	117,500	135,600	85,770	60,430	43,880	38,860

Observed

Calendar year 1959: Max 14,000 Min 524 Mean 1,828 Ac-ft 1,323,000
Water year 1959-60: Max 14,000 Min 540 Mean 1,633 Ac-ft 1,185,000

Adjusted

Calendar year 1959: Mean 1,793 Cfsm 6.14 In. 83.34 Ac-ft 1,298,000
Water year 1959-60: Mean 1,599 Cfsm 5.48 In. 74.61 Ac-ft 1,161,000

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Alder and La Grande Reservoirs.

880. Chop Creek near Eatonville, Wash.

Location.--Lat 46°52'50", long 122°16'45", in SE¼ sec.10, T.16 N., R.4 E., on left bank 400 ft downstream from Lynch Creek, 600 ft downstream from outlet of Chop Lake, and 1 mile northwest of Eatonville.

Drainage area.--35.5 sq mi.

Records available.--June 1927 to September 1932, September 1941 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 519.8 ft above mean sea level (stadia traverse). June 1, 1927, to Sept. 30, 1932, water-stage recorder at same site at datum 2.79 ft higher. Sept. 6, 1941, to Mar. 17, 1942, staff gage at present site and datum.

Average discharge.--24 years, 67.3 cfs (48,720 acre-ft per year).

Extremes.--Maximum discharge during year, 805 cfs Nov. 22 (gage height, 4.29 ft); minimum, 5.7 cfs Aug. 9, 10 (gage height, 1.52 ft).
1927-32, 1941-60: Maximum discharge, 1,740 cfs Dec. 9, 1953; maximum gage height, 5.97 ft Dec. 11, 1946; minimum discharge, 2.3 cfs Aug. 22, 23, 1944; minimum gage height observed, 1.12 ft Sept. 26, 1947.

Remarks.--Records good except those for period of no gage-height record, which are fair. Possible small diversions for domestic use. Natural regulation in Chop Lake.

Revisions (water years).--WSP 1246: Drainage area. WSP 1286: 1946.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 20				Nov. 21 to Sept. 30			
1.8	16.5	2.6	125	1.5	5.0	2.5	118
2.0	33	3.0	225	1.7	13.5	3.0	250
2.3	71	3.5	400	1.9	28	4.0	660
				2.1	50		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	67	70	53	85	42	129	64	87	25	8.5	21
2	22	58	80	50	*89	40	114	63	75	24	8.5	20
3	20	63	95	46	89	38	100	*58	67	22	8.2	18
4	18.5	58	75	44	77	38	87	66	60	22	8.2	32
5	*18	50	65	43	72	39	77	60	54	20	8.2	35
6	17	46	60	83	74	42	70	58	49	18.5	8.2	28
7	19.5	42	70	70	182	44	66	87	*44	18	7.8	25
8	19.5	39	65	63	158	61	61	87	40	17.5	7.8	22
9	42	36	60	57	145	69	60	72	37	17	7.1	20
10	29	*33	80	53	172	67	54	64	35	16	6.0	18.5
11	89	30	110	50	140	69	63	69	33	15.5	6.0	17.5
12	103	28	150	49	125	72	69	70	31	15	6.4	17
13	70	26	100	45	131	69	66	70	30	*13.5	6.4	17
14	54	26	180	44	136	67	82	70	36	13.5	6.4	16
15	53	27	338	43	175	135	112	64	50	13	*9.5	15
16	46	25	313	45	162	118	96	129	53	13	10.5	14
17	40	55	241	45	136	118	85	211	49	12.5	11	14
18	36	192	190	42	116	112	80	211	42	12.5	10	13.5
19	33	227	158	39	102	104	78	190	43	12	10	13.5
20	120	256	140	38	87	102	135	427	58	11	10	13.5
21	126	610	122	37	80	94	162	344	49	11	9.5	13
22	177	578	108	39	70	85	142	313	43	10.5	11	12.5
23	152	588	96	58	*64	75	131	238	39	10.5	16	13
24	154	*435	93	96	60	69	162	202	36	10	26	15
25	181	338	94	93	58	64	148	172	34	10	38	16
26	125	244	80	89	54	58	125	152	32	9.5	45	14
27	107	170	72	74	50	56	108	172	31	9.5	46	14
28	161	140	67	74	46	69	94	152	29	9.5	31	13
29	125	110	63	148	44	110	80	127	27	9.0	*26	13
30	96	85	*60	122	------	162	72	110	26	8.5	23	12.5
31	79	------	58	98	------	*131	------	102	------	8.5	22	------
Total	2,356.5	4,682	3,553	1,930	2,979	2,419	2,908	4,274	1,319	436.0	458.2	526.5
Mean	76.0	156	115	62.3	103	78.0	96.9	138	44.0	14.1	14.8	17.6
Cfsm	2.14	4.39	3.24	1.75	2.90	2.20	2.73	3.89	1.24	0.397	0.417	0.496
In.	2.47	4.90	3.72	2.02	3.12	2.53	3.05	4.48	1.38	0.46	0.48	0.55
Ac-ft	4,670	9,290	7,050	3,830	5,910	4,800	5,770	8,480	2,620	869	909	1,040

Calendar year 1959: Max 610 Min 7.5 Mean 79.4 Cfsm 2.24 In. 30.37 Ac-ft 57,520
Water year 1959-60: Max 610 Min 6.0 Mean 76.1 Cfsm 2.14 In. 29.16 Ac-ft 55,240

Peak discharge (base, 270 cfs).--Oct. 22 (3:30 p.m.) 325 cfs (3.30 ft); Oct. 24 (8:30 p.m.) 318 cfs (3.28 ft); Nov. 18 (11 p.m.) 400 cfs (3.50 ft); Nov. 21 (1 a.m.) 770 cfs (4.22 ft); Nov. 22 (6 p.m.) 805 cfs (4.29 ft); Dec. 15 (7:30 p.m.) 411 cfs (3.44 ft); May 20 (10 a.m.) 488 cfs (3.65 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 27 to Dec. 14; discharge estimated on basis of records for nearby stations.

885. Nisqually River near McKenna, Wash.

Location.--Lat 46°51'20", long 122°27'10", in SE¼ sec.20, T.16 N., R.3 E., on right bank 800 ft downstream from Elbow Creek, three-quarters of a mile upstream from Tanwax Creek, and 7.4 miles southeast of McKenna.

Drainage area.--445 sq mi.

Records available.--August 1941 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 373.6 ft above mean sea level (stadia traverse). Prior to Sept. 30, 1941, staff gage at same site and datum.

Average discharge.--19 years, 1,798 cfs (1,302,000 acre-ft per year).

Extremes.--Maximum discharge during year, 19,300 cfs Nov. 23 (gage height, 11.74 ft); minimum, 441 cfs Aug. 13 (gage height, 3.48 ft); minimum daily, 529 cfs Sept. 25.
1941-60: Maximum discharge, 20,800 cfs Dec. 12, 1955 (gage height, 12.06 ft); minimum, 85 cfs Oct. 19, 1945 (gage height, 2.57 ft); minimum daily, 176 cfs Jar. 30, 1945.

Remarks.--Records excellent. No diversion above station. Yelm Irrigation District Canal, abandoned in 1950, diverted water 3.6 miles above station. Major portion of flow regulated by Alder Reservoir and city of Tacoma powerplant at La Grande. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1286: 1947.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

3.6	499	7.0	4,250
4.0	735	8.0	6,400
5.0	1,500	9.0	9,000
6.0	2,700	11.0	16,100

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,650	1,790	2,410	2,090	2,100	2,080	2,380	1,270	2,440	1,350	950	874
2	1,550	1,960	2,410	2,070	2,270	2,030	2,240	1,940	2,400	1,180	912	1,010
3	1,420	1,960	2,520	2,190	2,280	2,100	1,880	2,090	2,380	1,140	978	863
4	1,350	2,020	2,470	2,300	2,280	2,000	2,110	2,120	2,340	722	1,020	1,110
5	1,580	1,990	2,360	2,110	2,160	1,910	2,200	2,080	2,330	923	1,440	822
6	*1,680	2,170	1,960	2,010	1,810	2,010	1,990	*2,010	2,310	797	1,550	980
7	1,730	2,160	2,360	2,040	2,210	2,070	1,980	2,120	*2,250	751	1,320	1,010
8	1,650	1,990	2,230	1,970	2,670	2,050	2,030	2,010	2,100	714	962	963
9	1,850	1,880	2,390	1,870	2,620	2,330	2,110	2,020	1,800	935	*990	1,010
10	1,680	1,900	2,260	2,040	2,510	2,310	1,840	2,020	1,400	851	1,090	940
11	1,780	1,870	2,020	1,990	2,370	2,250	2,040	2,000	1,090	748	895	817
12	2,210	*1,880	2,120	1,990	2,600	2,200	2,230	2,000	1,030	728	1,210	1,000
13	2,140	2,210	2,050	1,960	2,040	2,010	2,090	1,660	1,440	762	1,250	1,020
14	2,000	1,920	2,870	2,000	1,730	2,180	2,350	1,400	1,790	732	1,460	1,120
15	1,840	2,030	6,140	1,860	2,790	2,510	2,550	1,440	1,700	697	1,720	1,610
16	1,970	2,610	6,780	1,940	2,840	2,410	2,210	1,900	1,680	844	1,660	1,180
17	1,760	2,010	4,450	1,910	2,690	2,240	2,170	2,160	1,600	878	1,600	932
18	1,650	2,630	2,840	2,140	2,470	2,350	2,180	2,370	1,180	809	1,700	884
19	1,820	3,030	2,460	*1,920	2,340	2,270	2,210	2,420	1,170	1,180	1,140	848
20	2,010	2,850	2,160	1,800	2,280	2,010	2,690	3,440	1,950	1,260	1,050	977
21	2,360	5,320	2,450	1,730	2,300	2,180	2,830	3,110	1,800	944	1,160	1,020
22	2,690	8,070	*2,430	1,770	2,220	2,310	2,630	2,610	1,620	1,080	935	902
23	2,900	14,700	2,320	1,660	2,290	2,270	2,420	2,910	1,480	784	862	854
24	2,840	9,980	2,220	1,420	2,380	1,790	2,420	2,790	1,500	819	865	554
25	4,650	7,800	1,800	1,970	2,320	1,750	2,390	2,700	1,260	940	892	529
26	2,650	3,140	1,990	2,060	2,380	1,440	2,400	2,670	1,270	772	1,040	714
27	2,230	4,150	2,110	2,000	2,320	1,170	2,280	2,330	1,530	772	1,110	748
28	2,410	4,450	2,030	1,990	1,940	*1,510	1,910	2,540	1,280	889	984	1,550
29	2,390	2,730	2,050	2,810	2,260	2,000	2,100	2,570	1,390	824	946	1,620
30	2,070	2,660	2,020	2,210	-------	2,590	1,300	2,500	1,410	812	877	1,690
31	1,940	-------	1,930	1,950	-------	2,340	-------	2,490	-------	726	*840	-------
Total	64,450	105,860	80,610	61,770	67,470	64,680	66,160	69,690	50,920	27,363	35,408	30,151
Mean	2,079	3,529	2,600	1,993	2,327	2,086	2,205	2,248	1,697	883	1,142	1,005
Ac-ft	127,800	210,000	159,900	122,500	133,800	128,300	131,200	138,200	101,000	54,270	70,230	59,800

Calendar year 1959: Max 14,700 Min 438 Mean 2,079 Ac-ft 1,505,000
Water year 1959-60: Max 14,700 Min 529 Mean 1,980 Ac-ft 1,437,000

* Discharge measurement made on this day.

895. Nisqually River at McKenna, Wash.

Location.--Lat 46°56'00", long 122°33'35", in SE¼NW¼ sec.28, T.17 N., R.2 E., on left bank 100 ft downstream from highway bridge at McKenna and 9.0 miles downstream from Tanwax Creek.

Drainage area.--517 sq mi.

Records available.--October 1947 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 275 ft (from topographic map).

Extremes.--Maximum discharge during year, 20,500 cfs Nov. 23 (gage height, 11.78 ft), from rating curve extended above 11,000 cfs by logarithmic plotting; minimum, 37 cfs July 14, 15, Sept. 19 (gage height, 1.15 ft).
1947-60: Maximum discharge, that of Nov. 23, 1959; maximum gage height, 12.38 ft Dec. 12, 1955; minimum, that of July 14, 15, Sept. 19, 1960; minimum gage height, 0.98 ft Sept. 19, 1948.

Remarks.--Records excellent. Major portion of flow regulated by Alder Reservoir and city of Tacoma powerplants at Alder Dam and at La Grande. Centralia power canal diverts 4.4 miles above station; water is returned to river at powerplant 4.5 miles below station. Minor amount of diversion for irrigation above station.

Revisions.--WSP 1246: Drainage area.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	962	1,160	1,890	1,540	1,580	1,540	1,780	746	2,030	800	310	506
2	944	1,300	1,850	1,510	1,750	1,470	1,700	1,330	1,940	520	315	626
3	794	1,370	1,950	1,590	1,790	1,550	1,340	1,540	1,990	536	406	534
4	692	1,410	1,890	1,710	1,780	1,440	1,500	1,600	1,980	229	418	652
5	917	1,400	1,750	1,560	1,660	1,360	1,590	1,500	1,920	250	752	608
6	*1,050	1,570	1,370	1,490	1,420	1,460	1,410	1,460	1,860	248	922	554
7	1,080	1,520	1,760	1,460	1,670	1,550	1,390	1,540	1,750	201	884	676
8	989	1,360	1,650	1,400	2,110	1,570	1,420	*1,490	1,610	150	628	666
9	1,170	1,240	1,720	1,310	2,190	1,870	1,500	1,480	1,430	264	583	532
10	1,060	1,260	1,580	1,460	2,150	1,840	1,230	1,450	1,030	294	706	394
11	1,130	1,220	1,500	1,430	2,210	1,800	1,410	1,430	779	192	590	253
12	1,580	*1,230	1,610	1,440	2,130	1,710	1,570	1,440	504	121	723	542
13	1,540	1,590	1,630	1,390	1,610	1,510	1,470	1,150	772	192	872	492
14	1,380	1,280	2,140	1,420	1,310	1,630	1,720	884	1,150	142	1,080	525
15	1,200	1,420	5,510	1,310	2,350	2,030	1,960	866	1,150	136	1,270	1,000
16	1,350	1,590	6,790	1,360	2,480	1,930	1,680	1,190	1,060	221	1,330	726
17	1,440	1,390	4,360	1,330	2,270	1,740	1,560	1,540	1,050	293	*1,260	402
18	980	2,010	2,440	1,510	2,030	1,810	1,590	1,820	686	272	1,340	354
19	1,170	2,500	1,960	*1,350	1,870	1,720	1,640	1,800	550	465	862	308
20	1,290	2,240	1,640	1,260	1,830	1,520	2,080	2,870	1,280	696	696	◆424
21	1,750	4,590	1,920	1,180	1,780	1,570	2,330	2,870	1,220	310	792	492
22	1,890	6,880	*1,870	1,200	1,720	1,760	2,100	2,300	1,040	466	622	355
23	2,370	15,400	1,770	1,130	1,790	1,690	1,860	2,670	912	247	508	366
24	1,970	*10,900	1,670	968	1,780	1,300	1,870	2,420	926	256	491	141
25	4,260	8,990	1,310	1,350	1,780	1,190	1,830	2,340	678	289	520	46
26	2,070	2,930	1,400	1,600	1,850	904	1,830	2,290	622	200	680	144
27	1,660	3,500	1,570	1,500	1,790	723	1,720	2,040	944	212	800	191
28	1,790	4,330	1,460	1,420	1,410	*848	1,400	1,970	700	262	688	883
29	1,870	2,280	1,470	2,270	1,700	1,300	1,520	2,180	741	276	610	1,080
30	1,520	2,180	1,460	1,870	-------	2,090	898	2,110	784	235	*554	1,150
31	1,350	-------	1,330	1,490	-------	1,810	-------	2,080	-------	158	452	-------
Total	45,218	92,040	64,220	44,808	53,790	48,235	48,898	54,376	35,088	9,133	22,664	15,625
Mean	1,459	3,068	2,072	1,445	1,855	1,556	1,630	1,754	1,170	295	731	521
Ac-ft	89,690	182,600	127,400	88,880	106,700	95,670	96,990	107,900	69,600	18,120	44,950	30,990

Calendar year 1959: Max 15,400 Min 51 Mean 1,552 Ac-ft 1,123,000
Water year 1959-60: Max 15,400 Min 46 Mean 1,459 Ac-ft 1,059,000

* Discharge measurement made on this day.

902. Muck Creek at Roy, Wash.

Location.--Lat 47°00'20", long 122°32'30", in SW¼NW¼ sec.34, T.18 N., R.2 E., on right bank 0.3 mile downstream from Muck Lake at north edge of Roy.

Drainage area.--87.8 sq mi.

Records available.--May 1956 to September 1960.

Gage.--Staff gage read once daily. Altitude of gage is 310 ft (from topographic map).

Extremes.--Maximum discharge observed during year, 226 cfs Feb. 16 (gage height, 3.50 ft); no flow Oct. 1-5, Nov. 9-17.
1956-60: Maximum discharge observed, 351 cfs Jan. 25, 1959 (gage height, 4.16 ft); no flow for many days in each year.

Remarks.--Records fair. Some regulation in lakes above station. Small amount of diversion above station for domestic use.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

0.82	0	2.0	46
.9	.4	2.5	90
1.1	2.6	3.0	147
1.3	7.4	3.6	240
1.6	20		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	1.5	132	111	164	127	111	80	84	26	10.5	12
2	0	1.4	124	107	*162	120	109	80	78	25	10.5	11.5
3	0	1.5	118	102	172	115	107	76	73	25	10.5	10.5
4	0	1.8	113	98	174	113	102	76	69	24	10.5	10.5
5	0	1.6	107	90	162	113	75	75	67	24	10	9.8
6	*.1	1.5	102	90	157	113	53	*73	66	19.5	9.8	10
7	.2	1.3	100	90	186	115	53	78	61	16	7.8	9.8
8	.4	.8	96	90	201	120	42	76	61	29	7.4	9.2
9	.6	0	96	92	201	134	49	79	98	23	8.8	8.4
10	.8	0	96	88	201	144	49	85	78	19	8.8	7.8
11	1.3	0	98	*88	196	147	60	85	60	17	8.8	8.1
12	1.6	0	122	86	201	148	75	81	54	16	8.8	7.1
13	1.3	0	134	83	203	148	75	79	52	15	8.8	7.1
14	.9	0	134	84	209	143	75	76	31	*15	8.8	6.4
15	.6	0	155	82	213	146	92	74	38	14.5	6.8	6.1
16	.6	0	169	82	226	154	92	70	39	13.5	9.8	6.1
17	.6	0	171	80	216	148	88	68	*62	12.5	9.8	6.1
18	.6	1.8	172	77	209	146	84	70	59	21	9.8	6.1
19	.8	12	167	76	203	138	84	76	48	26	9.8	5.8
20	.9	13.5	161	75	192	132	90	79	45	23	9.8	5.8
21	1.5	42	155	73	188	126	100	89	45	19.5	14	5.8
22	2.3	88	153	73	180	119	100	101	42	17.5	14	5.8
23	1.8	94	147	90	*169	115	100	110	33	15.5	14	5.8
24	1.6	*110	142	100	165	111	124	114	40	15.5	18.5	5.8
25	3	124	142	111	156	107	91	116	37	14	28	5.8
26	1.9	137	134	134	151	102	101	116	36	13	28	5.8
27	1.6	140	129	147	143	98	122	113	33	11.5	22	5.8
28	1.8	140	124	147	135	96	87	107	31	11.5	18	5.6
29	2	140	118	155	130	*96	87	100	29	11	16	5.6
30	2	138	113	169	------	107	87	94	28	10.5	14.5	5.1
31	1.8	------	113	164	------	111	------	90	------	10.5	*13	------
Total	32.6	1,191.7	4,037	3,134	5,267	3,852	2,564	2,686	1,577	554.0	385.6	221.1
Mean	1.05	39.7	130	101	182	124	85.5	86.6	52.6	17.9	12.4	7.37
Ac-ft	65	2,360	8,010	6,220	10,450	7,640	5,090	5,330	3,130	1,100	765	439

Calendar year 1959: Max 351 Min 0 Mean 61.4 Ac-ft 44,450
Water year 1959-60: Max 226 Min 0 Mean 69.7 Ac-ft 50,600

* Discharge measurement made on this day.

910.5. Flett Creek at 74th Street, at Tacoma, Wash.

Location.--Lat 47°11'26", long 122°29'08", in SE¼ sec.25, T.20 N., R.2 E., on right bank just downstream from South 74th Street crossing in Tacoma and 3 miles upstream from mouth.

Drainage area.--5 sq mi, approximately.

Records available.--May 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 235 ft (from topographic map).

Extremes.--Maximum discharge during year, 6.5 cfs Nov. 21 (gage height, 2.34 ft); no flow for many days.
1959-60: Maximum discharge, that of Nov. 21, 1959; no flow for many days in each year.

Remarks.--Records good. No regulation or diversion above station.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

0.83	0	1.5	3.6
.9	.2	1.8	4.9
1.0	.5	2.35	6.5
1.2	1.8		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.1	0.1	1.1	0.4	0.2	0.2				
2	0	0	.1	.1	1.6	.4	.2	.2				
3	0	0	.1	.1	*2.0	.4	.2	.2				
4	0	0	.1		1.0	.4	.2	*.2				
5	0	*0	0		.7	.5	.2	.2				
6	0	0	0		1.7	.4	.2	.3				
7	0	0	*0		4.3	*.5	.2	.2				(*)
8	0	0	0	a.1	4.5	.6	.2	.2	(*)			
9	0	0	0		4.0	.6	.1	.2				
10	0	0	0		2.3	.7	.1	.2				
11	.1	0	.2		1.3	.6	.2	.2		(*)		
12	0	0	.8	.1	1.2	.5	.1	.2				
13	0	0	.5	.1	1.2	.5	*.2	.2				
14	0	0	.8	.1	2.1	.6	.4	.2				
15	0	0	4.6	*.1	2.6	1.1	.3	.1				
16	0	0	5.0	.1	1.4	.8	.2	.1				
17	0	.1	2.9	.1	.8	.6	.2	.2				
18	0	0	1.3	.1	.7	.6	.2	*.2				
19	*0	.1	.4	.1	.6	.5	.2	.3			(*)	
20	0	1.9	.3	.1	.6	.5	.6	.3				
21	0	6.4	.2	.1	.5	*.3	.7	.1	(*)			
22	0	6.2	.2	.1	.5	.3	.3	.1				
23	0	*5.8	.1	.3	*.5	.3	.2	.1				
24	0	4.3	.2	.4	.5	.3	.2	0				
25	0	2.3	.1	1.6	.5	.2	.2	0				
26	0	.7	.1	2.5	.5	.2	.2	0				
27	0	.3	.1	1.2	.4	.2	.2	0		(*)		
28	0	.2	.1	1.0	.4	.2	.2	0				
29	0	.2	.1	4.7	.4	.6	.2	0				
30	0	.2	.2	4.5	-------	.3	.2	0				
31	0	-------	.2	2.4	-------	.3	-------	0	-------			-------
Total	0.1	28.7	18.8	20.8	39.9	14.4	7.0	4.4	0	0	0	0
Mean	0.003	0.96	0.61	0.67	1.38	0.46	0.23	0.14	0	0	0	0
Ac-ft	0.2	57	37	41	79	29	14	8.7	0	0	0	0

Calendar year 1959: Max - Min - Mean - Ac-ft -
Water year 1959-60: Max 6.4 Min 0 Mean 0.37 Ac-ft 266

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage and records for nearby stations.

910.7. Flett Creek below Flett Springs, at Tacoma, Wash.

Location.--Lat 47°10'50", long 122°30'10", in NW¼ sec.36, T.20 N., R.2 E., on left bank 20 ft downstream from Flett Springs, a quarter of a mile south of city limits of Tacoma, and 1½ miles upstream from mouth.

Drainage area.--8 sq mi, approximately.

Records available.--July 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is about 230 ft (from topographic map).

Extremes.--Maximum discharge during year, 30 cfs Nov. 21 (gage height, 1.98 ft); maximum gage height, 2.14 ft Nov. 20 (backwater caused by work on control); no flow for part of Aug. 12.
1959-60: Maximum discharge, that of Nov. 21, 1959; maximum gage height, that of Nov. 20, 1959; minimum discharge, that of Aug. 12, 1960.

Remarks.--Records good. Storm sewer drainage above station. Several diversions for irrigation and industrial use.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 20		Nov. 20 to Sept. 30	
1.79	1.3	1.04	0.7
1.9	2.8	1.2	5.6
2.0	5.4	1.4	16.5
		1.7	27

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.0	1.9	8.8	11.5	16	14.5	10.5	11	6.9	4.5	1.7	2.5
2	2.0	1.9	8.8	11.5	19.5	14.5	10	11	6.4	4.5	1.9	2.5
3	2.0	2.3	8.8	11	*19	14.5	10	10.5	6.4	4.5	1.9	2.2
4	2.0	2.2	8.8	11	17.5	14.5	10	*10.5	6.4	4.5	2.2	2.5
5	2.0	*2.2	8.8	10.5	17.5	15.5	10	10.5	6.4	4.2	2.2	2.5
6	2.2	2.2	8.8	10.5	21	14	10	10.5	6.4	3.5	2.2	2.5
7	2.2	2.2	*8.4	11	26	*14	9.4	10.5	6.0	3.1	1.9	*2.5
8	*2.5	2.2	8.4	10.5	26	14.5	9.4	10	*6.0	3.5	1.4	2.5
9	2.5	2.2	8.4	10.5	25	13.5	9.4	10	6.4	3.1	.9	2.5
10	2.6	2.0	8.4	10	22	13.5	8.8	10	6.0	2.8	.7	2.5
11	4.2	2.2	9.4	10	20	13	10	10	6.0	*2.5	.9	2.5
12	2.6	2.2	13.5	10	22	13	9.4	9.4	6.0	2.8	.7	2.5
13	2.3	2.2	10	9.4	*20	12.5	*9.4	9.4	6.0	2.8	.9	2.5
14	2.2	2.2	10.5	9.4	24	12.5	*11	8.8	6.4	2.8	1.4	2.5
15	1.9	2.2	23	*9.4	23	14.5	11.5	8.8	6.4	2.8	2.2	2.5
16	*1.9	2.0	18.5	9.4	20	13.5	10	8.4	6.4	2.8	1.4	2.5
17	a2.4	4.2	15.5	8.8	19.5	13	9.4	8.8	6.0	3.1	1.2	2.5
18	a2.1	5.1	14	8.8	19	13	10	*8.4	5.6	2.8	1.2	2.5
19	*a2.3	4.5	14	8.8	18.5	12.5	10.5	8.4	5.6	2.8	*1.2	2.5
20	a2.6	*16.5	14	8.4	18	12.5	13	8.8	5.6	2.8	1.7	2.5
21	a2.6	25	13.5	8.4	18	*11.5	11.5	7.4	*5.6	2.5	2.5	2.5
22	a2.9	20	13.5	8.4	17.5	11.5	10	6.9	5.6	2.5	2.8	2.5
23	a2.6	16.5	13.5	10.5	*17	11	10.5	6.4	4.9	2.5	3.1	2.5
24	a2.6	11.5	13.5	13	17	11	11	6.0	4.9	2.5	3.5	2.5
25	a2.4	9.4	13.5	13.5	17	10.5	11	6.0	5.2	2.8	3.5	2.5
26	a2.0	7.8	13.5	14	16.5	10.5	11	6.4	5.2	2.8	3.1	2.5
27	a1.5	7.8	13.5	12.5	16.5	10.5	11	6.4	4.5	*2.4	2.8	2.5
28	1.3	7.8	13.5	13.5	16	10	11	6.4	3.8	1.7	2.8	2.5
29	1.4	7.8	13.5	23	16	12.5	11	6.4	4.2	1.4	2.5	2.2
30	1.6	8.4	13	18.5	-------	11.5	11	6.9	4.5	1.7	2.5	2.2
31	1.7	-------	12.5	16	-------	11	-------	6.9	-------	1.7	2.5	-------
Total	69.1	186.6	375.8	351.7	565.0	394.5	310.7	265.8	171.7	90.7	61.4	74.1
Mean	2.23	6.22	12.1	11.3	19.5	12.7	10.4	8.57	5.72	2.93	1.98	2.47
Ac-ft	137	370	745	698	1,120	782	616	527	341	180	122	147

Calendar year 1959: Max - Min - Mean - Ac-ft -
Water year 1959-60: Max 26 Min 0.7 Mean 7.97 Ac-ft 5,780

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement and records for station at Tacoma.

911. Flett Creek at Tacoma, Wash.

Location.--Lat 47°11'23", long 122°31'08", in SW¼ sec.26, T.20 N., R.2 E., on right bank at 75th Street, half a mile west of city limits of Tacoma and 0.6 mile upstream from mouth.

Drainage area.--10 sq mi, approximately.

Records available.--June 1959 to September 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 200 ft (from topographic map).

Extremes.--Maximum discharge during year, 36 cfs Feb. 6 (gage height, 2.48 ft); minimum, 1.3 cfs Aug. 12 (gage height, 1.47 ft).
1959-60: Maximum discharge, that of Feb. 6, 1960; maximum gage height, 2.64 ft June 19, 1959 (backwater from debris); minimum discharge, that of Aug. 12, 1960.

Remarks.--Records fair. Storm sewer drainage above station. Several diversions for irrigation and industrial use. At times, during winter months, 1,000 gpm is pumped into creek for short intervals from Mountain View Memorial Park.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

1.5	1.6	1.9	8.6
1.6	2.7	2.1	15
1.7	4.2	2.4	30

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	2.7	10.5	14.5	19	17	12.5	13	8.6	5.7	2.6	2.8
2	3.0	2.8	11	14	22	16.5	12.5	13	8.3	5.9	2.6	2.7
3	3.0	3.2	11	14	*23	16.5	12	12.5	8.3	5.7	2.6	2.7
4	3.0	3.1	11	13.5	21	17	12	*12.5	8.0	5.7	3.0	3.1
5	3.0	*3.1	10.5	13.5	21	18	12	12.5	8.0	5.3	3.0	3.1
6	3.1	3.0	10.5	13.5	25	17.5	11.5	13.5	8.0	4.7	3.0	3.1
7	3.2	3.0	*10.5	13.5	29	*17	11.5	13	7.7	4.6	2.7	*3.1
8	*3.4	3.0	10.5	13	30	18.5	11.5	12.5	*7.4	4.7	2.3	3.0
9	3.4	3.0	10.5	12.5	*28	17	11	12	7.2	4.6	1.8	3.0
10	3.6	3.0	11.5	12.5	26	17	10.5	12	7.0	4.2	1.6	3.0
11	5.7	3.0	13.5	12.5	24	16.5	11.5	12	7.0	*3.7	1.6	3.0
12	3.7	3.1	16.5	12	25	16	11.5	12.5	6.7	3.9	1.6	3.0
13	3.2	3.1	12.5	12	24	15.5	*11.5	12	6.5	3.9	1.6	3.0
14	3.1	3.1	14.5	11.5	27	15.5	15	11.5	7.0	3.9	2.1	3.1
15	3.0	3.2	24	*11.5	28	17.5	15.5	11	7.4	3.9	2.8	3.1
16	*2.7	3.1	21	11.5	25	15	12	10.5	7.0	4.0	2.3	3.0
17	3.7	5.7	17	10.5	24	14.5	11.5	11	6.5	4.0	2.0	3.0
18	3.1	8.6	16.5	10.5	23	14.5	11.5	*10.5	6.5	3.6	2.0	3.0
19	3.1	6.5	16	10.5	23	14.5	12.5	10.5	6.3	3.4	*2.0	3.0
20	3.9	*15	16.5	10.5	23	14	16	11.5	6.1	3.1	2.3	3.0
21	3.9	25	16.5	10	22	*14	14.5	9.8	*6.1	3.1	3.0	2.8
22	4.6	21	16	10.5	21	14	12	8.9	6.3	3.0	3.2	3.0
23	3.9	*18.5	16.5	14	*21	13.5	12.5	8.3	5.7	2.8	3.9	3.0
24	3.9	14.5	17.5	16.5	21	13.5	13.5	8.0	5.9	2.8	4.0	3.0
25	3.6	11.5	16.5	17.5	20	13	13.5	8.6	6.1	2.7	3.9	3.0
26	3.2	10	16.5	17	19	12.5	13.5	8.6	5.7	2.7	3.7	2.8
27	2.4	9.5	16	14.5	19	12.5	13.5	8.6	5.5	*2.7	3.4	2.8
28	2.4	9.8	15.5	16	18	12.5	13.5	8.6	5.3	2.4	3.1	2.8
29	2.4	10	15.5	27	18	15.5	13.5	8.6	5.7	2.3	3.0	2.7
30	2.6	10.5	15.5	22	-------	14.5	13.5	8.9	5.7	2.3	2.8	2.7
31	2.7	-------	15	19.5	-------	14	-------	8.9	-------	2.4	2.8	-------
Total	102.5	224.6	452.5	432.0	669	475.0	379.0	335.3	203.5	117.7	82.3	88.4
Mean	3.31	7.49	14.6	13.9	23.1	15.3	12.6	10.8	6.78	3.80	2.65	2.95
Ac-ft	203	445	898	857	1,330	942	752	665	404	233	163	175

Calendar year 1959: Max - Min - Mean - Ac-ft -
Water year 1959-60: Max 30 Min 1.6 Mean 9.73 Ac-ft 7,070

* Discharge measurement made on this day.

912. Leach Creek near Fircrest, Wash.

Location.--Lat 47°13'15", long 122°30'30", in lot 24, block 14, SE¼NE¼ sec.14, T.20 N., R.2 E., on right bank 1¼ miles south of Fircrest and 2 miles upstream from mouth.

Drainage area.--6.01 sq mi, of which 2.53 sq mi is noncontributing.

Records available.--March 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 190 ft (from topographic map).

Extremes.--Maximum discharge during year, 66 cfs Nov. 20 (gage height, 2.43 ft); minimum, 1.8 cfs Aug. 12, 14, 17, 18, 19, 20 (gage height, 1.18 ft).
1957-60: Maximum discharge, that of Nov. 20, 1959; minimum, that of Aug. 12, 14, 17, 18, 19, 20, 1960; minimum gage height, 0.75 ft Aug. 2, 5, 13, 14, Sept. 5, 6, 1957.

Remarks.--Records good. Drainage into upper end of basin influenced by urbanizing of area. No regulation or diversion above station.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

1.19	2.0	1.5	14
1.3	4.7	1.6	20
1.4	8.6	1.8	33

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.3	3.0	3.3	2.8	5.4	2.6	*4.7	3.3	2.8	3.0	2.4	*2.4
2	3.3	3.0	3.6	2.6	7.7	2.8	4.4	3.3	2.8	3.0	a2.4	2.4
3	3.3	4.7	3.8	2.6	5.4	2.8	4.4	3.3	2.8	3.0	a2.4	2.6
4	3.3	3.6	3.3	2.6	4.1	3.8	4.1	3.3	2.8	3.0	a2.4	3.6
5	3.3	3.0	3.3	2.6	4.1	5.4	4.1	3.0	2.8	3.0	a2.4	3.3
6	3.3	3.0	3.8	3.0	15.5	4.7	3.8	4.7	2.8	3.0	a2.2	2.4
7	3.3	3.0	3.6	3.6	13	4.4	3.8	3.3	2.8	2.8	a2.2	2.4
8	*4.1	3.0	3.6	2.8	14.5	8.6	4.1	3.0	2.8	2.8	*2.2	2.4
9	3.6	3.0	3.8	2.6	8.6	5.0	3.8	*2.8	*2.8	2.8	2.2	2.2
10	3.8	3.0	4.7	2.6	5.4	5.4	3.8	3.6	2.8	2.8	2.2	2.4
11	7.7	3.3	8.6	3.0	4.1	4.1	5.8	3.6	3.0	2.6	2.2	2.4
12	3.6	3.3	13	3.0	5.8	3.8	4.4	4.1	2.8	2.6	2.0	2.4
13	3.3	3.0	4.4	2.8	5.4	3.8	4.7	3.6	*2.8	2.6	2.0	2.4
14	3.3	3.0	11.5	3.0	10.5	3.8	*13	3.0	4.1	2.6	2.0	2.4
15	3.3	3.6	30	3.0	10	7.7	8.6	2.8	3.6	2.6	2.2	2.4
16	3.3	*3.0	9.0	3.0	4.7	4.1	4.4	3.0	3.6	2.6	2.0	2.6
17	3.3	7.3	5.4	2.8	4.4	4.1	4.1	3.0	3.0	2.4	2.0	2.6
18	3.3	8.1	4.7	2.6	4.1	3.8	4.1	2.8	3.0	2.4	2.0	2.6
19	3.3	6.1	4.1	2.6	3.6	3.6	4.7	3.6	3.3	2.4	2.0	2.8
20	5.0	*30	5.4	2.8	3.8	3.3	9.0	5.0	3.3	2.4	2.0	2.6
21	3.8	21	3.8	*2.8	4.7	3.3	5.8	3.0	3.0	2.4	3.3	2.4
22	5.4	14	3.3	3.0	3.3	3.0	4.1	2.8	3.0	2.4	2.4	2.6
23	3.6	7.3	3.3	8.6	3.3	3.0	4.1	2.8	3.0	2.4	5.4	2.8
24	4.4	5.8	6.5	10.5	3.0	3.0	4.7	2.8	3.0	2.4	4.1	2.8
25	3.6	5.0	3.8	12	*2.8	3.0	4.1	3.0	3.0	2.4	4.7	2.6
26	3.3	3.8	3.0	9.5	2.8	3.3	4.1	3.3	3.0	2.4	3.3	2.6
27	3.0	3.6	3.0	5.0	2.8	3.6	3.6	3.0	3.0	2.4	2.8	2.4
28	3.3	3.6	*2.8	9.0	2.8	3.8	3.6	2.8	3.0	2.4	2.4	2.4
29	3.0	3.8	2.8	29	2.6	10	3.3	2.6	3.0	2.4	2.6	2.4
30	3.0	3.6	3.0	9.0	-------	6.5	3.3	3.6	3.0	2.4	2.8	2.4
31	3.0	-------	3.0	5.8	-------	6.9	-------	3.0	-------	2.4	2.4	-------
Total	113.4	174.5	171.2	160.6	168.2	137.0	144.5	100.8	90.5	80.8	79.6	76.7
Mean	3.66	5.82	5.52	5.18	5.80	4.42	4.82	3.25	3.02	2.61	2.57	2.56
Ac-ft	225	346	340	319	334	272	287	200	180	160	158	152

Calendar year 1959: Max 30 Min 2.6 Mean 4.36 Ac-ft 3,150
Water year 1959-60: Max 30 Min 2.0 Mean 4.09 Ac-ft 2,970

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.

913. Leach Creek near Steilacoom, Wash.

Location.--Lat 47°11'55", long 122°31'15", in NW¼NW¼ sec.26, T.20 N., R.2 E., on left bank a third of a mile upstream from mouth and 4 miles northeast of Steilacoom.

Drainage area.--7.63 sq mi, of which 2.53 sq mi is noncontributing.

Records available.--February 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 140 ft (from topographic map).

Extremes.--Maximum discharge during year, 94 cfs Nov. 21 (gage height, 3.59 ft); minimum, 4.8 cfs Aug. 18, Sept. 18; minimum gage height, 1.72 ft Aug. 18.
1957-60: Maximum discharge, that of Nov. 21, 1959; minimum, 4.5 cfs July 13, 1958; minimum gage height, 1.36 ft Sept. 19, 1957.

Remarks.--Records good except those for periods Feb. 22 to Mar. 4, Mar. 11-14, 16-28, which are fair. Drainage into upper end of basin influenced by urbanizing of area. Some pumping for domestic use above gage. No regulation.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 26 to Mar. 4)

Oct. 1 to Nov. 20		Nov. 21 to Sept. 30	
1.9	5.5	1.7	4.1
2.1	14	1.9	10.5
2.6	44	2.1	19.5
		2.7	50

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.4	7.6	11	8.7	11.5	8.3	*11	7.7	8.7	7.1	6.5	*8.0
2	8.4	7.6	11	8.3	14.5	8.3	10.5	7.4	8.3	7.4	6.5	8.0
3	8.0	9.2	11	8.0	12.5	8.0	10.5	7.7	8.3	7.4	6.8	7.7
4	8.0	8.4	11	8.0	10.5	8.3	9.9	7.7	8.3	7.1	6.5	9.1
5	8.4	7.6	10.5	8.3	10.5	11.5	9.9	7.7	8.3	6.8	6.2	8.7
6	8.4	7.6	10.5	9.1	20	11	9.9	11	8.0	6.8	6.5	7.1
7	8.8	7.6	10.5	9.1	28	10.5	9.9	8.7	7.7	6.8	6.8	6.8
8	*10	7.6	10.5	8.3	22	15	9.9	8.0	7.7	7.1	*6.2	6.8
9	9.2	7.6	11	8.0	16.5	11	9.9	7.4	7.4	7.4	6.5	6.8
10	9.6	7.6	11.5	8.3	12.0	11	9.5	8.3	7.7	7.4	6.2	6.8
11	17	7.6	15.5	9.1	10.5	9.1	12.5	8.3	8.0	7.1	6.2	6.8
12	8.8	7.6	20	8.3	12.5	9.1	11	9.9	7.7	7.4	6.5	6.8
13	8.0	7.6	12	8.3	12	9.1	11.5	9.1	*7.4	7.1	6.5	7.4
14	8.0	7.6	16	8.3	17.2	9.1	*24	7.7	9.1	6.8	6.8	7.4
15	8.0	8.0	46	8.3	17.5	14.5	20	7.7	9.9	6.5	7.1	7.4
16	8.0	*7.6	22	8.3	11.5	9.1	11	8.0	9.1	6.8	6.8	7.4
17	7.6	15	14	7.7	10.5	9.1	10.5	8.0	8.3	6.8	6.5	7.4
18	7.6	24	12.5	7.4	9.9	9.1	10.5	7.7	8.0	6.5	6.8	7.4
19	7.6	17	11.5	7.4	9.5	9.1	11.5	*8.9	8.3	6.5	7.1	7.7
20	9.6	*43	12.5	7.7	9.5	9.1	*19	12.5	8.0	6.2	7.7	7.4
21	9.2	43	11	*7.7	11	9.1	12.5	8.3	7.7	6.2	10.5	6.8
22	12	19	11	8.3	9.9	9.1	9.9	8.0	7.7	6.5	8.7	7.4
23	8.8	16.5	11	14.5	9.5	9.1	10.5	8.0	7.4	6.5	12	7.7
24	10	12.5	13	21	9.1	9.1	12	8.3	*7.1	7.1	12	7.7
25	9.2	12.5	11	20	8.7	9.1	10.5	8.7	7.4	6.8	12	7.4
26	8.4	12	10.5	18	*8.3	9.1	10.5	8.7	7.4	6.5	10.5	7.1
27	8.4	11.5	9.9	10.5	8.3	9.1	9.1	8.0	7.1	6.5	9.5	7.1
28	8.4	11.5	*8.7	14	8.3	9.1	8.0	7.7	6.8	6.2	8.7	7.1
29	8.4	11.5	9.1	44	8.3	18	8.0	7.7	7.1	6.2	8.7	7.1
30	7.6	11.5	9.1	19	-------	14	7.7	9.5	7.4	6.8	8.7	7.1
31	7.6	-------	9.1	12.5	-------	13	-------	9.1	-------	6.8	8.7	-------
Total	275.4	384.9	403.9	354.4	360.3	317.1	341.1	261.4	237.3	211.1	242.7	221.4
Mean	8.88	12.8	13.0	11.4	12.4	10.2	11.4	8.43	7.91	6.81	7.83	7.38
Ac-ft	546	763	801	703	715	629	677	518	471	419	481	439

Calendar year 1959: Max 46 Min 6.4 Mean 10.2 Ac-ft 7,400
Water year 1959-60: Max 46 Min 6.2 Mean 9.87 Ac-ft 7,160

* Discharge measurement made on this day.

915. Chambers Creek below Leach Creek, near Steilacoom, Wash.

Location.--Lat 47°11'55", long 122°31'40", in NE¼NE¼ sec.27, T.20 N., R.2 E., on left bank a quarter of a mile downstream from Leach Creek, 1½ miles downstream from outlet of Steilacoom Lake, and 4 miles northeast of Steilacoom. Prior to Jan. 13, 1960, at site 150 ft upstream.

Drainage area.--104 sq mi.

Records available.--December 1937 to September 1940, July 1943 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 100 ft (from topographic map). Prior to Jan. 13, 1960, at sites 100 and 150 ft upstream at datum 0.95 ft higher.

Average discharge.--19 years (1938-40, 1943-60), 113 cfs (81, 810 acre-ft per year).

Extremes.--Maximum discharge during year, 313 cfs Feb. 6 (gage height, 2.54 ft); minimum, 28 cfs Oct. 17, 18, 19.
1937-40, 1943-60: Maximum discharge, 792 cfs Jan. 5, 1956 (gage height, 3.58 ft, site and datum then in use); minimum, that of Oct. 17, 18, 19, 1959.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Some regulation by gates at outlet of Steilacoom Lake. Some diversions from tributaries for domestic use.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 16-19, 28, 29)

Oct. 1 to Jan. 12		Jan. 13 to Sept. 30	
2.02	28	1.3	26
2.2	87	1.6	76
2.5	255	2.0	163
		2.5	301

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	39	31	60	145	202	180	*161	173	119	88	59	*54
2	39	31	53	140	221	178	158	173	119	88	58	56
3	39	36	53	140	221	178	158	173	117	90	58	56
4	42	36	50	135	210	180	154	170	116	92	58	59
5	42	36	47	135	207	188	149	168	115	90	58	58
6	42	39	47	130	237	180	152	176	114	86	59	56
7	44	39	44	130	260	178	147	173	113	80	59	54
8	*50	39	42	125	280	188	138	161	112	58	*60	54
9	44	39	47	125	280	178	142	*161	*111	44	59	54
10	44	39	50	120	277	178	140	161	104	49	59	53
11	60	39	68	120	263	173	145	158	88	49	56	53
12	47	39	150	120	263	170	142	161	92	51	53	54
13	42	39	140	119	257	170	145	156	94	53	53	54
14	39	42	160	119	280	176	166	142	100	56	53	53
15	36	39	180	119	277	196	168	142	104	58	56	53
16	33	*36	200	117	268	180	156	145	104	67	56	53
17	31	68	206	115	254	180	154	145	106	72	54	53
18	28	99	206	113	249	178	154	142	131	69	54	51
19	28	91	206	113	240	178	156	145	122	65	56	49
20	36	122	200	113	237	173	176	154	80	63	56	49
21	36	122	200	*109	235	170	170	142	48	63	59	48
22	44	95	195	113	226	168	168	140	49	63	58	47
23	40	83	190	128	218	166	173	138	*61	63	61	46
24	57	68	185	145	212	163	186	138	86	63	63	46
25	44	64	175	149	*207	161	186	138	98	61	61	46
26	39	60	165	149	202	163	191	138	113	61	58	46
27	36	57	160	145	196	158	186	128	126	63	56	44
28	31	60	*157	161	188	158	183	109	131	61	54	44
29	31	60	157	237	183	183	180	117	115	59	54	43
30	31	64	155	212	-------	178	176	119	98	59	54	43
31	33	-------	150	204	-------	173	-------	119	-------	58	53	-------
Total	1,227	1,712	4,098	4,245	6,850	5,421	4,860	4,605	3,086	2,042	1,765	1,529
Mean	39.6	57.1	132	137	236	175	162	149	103	65.9	56.9	51.0
Ac-ft	2,430	3,400	8,130	8,420	13,590	10,750	9,640	9,130	6,120	4,050	3,500	3,030

Calendar year 1959: Max 350 Min 28 Mean 114 Ac-ft 82,630
Water year 1959-60: Max 280 Min 28 Mean 113 Ac-ft 82,190

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 8-10, Dec. 12-15, 20-27, Dec. 30 to Jan. 12, Feb. 24, June 4-8, July 14; discharge estimated on basis of recorded range in stage and records for nearby stations.

920. Puyallup River near Electron, Wash.

Location.--Lat 46°54'10", long 122°02'00", in N½ sec.3, T.16 N., R.6 E., on left bank 1,000 ft upstream from Puget Sound Power & Light Co.'s flume headworks, a quarter of a mile downstream from Mowich River, and 10 miles southeast of Electron. Prior to Nov. 1, 1959, at site 100 ft upstream.

Drainage area.--92.8 sq mi.

Records available.--October 1908 to September 1926, October 1944 to September 1949, and October 1957 to September 1960 in reports of Geological Survey. October 1908 to September 1933 and October 1944 to September 1949 (monthly discharge only) in State Water-Supply Bulletin 6.

Gage.--Water-stage recorder. Altitude of gage is 1,640 ft (from river-profile map). Prior to Jan. 1, 1913, staff gage and Jan. 1, 1913, to Sept. 30, 1926, Oct. 1, 1944, to Sept. 30, 1949, and Oct. 1, 1957, to Oct. 31, 1959, water-stage recorder, all at sites within 125 ft upstream at different datums. Gage washed out Nov. 22, 1951, reestablished Aug. 19, 1960, at site 100 ft upstream at different datum.

Average discharge.--33 years (1908-33, 1944-49, 1957-60), 529 cfs (383,000 acre-ft per year).

Extremes.--Maximum discharge during year, 10,800 cfs Nov. 22 (gage height, 11.9 ft, from floodmarks, site and datum in use Oct. 1, 1957, to Oct. 31, 1959), result of slope-area measurement; minimum recorded, 162 cfs Aug. 22 (gage height, 1.68 ft).
1908-26, 1944-49, 1957-60: Maximum discharge, that of Nov. 22, 1959; minimum not determined, probably occurred during period of ice effect in December 1914 or December 1922.

Remarks.--Records fair prior to Aug. 19, good thereafter. No regulation or diversion above station.

Revisions (water years).--WSP 1092: 1946(M). WSP 1346: 1913, 1916-17(M), 1918-23, drainage area. WSP 1566: 1945(M), 1947(P).

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	530	720	580	254	542	220	593	474	900	580	520	390
2	500	720	500	258	542	203	615	474	1,000	520	460	336
3	450	860	490	248	470	200	615	426	1,100	520	410	400
4	402	760	426	237	430	200	625	431	1,000	540	385	669
5	358	720	410	237	480	200	642	415	920	590	395	540
6	326	690	393	356	560	230	652	440	880	700	405	406
7	*312	650	407	254	1,220	213	687	1,080	750	720	440	355
8	608	640	372	244	899	254	793	863	620	630	480	326
9	906	610	356	233	740	223	863	757	615	550	510	*340
10	626	600	360	220	673	207	705	863	650	500	530	385
11	1,950	580	580	226	565	200	659	1,110	660	470	530	416
12	1,600	560	750	220	474	200	542	1,460	640	480	440	428
13	1,090	550	570	210	474	199	533	1,000	650	570	420	433
14	916	530	1,170	207	593	193	551	840	740	550	350	416
15	848	520	4,210	203	680	313	515	720	900	530	330	365
16	626	520	1,530	203	565	220	372	720	1,110	550	330	331
17	530	*580	1,180	199	529	265	364	740	890	650	440	307
18	490	1,050	867	186	515	261	352	820	690	730	510	307
19	434	1,020	648	183	342	277	352	900	620	710	470	380
20	792	2,400	520	186	316	372	415	1,390	720	620	395	331
21	874	*2,300	474	183	313	604	470	1,220	660	540	345	284
22	*3,380	*4,200	426	183	294	670	367	1,000	620	520	199	252
23	*2,590	3,700	412	223	273	659	364	793	630	470	326	336
24	2,220	2,600	404	334	265	659	364	740	680	420	422	499
25	2,010	2,400	384	342	258	670	345	705	650	440	380	488
26	1,250	1,430	356	393	230	680	334	750	570	480	669	370
27	1,040	1,080	342	330	216	666	342	881	580	620	682	350
28	1,080	940	327	287	226	670	360	800	580	580	455	345
29	951	720	309	1,220	226	625	453	720	590	560	*416	345
30	895	680	302	969	------	740	453	800	560	560	406	321
31	874	------	284	648	------	625	------	1,000	------	550	433	------
Total	31,458	35,330	20,339	9,676	13,910	11,918	15,297	25,332	22,175	17,450	13,483	11,451
Mean	1,015	1,178	656	312	480	384	510	817	739	563	435	382
Cfsm	10.9	12.7	7.07	3.36	5.17	4.14	5.50	8.80	7.96	6.07	4.69	4.12
In.	12.61	14.16	8.15	3.88	5.57	4.78	6.13	10.15	8.89	6.99	5.40	4.59
Ac-ft	62,400	70,080	40,340	19,190	27,590	23,640	30,340	50,250	43,980	34,610	26,740	22,710

Calendar year 1959: Max 4,210 Min 228 Mean 670 Cfsm 7.22 In. 98.06 Ac-ft 485,300
Water year 1959-60: Max 4,210 Min 183 Mean 622 Cfsm 6.70 In. 91.30 Ac-ft 451,900

Peak discharge (base, 2,300 cfs).--Oct. 11 (6:30 a.m.) 2,530 cfs (6.45 ft); Oct. 22 (1 p.m.) 4,840 cfs (8.90 ft); Oct. 24 (8 p.m.) 3,550 cfs (7.40 ft); probably Nov. 20 (time and discharge unknown); Nov. 22 (time unknown) 10,800 cfs (11.9 ft); probably Dec. 14 (time and discharge unknown).

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 1 to Aug. 19; discharge estimated on basis of once-daily readings on temporary staff gage (not rated) 1,000 ft downstream, by employees of Puget Sound Power & Light Co., 3 discharge measurements, and records for station near Orting.

935. Puyallup River near Orting, Wash.

Location.--Lat 47°02'20", long 122°12'25", in SW¼SW¼ sec.17, T.18 N., R.5 E., on right bank 600 ft downstream from highway bridge, 4 miles south of Orting, and 9 miles upstream from Carbon River.

Drainage area.--172 sq mi.

Records available.--September 1931 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 357.5 ft above mean sea level, unadjusted. Prior to Feb. 6, 1946, at site 600 ft upstream at datum 3.93 ft higher. Supplementary water-stage recorder 200 ft upstream at datum 2.1 ft higher than present gage datum used at times during periods in 1942-46.

Average discharge.--29 years, 710 cfs (514,000 acre-ft per year).

Extremes.--Maximum discharge during year, 12,900 cfs Nov. 22 (gage height, 7.25 ft in gage well, 8.47 ft from outside gage), from rating curve extended above 8,600 cfs on basis of slope-area measurement of peak flow; minimum, 129 cfs Aug. 16; minimum gage height, 1.22 ft Jan. 6, 7, 8, 9, 20; minimum daily discharge, 237 cfs Jan. 18.
1931-60: Maximum discharge, that of Nov. 22, 1959; minimum, 25 cfs Nov. 28, 1952; minimum gage height, that of Jan. 6, 7, 8, 9, 20, 1960; minimum daily discharge, 59 cfs Nov. 29, 1952.

Remarks.--Records fair prior to May 23, good thereafter. Water diverted for Electron powerplant of Puget Sound Power & Light Co. returned to river above gage. Some regulation by Electron powerplant. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 932: 1937-39. WSP 962: 1934. WSP 1246: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 22-28, Nov. 18-25, Jan. 1-24, Mar. 26 to May 21)

Oct. 1-22		Oct. 22 to May 19		May 20 to Sept. 30	
2.8	400	1.3	165	1.7	250
3.2	600	2.0	790	2.3	610
4.0	1,080	3.0	1,950	3.0	1,220
5.0	1,920	4.0	3,290	4.5	3,000
		5.0	4,790		
		6.0	6,440		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	625	1,000	*800	384	720	285	889	563	1,110	624	568	457
2	595	1,000	700	368	*750	269	845	640	1,190	554	501	397
3	555	1,200	680	342	630	293	834	600	1,220	561	451	403
4	525	1,050	554	334	536	277	823	600	1,140	582	421	744
5	490	1,000	491	317	590	293	845	545	1,020	631	433	659
6	470	950	428	437	690	325	856	650	984	752	445	520
7	*445	900	482	410	2,090	325	922	1,390	832	768	482	439
8	549	880	393	359	1,430	350	966	1,110	688	666	520	403
9	968	850	384	*317	1,150	400	1,000	889	680	589	554	*379
10	695	820	428	317	1,080	380	750	966	720	534	575	403
11	1,730	800	801	317	933	370	680	*1,300	736	501	575	439
12	1,710	780	1,040	309	834	359	600	1,550	704	520	*488	445
13	1,280	760	790	277	911	342	563	1,230	720	617	463	457
14	1,040	740	1,630	269	1,020	334	700	1,050	816	589	397	451
15	996	720	*4,680	245	1,290	690	680	878	1,000	568	373	409
16	814	720	2,970	261	1,050	572	581	1,010	*1,230	589	367	361
17	700	800	1,950	245	889	572	554	1,130	993	696	482	333
18	675	1,450	1,540	237	750	536	491	1,240	768	784	554	311
19	635	*1,430	1,300	245	640	527	491	1,280	704	760	514	379
20	982	3,980	950	245	563	700	690	2,800	800	666	439	379
21	1,250	*4,340	800	245	581	845	801	2,040	728	575	397	311
22	*4,670	*5,930	700	253	500	911	700	1,500	680	554	316	280
23	*3,290	5,250	650	317	446	900	650	1,150	696	501	367	350
24	2,670	3,600	600	572	419	812	680	1,000	752	445	463	501
25	2,590	3,350	560	600	428	845	620	912	720	475	457	575
26	1,850	2,000	520	670	*350	889	545	912	631	520	704	482
27	1,550	1,500	500	527	325	878	518	1,030	638	666	885	415
28	1,780	1,300	460	518	309	889	491	930	645	624	568	385
29	1,500	1,000	440	1,960	301	944	545	876	659	596	508	367
30	1,300	950	420	1,370	------	1,110	545	1,020	617	596	457	350
31	1,100	------	400	878	------	*955	------	1,270	------	582	501	------
Total	40,029	51,050	29,041	14,145	22,205	18,177	20,855	34,061	24,821	18,685	15,225	12,784
Mean	1,291	1,702	937	456	766	586	695	1,099	827	603	491	426
Cfsm	7.51	9.90	5.45	2.65	4.45	3.41	4.04	6.39	4.81	3.51	2.85	2.48
In.	8.66	11.04	6.28	3.06	4.80	3.93	4.51	7.36	5.37	4.04	3.29	2.76
Ac-ft	79,400	101,300	57,600	28,060	44,040	36,050	41,370	67,560	49,230	37,060	30,200	25,360

Calendar year 1959: Max 5,930 Min 320 Mean 869 Cfsm 5.05 In. 68.59 Ac-ft 629,200
Water year 1959-60: Max 5,930 Min 237 Mean 823 Cfsm 4.78 In. 65.10 Ac-ft 597,200

Peak discharge (base, 4,500 cfs).--Oct. 22 (3:30 p.m.) 8,820 cfs (7.31 ft); Nov. 21 (12:30 a.m.) 6,050 cfs (6.17 ft); Nov. 22 (8:30 p.m.) 12,900 cfs (7.25 ft); Dec. 15 (1 a.m.) 5,900 cfs (5.68 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 29 to Nov. 17, Nov. 26 to Dec. 2, Dec. 20-31, Mar. 8-11; discharge estimated on basis of 1 discharge measurement and records for nearby stations.

940. Carbon River near Fairfax, Wash.

Location.--Lat 47°01'40", long 122°01'50", in SW¼SW¼ sec.22, T.18 N., R.6 E., on left bank 1¼ miles upstream from highway bridge, 1¼ miles northwest of Fairfax, and 2¼ miles downstream from Evans Creek.

Drainage area.--78.9 sq mi.

Records available.--November 1910 to July 1912, March 1929 to September 1960. Published as "at Fairfax" 1910-12.

Gage.--Water-stage recorder. Datum of gage is 1,212.6 ft above mean sea level (river-profile survey). Prior to July 13, 1912, staff gage at railroad crossing 1.7 miles upstream at different datum.

Average discharge.--31 years (1929-60), 422 cfs (305,500 acre-ft per year).

Extremes.--Maximum discharge during year, 9,970 cfs Nov. 23 (gage height, 8.56 ft); minimum recorded, 131 cfs Mar. 2 (gage height, 0.85 ft).
1910-12, 1929-60: Maximum discharge, 11,000 cfs Dec. 9, 1933 (gage height, 10.2 ft), from rating curve extended above 4,200 cfs; minimum, 36 cfs Nov. 28, 29, 1952; minimum gage height recorded, 0.75 ft Nov. 20, 1944.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 1246: Drainage area. WSP 1286: 1930, 1931-32(M), 1933-35.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 26 to Nov. 19, Dec. 3-14, Jar. 25 to Feb. 25, Mar. 2 to May 20, Aug. 27 to Sept. 30)

0.9	120	4.0	1,960
1.4	250	5.0	3,140
2.0	480	6.0	4,680
2.5	740	7.0	6,530
3.0	1,080		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	471	476	*a450	200	343	a140	399	440	877	485	378	304
2	417	440	a420	182	326	*133	*471	495	989	448	332	259
3	386	650	408	179	287	138	520	448	989	444	312	235
4	354	600	370	174	262	142	545	404	933	458	304	352
5	329	520	350	171	274	149	585	370	814	530	304	412
6	312	412	343	a200	336	169	590	478	752	635	301	318
7	304	386	350	*182	982	174	645	898	645	605	315	268
8	383	358	322	184	620	203	665	675	565	580	336	238
9	746	340	315	182	480	226	640	560	545	485	346	*229
10	590	315	343	174	430	223	480	*610	565	426	358	232
11	1,750	294	476	174	358	229	430	800	590	394	366	244
12	1,470	287	471	171	350	214	382	989	585	412	*326	265
13	905	271	404	169	340	200	362	788	580	448	284	268
14	*686	256	1,440	166	435	192	378	686	706	462	265	250
15	686	a300	3,460	166	480	235	350	600	*891	453	262	223
16	595	a280	1,460	166	378	241	318	640	1,160	444	259	209
17	505	*417	863	166	326	223	318	645	863	471	308	195
18	448	1,380	645	164	308	217	301	665	630	505	366	198
19	408	1,090	495	161	265	214	290	813	595	495	358	232
20	632	2,040	430	161	244	284	354	1,800	625	435	301	229
21	704	2,420	362	159	235	458	354	1,100	600	394	268	198
22	*3,240	4,480	322	159	212	545	329	807	575	370	229	179
23	*1,880	4,980	301	184	198	540	329	665	595	343	265	212
24	1,560	2,440	287	247	189	500	322	610	625	318	308	293
25	1,570	a1,500	268	*277	179	545	318	560	595	318	332	394
26	989	a1,000	250	284	a170	615	308	580	540	350	549	374
27	764	a800	250	247	a160	540	312	665	525	417	611	265
28	856	a650	241	253	a150	505	336	620	525	422	343	235
29	692	a550	220	670	a150	458	390	620	530	399	290	212
30	575	a500	214	570	------	466	382	857	520	390	256	200
31	515	------	206	404	------	426	------	1,100	------	382	262	------
Total	25,722	30,432	16,736	6,946	9,467	9,544	12,403	21,968	20,529	13,718	10,094	7,722
Mean	830	1,014	540	224	326	308	413	709	684	443	326	257
Cfsm	10.5	12.9	6.84	2.84	4.13	3.90	5.23	8.99	8.67	5.61	4.13	3.26
In.	12.12	14.34	7.89	3.27	4.46	4.50	5.85	10.35	9.68	6.47	4.76	3.64
Ac-ft	51,020	60,360	33,200	13,780	18,780	18,930	24,600	43,570	40,720	27,210	20,020	15,320

Calendar year 1959: Max 4,980 Min 174 Mean 546 Cfsm 6.92 In. 93.85 Ac-ft 394,900
Water year 1959-60: Max 4,980 Min 133 Mean 506 Cfsm 6.41 In. 87.33 Ac-ft 367,500

Peak discharge (base, 1,800 cfs).--Oct. 11 (9 a.m.) 2,470 cfs (4.47 ft); Oct. 22 (2:30 p.m.) 6,020 cfs (6.74 ft); Oct. 24 (9:30 p.m.) 2,350 cfs (4.36 ft); Nov. 21 (12:30 a.m.) 3,770 cfs (5.44 ft); Nov. 23 (1 a.m.) 9,970 cfs (8.56 ft); Dec. 15 (3 a.m.) 5,310 cfs (6.36 ft); May 20 (7 a.m.) 2,180 cfs (3.96 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement and records for nearby stations.

950. South Prairie Creek at South Prairie, Wash.

Location.--Lat 47°08'30", long 122°05'30", in NE¼NW¼ sec.18, T.19 N., R.6 E., or right bank 0.3 mile northeast of South Prairie and 5 miles upstream from mouth.

Drainage area.--78.6 sq mi.

Records available.--June 1949 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 430 ft (from topograhic map).

Average discharge.--11 years, 251 cfs (181,700 acre-ft per year).

Extremes.--Maximum discharge during year, 3,900 cfs Nov. 20 (gage height, 7.56 ft); minimum, 41 cfs Aug. 9, 10, Sept. 30; minimum gage height, 1.53 ft July 10,11.
1949-60: Maximum discharge, 6,850 cfs Dec. 11, 1955 (gage height, 9.78 ft), from rating curve extended above 3,000 cfs; minimum, 22 cfs Nov. 29, 1952 (gage height, 1.25 ft).

Remarks.--Records good prior to July 11, fair thereafter. Small amount of diversion for domestic use. No regulation.

Revisions.--WSP 1286: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 23 to Apr. 22, July 12 to Sept. 30)

Oct. 1 to Nov. 19				Nov. 20 to Sept. 30			
1.9	92	4.0	805	1.3	41	3.0	422
2.4	199	5.0	1,420	1.6	83	4.0	835
3.0	370			2.0	152	5.0	1,430
				2.5	272	7.0	3,280

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	199	187	258	152	300	115	330	269	327	110	49	104
2	166	164	253	146	286	*112	348	294	315	107	49	112
3	141	290	278	139	256	110	345	267	297	105	45	94
4	126	312	230	135	228	110	336	264	253	101	48	186
5	114	236	208	133	230	117	324	248	238	102	49	187
6	108	207	198	175	302	135	*303	303	213	96	54	*152
7	*118	177	222	162	870	133	306	538	180	89	55	126
8	141	159	191	*152	542	175	294	503	160	83	55	107
9	383	148	182	139	425	162	322	390	156	78	44	94
10	241	132	196	135	403	152	225	*369	160	76	42	85
11	875	122	328	135	339	144	225	409	156	74	44	78
12	470	124	439	129	336	141	232	538	148	74	*45	71
13	421	108	360	124	342	139	248	460	141	72	44	71
14	361	103	777	122	418	137	261	419	190	71	49	67
15	289	134	*2,090	122	542	242	294	357	*283	70	97	62
16	230	112	1,260	122	416	215	261	409	356	72	86	60
17	199	204	690	119	336	225	253	449	232	70	83	55
18	173	725	500	110	286	230	242	507	187	68	72	54
19	157	715	387	107	242	230	232	522	196	64	62	54
20	326	1,550	354	107	215	278	344	1,400	286	58	58	62
21	470	2,740	318	104	206	339	393	918	242	54	70	53
22	*1,070	1,700	275	112	182	342	375	654	210	57	86	49
23	715	1,990	256	192	167	315	357	503	194	54	94	55
24	626	1,390	261	400	160	280	339	425	175	53	120	61
25	690	1,040	250	416	150	283	330	384	148	50	154	88
26	421	664	220	442	139	286	294	369	139	49	240	68
27	324	481	203	*345	129	253	269	515	131	50	336	55
28	470	409	191	324	122	283	264	442	133	46	169	49
29	324	348	182	610	119	258	286	393	128	45	126	46
30	260	294	182	456	------	306	258	406	122	46	107	42
31	217	------	171	345	------	321	------	416	------	49	102	------
Total	10,825	16,965	11,910	6,411	8,688	6,568	8,890	14,340	6,096	2,193	2,734	2,447
Mean	349	566	384	207	300	212	296	463	203	70.7	88.2	81.6
Cfsm	4.44	7.20	4.89	2.63	3.82	2.70	3.77	5.89	2.58	0.899	1.12	1.04
In.	5.12	8.03	5.64	3.03	4.11	3.11	4.21	6.79	2.88	1.04	1.29	1.16
Ac-ft	21,470	33,650	23,620	12,720	17,230	13,030	17,630	28,440	12,090	4,350	5,420	4,850

Calendar year 1959: Max 2,740 Min 34 Mean 286 Cfsm 3.64 In. 49.43 Ac-ft 207,200
Water year 1959-60: Max 2,740 Min 42 Mean 268 Cfsm 3.41 In. 46.41 Ac-ft 194,500

Peak discharge (base, 2,000 cfs).--Oct. 22 (2 p.m.) 2,180 cfs (5.91 ft); Nov. 20 (12 p.m.) 3,900 cfs (7.56 ft); Nov. 23 (3 a.m.) 2,630 cfs (6.38 ft); Dec. 15 (2 a.m.) 2,480 cfs (6.23 ft).

* Discharge measurement made on this day.

970. White River at Greenwater, Wash.

Location.--Lat 47°08'50", long 121°38'50", in SE¼ sec.10, T.19 N., R.9 E., on right bank three-quarters of a mile southeast of Greenwater, three-quarters of a mile upstream from Greenwater River, and 18½ miles east of and 25 miles upstream from Buckley.

Drainage area.--216 sq mi.

Records available.--December 1911 to May 1912 (fragmentary), March 1929 to September 1960. Published as "near Enumclaw" 1911-12.

Gage.--Water-stage recorder. Altitude of gage is 1,725 ft (from river-profile map). Prior to May 6, 1912, staff gage at site 2 miles upstream at different datum.

Average discharge.--31 years (1929-60), 855 cfs (619,000 acre-ft per year).

Extremes.--Maximum discharge during year, 14,300 cfs Nov. 23 (gage height, 8.96 ft), from rating curve extended above 4,800 cfs on basis of slope-area measurement of peak flow; minimum, 353 cfs Sept. 22 (gage height, 2.10 ft).
1911-12, 1929-60: Maximum discharge, 18,100 cfs Dec. 21, 1933 (gage height, 9.38 ft), from rating curve extended above 3,600 cfs by logarithmic plotting; minimum, 120 cfs Nov. 2, 1935 (gage height, 1.69 ft).
Revisions.--The maximum discharge for the water year 1956 has been revised to 10,100 cfs Dec. 12, 1955 (gage height, 7.48 ft), superseding figure published in WSP 1446.

Remarks.--Records good. No regulation or diversion above station.

Revisions (water years).--WSP 1286: 1932-33(M), 1934, 1943(M). WSP 1636: 1930(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-22				Oct. 22 to Sept. 30			
2.5	560	4.0	1,970	2.0	328	4.0	2,120
3.0	926	4.5	2,660	2.5	615	5.0	3,900
3.5	1,390			3.0	990	6.0	6,100
				3.5	1,480	8.0	11,300

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	755	948	1,080	615	825	436	873	897	1,670	1,340	889	460
2	712	914	1,020	608	772	430	889	914	2,020	1,190	802	430
3	683	1,060	939	582	708	414	922	897	2,320	1,170	772	460
4	648	1,010	881	570	674	436	964	865	2,400	1,200	765	589
5	627	922	865	570	715	436	1,040	825	2,160	1,240	736	550
6	600	905	849	589	885	430	1,100	922	2,050	1,370	722	466
7	567	889	810	550	2,240	436	1,240	1,360	1,750	1,410	758	430
8	634	881	758	538	1,570	442	1,390	1,260	1,570	1,340	818	420
9	926	865	736	514	1,220	420	1,420	1,140	1,540	1,170	818	425
10	748	849	743	502	1,040	409	1,210	1,240	1,600	1,090	857	466
11	2,080	818	865	508	873	399	1,090	1,670	1,670	1,020	857	490
12	1,580	795	881	490	825	394	964	2,050	1,670	1,020	758	532
13	1,190	729	849	*478	*810	394	905	1,740	1,710	1,100	680	544
14	1,040	729	1,640	472	818	388	905	1,470	1,880	1,080	615	520
15	960	795	*5,160	466	833	430	865	1,290	1,810	*1,080	563	484
16	862	701	3,350	454	818	404	795	1,260	2,160	1,060	582	448
17	831	798	2,150	442	788	414	780	1,150	1,810	1,120	694	420
18	800	1,230	1,710	409	736	436	743	1,090	1,490	1,180	750	425
19	748	1,250	1,420	420	680	*466	*715	1,090	1,350	1,170	743	460
20	823	2,280	1,250	430	648	596	818	1,780	1,250	1,130	648	430
21	831	3,600	1,120	414	628	849	802	1,640	1,120	956	589	394
22	3,200	5,480	1,020	*409	589	973	750	1,380	1,120	914	508	368
23	3,040	*10,300	964	420	556	1,010	758	1,210	1,220	841	502	404
24	2,300	5,000	930	496	538	973	743	1,130	1,420	802	490	520
25	2,300	*3,270	914	508	526	1,050	736	1,070	1,370	818	478	563
26	*1,650	2,350	849	538	484	1,140	729	1,090	1,320	881	*550	472
27	1,400	1,880	825	502	472	1,070	729	1,100	1,320	1,020	532	436
28	1,320	1,590	780	550	460	990	772	1,080	1,350	964	448	430
29	1,170	1,380	743	1,280	442	973	825	1,110	1,410	914	436	414
30	1,060	1,200	729	1,060	------	982	873	1,270	1,380	922	442	404
31	999	------	687	873	------	905	------	*1,600	------	905	490	------
Total	37,084	55,418	37,517	17,257	23,173	19,525	27,345	38,590	48,910	33,417	20,292	13,854
Mean	1,196	1,847	1,210	557	799	630	912	1,245	1,630	1,078	655	462
Cfsm	5.54	8.55	5.60	2.58	3.70	2.92	4.22	5.76	7.55	4.99	3.03	2.14
In.	6.38	9.54	6.46	2.97	3.99	3.36	4.71	6.64	8.42	5.75	3.49	2.39
Ac-ft	73,560	109,900	74,410	34,230	45,960	38,730	54,240	76,540	97,010	66,280	40,250	27,480

Calendar year 1959: Max 10,300 Min 484 Mean 1,153 Cfsm 5.34 In. 72.43 Ac-ft 834,500
Water year 1959-60: Max 10,300 Min 368 Mean 1,017 Cfsm 4.71 In. 64.10 Ac-ft 738,600

Peak discharge (base, 2,400 cfs).--Oct. 11 (9 a.m.) 2,600 cfs (4.46 ft); Oct. 22 (3:30 p.m.) 5,660 cfs (5.81 ft); Oct. 24 (11 p.m.) 2,900 cfs (4.48 ft); Nov. 21 (4:30 a.m.) 4,240 cfs (5.16 ft); Nov. 23 (12:30 a.m.) 14,300 cfs (8.96 ft); Dec. 15 (3:30 a.m.) 5,890 cfs (5.90 ft); Feb. 7 (4 a.m.) 2,680 cfs (4.35 ft); June 4 (12:30 a.m.) 2,680 cfs (4.35 ft).

* Discharge measurement made on this day.

975. Greenwater River at Greenwater, Wash.

Location.--Lat 47°09'15", long 121°38'00", in NW¼NW¼ sec.11, T.19 N., R.9 E., on left bank 1 mile upstream from mouth, 1 mile east of Greenwater, and 19 miles east of Buckley.

Drainage area.--73.9 sq mi.

Records available.--September 1911 to August 1912 (fragmentary), May 1929 to September 1960. Published as "near Enumclaw" 1911-12.

Gage.--Water-stage recorder. Altitude of gage is 1,725 ft (from topographic map). Prior to Aug. 10, 1912, staff gages at approximately same site at different datums. May 1, 1929, to Aug. 14, 1934, water-stage recorder at site 900 ft upstream at different datum.

Average discharge.--31 years (1929-60), 209 cfs (151,300 acre-ft per year).

Extremes.--Maximum discharge during year, 5,360 cfs Nov. 22 (gage height, 7.67 ft), from rating curve extended above 1,200 cfs on basis of slope-area measurement of peak flow; minimum daily, 44 cfs Sept. 30.

1911-12, 1929-60: Maximum discharge, that of Nov. 22, 1959; minimum, 23 cfs Oct. 7, 1934; minimum gage height, 2.00 ft Nov. 28 to Dec. 2, 1952.

Revisions.--The maximum discharge for the water year 1947 has been revised to 5,000 cfs Dec. 11, 1946 (gage height, 7.50 ft), superseding figure published in WSP 1286 and 1316.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation or diversion above station.

Revisions.--WSP 1246: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22				Nov. 23 to Sept. 30			
2.7	124	4.0	640	2.0	40	3.5	450
3.0	210	5.0	1,360	2.2	64	4.0	750
3.5	390	6.0	2,520	2.5	118	5.0	1,610
				3.0	248	7.0	4,210

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	245	294	358	167	165	106	289	262	380	183	84	74
2	203	273	334	160	162	102	307	272	412	175	80	72
3	177	290	314	155	155	98	330	265	445	165	80	69
4	160	301	289	150	148	102	358	258	460	160	78	72
5	144	280	272	148	153	102	384	248	450	155	77	87
6	136	266	258	153	164	100	393	268	436	150	75	80
7	132	248	255	141	393	100	412	334	407	146	74	72
8	142	238	242	137	334	100	436	346	371	141	72	71
9	248	231	232	133	275	96	445	334	346	137	70	68
10	224	220	232	128	245	94	398	342	330	135	69	66
11	610	210	255	126	217	91	358	376	314	131	69	65
12	540	210	272	124	202	89	330	421	307	124	67	63
13	414	190	258	*120	*194	89	311	416	296	122	64	61
14	346	187	360	118	202	87	304	407	304	120	66	60
15	301	224	*1,200	116	229	98	286	389	307	*116	74	58
16	266	200	1,030	114	214	94	265	398	322	114	69	57
17	238	207	662	110	197	*104	258	384	307	112	69	56
18	214	312	490	106	183	112	245	393	286	110	66	55
19	194	394	416	104	170	128	*236	402	275	108	63	56
20	214	555	367	100	157	196	255	548	282	104	61	60
21	220	1,100	322	98	157	311	258	566	286	102	63	58
22	950	*2,210	296	*98	146	358	245	485	272	100	63	55
23	820	2,860	275	98	137	371	242	431	258	98	67	56
24	745	1,500	258	106	133	350	236	398	245	96	66	60
25	605	*1,100	245	110	128	367	229	371	236	94	64	63
26	*460	844	223	118	118	402	226	*350	223	93	*91	57
27	402	662	211	116	112	376	226	350	214	94	95	50
28	398	542	202	114	112	342	239	342	205	91	85	46
29	366	465	194	170	108	311	245	334	197	89	75	45
30	340	393	188	183	------	304	255	346	188	85	74	44
31	315	------	178	170	------	293	------	367	------	85	73	------
Total	10,769	17,006	10,688	3,991	5,310	5,873	9,001	11,403	9,361	3,735	2,243	1,856
Mean	347	567	345	129	183	189	300	368	312	120	72.4	61.9
Cfsm	4.70	7.67	4.67	1.75	2.48	2.56	4.06	4.98	4.22	1.62	0 980	0.838
In.	5.42	8.56	5.38	2.01	2.67	2.96	4.53	5.74	4.71	1.88	1.13	0.93
Ac-ft	21,360	33,730	21,200	7,920	10,530	11,650	17,850	22,620	18,570	7,410	4,450	3,680

Calendar year 1959: Max 2,860 Min 50 Mean 292 Cfsm 3.95 In. 53.62 Ac-ft 211,400
Water year 1959-60: Max 2,860 Min 44 Mean 249 Cfsm 3.37 In. 45.92 Ac-ft 181,000

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 22-25, Aug. 27 to Sept. 30; discharge estimated on basis of recorded range in stage and records for nearby stations.

980. Mud Mountain Reservoir near Buckley, Wash.

Location.--Lat 47°08'30", long 121°55'50", in NE¼ sec.17, T.19 N., R.7 E., on left bank of reservoir just upstream from Mud Mountain Dam on White River, 5 miles southeast of Buckley and 6 miles downstream from Clearwater River.

Drainage area.--400 sq mi.

Records available.--October 1943 to September 1960. Month-end contents only October 1943 to September 1944, published in WSP 1316.

Gage.--Staff gage read once daily. Datum of gage is at mean sea level (levels by Corps of Engineers).

Extremes.--Maximum contents observed during year, 21,500 acre-ft Nov. 23 (elevation, 1,081.9 ft); minimum observed, 168 acre-ft Aug. 9 to Sept. 13, Sept. 15-30 (elevation, 928.0 ft).
1943-60: Maximum contents observed since dam was completed, 37,300 acre-ft June 20, 1956 (elevation, 1,117.1 ft); no pool at times in some years.

Remarks.--Reservoir, for flood control, is formed by earth-fill dam. Embankment completed and storage began on small scale in 1942. Capacity, 106,000 acre-ft between elevations 895 (invert of outlet tunnel) and 1,215 ft (spillway crest). Storage is not retained but is dissipated as soon after a flood as is possible without creating damaging flows downstream in order to have the maximum capacity available for any following flood which might develop.

Cooperation.--Records of reservoir elevations and capacity table furnished by Corps of Engineers.

Capacity table, water year 1959-60 (elevation, in feet, and contents, in acre-feet)

920	107	990	2,910
930	191	1,020	6,260
950	641	1,050	11,850
970	1,520	1,100	29,050

Contents, in acre-feet, at 12:30 p.m., water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,650	2,140	19,200	11,600	578	413	519	519	979	609	609	168
2	5,350	2,020	18,200	8,200	654	413	519	519	1,520	609	366	168
3	3,540	2,110	16,500	6,610	654	413	519	3,500	3,020	609	366	168
4	1,820	2,270	16,500	6,770	667	413	519	6,370	4,350	609	366	168
5	1,820	2,040	16,400	6,960	674	366	519	8,980	4,300	609	366	168
6	1,820	2,040	16,400	7,370	715	366	519	11,300	3,930	609	366	168
7	1,820	2,010	16,500	7,190	3,680	366	519	11,600	3,110	609	366	168
8	1,820	2,000	16,500	6,880	5,260	366	519	12,500	1,820	609	284	168
9	2,170	1,970	14,900	a6,620	4,930	366	519	12,500	519	609	168	168
10	1,940	1,980	12,900	a6,080	4,890	366	519	12,400	519	609	168	168
11	5,560	1,990	12,100	5,810	4,240	366	519	11,700	519	609	168	168
12	10,900	2,000	11,600	5,460	3,770	366	519	11,200	519	609	168	168
13	12,100	1,960	11,400	5,060	1,260	366	519	9,910	519	609	168	168
14	12,000	1,960	11,600	2,840	864	366	519	7,820	519	609	168	896
15	13,100	1,960	15,700	1,300	787	366	519	5,300	1,020	609	168	168
16	11,600	1,960	14,400	4,090	736	366	519	2,960	1,520	609	168	168
17	9,380	2,190	13,900	a3,600	747	366	519	2,670	1,640	609	168	168
18	6,820	3,390	11,600	3,080	740	366	519	3,600	1,700	609	168	168
19	4,310	5,700	11,400	3,310	712	366	519	4,500	1,700	609	168	168
20	2,440	7,100	10,700	3,550	674	366	519	7,960	2,790	609	168	168
21	2,180	9,280	11,600	3,830	644	366	519	9,880	1,210	609	168	168
22	3,900	3,600	11,400	4,040	648	519	519	10,600	609	609	168	168
23	17,400	21,500	11,900	a4,030	635	519	519	8,860	609	609	168	168
24	17,300	20,100	14,400	4,030	638	519	519	8,170	609	609	168	168
25	17,000	14,900	16,300	5,350	635	519	519	5,920	609	609	168	168
26	15,200	17,400	15,600	6,760	612	519	519	3,260	609	609	168	168
27	14,700	17,800	15,200	7,450	606	519	519	1,560	609	609	168	168
28	14,200	18,200	15,000	6,800	594	519	519	519	609	609	168	168
29	12,200	17,900	14,700	7,480	609	519	519	519	609	609	168	168
30	5,240	18,400	14,400	5,970	-------	519	519	519	609	609	168	168
31	4,080	-------	14,100	2,210	-------	519	-------	1,020	-------	609	168	-------
(†)	991.7	1,074.3	1,054.1	965.1	945.6	946.0	946.0	959.5	949.0	949.0	928.0	928.0
(‡)	+750	+15,740	-5,960	-11,580	-752	+11	0	+481	-391	0	-441	0

Calendar year 1959..... ‡ +1,800
Water year 1959-60..... ‡ -2,140

† Elevation, in feet, at 12 p.m. (estimated) on last day of month.
‡ Change in contents, in acre-feet.
a No record; contents estimated.

985. White River near Buckley, Wash.

Location.--Lat 47°09'05", long 121°57'00", in SW¼NW¼ sec.8, T.19 N., R.7 E., or right bank 0.7 mile upstream from Red Creek, 1 mile downstream from Mud Mountain Dam, 4 miles east of Buckley, and 8 miles downstream from Clearwater River.
Drainage area.--401 sq mi.
Records available.--October 1928 to November 1933, October 1938 to September 1960.
Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929 (Corps of Engineers bench mark). Oct. 26 to Dec. 9, 1928, staff gage and Dec. 9, 1928, to Nov. 30, 1933, water-stage recorder, at site 3 miles upstream at different datum. Nov. 26, 1938, to Feb. 14, 1939, staff gage at present site and datum.
Average discharge.--27 years, 1,434 cfs (1,038,000 acre-ft per year), adjusted for storage since December 1943.
Extremes.--Maximum discharge during year, 13,000 cfs Nov. 23 (elevation, 807.91 ft); minimum, 9.8 cfs Oct. 28; minimum elevation, 798.14 ft Sept. 16; minimum daily, 313 cfs Dec. 24.
1928-33, 1938-60: Maximum discharge, 17,000 cfs Feb. 26, 1932 (gage height, 17.5 ft, site and datum then in use), from rating curve extended above 4,000 cfs: probably no flow for part of each day Oct. 1, 2, 7, 8, Nov. 14, Dec. 1, 5, 15, 1958, Jan. 3, Mar.24, June 8, Aug. 19, 1959; minimum daily, 59 cfs June 25, 1957, Mar. 26, 1958.
Maximum stage known, 23.4 ft in December 1933, from floodmarks, at former site (discharge, 28,000 cfs, from rating curve extended above 3,000 cfs).
Remarks.--Records good except those for period Oct. 1 to Nov. 22, which are fair. Diversion for some community use within basin. Flow regulated by Mud Mountain Reservoir for flood control (see preceding page). Storage is not retained and observed annual runoff closely represents natural runoff of basin.
Cooperation.--Water-stage recorder inspected by employees of Corps of Engineers.
Revisions.--WSP 1246: Drainage area.

Rating tables, water year 1959-60 (elevation, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 22)

Oct. 1 to May 11				May 12 to Sept. 30	
799.8	285	803.0	2,570	799.8	369
801.0	840	805.0	5,690	801.0	895
802.0	1,540	808.0	13,220	802.0	1,550
				804.0	3,940

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*809	1,470	1,970	2,110	1,440	675	1,640	1,460	2,350	1,600	1,000	716
2	845	1,290	2,200	1,770	1,320	680	*1,720	1,060	2,500	1,420	928	678
3	1,990	1,540	2,080	1,040	1,170	*635	1,800	376	2,280	1,360	900	664
4	1,320	1,860	1,710	812	1,090	715	1,860	392	2,950	1,380	885	849
5	1,030	1,540	1,400	796	1,120	741	1,940	418	2,970	1,400	880	859
6	973	1,400	1,330	862	1,240	763	1,960	980	2,940	1,510	840	750
7	955	1,300	1,330	955	2,730	758	2,070	1,960	2,820	1,570	870	*659
8	949	1,210	1,840	943	2,860	829	2,220	1,990	2,610	1,520	930	632
9	1,740	1,150	2,030	925	2,330	774	2,310	1,990	2,140	1,360	940	627
10	1,430	1,080	1,920	895	2,040	725	1,980	2,190	2,050	1,260	1,000	655
11	2,060	1,030	1,810	884	1,880	710	1,760	2,610	2,110	1,190	*1,050	655
12	2,420	1,070	1,800	878	1,940	685	1,620	*3,200	2,100	1,180	950	697
13	2,470	961	1,770	1,100	2,130	715	1,530	3,370	2,080	1,210	859	591
14	1,910	919	1,720	1,350	1,530	705	1,550	3,240	2,240	1,240	819	578
15	1,840	1,120	10,100	774	1,850	846	1,440	3,060	2,370	1,230	799	807
16	2,420	1,020	7,150	445	1,580	796	1,300	2,690	*2,580	1,220	774	617
17	2,340	1,130	4,330	476	1,390	846	1,270	1,950	2,470	1,240	895	586
18	2,240	1,930	3,270	481	1,280	878	1,230	1,700	1,930	1,300	1,310	569
19	2,080	2,140	2,610	490	1,160	907	1,180	1,960	1,660	1,280	1,250	609
20	1,920	*3,680	1,910	504	1,070	1,120	1,380	2,260	1,820	1,190	994	591
21	1,780	8,400	1,660	508	1,050	1,590	1,460	3,420	2,190	1,100	854	526
22	2,080	7,900	1,670	*571	967	1,860	1,340	3,410	1,600	1,050	750	494
23	3,530	11,200	847	655	907	1,910	1,310	3,020	1,630	1,000	750	535
24	4,230	10,700	313	665	884	1,810	1,300	2,400	1,800	944	735	604
25	4,200	6,490	1,110	685	856	1,890	1,310	2,760	1,750	939	716	750
26	3,210	4,530	1,430	768	774	2,050	1,260	2,840	1,640	983	912	632
27	2,670	3,310	1,280	1,050	720	1,920	1,240	2,560	1,620	1,120	1,010	569
28	2,350	2,730	1,220	1,180	720	1,810	1,290	2,080	1,600	1,090	799	564
29	3,570	2,530	*1,200	2,260	685	1,690	1,390	1,890	1,660	1,020	735	535
30	3,800	1,490	1,160	2,940	-------	1,780	1,410	2,000	1,640	1,020	702	522
31	1,760	-------	1,440	2,570	-------	1,890	-------	2,310	-------	988	735	-------
Total	66,921	88,120	67,410	32,342	40,693	35,503	47,070	67,546	64,100	37,894	27,571	19,120
Mean	2,159	2,937	2,175	1,043	1,403	1,145	1,569	2,179	2,137	1,222	889	637
Ac-ft	132,700	174,800	133,700	64,150	80,710	70,420	93,360	134,000	127,100	75,160	54,690	37,920
(†)	+750	+15,740	-5,960	-11,580	-752	+11	0	+481	-391	0	-441	0

Adjusted for change in contents in Mud Mountain Reservoir

Mean	2,170	3,201	2,077	855	1,390	1,145	1,569	2,187	2,129	1,222	882	637
Cfsm	5.41	7.98	5.18	2.13	3.47	2.86	3.91	5.45	5.31	3.05	2.20	1.59
In.	6.24	8.91	5.97	2.46	3.74	3.29	4.37	6.29	5.92	3.51	2.54	1.77
Ac-ft	133,400	190,500	127,700	52,570	79,960	70,430	93,360	134,500	126,700	75,160	54,250	37,920

Observed

Calendar year 1959: Max 11,200 Min 167 Mean 1,862 Ac-ft 1,348,000
Water year 1959-60: Max 11,200 Min 313 Mean 1,621 Ac-ft 1,179,000

Adjusted

Calendar year 1959: Mean 1,865 Cfsm 4.65 In. 63.09 Ac-ft 1,350,000
Water year 1959-60: Mean 1,621 Cfsm 4.04 In. 55.01 Ac-ft 1,177,000

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Mud Mountain Reservoir, furnished by Corps of Engineers.

1005. White River near Sumner, Wash.
(Formerly published as Stuck River near Sumner)

Location.--Lat 47°14'55", long 122°14'35", in NE¼SW¼ sec.1, T.20 N., R.4 E., on right bank 300 ft downstream from county bridge, 3 miles north of Sumner, and 4½ miles upstream from mouth.

Drainage area.--470 sq mi, excludes that of Lake Tapps.

Records available.--January 1945 to September 1960. Prior to October 1959, published as Stuck River near Sumner.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (Intercounty River Improvement Commission bench mark).

Average discharge.--15 years, 623 cfs (451,000 acre-ft per year).

Extremes.--Maximum discharge during year, 14,700 cfs Nov. 24 (elevation, 60.96 ft); minimum, 35 cfs July 28; minimum elevation, 50.64 ft Nov. 17.
1945-60: Maximum discharge, 15,100 cfs Dec. 12, 1955 (elevation, 61.40 ft); minimum, 28 cfs Nov. 1, 1958; minimum elevation, 48.48 ft Feb. 1, 1945 (channel affected by dredging).

Remarks.--Records good except those for period of no gage-height record, which are poor. An average of 600 to 900 cfs diverted above station into Lake Tapps for Dieringer powerplant of Puget Sound Power & Light Co. High flow influenced by regulation in Mud Mountain Reservoir (see p. 88).

Revisions.--WSP 1216: Drainage area. Revised figures of discharge, in cubic feet per second, for high-water period in the water year 1959, superseding those published in WSP 1636, are given herewith:

1959	
Sept.26	175
27	2,540
28	2,550
29	1,520
30	238

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
September 1959	9,644	2,550	56	321	19,130
Water year 1958-59	-	11,300	32	962	696,300

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	126	918	667	376	392	96	282	217	1,120	77	58	156
2	91	697	822	345	224	104	268	1,050	1,130	73	58	459
3	88	366	521	200	212	104	259	492	a2,200	70	58	68
4	71	888	287	177	188	*102	246	486	a1,700	70	58	73
5	69	282	109	177	180	106	259	486	a1,700	66	58	63
6	63	95	96	196	180	106	*242	492	a1,900	64	59	55
7	62	71	94	204	696	96	237	296	a4,000	66	56	55
8	68	65	96	*188	1,110	125	325	301	a3,000	58	53	*55
9	105	61	220	166	716	137	413	282	a800	58	48	56
10	64	56	315	163	413	119	330	568	a500	58	45	46
11	173	53	268	163	296	112	216	*1,360	a500	58	48	53
12	478	53	320	160	218	106	177	1,870	a500	58	53	55
13	504	49	220	160	688	94	152	2,310	a500	56	56	464
14	292	42	220	163	255	102	180	2,910	a600	71	53	429
15	97	52	9,470	174	340	134	192	2,910	a700	56	55	125
16	*460	50	9,540	163	237	373	166	3,680	a900	56	*56	86
17	804	50	4,850	170	204	583	152	3,060	*860	71	56	77
18	678	527	3,000	163	170	140	149	2,480	301	71	56	70
19	464	*918	1,420	156	152	122	156	1,210	200	66	46	73
20	306	2,300	786	152	140	119	*200	1,540	212	58	45	70
21	239	8,330	381	152	140	119	242	2,500	509	48	53	68
22	355	7,730	306	146	134	156	216	2,460	242	43	71	64
23	1,680	*10,300	519	166	379	174	184	2,000	140	43	439	77
24	2,790	12,500	552	242	680	684	166	1,690	128	42	104	71
25	2,810	9,480	480	250	140	1,340	163	1,690	122	42	79	71
26	2,220	3,230	242	273	109	350	156	1,800	116	42	75	77
27	1,510	2,110	220	*220	106	315	146	1,580	106	41	109	73
28	1,500	1,520	196	208	102	268	629	1,150	86	73	70	71
29	2,240	1,470	196	745	96	264	960	723	81	90	55	75
30	2,820	1,040	212	1,320	------	277	188	654	79	56	50	66
31	1,320	------	200	974	------	287	------	990	------	56	52	------
Total	24,547	65,303	36,825	8,512	9,097	7,214	7,651	45,237	24,932	1,857	2,232	3,301
Mean	792	2,177	1,188	275	314	233	255	1,459	831	59.9	72.0	110
Ac-ft	48,690	129,500	73,040	16,880	18,040	14,310	15,180	89,730	49,450	3,680	4,430	6,550

Calendar year 1959: Max 12,500 Min 40 Mean 954 Ac-ft 690,200
Water year 1959-60: Max 12,500 Min 41 Mean 647 Ac-ft 469,500

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage and unpublished record for station at Buckley.

1010. Lake Tapps near Sumner, Wash.

Location.--Lat 47°14'30", long 122°11'30", in NE¼ sec.8, T.20 N., R.5 E., 1½ miles east of Dieringer and 3 miles northeast of Sumner.

Drainage area.--12.5 sq mi.

Records available.--November 1911 to September 1960. October 1934 to October 1950, change in contents published with records for Puyallup River at Puyallup. Month-end contents only November 1911 to September 1950, published in WSP 1316.

Gage.--Staff gage read hourly. Datum of gage is 0.7 ft above mean sea level (levels by Puget Sound Power & Light Co.).

Extremes.--Maximum contents observed during year, 46,660 acre-ft Oct. 17 (gage height, 543.00 ft); minimum observed, 4,270 acre-ft Mar. 18 (gage height, 519.35 ft).
1911-60: Maximum contents observed, 51,710 acre-ft June 30, 1958 (gage height, 541.57 ft, capacity table dated Jan. 19, 1920); maximum gage height, that of Oct. 17, 1959; minimum contents observed, 458 acre-ft June 24, 1912 (gage height, 505.70 ft).

Remarks.--Reservoir is formed on natural lake into which a great part of the low-water flow of White River is diverted. Usable capacity, 46,660 acre-ft between elevations 515 and 543 ft from capacity table dated July 28, 1959. Storage used for power.

Cooperation.--Gage-height record and contents curve furnished by Puget Sound Power & Light Co.

Month-end gage height and contents, water year October 1959 to September 1960

Date	Gage height (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	542.61	45,670	-
Oct. 31	542.58	45,600	-70
Nov. 30	540.14	39,640	-5,960
Dec. 31	537.90	34,440	-5,200
Calendar year 1959	-	-	-8,380
Jan. 31	539.15	37,320	+2,880
Feb. 29	532.82	23,680	-13,640
Mar. 31	533.28	24,580	+900
Apr. 30	539.24	37,530	+12,950
May 31	541.70	43,400	+5,870
June 30	542.21	44,670	+1,270
July 31	542.60	45,650	+980
Aug. 31	542.50	45,400	-250
Sept.30	541.58	43,110	-2,290
Water year 1959-60	-	-	-2,560

† Gage height at 12 p.m.

1011. Lake Tapps diversion at Dieringer, Wash.

Location.--Lat 47°14'20", long 122°13'40", in NW¼ sec.7, T.20 N., R.5 E., on right bank 900 ft downstream from Dieringer powerplant, 1,200 upstream from mouth, and 2½ miles north of Sumner.

Records available.--April 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 60 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,310 cfs Nov. 23 (gage height, 6.00 ft); minimum daily, 32 cfs Sept. 24, 25.
1958-60: Maximum discharge, that of Nov. 23, 1959; minimum daily, 19.5 cfs Aug. 22, 23, 1959.

Remarks.--Records excellent except those for period of no gage-height record, which are good. Regulation by White River powerplant.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

0.6	31	3.0	700
1.0	93	4.0	1,170
1.5	196	6.0	2,310
2.0	340		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,460	1,310	1,500	745	1,420	2,050	1,400	1,040	1,380	1,630	1,280	546
2	1,470	1,430	1,490	1,030	1,420	1,690	1,340	755	1,460	2,000	1,300	884
3	1,100	1,500	1,530	1,140	1,480	1,940	982	102	1,550	1,860	1,150	227
4	904	1,610	1,560	1,360	1,490	*1,460	878	54	1,820	1,660	900	252
5	1,290	1,830	1,460	1,240	1,540	1,060	923	49	1,780	1,680	959	301
6	1,490	1,510	1,360	1,170	1,370	742	878	37	1,500	1,810	908	822
7	1,370	1,370	1,460	1,060	1,300	1,120	*950	312	1,530	1,850	818	*950
8	1,070	1,250	1,520	938	1,480	1,120	1,210	37	1,570	1,470	824	839
9	860	1,360	1,550	459	1,510	1,100	939	468	1,560	1,380	620	867
10	890	1,300	1,520	385	1,420	1,140	536	1,250	1,590	994	736	434
11	1,150	1,300	1,560	932	1,460	1,110	1,430	1,720	1,580	1,280	678	104
12	1,330	1,350	1,460	794	1,600	974	1,630	1,730	1,510	1,290	882	816
13	1,700	1,290	1,460	839	1,540	916	1,640	1,970	1,600	1,210	764	914
14	1,800	1,320	1,500	970	1,440	1,110	1,830	1,490	1,730	1,290	697	914
15	1,820	1,180	1,350	996	1,580	1,030	1,640	690	2,060	1,320	826	803
16	1,570	1,450	1,530	934	1,570	977	1,480	293	2,030	956	*1,130	736
17	1,650	1,500	1,500	404	2,140	753	1,560	1,090	*2,070	486	902	794
18	1,540	1,250	1,460	1,080	1,710	882	1,570	1,270	2,130	1,290	704	318
19	1,610	*1,240	1,380	1,080	1,670	472	1,560	1,140	2,180	1,250	768	822
20	1,670	1,320	1,300	1,120	1,440	61	1,580	1,460	2,150	1,350	797	788
21	1,670	1,450	1,500	1,020	1,400	417	1,590	2,150	1,610	1,350	754	307
22	1,630	1,420	1,520	986	1,430	740	1,590	2,150	1,660	1,330	671	722
23	1,600	1,460	1,430	214	1,580	882	1,400	1,610	1,680	761	410	447
24	1,600	1,260	1,240	42	1,500	916	1,420	1,300	1,660	188	301	32
25	1,540	1,280	1,400	798	1,920	172	1,510	952	1,850	1,280	848	32
26	1,640	749	1,430	610	1,970	464	1,440	963	1,420	1,300	787	420
27	1,560	1,090	1,390	*882	2,120	336	1,360	2,040	1,620	1,120	1,050	332
28	1,440	1,340	1,500	1,050	1,930	1,220	1,430	2,170	1,610	1,220	968	412
29	1,580	1,180	1,450	1,360	2,090	1,390	1,480	2,170	1,590	1,270	510	466
30	1,560	1,320	1,420	1,310	-------	1,490	1,330	2,170	1,650	152	84	498
31	1,380	-------	1,490	1,230	-------	1,490	-------	2,030	--------	39	236	-------
Total	44,744	40,219	45,220	28,178	46,520	31,224	40,306	36,662	51,130	38,066	24,262	16,799
Mean	1,443	1,341	1,459	909	1,604	1,007	1,344	1,183	1,704	1,228	783	560
Ac-ft	88,750	79,770	89,690	55,890	92,270	61,930	79,950	72,720	101,400	75,500	48,120	33,320

Calendar year 1959: Max 2,190 Min 19.5 Mean 1,261 Ac-ft 913,200
Water year 1959-60: Max 2,180 Min 32 Mean 1,211 Ac-ft 879,300

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 6-31; discharge obtained from Puget Sound Power & Light Co. powerplant logs.

1015. Puyallup River at Puyallup, Wash.

Location.--Lat 47°12'30", long 122°19'35", in NW¼ sec.20, T.20 N., R.4 E., on left bank 0.8 mile upstream from bridge at Clark Creek, 1 mile northwest of Puyallup, and 7 miles upstream from mouth.
Drainage area.--948 sq mi.
Records available.--May 1914 to September 1960.
Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Dec. 3, 1919, at sites 1¼ miles and 900 ft upstream at different datums. Dec. 3, 1919, to Nov. 9, 1935, at site 500 ft upstream at datum 9.61 ft higher than present datum.
Average discharge.--46 years, 3,350 cfs (2,425,000 acre-ft per year), adjusted for storage in Lake Tapps since October 1934 and Mud Mountain Reservoir October 1944 to September 1947.
Extremes.--Maximum discharge during year, 35,600 cfs Nov. 23 (elevation, 25.05 ft); minimum, 705 cfs Sept. 18; minimum elevation, 8.70 ft Sept. 18, 24; minimum daily discharge, 1,930 cfs Sept. 24.
1914-60: Maximum discharge, 57,000 cfs Dec. 10, 1933 (elevation, 31.0 ft, present datum); minimum, 306 cfs Sept. 25, 1955 (elevation, 8.23 ft); minimum daily, 400 cfs Nov. 30, 1952.
Remarks.--Records excellent. All diverted water returned to river above gage. Large part of flow of White River diverted into Lake Tapps (see preceding page) returned via White River (formerly Stuck River) above station. Flood flow regulated by Mud Mountain Reservoir on White River (see p. 88). Some pondage on tributaries and upper Puyallup River. Diurnal fluctuations caused by powerplants and glacial melts above station. Since 1912 the city of Tacoma pipeline diversion from Green River has spilled as much as 110 cfs daily (an average of 40 cfs, or 2,380 acre-ft per month) into Puyallup River at south line of sec.7, T.19 N., R.5 E., half a mile east of McMillin. Monthly mean discharges, in cubic feet per second, for the water year 1960 are as follows:

October.....	61.3	February.....	40.8	June.....	25.9
November.....	71.0	March.....	65.5	July.....	35.1
December.....	73.1	April.....	61.5	August.....	44.8
January.....	40.4	May.....	60.8	September.....	39.9

Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.
Revisions.--WSP 832: Drainage area.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,130	5,810	5,840	4,020	5,660	2,770	5,040	4,310	6,790	4,750	3,490	2,800
2	4,550	5,500	5,800	4,090	5,160	2,680	4,870	5,840	7,000	5,040	3.780	3,860
3	4,020	5,610	5,720	3,780	*4,760	2,920	4,690	2,360	8,420	4,840	3.450	2,240
4	3,560	6,670	5,310	4,080	4,740	*2,480	4,450	2,200	7,880	4,660	3.140	2,910
5	3,840	6,010	4,660	4,020	4,810	3,290	4,550	2,140	7,470	4,690	3.160	3,230
6	3,940	4,980	4,450	4,130	4,700	3,090	4,580	2,220	6,950	5,270	3.200	*3,170
7	3,860	4,640	4,660	3,960	8,930	3,350	*4,650	3,740	8,400	5,470	3.100	3,260
8	3,650	4,340	4,720	3,740	8,470	3,810	5,210	3,160	7,760	4,760	3.130	3,010
9	5,390	4,430	4,920	2,720	7,460	3,850	5,400	4,250	5,550	4,450	3.120	2,950
10	4,340	4,190	5,220	2,640	6,450	3,760	4,100	5,270	5,080	3,770	3.140	2,380
11	7,980	4,090	5,910	3,360	5,770	3,650	4,450	*5,810	5,060	4,040	3.060	2,010
12	9,400	4,160	6,480	3,150	5,390	3,350	4,810	7,320	4,940	4,020	3.210	2,900
13	7,820	3,930	6,060	3,200	6,520	3,230	4,850	7,580	5,090	4,070	2,820	3,570
14	6,930	3,920	5,300	3,280	5,860	3,440	5,180	8,910	5,520	4,150	2,740	3,620
15	5,940	3,840	20,800	3,510	7,010	4,190	5,300	7,630	7,180	4,040	2,880	2,900
16	5,800	4,130	20,000	3,310	6,250	4,260	4,700	7,620	7,700	3,560	3.150	2,830
17	5,860	4,380	11,500	2,520	6,390	4,570	4,560	8,000	7,920	3,180	*3.350	2,390
18	5,480	8,240	8,620	3,270	5,500	3,830	4,560	8,140	6,480	4,340	3.120	1,990
19	5,240	6,910	7,790	3,400	5,150	3,040	4,600	6,630	6,040	4,300	3.050	2,720
20	5,790	9,720	6,530	3,360	4,440	2,920	5,180	9,450	6,390	4,200	2,880	2,830
21	7,260	23,500	5,750	3,240	4,470	3,740	5,750	9,920	5,890	4,140	2,810	2,170
22	9,590	20,200	5,250	3,180	4,400	4,490	5,340	8,360	5,460	3,960	2,650	2,400
23	11,600	*32,100	5,340	2,420	4,710	4,660	4,910	8,440	*5,100	3,170	3,010	2,330
24	9,760	24,600	5,280	3,270	5,280	5,210	4,810	7,080	5,310	2,320	2,650	1,930
25	*11,200	20,000	5,160	4,580	3,300	5,580	4,850	6,510	5,470	3,390	3.310	2,370
26	8,260	9,260	4,770	4,660	3,220	4,170	4,690	6,420	4,710	3,680	3.860	2,760
27	8,010	7,120	4,670	4,420	3,260	3,800	4,400	7,760	4,880	3,810	5,360	2,370
28	8,520	7,910	4,740	4,380	3,030	4,790	5,220	5,540	4,720	4,050	3.930	2,410
29	8,680	7,310	4,610	7,520	3,130	4,930	6,190	5,000	4,850	4,020	2,930	2,440
30	9,160	6,390	4,620	8,020	-------	5,490	4,480	5,140	4,790	2,600	2,130	2,440
31	6,790	-------	4,530	6,810	-------	5,440	-------	6,420	-------	2,280	2,290	-------
Total	207,350	263,890	205,010	122,040	154,220	120,780	146,370	189,170	184,780	125,000	97,900	81,190
Mean	6,689	8,796	6,613	3,937	5,318	3,896	4,879	6,102	6,159	4,032	3.158	2,706
Ac-ft	411,300	523,400	406,600	242,100	305,900	239,600	290,300	375,200	366,500	247,900	194,200	161,000
(†)	-70	-5,960	-5,200	+2,880	-13,640	+900	+12,950	+5,870	+1,270	+980	-250	-2,290

Adjusted for change in contents in Lake Tapps

Mean	6,688	8,695	6,528	3,985	5,082	3,911	5,095	6,198	6,181	4,048	3.155	2,667
Ac-ft	411,200	517,400	401,400	245,000	292,300	240,500	303,200	381,100	367,800	248,900	194.000	158,700

Observed

Calendar year 1959: Max 32,100 Min 772 Mean 4,675 Ac-ft 3,385,000
Water year 1959-60: Max 32,100 Min 1,930 Mean 5,185 Ac-ft 3,764,000

Adjusted

Calendar year 1959: Mean 4,665 Cfsm - In. - Ac-ft 3,377,000
Water year 1959-60: Mean 5,181 Cfsm 5.47 In. 74.39 Ac-ft 3,761,000

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Lake Tapps, from information by Puget Sound Power & Light Co.

1035. Snow Creek near Lester, Wash.

Location.--Lat 47°15'00", long 121°24'00", in NW¼NW¼ sec.3, T.20 N., R.11 E., on right bank 60 ft upstream from bridge, a quarter of a mile upstream from mouth, and 5½ miles northeast of Lester. Prior to Jan. 6, 1960, at site 60 ft downstream.

Drainage area.--11.9 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,950 ft (from topographic map). Prior to Apr. 17, 1957, at site 140 ft upstream at datum 3.84 ft higher. Apr. 17, 1957, to Jan. 5, 1960, at site 60 ft downstream at present datum.

Average discharge.--15 years, 69.1 cfs (50,030 acre-ft per year).

Extremes.--Maximum discharge during year, 3,400 cfs Nov. 23 (gage height, 8.0 ft), from rating curve extended above 1,300 cfs; minimum daily, 6.5 cfs Aug. 14.
1945-60: Maximum discharge, that of Nov. 23, 1959; minimum, 3.0 cfs Nov. 29, 30, 1952; minimum gage height, 1.00 ft Sept. 12, 13, 1958.
Revisions.--The figure of maximum gage height for the water year 1957 has been revised to 6.1 ft, from floodmarks, at present datum at site then in use, Dec. 9, 1956 (discharge, 1,730 cfs), superseding that published in WSP 1516, 1566, and 1636.

Remarks.--Records good except those for periods of doubtful or no gage-height record and shifting control, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 1636: 1958.

Rating tables, water year 1959-60, except periods of shifting control (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 5				Jan. 6 to Sept. 30			
1.3	19	3.5	409	5.3	4.0	6.0	74
1.5	35	4.5	760	5.4	7.7	6.3	145
2.0	94	5.5	1,300	5.6	20	6.7	290
2.5	174			5.8	42		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	66	*59	25	24	17.5	101	125	139	29	9.0	12
2	63	59	56	23	23	16.5	137	120	142	27	8.5	11.5
3	53	97	52	21	22	16	172	108	142	25	8.5	11
4	44	104	44	20	20	15	206	94	123	24	8.5	11.5
5	39	91	42	*19	40	15	222	92	110	24	8	17.5
6	35	79	42	17	150	15	226	120	101	23	8	14.5
7	33	67	46	15	140	15	254	163	82	21	8	14
8	62	60	46	15	100	15	250	142	72	19.5	7.5	*12.5
9	102	54	40	15	*72	14.5	206	125	67	18	*7.3	12
10	95	48	37	14	67	14	145	151	67	17.5	7.3	12
11	248	46	44	14	56	13	120	175	67	16.5	6.9	11.5
12	230	49	47	13	50	12.5	103	182	63	15	6.9	11.5
13	154	41	43	13	46	12.5	92	163	60	14.5	6.9	11
14	112	39	*400	13	50	12.5	84	142	61	14	6.5	11
15	91	44	*1,160	13	58	16.5	74	120	69	13	6.9	10.5
16	72	36	640	12	49	14	65	117	108	13	7.3	10.5
17	61	37	200	12	42	17.5	61	110	92	13	8.7	9.8
18	52	47	100	14	37	21	56	106	78	12.5	7.7	9.2
19	46	79	80	13	32	*28	58	110	69	12	6.9	9.8
20	70	318	70	12	31	65	82	218	69	12	6.9	9.8
21	87	351	60	11	31	125	*78	189	*67	12	6.9	9.2
22	283	835	54	10	27	154	65	154	63	12	6.9	9.2
23	210	1,220	48	10	25	160	58	123	61	11.5	12.5	9.2
24	160	350	44	11	25	163	56	108	58	11	11	12
25	160	220	40	12	23	192	60	*101	52	10.5	11.5	12
26	125	175	36	13	20	226	65	101	45	10	19.5	9.8
27	*104	125	33	13	20	178	78	112	42	10	17.5	9.2
28	101	100	31	13	19	151	92	110	38	9.5	14	9.2
29	91	80	30	25	18	134	106	117	37	9.5	12.5	8.7
30	80	70	29	28	------	131	123	145	32	9	12	8.7
31	72	------	28	26	------	110	------	163	------	9	12.5	------
Total	3,215	4,987	3,681	485	1,317	2,090.0	3,495	4,106	2,276	477.5	289.0	330.3
Mean	104	166	119	15.6	45.4	67.4	116	132	75.9	15.4	9.32	11.0
Cfsm	8.74	13.9	10.0	1.31	3.82	5.66	9.75	11.1	6.38	1.29	0.783	0.924
In.	10.05	15.59	11.50	1.52	4.12	6.53	10.92	12.83	7.11	1.49	0.90	1.03
Ac-ft	6,380	9,890	7,300	962	2,610	4,150	6,930	8,140	4,510	947	573	655

Calendar year 1959: Max 1,220 Min 7.4 Mean 88.9 Cfsm 7.47 In. 101.45 Ac-ft 64,400
Water year 1959-60: Max 1,220 Min 6.5 Mean 73.1 Cfsm 6.14 In. 83.59 Ac-ft 53,050

Peak discharge (base, 350 cfs).--Oct. 22 (12 m.) 409 cfs (3.37 ft); Nov. 20 (10 p.m.) 453 cfs (3.52 ft); Nov. 23 (1 a.m.) 3,400 cfs (8.0 ft); Dec. 15 (8:30 a.m.) 1,300 cfs (5.5 ft).

* Discharge measurement made on this day.
Note.--Doubtful or no gage-height record Nov. 24-30, Dec. 2-14, Dec. 17 to Jan. 5, Jan. 8 to Feb. 8, Mar. 3, July 25 to Aug. 8; discharge estimated on basis of 2 discharge measurements and records for Friday Creek near Lester. Shifting-control method used Oct. 1 to Nov. 23, Dec. 1, Jan. 6, 7.

1040. Friday Creek near Lester, Wash.

Location.--Lat 47°13'10", long 121°27'10", in SE¼NW¼ sec.18, T.20 N., R.11 E., on left bank 0.4 mile upstream from mouth and 2 miles northeast of Lester.

Drainage area.--4.55 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Concrete control since Aug. 9, 1951. Altitude of gage is 1,760 ft (from topographic map).

Average discharge.--15 years, 28.1 cfs (20,340 acre-ft per year).

Extremes.--Maximum discharge during year, 1,370 cfs Nov. 22 (gage height, 6.04 ft, from high-water mark in well), from rating curve extended above 230 cfs on basis of slope-area measurement of peak flow; minimum recorded, 3.6 cfs Aug. 14, 20, 21, 22, Sept. 30 (gage height, 1.64 ft).
1945-60: Maximum discharge, that of Nov. 22, 1959; minimum, 1.2 cfs Sept. 6, 1958; minimum gage height, that of Aug. 14, 20, 21, 22, Sept. 30, 1960.
Revisions.--Figures of maximum discharge for the water years 1957 and 1959 have been revised to 424 cfs Dec. 10, 1956 (gage height, 4.42 ft) and 590 cfs Nov. 12, 1958 (gage height, 4.76 ft), superseding figures published in WSP 1516 and 1636, respectively.

Remarks.--Records good except those for periods of shifting-control, which are fair. Small diversion above gage of about 1,000 gpd for domestic use. No regulation.

Revisions.--WSP 1216: Drainage area.

Rating tables, water year 1959-60, except period of shifting control (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22				Nov. 22 to Sept. 30			
2.8	11	3.5	96	1.6	3.0	3.0	96
2.9	16.5	3.9	216	1.8	6.8	3.5	184
3.1	32	4.4	460	2.0	13	4.0	315
3.3	57			2.4	34	4.5	490

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	24	*29	12	14	7	37	34	59	14	4.4	4.6
2	25	21	27	12	13.5	7	44	36	60	12.5	4.4	4.4
3	21	29	25	11	12.5	6	48	36	62	12	4.4	4.3
4	17.5	32	22	10.5	11	6	53	33	57	11.5	4.4	5.0
5	15.5	28	20	*10.5	13.5	6	62	33	52	10.5	4.3	6.8
6	14.5	24	20	10.5	26	6	67	40	48	10.5	4.1	5.3
7	14.5	21	23	9.6	76	6	75	60	42	9.6	4.1	4.6
8	19.5	19	22	9.3	43	6	77	59	36	9.0	4.0	*4.4
9	34	17.5	18.5	9.0	*31	6	69	51	34	8.8	*3.8	4.3
10	31	16.5	17.5	8.5	29	5	55	55	33	8.5	3.8	4.3
11	146	15	21	8.8	25	5	44	64	33	7.9	3.8	4.3
12	101	17	23	8.2	22	5	39	73	32	7.6	3.8	4.1
13	61	14	20	7.6	20	5	36	71	30	7.4	3.8	4.0
14	42	14	67	7.6	23	6	34	70	31	6.8	4.0	4.0
15	33	17	*232	7.6	31	5	31	59	32	6.6	4.4	3.8
16	27	14.5	136	7.4	24	6	29	56	44	6.4	4.8	3.8
17	22	15	72	6.8	19	8	28	54	37	6.4	5.3	3.8
18	19	23	52	9.0	16	11	26	54	32	5.9	4.0	3.8
19	16.5	44	40	8.2	14	*18	26	56	30	5.7	3.8	4.1
20	25	147	33	6.1	13.5	30	32	96	33	5.7	3.6	4.1
21	29	178	30	6.1	14.5	42	*31	81	*35	5.5	3.8	3.8
22	192	*426	26	5.9	12.5	46	26	63	32	5.5	3.6	3.8
23	110	322	23	6.1	10	48	24	51	29	5.3	8.6	4.0
24	70	158	21	6.4	10	47	23	46	27	5.3	6.4	6.1
25	64	117	19.5	6.6	9	53	23	*42	24	5.0	5.9	5.5
26	49	73	17	7.9	8	59	23	43	22	5.0	9.9	4.3
27	*40	56	16	7.4	8	51	24	48	19.5	4.8	6.6	4.0
28	43	44	15	7.9	7	45	26	49	17.5	4.8	5.5	3.8
29	41	37	14.5	16.5	7	42	28	50	16	4.6	5.0	3.8
30	33	32	14	16	------	42	31	58	15	4.6	4.8	3.6
31	28	------	13	14.5	------	38	------	63	------	4.6	4.8	------
Total	1,416	1,995.5	1,129.0	281.5	563.0	673	1,171	1,684	1,054.0	228.3	147.9	130.5
Mean	45.7	66.5	36.4	9.08	19.4	21.7	39.0	54.3	35.1	7.36	4.77	4.35
Cfsm	10.0	14.6	8.00	2.00	4.26	4.77	8.57	11.9	7.71	1.62	1.05	0.956
In.	11.57	16.31	9.23	2.30	4.60	5.50	9.57	13.76	8.62	1.87	1.21	1.07
Ac-ft	2,810	3,960	2,240	558	1,120	1,330	2,320	3,340	2,090	453	293	259

Calendar year 1959: Max 426 Min 2.8 Mean 34.8 Cfsm 7.65 In. 103.96 Ac-ft 25,230
Water year 1959-60: Max 426 Min 3.6 Mean 28.6 Cfsm 6.29 In. 85.61 Ac-ft 20,770

Peak discharge (base, 150 cfs).--Oct. 11 (6:30 a.m.) 184 cfs (3.84 ft); Oct. 22 (11:30 a.m.) 368 cfs (4.27 ft); Nov. 22 (7 p.m.) 1,370 cfs (6.04 ft); Dec. 15 (4 p.m.) 288 cfs (3.91 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Feb. 23 to Mar. 18; discharge estimated on basis of record for Snow Creek near Lester. Shifting-control method used Oct. 1 to Dec. 14.

1045. Green River near Lester, Wash.

Location.--Lat 47°12'25", long 121°33'15", in NE¼SE¼ sec.20, T.20 N., R.10 E., on left bank 0.3 mile upstream from Champion Creek, 1¼ miles downstream from McCain Creek, and 3 miles west of Lester. Prior to Nov. 22, 1959, at site 300 ft upstream and Dec. 28, 1959, to Sept. 21, 1960, at site 400 ft downstream.

Drainage area.--104 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,480 ft (from river-profile map). Prior to Nov. 22, 1959, at site 300 ft upstream at different datum (gage destroyed by flood of Nov. 22, 1959). Dec. 28 1959, to Sept. 21, 1960, staff gage at site 400 ft downstream at different datum.

Average discharge.--15 years, 436 cfs (315,700 acre-ft per year).

Extremes.--Maximum discharge during year, 22,000 cfs Nov. 22 (gage height, about 16.0 ft, from floodmarks, site and datum then in use), result of slope-area measurement of peak flow; minimum daily, 46 cfs Aug. 8-14.
1945-60: Maximum discharge, that of Nov. 22, 1959; minimum, 22 cfs Nov. 30, 1952.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 1286: 1947(M). WSP 1316: 1948(M).

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	522	440	500	200	330	170	660	570	700	190	60	90
2	427	400	470	190	310	160	700	585	640	185	59	78
3	363	500	450	180	280	150	740	564	640	180	59	70
4	311	650	420	170	260	150	790	515	620	170	56	80
5	277	600	390	160	280	150	850	468	540	160	53	100
6	248	550	370	*180	400	150	840	550	470	157	50	90
7	232	500	420	170	1,400	150	860	680	410	151	48	70
8	298	370	380	160	1,000	160	900	700	360	145	*46	*60
9	550	350	350	150	*530	150	800	650	320	135	46	60
10	603	320	370	140	480	140	700	690	290	130	46	60
11	2,430	300	450	136	450	140	590	810	280	123	46	60
12	1,610	350	580	134	410	140	520	940	270	115	46	60
13	1,030	300	500	125	380	140	470	830	260	110	46	60
14	720	270	1,200	120	470	140	440	700	330	110	46	60
15	568	350	8,000	115	700	200	410	650	380	110	54	60
16	467	300	*3,020	110	550	210	380	645	515	110	56	60
17	402	350	1,500	110	450	210	360	665	450	110	80	60
18	350	500	1,000	110	370	230	350	665	420	105	58	64
19	311	1,000	700	110	330	*240	450	649	330	105	55	80
20	398	2,000	600	110	290	350	*530	1,220	340	105	54	94
21	475	5,000	500	110	300	600	660	1,190	390	92	56	120
22	2,450	*15,000	450	110	270	800	480	900	*340	90	59	93
23	1,920	9,000	380	120	250	760	460	780	330	88	72	94
24	1,210	4,000	350	150	230	750	440	*688	310	84	64	101
25	1,150	2,500	310	290	215	780	420	660	280	78	96	109
26	912	1,500	290	250	200	900	414	640	260	74	120	102
27	*708	1,000	270	250	190	790	420	625	240	73	130	96
28	650	900	251	250	180	760	480	680	230	70	120	94
29	600	650	240	500	175	700	529	670	220	67	90	93
30	550	*537	220	450	---	760	550	660	200	64	82	93
31	500	---	210	380	---	710	---	740	---	60	86	---
Total	23,242	50,487	25,141	5,740	11,680	11,840	17,193	21,979	11,365	3,546	2,039	2,411
Mean	750	1,683	811	185	403	382	573	709	379	114	65.8	80.4
Cfsm	7.21	16.2	7.80	1.78	3.87	3.67	5.51	6.82	3.64	1.10	0.633	0.773
In.	8.31	18.05	8.99	2.05	4.18	4.23	6.15	7.86	4.06	1.27	0.73	0.86
Ac-ft	46,100	100,100	49,870	11,390	23,170	23,480	34,100	43,590	22,540	7,030	4,040	4,780

Calendar year 1959: Max 15,000 Min 47 Mean 608 Cfsm 5.85 In. 79.29 Ac-ft 439,800
Water year 1959-60: Max 15,000 Min 46 Mean 510 Cfsm 4.90 In. 66.74 Ac-ft 370,200

Peak discharge (base, 1,500 cfs).--Oct. 11 (7:30 a.m.) 2,780 cfs (8.03 ft); Oct. 22 (3 p.m.) 3,880 cfs (8.94 ft); Nov. 22 (time unknown) 22,000 cfs (about 16.0 ft); probably Dec. 15 (time and discharge unknown); probably Feb. 7 (time and discharge unknown); probably May 20 (time and discharge unknown).

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 28 to Jan. 10, Jan. 14 to Apr. 21, Apr. 23, 24, 30, May 1, 7, 8, 14, 15, 21, 22, 25, 26, May 28 to June 13, June 18-21, June 23 to July 5, July 9, 10, 16, 17, July 23 to Sept. 21; discharge estimated on basis of 9 discharge measurements and records for station near Palmer. Discharge computed from once-daily staff-gage readings Jan. 11-13, Apr. 22, 25-29, May 2-6, 9-13, 16-20, 23, 24, 27, June 14-17, 22, July 6-8, 11-15, 18-22.

1047. Green Canyon Creek near Lester, Wash.

Location.--Lat 47°13'10", long 121°34'30", in SE¼ sec.18, T.20 N., R.10 E., on left bank a quarter of a mile upstream from mouth and 4 miles west of Lester.

Drainage area.--3.23 sq mi.

Records available.--April to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,480 ft (from topographic map).

Extremes.--Maximum discharge during period, 52 cfs May 20 (gage height, 1.71 ft), from recorded range in stage); minimum daily, 2.4 cfs Sept. 15-20, 22.
Maximum stage known, 3.36 ft Nov. 22, 1959, from floodmarks (discharge, 359 cfs, result of culvert measurement of peak flow).

Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation or diversion above station.

Discharge, in cubic feet per second, April to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							16	14.5	14	5.7	4.4	3.5
2							18	13.5	13	5.7	4.4	3
3							19	12.5	13	5.4	4.4	3
4							21	12	12.5	5.0	4.4	4
5							22	13	12	5.0	4.1	5
6							25	16.5	11.5	4.7	4.1	3.5
7							25	18.5	10.5	4.7	3.8	3
8							24	16	10.5	4.7	*3.6	*2.8
9							22	16	9.4	4.7	3.3	2.6
10							19	15.5	9.0	4.7	3.6	2.6
11							17	15	8.5	4.7	3.8	2.6
12							15	16	8.0	4.7	3.8	2.6
13							15	16	7.6	4.4	4	2.6
14							14	16	8.5	4.4	4	2.6
15			†223				14	16	8.5	4.4	4	2.4
16							14	16	11.5	4.7	4.5	2.4
17							14.5	16	9.8	4.4	4	2.4
18							15	16	8.5	4.4	3.5	2.4
19							15.5	20	8.5	4.4	3	2.4
20							25	40	9.8	4.4	3	2.4
21							*26	30	*11.5	4.4	3	2.8
22		†359					20	24	11.5	4.4	3.5	2.4
23							17.5	22	9.8	4.1	6	2.5
24							16	20	9.0	4.1	4.5	5
25							16	*18	8.0	4.1	4	4
26							17.5	16.5	7.2	4.1	8	3
27							18	18	6.4	4.1	5	3
28							16	18	6.0	3.8	4.5	3
29							14.5	17.5	6.4	3.8	4	3
30					------		14.5	16.5	6.0	3.8	3.5	2.5
31		------			------		------	15	------	4.1	3.5	------
Total							546.0	550.5	286.4	140.0	127.2	89.0
Mean							18.2	17.8	9.55	4.52	4.10	2.97
Cfsm							5.76	5.63	3.02	1.43	1.30	0.940
In.							6.43	6.48	3.37	1.65	1.50	1.05
Ac-ft							1,080	1,090	568	278	252	177

Calendar year : Max	Min	Mean	Cfsm	In.	Ac-ft
Water year : Max	Min	Mean	Cfsm	In.	Ac-ft

* Discharge measurement made on this day.
† Result of indirect measurement of flow through culvert.
Note.--No gage-height record Apr. 1-14, May 14-24, Aug. 13 to Sept. 7, Sept. 23-30; discharge estimated on basis of recorded range in stage and records for nearby stations.

1050. Smay Creek near Lester, Wash.

Location.--Lat 47°15'40", long 121°33'50", in SW¼ sec.32, T.21 N., R.10 E., on right bank 3½ miles upstream from mouth and 4½ miles northwest of Lester.

Drainage area.--8.71 sq mi.

Records available.--September 1946 to September 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,900 ft (from topographic map). Prior to Dec. 11, 1946, water-stage recorder at site 200 ft upstream at datum 4.28 ft higher (destroyed by high water of Dec. 11, 1946).

Average discharge.--14 years, 53.0 cfs (38,370 acre-ft per year).

Extremes.--Maximum discharge during year, 2,380 cfs Nov. 23 (gage height, 8.14 ft), from rating curve extended above 310 cfs on basis of slope-area measurement of peak flow; minimum, 8.2 cfs Sept. 30; minimum gage height, 4.00 ft Oct. 16.
1946-60: Maximum discharge, that of Nov. 23, 1959; minimum, 4.2 cfs Nov. 21 to Dec. 1, 1952.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation or diversion above station.

Revisions.--WSP 1216: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 7)

Oct. 1 to Nov. 23		Nov. 23 to May 23		May 24 to Sept. 30	
4.0	40	5.5	345	6.0	16.5
4.3	61	6.0	560	6.3	37
4.6	100	7.0	1,210	6.6	73
5.0	185			7.0	165
				4.3	6.6
				4.5	16.5
				4.8	44
				5.2	94

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	82	61	75	33	35	17	75	60	90	30	12.3	10.1
2	71	57	68	32	35	16	85	62	88	28	11.7	9.7
3	62	68	*62	31	33	15	95	62	91	28	11.7	9.7
4	56	66	58	30	30	15	105	57	87	27	11.1	11.7
5	52	64	54	29	60	15	120	54	80	25	11.1	12.9
6	50	60	50	*28	120	15	130	73	*77	24	10.5	11.7
7	48	56	60	27	180	15	140	83	72	23	10.1	10.5
8	52	53	55	26	*104	15	150	90	66	23	*10.1	*10.5
9	56	51	50	24	76	14	130	80	62	22	10.1	10.1
10	58	48	50	23	66	13	100	78	59	22	9.7	10.1
11	180	46	55	23	55	13	90	90	59	21	9.7	9.7
12	168	46	62	22	52	12	80	102	56	19.9	9.7	9.7
13	128	44	55	21	48	12	70	100	53	19.0	9.3	9.7
14	94	43	130	20	53	15	66	92	53	18.2	9.3	9.7
15	78	44	290	20	59	13	62	82	53	18.2	9.7	9.3
16	66	40	232	20	52	15	58	80	60	17.4	9.7	9.3
17	60	42	150	20	46	*21	56	76	56	16.5	9.7	9.3
18	56	55	120	20	42	21	53	78	52	15.9	9.3	9.3
19	51	72	100	20	38	21	53	87	48	15.9	9.3	9.3
20	60	180	85	17	37	27	*67	159	50	15.3	8.9	9.3
21	62	*298	75	17	36	41	67	162	48	15.3	8.9	8.9
22	214	504	65	17	34	63	60	125	*47	14.7	8.9	8.6
23	202	*1,180	60	17	32	78	57	98	45	14.1	12.3	8.9
24	142	501	55	17	27	85	53	*90	43	13.5	11.7	11.1
25	128	406	50	19	23	98	52	84	41	13.5	11.7	9.7
26	*108	296	45	22	21	112	51	81	38	13.5	14.7	9.3
27	92	245	43	20	20	102	52	83	36	12.9	12.3	8.9
28	85	140	40	20	19	90	54	83	33	12.9	11.1	8.6
29	77	110	38	30	18	85	57	83	32	12.3	10.5	8.6
30	71	90	36	40	------	80	58	87	31	12.3	9.7	8.6
31	66	------	35	40	------	75	------	94	------	12.3	10.1	------
Total	2,775	4,966	2,403	745	1,451	1,229	2,346	2,715	1,706	576.6	324.9	292.8
Mean	89.5	166	77.5	24.0	50.0	39.6	78.2	87.6	56.9	18.6	10.5	9.76
Cfsm	10.3	19.1	8.90	2.76	5.74	4.55	8.98	10.1	6.53	2.14	1.21	1.12
In.	11.85	21.20	10.26	3.18	6.20	5.25	10.02	11.59	7.28	2.46	1.39	1.25
Ac-ft	5,500	9,850	4,770	1,480	2,880	2,440	4,650	5,390	3,380	1,140	644	581

Calendar year 1959: Max 1,180 Min 8.6 Mean 70.3 Cfsm 8.07 In. 109.63 Ac-ft 50,940
Water year 1959-60: Max 1,180 Min 8.6 Mean 58.8 Cfsm 6.75 In. 91.93 Ac-ft 42,700

Peak discharge (base, 200 cfs).--Oct. 11 (11 a.m. to 2 p.m.) 200 cfs (5.06 ft); Oct. 22 (1 p.m.) 305 cfs (5.40 ft); Nov. 21 (2:30 a.m.) 337 cfs (5.48 ft); Nov. 23 (3 and 5 a.m.) 2,380 cfs (8.14 ft); Dec. 15 (3 p.m.) 308 cfs (7.33 ft); probably Feb. 7 (time and discharge unknown).

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 28 to Dec. 14, Dec. 18 to Feb. 7, Feb. 25 to Mar. 16, Mar. 29 to Apr. 18; discharge estimated on basis of 2 discharge measurements and records for nearby stations.

1057. North Fork Green River near Eagle Gorge, Wash.

Location.--Lat 47°18'40", long 122°46'20", in SW¼NE¼ sec.15, T.21 N., R.8 E., on right bank 2.4 miles upstream from mouth and 3 miles northwest of Eagle Gorge.

Drainage area.--16.5 sq mi.

Records available.--September 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,320 ft (from topographic map). Prior to June 25, 1959, at site 1,000 ft upstream at different datum.

Extremes.--Maximum discharge during year, about 2,000 cfs Nov. 23; minimum, 3.1 cfs Aug. 9, 10, 11, 12, 13; minimum gage height, 1.60 ft Nov. 16.
1956-60: Maximum discharge, that of Nov. 23, 1959; minimum, that of Aug. 9, 10, 11, 12, 13, 1960; minimum gage height, 1.18 ft Aug. 25, 26, 1959.

Remarks.--Records good except those for periods of doubtful or no gage-height record, which are fair. No regulation or diversion above station.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 21, Dec. 4-10)

Oct. 1 to Nov. 30				Dec. 1 to Sept. 30			
1.6	41	3.0	470	1.9	2.8	3.0	120
2.0	112	4.0	1,100	2.1	9.7	3.5	245
2.5	250			2.3	22	4.0	410
				2.6	53	6.0	1,320

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	130	85	a98	34	126	33	142	100	114	29	5.3	22
2	103	77	a90	34	116	30	190	110	*108	28	5.3	21
3	83	125	a87	32	97	27	195	93	100	25	5.0	16.5
4	72	119	*83	*32	86	30	190	85	88	24	5.0	23
5	62	101	77	32	108	29	185	83	80	22	4.8	38
6	56	90	75	40	178	31	178	110	72	21	4.5	28
7	53	81	85	35	375	33	188	160	61	19	3.9	24
8	75	74	75	32	236	35	175	132	56	18.5	3.6	21
9	94	67	70	30	172	30	158	122	52	17	3.4	*18
10	77	59	75	28	*158	30	122	124	49	15.5	3.4	15
11	363	59	a88	28	126	28	112	124	46	15	3.4	14
12	290	74	a100	27	116	28	106	134	41	14.5	3.4	13
13	205	54	a91	25	110	28	102	134	38	13.5	3.4	12.5
14	155	53	a240	24	145	*28	97	114	46	12.5	3.6	11.5
15	138	67	*a1,100	24	175	46	90	97	57	12.5	9.3	11.5
16	112	52	530	24	138	40	83	112	126	11.5	7.2	10
17	92	76	284	22	114	56	86	108	78	10	*12.5	9.3
18	81	172	200	20	93	56	86	130	63	9.7	6.4	8.9
19	72	211	152	18	80	64	102	145	63	8.9	5.6	9.3
20	118	487	128	19	75	104	172	266	*77	8.5	5.0	10
21	126	*633	104	18	75	155	155	212	70	8.1	5.3	8.5
22	508	a900	88	18	63	168	*132	178	60	8.1	6.0	8.5
23	305	a1,500	80	21	58	165	116	150	54	7.6	24	10
24	281	a620	72	52	53	160	108	140	49	7.2	26	15
25	258	a415	67	63	49	168	106	132	45	6.8	31	15.5
26	196	a260	59	93	43	178	104	126	40	6.4	44	11
27	158	a190	53	77	39	158	106	158	38	6.4	32	8.9
28	*148	a155	48	89	37	152	106	134	34	5.6	22	8.5
29	126	a130	44	245	35	170	104	124	32	5.3	24	7.6
30	108	a110	44	190	------	180	98	134	30	5.3	19	7.2
31	94	------	39	145	------	158	------	136	------	5.3	24	------
Total	4,739	7,096	4,426	1,571	3,274	2,598	3,894	4,107	1,867	407.7	361.3	437.2
Mean	153	237	143	50.7	113	83.8	130	132	62.2	13.2	11.7	14.6
Cfsm	9.27	14.4	8.67	3.07	6.85	5.08	7.88	8.00	3.77	0.800	0.709	0.885
In.	10.68	15.99	9.98	3.54	7.38	5.86	8.78	9.26	4.21	0.92	0.81	0.99
Ac-ft	9,400	14,070	8,780	3,120	6,490	5,150	7,720	8,150	3,700	809	717	867

Calendar year 1959: Max 1,500 Min 7.2 Mean 113 Cfsm 6.85 In. 92.72 Ac-ft 81,580
Water year 1959-60: Max 1,500 Min 3.4 Mean 95.0 Cfsm 5.76 In. 78.40 Ac-ft 68,970

Peak discharge (base, 500 cfs).--Oct. 11 (7 a.m.) 515 cfs (3.09 ft); Oct. 22 (10 a.m.) 974 cfs (3.77 ft); Nov. 21 (12:05 and 4:30 a.m.) 862 cfs (3.80 ft); Nov. 23 (1:30 p.m.) about 2,000 cfs; Dec. 15 (2 p.m.) 1,410 cfs (6.18 ft); Feb. 7 (12 p.m. to 1 a.m.) 514 cfs (4.26 ft).

* Discharge measurement made on this day.
a Doubtful or no gage-height record; discharge estimated on basis of 1 discharge measurement and records for nearby stations.

1065. Green River near Palmer, Wash.

Location.--Lat 47°17'40", long 121°49'20", in SW¼NW¼ sec.20, T.21 N., R.8 E., on right bank 1½ miles upstream from diversion dam and intake of Tacoma water-supply system, 2½ miles downstream from North Fork, and 3½ miles southeast of Palmer.

Drainage area.--230 sq mi.

Records available.--October 1931 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 912.6 ft above mean sea level (river-profile survey). Prior to Nov. 18, 1931, staff gage at same site and datum.

Average discharge.--29 years, 1,095 cfs (792,700 acre-ft per year).

Extremes.--Maximum discharge during year, 27,800 cfs Nov. 23 (gage height, 21.00 ft); minimum, 150 cfs Sept. 29 (gage height, 4.55 ft).
1931-60: Maximum discharge, that of Nov. 23, 1959; minimum, 81 cfs Sept. 4, 5, 1934; minimum gage height, 3.35 ft Sept. 2, 3, 1945.
Flood in December 1917 reached a stage of about 20 ft, from crest head over city of Tacoma diversion dam and gage-height relationship curve (discharge, about 25,000 cfs).

Remarks.--Records good. No regulation or diversion above station. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1062: 1932-34, 1935(M). 1938(M). WSP 1214: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 20		Nov. 20 to Sept. 30			
5.6	753	4.6	170	10.0	4,100
7.0	1,500	5.0	350	13.0	8,370
9.0	3,000	6.0	920	16.0	14,200
12.0	6,700	8.0	2,250	19.0	21,800

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,710	1,320	1,530	680	1,150	554	1,900	1,400	1,680	534	224	273
2	1,390	1,200	1,440	662	1,130	530	2,040	1,430	1,590	506	224	264
3	1,180	1,560	1,390	626	1,030	485	2,230	1,350	1,610	480	214	250
4	1,020	1,810	1,300	*602	926	480	2,340	1,240	1,480	460	214	268
5	901	1,590	1,210	590	992	495	2,510	1,140	1,340	440	210	340
6	829	1,410	1,160	674	1,410	500	2,500	1,270	1,240	425	202	310
7	788	1,260	1,220	626	4,260	512	2,610	1,870	1,110	405	198	286
8	867	1,140	1,170	590	2,750	536	2,650	1,940	998	395	190	255
9	1,330	1,060	1,120	554	2,010	495	2,450	1,680	914	390	182	*246
10	1,300	970	1,140	536	*1,820	485	1,960	1,650	866	395	182	242
11	5,030	935	1,390	530	1,540	465	1,660	1,790	842	385	178	237
12	4,060	1,020	1,590	512	1,400	460	1,470	2,000	806	345	178	228
13	2,780	886	1,460	490	1,360	480	1,400	1,970	770	330	178	224
14	2,080	853	2,860	480	1,720	490	1,380	1,930	788	320	178	218
15	1,750	1,030	13,300	475	2,230	*776	1,320	1,690	878	315	202	214
16	1,450	901	7,630	465	1,800	740	1,220	1,690	1,330	300	*202	210
17	1,260	970	4,030	450	1,450	812	1,210	1,700	1,120	296	214	206
18	1,110	1,820	2,810	420	1,240	872	1,180	1,870	980	291	202	202
19	990	2,580	2,190	410	1,090	956	*1,240	1,890	926	282	190	206
20	1,300	5,320	1,860	405	992	1,330	1,780	3,350	*998	273	186	210
21	1,700	9,020	1,560	400	998	1,960	1,870	3,270	1,000	268	190	202
22	5,500	9,800	1,360	395	878	2,350	1,560	2,680	932	264	194	194
23	4,540	*19,100	1,230	415	812	2,360	1,380	2,220	872	260	264	202
24	3,380	*8,990	1,120	548	776	2,270	1,290	1,940	818	255	305	214
25	3,190	6,570	1,080	620	734	2,410	1,270	1,730	764	250	315	246
26	2,540	4,110	980	818	674	2,640	1,220	1,610	710	250	385	214
27	2,060	2,990	908	788	626	2,290	1,220	*1,810	656	250	400	190
28	*1,990	3,214	854	806	602	2,060	1,270	1,730	608	242	320	186
29	1,850	2,030	806	1,640	572	1,960	1,330	1,640	578	228	291	182
30	1,670	1,740	794	1,500	------	2,110	1,370	1,690	554	228	268	178
31	1,480	------	736	1,270	------	2,020	------	1,820	------	228	273	------
Total	63,025	96,415	63,228	19,977	38,972	36,883	50,830	56,990	29,758	10,210	7,153	6,898
Mean	2,033	3,214	2,040	644	1,344	1,190	1,694	1,838	992	329	231	230
Cfsm	8.84	14.0	8.87	2.80	5.84	5.17	7.37	7.99	4.31	1.43	1.00	1.00
In.	10.19	15.59	10.22	3.23	6.30	5.96	8.22	9.22	4.81	1.65	1.16	1.12
Ac-ft	125,000	191,200	125,400	39,620	77,300	73,160	100,800	113,000	59,020	20,250	14,190	13,680

Calendar year 1959: Max 19,100 Min 171 Mean 1,558 Cfsm 6.77 In. 91.97 Ac-ft 1,128,000
Water year 1959-60: Max 19,100 Min 178 Mean 1,312 Cfsm 5.70 In. 77.67 Ac-ft 952,600

Peak discharge (base, 6,000 cfs).--Oct. 11 (12 m.) 6,310 cfs (11.72 ft); Oct. 22 (4:30 p.m.) 8,760 cfs (13.35 ft); Nov. 21 (5 a.m.) 10,500 cfs (14.13 ft); Nov. 23 (2:30 a.m.) 27,800 cfs (21.00 ft); Dec. 15 (4 a.m.) 14,300 cfs (16.02 ft).

* Discharge measurement made on this day.

1085. Newaukum Creek near Black Diamond, Wash.

Location.--Lat 47°16'30", long 122°03'30", in SW¼ sec. 28, T.21 N., R.6 E., on right bank three-quarters of a mile upstream from mouth and 3½ miles southwest of Black Diamond.

Drainage area.--25.5 sq mi.

Records available.--July 1944 to November 1950, September 1952 to September 1960. Annual maximum discharge only, for water years 1951-52.

Gage.--Water-stage recorder. Altitude of gage is 310 ft (from topographic map). November 1950 to September 1952 stilling well with staff gage only.

Average discharge.--14 years (1944-50, 1952-60), 65.7 cfs (47,560 acre-ft per year).

Extremes.--Maximum discharge during year, 878 cfs Nov. 21 (gage height, 3.02 ft); minimum, 17.5 cfs Aug. 9, Sept. 30; minimum gage height, 0.69 ft Aug. 9.
1944-60: Maximum discharge, 1,820 cfs probably Feb. 17, 1949 (gage height, 3.54 ft, from recorded range in stage), from rating curve extended above 600 cfs.
1944-50, 1952-60: Minimum discharge, 8.0 cfs Oct. 13, 14, 1952; minimum gage height, 0.62 ft Aug. 26, 1958.

Remarks.--Records excellent. Many small diversions above station for irrigation and domestic use. No regulation.

Revisions (water years).--WSP 1286: Drainage area. WSP 1396: 1946(M), 1949(P).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 20				Nov. 21 to Sept. 30			
0.8	25	2.0	240	0.7	18	2.0	240
1.1	48	2.5	480	1.0	42	2.5	480
1.5	104			1.5	105		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44	48	89	75	102	56	86	61	63	36	24	23
2	39	46	94	71	107	55	76	58	59	35	24	23
3	37	99	119	68	103	53	69	55	55	34	24	22
4	35	108	91	*65	*89	54	65	54	53	33	24	33
5	34	76	82	65	85	59	60	52	51	32	23	31
6	32	65	81	89	138	63	58	60	49	31	22	26
7	31	57	*86	94	265	61	55	91	48	31	22	24
8	34	54	78	83	167	102	58	79	47	31	20	23
9	38	50	79	75	139	92	61	63	46	31	18	22
10	35	48	92	70	119	*89	54	60	44	31	18.5	21
11	94	48	154	71	97	83	63	67	43	31	20	21
12	69	46	199	73	97	71	64	89	42	*28	20	21
13	50	45	121	70	102	69	63	79	41	27	19.5	21
14	46	44	186	69	135	69	78	68	46	28	20	21
15	42	54	395	82	162	113	83	60	51	27	24	21
16	38	48	355	83	109	86	67	70	50	26	24	21
17	37	94	196	73	94	88	62	74	46	27	*22	20
18	34	239	139	64	88	81	*60	81	43	25	22	20
19	34	215	117	66	81	73	63	78	46	25	22	20
20	62	377	121	59	76	69	109	230	52	24	22	20
21	72	456	107	58	79	65	137	149	46	24	23	19.5
22	86	355	94	59	73	62	119	111	44	24	23	19.5
23	74	*335	92	95	69	59	88	*91	40	24	28	20
24	101	292	113	149	68	56	82	83	39	24	32	20
25	97	236	102	137	67	55	79	82	38	23	31	21
26	73	157	88	149	63	55	71	82	38	24	31	20
27	63	127	81	100	60	54	63	92	38	22	35	19.5
28	*76	119	76	100	59	67	59	85	37	22	26	18.5
29	61	109	74	276	58	74	67	73	36	22	25	18
30	54	95	106	147	------	92	59	73	36	22	24	18
31	50	------	89	109	------	105	------	73	------	24	24	------
Total	1,672	4,142	3,896	2,838	2,951	2,230	2,178	2,520	1,367	848	737.0	648.0
Mean	53.9	138	126	91.5	102	71.9	72.6	81.3	45.6	27.4	23.8	21.6
Cfsm	2.11	5.41	4.94	3.59	4.00	2.82	2.85	3.19	1.79	1.07	0.933	0.847
In.	2.44	6.04	5.68	4.14	4.30	3.25	3.18	3.68	1.99	1.24	1.07	0.95
Ac-ft	3,320	8,220	7,730	5,630	5,850	4,420	4,320	5,000	2,710	1,680	1,460	1,290

Calendar year 1959: Max 456 Min 21 Mean 75.5 Cfsm 2.96 In. 40.17 Ac-ft 54,640
Water year 1959-60: Max 456 Min 18 Mean 71.1 Cfsm 2.79 In. 37.96 Ac-ft 51,630

Peak discharge (base, 350 cfs).--Nov. 21 (3:30 a.m.) 878 cfs (3.02 ft); Dec. 15 (4 p.m.) 589 cfs (2.67 ft); Jan. 29 (7 a.m.) 400 cfs (2.36 ft); Feb. 7 (1 a.m.) 432 cfs (2.42 ft).

* Discharge measurement made on this day.

1110. Lake Sawyer near Black Diamond, Wash.

Location.--Lat 47°20'00", long 122°02'15", in SE¼ sec.4, T.21 N., R.6 E., on west shore three-eighths of a mile south of lake outlet and 2 miles northwest of Black Diamond.

Drainage area.--9.77 sq mi.

Records available.--April 1952 to September 1960.

Gage.--Staff gage read once daily. Datum of gage is 512.34 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Extremes.--Maximum gage height observed during year, 7.30 ft Nov. 22; minimum observed, 5.76 ft Sept. 30.
1952-60: Maximum gage height observed, that of Nov. 22, 1959; minimum observed, 3.04 ft Dec. 1, 2, 1952.

Remarks.--Lake controlled for elevation by concrete dam at outlet constructed during July and August 1952. Probably small diversions for domestic use.

Revisions.--WSP 1396: Drainage area.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.50	6.46	6.74	6.59	6.72	6.48	6.54	6.52	6.52	6.34	6.16	6.14
2	6.48	6.46	6.72	6.58	6.70	6.48	6.54	6.50	6.50	6.34	6.16	6.14
3	6.44	6.48	6.70	6.58	6.68	6.48	6.52	6.48	6.48	6.32	6.16	6.14
4	6.42	6.50	6.68	6.58	6.66	6.48	6.52	6.48	6.48	6.32	6.14	6.16
5	6.42	6.52	6.66	6.58	6.64	6.50	6.50	6.48	6.46	6.30	6.14	6.16
6	6.42	6.50	6.66	6.58	6.68	6.50	6.50	6.48	6.46	6.30	6.12	6.16
7	6.42	6.48	6.64	6.58	6.74	6.52	6.48	6.50	6.44	6.30	6.12	6.16
8	6.42	6.48	6.64	6.56	6.72	6.52	6.48	6.50	6.42	6.30	6.10	6.16
9	6.42	6.46	6.64	6.54	6.72	6.52	6.48	6.48	6.42	6.30	6.10	6.14
10	6.44	6.46	6.64	6.54	6.70	6.52	6.50	6.46	6.42	6.30	6.08	6.12
11	6.48	6.44	6.66	6.54	6.68	6.52	6.50	6.46	6.42	6.28	6.08	6.10
12	6 50	6.44	6.68	6.54	6.68	6.52	6.52	6.46	6.40	6.28	6.06	6.08
13	6.48	6.42	6.70	6.54	6.68	6.52	6.52	6.48	6.40	6.28	6.06	6.04
14	6.46	6.42	6.74	6.54	6.70	6.52	6.54	6.48	6.40	6.26	6.04	6.02
15	6.44	6.42	6.82	6.54	6.70	6.54	6.54	6.50	6.40	6.24	6.04	6.00
16	6.44	6.44	7.22	6.54	6.68	6.56	6.52	6.50	6.40	6.24	6.02	5.98
17	6.42	6.46	7.18	6.54	6.68	6.56	6.52	6.48	6.40	6.22	6.02	5.96
18	6.42	6.54	6.92	6.54	6.66	6.56	6.50	6.50	6.40	6.22	6.02	5.96
19	6.42	6.62	6.88	6.52	6.64	6.56	6.52	6.52	6.40	6.22	6.02	5.94
20	6.44	6.74	6.86	6.50	6.62	6.54	6.52	6.56	6.40	6.22	6.00	5.92
21	6.46	7.12	6.80	6.48	6.60	6.54	6.54	6.58	6.40	6.22	6.00	5.90
22	6.48	7.30	6.76	6.50	6.58	6.52	6.54	6.62	6.40	6.22	6.02	5.90
23	6.48	7.20	6.74	6.52	6.56	6.52	6.56	6.62	6.38	6.22	6.06	5.88
24	6.50	7.10	6.72	6.54	6.56	6.50	6.56	6.62	6.38	6.22	6.08	5.88
25	6.56	7.06	6.72	6.56	6.54	6.50	6.58	6.60	6.36	6.22	6.10	5.86
26	6.54	6.98	6.68	6.58	6.52	6.50	6.60	6.58	6.36	6.22	6.12	5.84
27	6.54	6.92	6.68	6.60	6.50	6.48	6.58	6.56	6.36	6.22	6.14	5.82
28	6.46	6.86	6.66	6.60	6.50	6.50	6.56	6.56	6.36	6.22	6.16	5.80
29	6.50	6.82	6.66	6.70	6.50	6.52	6.54	6.54	6.36	6.22	6.16	5.78
30	6.48	6.78	6.64	6.74	-------	6.54	6.52	6.54	6.36	6.20	6.16	5.76
31	6.48	-------	6.62	6.72	-------	6.56	-------	6.52	-------	6.18	6.16	-------

Note.--Gage usually read once daily between 9:45 and 11 a.m.

1130. Green River near Auburn, Wash.

Location.--Lat 47°18'45", long 122°12'10", in lot 3, sec.17, T.21 N., R.5 E., on left bank 1½ miles east of Auburn and 2 miles downstream from Big Soos Creek.

Drainage area.--382 sq mi (excludes 4 sq mi in the vicinity of Youngs Lake, flow from which has been diverted to Cedar River basin since about 1935).

Records available.--August 1936 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Oct. 19, 1936, staff gage at same site and datum.

Average discharge.--24 years, 1,334 cfs (965,800 acre-ft per year).

Extremes.--Maximum discharge during year, 28,100 cfs Nov. 23 (elevation, 69.75 ft); minimum, 189 cfs Sept. 30 (elevation, 54.21 ft).
1936-60: Maximum discharge, that of Nov. 23, 1959; minimum, 81 cfs Sept. 23, 1952; minimum elevation, 53.85 ft Aug. 26, 1958.

Remarks.--Records excellent. City of Tacoma diverts about 110 cfs from river near Palmer, several miles above station, for municipal use. Minor diversions for domestic use. Minor regulation on Little Soos Creek, a tributary. Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Revisions.--WSP 1246: Drainage area.

Rating tables, water year 1959-60 (elevation, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 23				Nov. 24 to Sept. 30			
55.4	880	64.0	11,800	54.2	185	57.0	2,100
56.0	1,400	68.0	21,200	54.5	305	61.0	7,100
57.0	2,300	69.0	24,900	55.0	555	65.0	13,600
60.0	5,750						

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,950	1,490	2,320	1,250	*1,860	947	2,330	1,660	1,970	735	285	435
2	1,620	1,360	*2,130	1,170	1,780	926	2,300	1,690	1,860	705	281	405
3	1,380	1,540	2,140	1,130	1,720	863	2,530	1,630	1,860	669	277	314
4	1,210	2,080	1,970	*1,090	1,550	856	2,590	1,530	1,780	639	273	346
5	1,080	1,790	1,800	1,070	1,510	898	2,800	1,440	1,620	603	269	390
6	992	1,610	1,700	1,160	1,700	919	2,810	1,480	1,500	585	261	415
7	936	1,450	1,750	1,170	4,880	*884	2,880	1,990	1,400	555	261	368
8	912	1,330	1,680	1,120	3,790	1,020	2,980	2,250	1,280	537	249	332
9	1,320	1,240	1,620	1,080	2,910	1,000	2,850	1,960	1,170	519	233	301
10	1,380	1,150	1,620	1,020	2,520	954	2,320	1,860	1,120	501	225	285
11	3,960	1,080	1,950	1,000	2,220	926	*1,980	1,960	1,090	495	221	273
12	4,390	1,150	2,440	982	2,000	877	1,780	2,210	1,050	475	225	265
13	3,030	1,070	2,300	947	2,000	870	1,720	2,280	1,000	465	221	261
14	2,300	984	2,480	919	2,180	891	1,740	2,170	1,010	450	221	257
15	1,930	1,080	12,800	947	3,030	1,150	1,750	1,970	1,130	440	*237	249
16	1,630	1,070	10,400	947	2,630	1,210	1,600	1,920	1,390	420	261	245
17	1,410	1,070	5,900	905	2,240	1,210	1,530	*1,950	1,400	405	257	233
18	1,260	1,900	4,230	856	1,900	1,290	1,500	2,110	1,230	390	261	221
19	*1,150	2,730	3,370	794	1,670	1,290	1,550	2,140	1,140	382	241	217
20	1,200	4,600	2,890	787	1,530	1,480	1,990	3,630	1,210	372	225	221
21	1,860	10,400	2,510	774	1,530	2,050	2,470	4,130	1,200	359	225	221
22	3,870	8,040	2,220	761	1,410	2,530	2,120	3,390	1,140	350	237	209
23	5,560	*21,400	2,010	828	1,310	2,580	1,860	2,760	1,090	341	265	209
24	3,460	11,300	1,960	1,090	1,250	2,510	1,730	2,360	1,030	336	382	217
25	3,440	7,940	1,860	1,200	1,210	2,530	1,680	2,180	982	323	420	241
26	2,760	5,920	1,690	1,420	1,140	2,860	1,600	1,990	926	310	420	253
27	2,260	4,400	1,550	1,430	1,070	2,630	1,530	2,130	*870	305	513	221
28	2,160	3,570	1,480	1,350	1,020	2,390	1,530	2,080	821	297	435	209
29	2,010	3,030	1,410	2,300	996	2,230	1,610	1,950	780	293	377	197
30	1,820	2,610	1,450	2,390	-------	2,480	1,630	1,920	754	289	350	189
31	1,650	-------	1,370	2,020	-------	2,520	-------	2,060	-------	285	350	-------
Total	65,890	110,384	87,000	35,887	56,556	47,771	61,290	66,780	36,803	13,830	8,958	8,199
Mean	2,125	3,679	2,806	1,158	1,950	1,541	2,043	2,154	1,227	446	289	273
Ac-ft	130,700	218,900	172,600	71,180	112,200	94,750	121,600	132,500	73,000	27,430	17,770	16,260

Calendar year 1959: Max 21,400 Min 216 Mean 1,896 Ac-ft 1,373,000
Water year 1959-60: Max 21,400 Min 189 Mean 1,638 Ac-ft 1,189,000

Peak discharge (base, 6,000 cfs).--Oct. 22 (10 p.m.) 7,800 cfs (61.50 ft); Nov. 21 (11 a.m.) 11,500 cfs (63.87 ft); Nov. 23 (10:30 a.m.) 28,100 cfs (69.75 ft); Dec. 15 (10:30 p.m.) 15,500 cfs (65.89 ft).

* Discharge measurement made on this day.

1135. North Fork Cedar River near Lester, Wash.

Location.--Lat 47°19'10", long 121°30'05", in SW¼ sec.11, T.21 N., R.10 E., on left bank 400 ft upstream from falls, 1½ miles upstream from confluence with South Fork, and 7½ miles north of Lester. Prior to Nov. 22, 1959, at site 520 ft downstream.

Drainage area.--8.81 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,320 ft (from topographic map). Oct.12, 1944, to Nov. 30, 1951, at site 420 ft downstream at different datum. Dec. 1, 1951, to Sept. 23, 1953, at site 450 ft downstream at different datum. Sept. 24, 1953, to Nov. 22, 1959, at site 520 ft downstream at different datum (gage destroyed by flood of Nov. 22, 1959).

Average discharge.--16 years, 72.2 cfs (52,270 acre-ft per year).

Extremes.--Maximum discharge during year, 3,160 cfs Nov. 22 (gage height, about 8.4 ft, from floodmarks, site and datum then in use), result of slope-area measurement of peak flow; minimum, 10.6 cfs Aug. 20, 21, 22.

1944-60: Maximum discharge, that of Nov. 22, 1959; maximum gage height, 8.9 ft, datum then in use, probably Jan. 31, 1953 (from high-water mark, backwater from logjam); minimum daily discharge, 5.4 cfs Nov. 27-30, 1952.

Remarks.--Records good except those for period of no gage-height record, which are poor. No regulation or diversion above station.

Revisions (water years).--WSP 1246: Drainage area. WSP 1286: 1945-47. WSP 1446: 1954-55.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	58	62	28	45	17	90	100	210	58	14.3	15.3
2	60	54	60	26	50	17	100	100	230	53	14.3	14.6
3	51	*110	50	25	45	16	130	55	210	52	14.0	14.0
4	44	90	46	24	40	17	150	75	190	49	14.0	17.5
5	39	80	42	22	45	18	160	60	175	49	13.7	29
6	36	70	39	24	100	19	175	100	165	48	13.0	25
7	35	60	*38	26	200	19	190	200	155	44	*13.0	22
8	76	55	35	24	130	19	200	170	140	38	12.7	19.6
9	100	50	33	22	90	18	170	140	130	34	12.1	18.4
10	77	45	40	21	70	18	140	170	140	31	12.1	17.5
11	257	42	60	20	55	17	105	210	148	28	12.1	16.3
12	222	45	60	19	45	17	90	250	140	26	11.8	16.0
13	145	40	50	*19	35	18	80	210	134	25	11.5	15.3
14	106	37	300	18	40	19	75	170	152	24	11.8	15.0
15	82	40	*1,000	17	45	23	70	150	180	22	12.1	14.6
16	66	35	550	16	*37	24	65	130	296	20	12.7	14.6
17	57	43	200	16	33	25	60	120	168	19.6	13.7	13.7
18	51	60	140	15	31	28	55	110	128	19.2	11.8	13.3
19	45	120	100	13	29	30	80	120	108	18.4	11.2	13.7
20	68	400	90	15	28	50	110	350	106	17.5	11.2	*13.0
21	73	600	75	15	29	70	90	300	102	16.7	11.2	13.0
22	306	*1,100	65	16	27	*80	70	240	104	16.7	11.2	12.7
23	173	1,000	55	18	26	85	50	200	*116	16.3	14.6	13.0
24	150	450	50	20	24	90	40	170	114	16.0	14.3	15.3
25	145	300	45	22	23	120	40	150	95	15.6	14.6	15.0
26	109	180	40	25	22	150	*40	160	84	15.3	22	13.0
27	83	120	37	23	20	140	45	190	81	15.3	21	12.4
28	81	100	35	30	19	130	55	170	78	15.0	16.0	12.1
29	70	85	33	80	18	130	70	190	74	14.6	16.0	12.1
30	64	70	31	60	------	120	90	220	68	14.6	14.6	11.8
31	61	------	30	50	------	100	------	*250	------	14.3	15.3	------
Total	2,999	5,539	3,491	769	1,401	1,644	2,885	5,230	4,221	846.1	423.9	468.8
Mean	96.7	185	113	24.8	48.3	53.0	96.2	169	141	27.3	13.7	15.6
Cfsm	11.0	21.0	12.8	2.81	5.48	6.02	10.9	19.2	16.0	3.10	1.56	1.77
In.	12.66	23.38	14.74	3.25	5.91	6.94	12.18	22.08	17.82	3.57	1.79	1.98
Ac-ft	5,950	10,990	6,920	1,530	2,780	3,260	5,720	10,370	8,370	1,680	841	930

Calendar year 1959: Max 1,100 Min 11.5 Mean 93.5 Cfsm 10.6 In. 144.03 Ac-ft 67,660
Water year 1959-60: Max 1,100 Min 11.2 Mean 81.7 Cfsm 9.27 In. 126.30 Ac-ft 59,340

Peak discharge (base, 400 cfs).--Nov. 22 (time unknown) 3,160 cfs (about 8.4 ft); Dec. 15 (time and discharge unknown); probably May 20 (time and discharge unknown).

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 3 to June 9; discharge estimated on basis of 9 discharge measurements, weather records, and records for nearby stations.

1140. South Fork Cedar River near Lester, Wash.

Location.--Lat 47°18'30", long 121°31'00", in SW¼NE¼ sec.15, T.21 N., R.10 E., on left bank about 0.6 mile upstream from confluence with North Fork and 7 miles northwest of Lester.

Drainage area.--6.00 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Concrete control Aug. 31, 1951, to Dec. 9, 1956, and since Oct. 8, 1957. Altitude of gage is 2,300 ft (from topographic map).

Average discharge.--16 years, 40.7 cfs (29,470 acre-ft per year).

Extremes.--Maximum discharge during year, 1,940 cfs Nov. 22 (gage height, about 9.8 ft, from floodmarks), result of slope-area measurement of peak flow; minimum, 4.1 cfs Aug. 19, 20, 21 (gage height, 4.30 ft).
1944-60: Maximum discharge, 2,340 cfs Dec. 9, 1956 (gage height, 10.41 ft, from floodmarks), from rating curve extended above 300 cfs on basis of slope-area measurement of peak flow; minimum, 1.9 cfs Nov. 27, 28, 1952; minimum gage height, 1.25 ft Oct. 17-19, 1946.

Remarks.--Records good except those for period of doubtful gage-height record, which are fair, and those for period of no gage-height record, which are poor. No regulation or diversion above station.

Revisions (water years).--WSP 1446: 1953-54.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	35	38	16	28	10.5	58	48	90	17.8	5.2	7.5
2	40	34	39	15	26	10	55	52	94	15.8	5.2	7.3
3	35	*48	31	14	26	9.5	70	50	99	14.1	5.2	6.9
4	31	55	27	13	23	9.2	85	62	86	12.9	5.1	8.0
5	26	45	25	13	25	9.6	92	64	74	12.6	5.1	11.8
6	24	40	24	14	50	10	95	80	67	11.8	5.1	11.0
7	22	35	*23	13	105	10.5	100	122	56	11.4	*5.1	10.3
8	31	33	22	12	75	11	110	104	49	10.6	5.1	9.4
9	41	30	21	11	50	10.5	95	92	46	10.0	5.1	8.9
10	42	28	23	10.5	38	10	80	109	46	9.2	5.1	8.6
11	122	25	31	10	32	10	70	133	46	9.0	5.1	8.0
12	111	27	36	9.5	27	10	60	144	43	8.6	5.1	7.5
13	84	25	32	*8.5	25	10	53	124	41	8.2	5.1	7.3
14	65	23	100	8.2	22	10.5	48	102	43	7.8	5.2	6.9
15	51	24	450	7.8	26	13	45	86	49	7.6	5.2	6.9
16	41	21	*200	7.6	*28	13.5	43	84	70	7.4	5.4	6.5
17	39	26	118	7.2	22	13.5	40	74	59	7.2	5.2	6.5
18	34	35	86	7.0	19	14	37	67	48	7.0	4.4	6.1
19	29	60	64	6.6	17	16	36	70	42	6.8	4.3	6.3
20	39	230	50	6.4	15.5	25	47	141	41	6.6	4.1	*6.1
21	50	350	43	7.0	16	36	44	124	37	6.4	4.3	5.9
22	136	*700	38	7.2	15.5	*45	39	90	36	6.2	4.7	5.9
23	111	500	34	8.0	15	56	36	74	*36	6.0	7.5	6.1
24	93	300	30	9.0	14.5	65	33	69	36	6.0	6.9	7.1
25	91	190	28	10	13.5	72	32	67	32	5.8	7.3	6.5
26	75	100	26	12	13	86	*32	69	28	5.8	12.2	5.9
27	60	76	24	12	12	80	34	78	26	5.6	10.0	5.7
28	54	60	21	16	11.5	72	37	78	24	5.6	8.6	5.5
29	44	49	20	35	11	68	40	80	22	5.4	8.3	5.5
30	40	43	18	41	------	70	44	99	19.7	5.4	7.5	5.5
31	37	------	17	32	------	66	------	*111	------	5.2	7.7	------
Total	1,746	3,247	1,739	399.5	801.5	952.3	1,690	2,747	1,485.7	265.8	185.4	217.4
Mean	56.3	108	56.1	12.9	27.6	30.7	56.3	88.6	49.5	8.57	5.98	7.25
Cfsm	9.38	18.0	9.35	2.15	4.60	5.12	9.38	14.8	8.25	1.43	1.00	1.21
In.	10.82	20.13	10.78	2.48	4.97	5.90	10.48	17.03	9.21	1.65	1.15	1.35
Ac-ft	3,460	6,440	3,450	792	1,590	1,890	3,350	5,450	2,950	527	368	431

Calendar year 1959: Max 700 Min 4.5 Mean 48.7 Cfsm 8.12 In. 110.10 Ac-ft 35,220
Water year 1959-60: Max 700 Min 4.1 Mean 42.3 Cfsm 7.05 In. 95.95 Ac-ft 30,700

Peak discharge (base, 200 cfs).--Nov. 22 (time unknown) 1,940 cfs (about 9.8 ft); probably Dec. 15 (time and discharge unknown).

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 4 to May 3 (gage destroyed by flood of Nov. 22, 1959); discharge estimated on basis of 7 discharge measurements and records for nearby stations. Doubtful gage-height record July 11 to Aug. 6; discharge estimated on basis of records for nearby stations.

1145. Cedar River below Bear Creek, near Cedar Falls, Wash.

Location.--Lat 47°20'30", long 121°32'50", in SE¼SE¼ sec.32, T.22 N., R.10 E., on right bank 500 ft downstream from Bear Creek and 12¼ miles southeast of Cedar Falls. Prior to Sept. 16, 1960, at site 25 ft upstream.

Drainage area.--25.4 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,880 ft (from topographic map). Prior to Sept. 16, 1960, at site 25 ft upstream at datum 2.35 ft higher.

Average discharge.--15 years, 183 cfs (132,500 acre-ft per year).

Extremes.--Maximum discharge during year, 7,620 cfs Nov. 22 (gage height, 6.98 ft, site and datum then in use), from rating curve extended above 890 cfs on basis of slope-area measurement of peak flow; minimum recorded, 25 cfs Sept. 29, 30.
1945-60: Maximum discharge, that of Nov. 22, 1959; maximum gage height, 7.08 ft Dec. 9, 1956, site and datum then in use; minimum discharge, 12.5 cfs Nov. 27, 1952.
Revisions.--The figures of maximum discharge for some water years have been revised, as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Water year	Date	Discharge (cfs)	Gage height (feet)†
1446	1956	Dec. 12, 1955	2,200	6.47
1516	1957	Dec. 9, 1956	3,260	7.08
1636	1959	Nov. 12, 1958	2,140	6.32

† Site and datum then in use.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No regulation or diversion above station.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	208	161	175	65	110	56	274	230	412	100	29	39
2	171	150	180	60	115	52	340	230	440	92	29	37
3	148	242	150	58	105	50	390	215	478	88	30	35
4	129	231	130	54	94	52	462	200	406	82	30	44
5	114	203	110	54	100	56	515	190	368	78	31	53
6	105	180	105	58	150	58	535	252	340	76	31	50
7	103	161	110	*61	450	58	600	423	247	72	31	44
8	175	146	*110	59	350	58	605	362	220	68	30	39
9	226	135	105	57	250	55	530	318	214	64	30	36
10	190	123	110	55	200	54	401	379	230	59	29	34
11	632	119	120	54	160	52	302	462	242	55	28	33
12	580	121	135	52	145	51	247	510	230	53	29	31
13	384	106	130	51	125	52	230	456	214	51	28	31
14	284	103	600	49	140	57	210	379	252	48	29	31
15	228	105	2,200	48	*159	70	190	313	296	46	33	31
16	185	93	*1,100	47	130	66	180	313	484	45	30	31
17	159	96	640	45	110	70	170	274	324	43	35	30
18	141	139	400	42	100	80	170	269	236	42	31	29
19	127	197	280	38	92	90	190	269	203	40	29	*30
20	183	1,120	210	41	90	120	250	535	198	38	29	30
21	211	*1,150	180	41	90	210	230	484	192	37	29	28
22	670	*2,490	150	42	85	*250	190	390	181	36	29	27
23	535	2,300	130	43	80	264	170	302	*192	35	35	29
24	434	1,500	120	45	75	302	160	264	180	34	38	37
25	412	900	105	49	70	384	*150	236	165	33	41	35
26	315	560	95	56	66	467	170	242	150	32	50	29
27	254	400	85	56	62	401	180	291	140	31	45	28
28	251	310	80	70	60	357	190	286	130	30	38	27
29	214	240	75	160	59	384	200	308	120	30	38	26
30	*190	210	73	140	------	379	210	418	110	29	35	25
31	173	------	70	120	------	302	------	*494	------	29	37	------
Total	8,131	13,991	8,263	1,870	3,822	4,957	8,641	10,294	7,594	1,596	1,016	1,009
Mean	262	466	267	60.3	132	160	288	332	253	51.5	32.8	33.6
Cfsm	10.3	18.3	10.5	2.37	5.20	6.30	11.3	13.1	9.96	2.03	1.29	1.32
In.	11.91	20.49	12.10	2.74	5.60	7.26	12.65	15.07	11.12	2.34	1.49	1.48
Ac-ft	16,130	27,750	16,390	3,710	7,580	9,830	17,140	20,420	15,060	3,170	2,020	2,000

Calendar year 1959 : Max 2,490 Min 26 Mean 235 Cfsm 9.25 In. 125.63 Ac-ft 170,200
Water year 1959-60 : Max 2,490 Min 25 Mean 194 Cfsm 7.64 In. 104.25 Ac-ft 141,200

Peak discharge (base, 1,000 cfs).--Nov. 22 (7 p.m.) 7,620 cfs (6.98 ft); Dec. 15 (time and discharge unknown).

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 23 to Feb. 14, Feb. 16 to Mar. 22, Apr. 13 to May 5, June 24 to Sept. 15; discharge estimated on basis of 5 discharge measurements and records for station near Cedar Falls, and nearby stations.

1150. Cedar River near Cedar Falls, Wash.

Location.--Lat 47°22'20", long 121°37'30", in SE¼SW¼ sec.23, T.22 N., R.9 E., or left bank 2 miles upstream from Chester Morse Lake and 8 miles southeast of Cedar Falls.

Drainage area.--41.8 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,560 ft (from topographic map). Prior to Oct. 26, 1957, at site 80 ft downstream at same datum.

Average discharge.--15 years, 284 cfs (205,600 acre-ft per year).

Extremes.--Maximum discharge during year, 9,490 cfs Nov. 22 (gage height, 11.34 ft, from high-water mark in well), from rating curve extended above 4,300 cfs on basis of slope-area measurements at gage heights 10.16 and 11.34 ft; minimum, 38 cfs Aug. 20 (gage height, 2.70 ft).
1945-60: Maximum discharge, that of Nov. 22, 1959; maximum gage height, 11.4 ft Feb. 11, 1951 (backwater from Chester Morse Lake); minimum discharge, 20 cfs Nov. 30 to Dec. 1, 1952; minimum gage height recorded, 1.84 ft Sept. 30, 1957.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 1286: 1946-48, 1950(P), 1951. WSP 1516: 1946(M), 1947-48(P), 1950-51(M), 1953-54(P), 1955(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec.8-13)

Oct. 1 to Nov. 21				Nov. 22 to Sept. 30			
2.9	128	5.0	770	2.7	38	5.0	790
3.4	220	7.0	2,010	3.0	68	7.0	2,010
4.0	380			3.5	154	9.0	4,100
				4.0	305		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	332	238	250	103	179	92	376	329	*570	143	41	57
2	275	218	260	99	190	84	440	333	575	128	41	54
3	230	335	230	93	174	68	530	313	625	122	42	49
4	200	340	200	90	150	88	610	280	535	117	43	56
5	178	300	180	88	164	88	700	282	475	111	44	80
6	167	260	170	104	263	87	710	337	450	108	44	72
7	162	240	180	*104	855	88	810	585	345	103	*44	62
8	220	210	*187	99	540	90	840	520	298	96	43	56
9	350	200	176	96	368	84	745	440	287	88	42	53
10	288	180	179	92	321	82	550	500	294	84	40	50
11	894	170	209	90	259	78	435	600	309	80	41	48
12	845	175	230	87	230	77	368	685	294	76	41	45
13	574	160	209	84	221	78	329	620	283	72	40	44
14	422	150	819	81	266	78	313	515	305	69	41	45
15	347	155	*3,540	81	363	108	280	425	368	66	47	45
16	285	140	1,600	78	280	96	256	430	640	64	43	46
17	240	150	865	76	*239	104	246	400	445	61	50	46
18	210	200	595	66	206	115	230	415	329	59	43	47
19	190	330	445	60	179	126	252	415	283	57	41	*49
20	270	1,800	350	68	166	172	372	805	276	55	41	50
21	320	*1,900	283	69	169	287	341	740	266	53	40	47
22	950	*3,500	243	71	145	376	273	585	252	52	41	45
23	800	3,500	215	71	134	*445	239	465	259	51	51	48
24	650	2,000	195	77	128	455	218	400	*276	49	56	55
25	620	1,300	182	82	121	530	233	354	256	47	58	58
26	480	800	159	98	108	640	*236	354	224	46	74	51
27	380	600	143	93	104	550	252	435	201	45	66	46
28	380	450	134	106	99	490	273	415	184	43	54	44
29	320	350	124	273	94	530	283	425	169	42	54	43
30	*285	300	121	239	------	590	301	535	159	42	50	42
31	260	------	113	198	------	460	------	695	------	42	52	------
Total	12,124	20,651	12,786	3,117	6,715	7,236	12,041	14,612	10,232	2,271	1,448	1,533
Mean	391	688	412	101	232	233	401	471	341	73.3	46.7	51.1
Cfsm	9.35	16.5	9.86	2.42	5.55	5.57	9.59	11.3	8.16	1.75	1.12	1.22
In.	10.79	18.37	11.38	2.77	5.97	6.44	10.71	13.00	9.10	2.02	1.29	1.36
Ac-ft	24,050	40,960	25,360	6,180	13,320	14,350	23,880	28,980	20,290	4,500	2,870	3,040

Calendar year 1959: Max 3,540 Min 44 Mean 363 Cfsm 8.68 In. 117.85 Ac-ft 262,700
Water year 1959-60: Max 3,540 Min 40 Mean 286 Cfsm 6.84 In. 93.20 Ac-ft 207,800

Peak discharge (base, 1,000 cfs).--Oct. 11 (10 a.m.) 1,070 cfs (5.55 ft); Oct. 22 (time unknown) 2,070 cfs (7.08 ft); Nov. 20 (time unknown) about 2,800 cfs; Nov. 22 (time unknown) 9,490 cfs (11.34 ft); Dec. 15 (3 p.m.) 3,950 cfs (8.88 ft); Feb. 7 (4 a.m.) 1,020 cfs (5.47 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 17-29, Nov. 4-20, Nov. 22 to Dec. 7; discharge estimated on basis of recorded range in stage and records for nearby stations.

1155. Rex River near Cedar Falls, Wash.

Location.--Lat 47°21'10", long 121°39'50", in NE¼NW¼ sec.33, T.22 N., R.9 E., on right bank 2½ miles upstream from mouth and Chester Morse Lake and 7 miles southeast of Cedar Falls.

Drainage area.--13.0 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,600 ft (from topographic map).

Average discharge.--15 years, 106 cfs (76,740 acre-ft per year).

Extremes.--Maximum discharge during year, 4,200 cfs Nov. 22 (gage height, 8.20 ft), from rating curve extended above 1,600 cfs on basis of contracted-opening measurement at gage height 7.19 ft and slope-area measurement of peak flow; minimum, 7.9 cfs Aug. 12, 13, 14 (gage height, 2.98 ft).
1945-60: Maximum discharge, that of Nov. 22, 1959; minimum, 4.3 cfs Nov. 29, 1952 (gage height, 2.43 ft).

Remarks.--Records good except those for periods of no gage-height record and those below 20 cfs, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 1286: 1946, 1948(P), 1949(M), 1950(P), 1952(M). WSP 1446: 1946(M), 1951, 1953-55(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 1-10)

Oct. 1 to Nov. 22				Nov. 23 to Sept. 30			
3.2	42	4.5	400	2.9	5.5	4.0	130
3.6	99	5.0	695	3.1	12.5	4.5	300
4.0	197	6.0	1,420	3.3	23	5.0	540
				3.6	53	6.5	1,630

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	105	78	76	29	110	a27	148	125	*197	42	11	36
2	85	70	82	30	105	a25	218	133	208	39	10.5	32
3	72	148	76	27	89	a23	218	118	200	36	10.5	28
4	63	*128	70	28	76	a25	236	105	169	33	10.5	47
5	57	105	62	27	87	25	250	101	160	31	10	75
6	52	90	64	30	214	25	250	161	136	29	9.7	51
7	52	79	80	*26	390	31	280	260	112	27	*9.0	42
8	101	70	*68	25	204	31	280	211	97	25	8.6	36
9	125	63	66	25	142	28	242	181	95	24	8.6	31
10	110	57	78	22	120	27	172	197	97	22	8.2	29
11	493	58	120	22	97	25	142	214	95	21	8.2	25
12	314	64	122	22	95	24	133	242	91	20	8.2	23
13	197	50	99	21	91	25	133	250	85	19	8.2	22
14	145	49	662	21	116	25	125	194	108	18	9.0	21
15	124	53	*1,620	20	169	35	105	157	128	17	15.5	19.5
16	96	42	450	19.5	110	30	95	175	285	16	13	18
17	80	76	222	18	*83	41	91	163	157	15.5	18	17
18	70	191	148	a17	71	43	87	178	120	15	10.5	16.5
19	63	247	105	a16	60	51	99	199	112	14.5	10	*19
20	159	761	89	a16.5	58	82	175	405	120	14	9.3	19
21	177	748	75	a16.5	59	136	136	276	105	13.5	11	15.5
22	641	*1,400	64	a17	51	166	103	211	93	13.5	11.5	15
23	300	1,340	59	17.5	46	*178	89	169	87	13	35	19.5
24	279	708	58	51	42	184	85	151	*80	12.5	39	29
25	243	462	54	56	39	214	85	139	71	12.5	46	27
26	165	225	48	78	33	232	*87	142	64	12	70	20
27	130	151	45	65	a31	197	99	211	59	12	42	17.5
28	135	120	40	89	a30	175	110	172	54	11.5	31	16.5
29	115	103	38	246	a29	229	112	169	51	11.5	39	16
30	97	85	37	169	------	232	115	222	47	11	29	15
31	87	------	33	130	------	172	------	246	------	11	40	------
Total	4,932	7,821	4,910	1,397.0	2,847	2,763	4,500	5,877	3,483	612.0	600.0	798.0
Mean	159	261	158	45.1	98.2	89.1	150	190	116	19.7	19.4	26.6
Cfsm	12.2	20.1	12.2	3.47	7.55	6.85	11.5	14.6	8.92	1.52	1.49	2.05
In.	14.11	22.37	14.05	4.00	8.14	7.90	12.87	16.81	9.96	1.75	1.72	2.28
Ac-ft	9,780	15,510	9,740	2,770	5,650	5,480	8,930	11,660	6,910	1,210	1,190	1,580

Calendar year 1959: Max 1,620 Min 9.7 Mean 136 Cfsm 10.5 In. 142.20 Ac-ft 98,590
Water year 1959-60: Max 1,620 Min 8.2 Mean 111 Cfsm 8.54 In. 115.96 Ac-ft 80,410

Peak discharge (base, 700 cfs).--Oct. 22 (8:30 a.m.) 1,360 cfs (5.93 ft); Nov. 20 (10:30 p.m.) 1,140 cfs (5.65 ft); Nov. 22 (10 p.m.) 4,200 cfs (8.20 ft); Nov. 24 (9 p.m.) 1,000 cfs (5.71 ft); Dec. 15 (3:30 a.m.) 2,140 cfs (6.99 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.

1165. Cedar River at Cedar Falls, Wash.

Location.--Lat 47°25'10", long 121°47'20", in SE¼ sec.4, T.22 N., R.8 E., on right bank three-quarters of a mile downstream from Seattle municipal powerplant at Cedar Falls and 3 miles downstream from Chester Morse Lake (formerly Cedar Lake).

Drainage area.--84.2 sq mi.

Records available.--April 1914 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 910 ft (from river-profile map).

Average discharge.--46 years, 309 cfs (223,700 acre-ft per year).

Extremes.--Maximum discharge during year, 3,560 cfs Nov. 24 (gage height, 9.89 ft); minimum, 12.9 cfs Sept. 25 (gage height, 4.47 ft); minimum daily, 20 cfs Sept. 29, 30.
1914-60: Maximum discharge, 6,440 cfs Dec. 22, 1933 (gage height, 11.5 ft); no flow for part of Nov. 25, 1917, Aug. 18, 1923; minimum daily, 0.5 cfs Oct. 6, 1958.

Remarks.--Records good. All artificially diverted water returned to river above station. Some regulation by Chester Morse Lake (formerly Cedar Lake) for power.

Cooperation.--Gage-height record collected in cooperation with city of Seattle.

Revisions (water years).--WSP 722: 1930. WSP 1286: 1934(M), drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 15)

Oct. 1 to Nov. 22		Nov. 23 to Sept. 30			
6.1	228	4.5	14.5	6.5	495
6.5	365	4.8	38	7.0	750
7.0	635	5.2	92	8.0	1,450
8.0	1,290	5.6	176	10.0	3,710
		6.0	295		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	625	514	982	514	420	187	610	476	*438	398	186	27
2	613	584	740	496	434	206	500	526	464	372	353	27
3	330	567	552	474	452	158	612	558	436	398	228	26
4	313	552	*490	500	465	90	688	578	545	77	50	29
5	536	579	512	500	435	44	685	596	545	134	37	30
6	517	635	614	534	452	44	696	540	536	56	46	155
7	504	725	657	542	170	154	572	567	518	29	45	225
8	355	593	620	575	469	226	570	477	490	30	49	27
9	261	568	594	520	525	66	564	626	459	26	154	26
10	228	544	564	677	*482	49	510	558	442	25	48	25
11	416	517	573	512	526	48	685	518	430	62	45	24
12	574	567	515	542	601	*47	676	294	418	136	145	216
13	433	689	500	513	537	50	625	602	410	164	44	37
14	420	475	544	*478	478	179	640	521	410	61	47	58
15	483	502	1,620	465	552	170	612	644	410	301	122	174
16	785	558	2,470	174	554	*176	562	479	438	306	50	23
17	237	554	2,180	79	516	324	532	364	454	226	52	23
18	267	560	1,710	417	483	348	614	358	450	259	42	23
19	295	579	1,390	162	484	47	608	362	438	273	42	212
20	318	595	1,170	128	416	52	656	360	430	267	46	115
21	448	698	1,040	82	446	312	717	326	422	240	41	166
22	627	1,210	896	27	646	388	706	406	414	144	118	296
23	937	*3,060	778	53	603	437	521	402	380	186	45	335
24	948	3,260	688	34	272	538	548	402	360	398	68	196
25	767	3,070	315	156	122	602	602	398	410	297	*45	178
26	978	2,310	537	251	319	474	677	352	410	266	120	130
27	837	1,910	379	92	48	442	574	371	410	272	31	128
28	742	1,580	519	257	47	656	516	312	406	248	28	100
29	786	1,260	544	255	202	690	514	396	406	202	66	20
30	787	1,100	524	146	-------	696	532	406	402	34	107	20
31	595	-------	552	203	-------	655	-------	422	-------	34	97	-------
Total	16,962	30,915	25,769	10,358	12,156	8,555	18,124	14,197	13,181	5,926	2,597	3,071
Mean	547	1,031	831	334	419	276	604	458	439	191	83.8	102
Ac-ft	33,640	61,320	51,110	20,540	24,110	16,970	35,950	28,160	26,140	11,750	5,150	6,090

Calendar year 1959: Max 3,260 Min 16.5 Mean 505 Ac-ft 365,700
Water year 1959-60: Max 3,260 Min 20 Mean 442 Ac-ft 320,900

* Discharge measurement made on this day.

1167. Middle Fork Taylor Creek near Selleck, Wash.

Location.--Lat 47°21'15", long 121°47'30", in NW¼ sec.33, T.22 N., R.8 E., on left bank 0.7 mile upstream from mouth and 4 miles southeast of Selleck.

Drainage area.--4.85 sq mi.

Records available.--August 1956 to September 1960.

Gage.--Water-stage recorder; concrete control since Aug. 15, 1958. Altitude of gage is 1,440 ft (from topographic map).

Extremes.--Maximum discharge during year, 823 cfs Dec. 15 (gage height, 4.08 ft); minimum, 7.6 cfs Aug. 8-14, 20, 21, Sept. 28-30; minimum gage height, 1.88 ft Aug. 8-14, 20, 21.
1956-60: Maximum discharge, that of Dec. 15, 1959; minimum, 4.7 cfs Sept. 7-9, 1958.

Remarks.--Records excellent except those above 150 cfs, which are good. No regulation or diversion above station.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 14				Dec. 15 to Sept. 30			
2.0	16	2.7	179	1.8	4	2.5	73
2.2	38	3.0	345	2.0	14	3.0	203
2.4	77			2.2	30	3.6	484

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	37	48	26	51	21	57	48	44	18	9.2	14.5
2	40	34	48	25	*48	20	73	48	41	17	9.2	13.5
3	34	67	46	23	41	19	64	42	39	17	9.2	12
4	30	*52	43	23	38	19.5	64	40	34	16	9.2	20
5	26	45	37	22	51	19.5	62	39	32	15.5	9.2	23
6	24	40	38	26	113	20	62	49	31	14.5	8.6	17
7	22	37	43	23	161	23	64	62	29	*14	8.0	14.5
8	31	33	37	21	94	20	64	51	27	14	8.0	13.5
9	26	30	*37	20	69	18	59	47	26	14	7.6	12
10	24	28	41	19.5	62	18	48	47	26	13.5	7.6	11.5
11	120	29	62	19	49	17.5	47	45	25	13.5	7.6	11
12	75	30	62	18	49	17.5	48	49	23	13	7.6	11
13	57	24	52	17.5	45	17.5	44	49	22	13	7.6	11
14	48	23	174	17.5	79	17.5	44	42	26	12	9.6	10.5
15	45	29	*492	17	79	24	*40	40	27	12	13	10.5
16	38	21	253	17	60	23	40	47	50	11.5	10.5	9.8
17	34	35	140	16	49	29	42	45	30	11.5	*11	9.8
18	32	94	99	14.5	42	29	42	51	27	10.5	8.6	9.2
19	29	102	77	14	37	*32	49	58	27	10.5	8.6	9.8
20	55	267	66	14	36	41	90	111	29	10.5	8.0	9.8
21	45	269	54	14	36	51	66	90	26	9.8	9.2	8.6
22	99	242	47	14	30	54	55	75	24	9.8	9.2	8.6
23	73	*236	44	18	28	54	51	66	23	9.8	15.5	9.2
24	89	216	42	31	27	54	48	*64	22	9.2	17.5	12.5
25	77	202	39	33	26	59	47	59	22	9.2	18	14
26	62	129	34	49	25	60	44	54	21	9.2	24	9.8
27	53	91	32	38	24	57	42	57	19.5	9.2	17	8.6
28	62	70	31	56	22	59	49	51	19	9.2	13	8.0
29	50	62	29	151	22	73	54	47	18	9.2	16	7.6
30	45	53	*29	88	------	68	48	49	18	9.2	12	7.6
31	40	------	26	60	------	60	------	51	------	9.2	17.5	------
Total	1,533	2,627	2,302	945.0	1,493	1,095.0	1,607	1,673	827.5	374.5	346.8	348.4
Mean	49.5	87.6	74.3	30.5	51.5	35.3	53.6	54.0	27.6	12.1	11.2	11.6
Cfsm	10.2	18.1	15.3	6.29	10.6	7.28	11.1	11.1	5.69	2.49	2.31	2.39
In.	11.76	20.14	17.65	7.25	11.45	8.40	12.32	12.83	6.35	2.87	2.66	2.67
Ac-ft	3,040	5,210	4,570	1,870	2,960	2,170	3,190	3,320	1,640	743	688	691

Calendar year 1959: Max 492 Min 8.7 Mean 51.7 Cfsm 10.7 In. 144.83 Ac-ft 37,460
Water year 1959-60: Max 492 Min 7.6 Mean 41.5 Cfsm 8.56 In. 116.35 Ac-ft 30,100

Peak discharge (base, 250 cfs).--Nov. 20 (10 p.m.) 368 cfs (3.07 ft); Nov. 22 (11 p.m.) 390 cfs (3.10 ft); Dec. 15 (2 p.m.) 823 cfs (4.08 ft); Feb. 6 (9 p.m.) 402 cfs (3.45 ft).

* Discharge measurement made on this day.

1168. North Fork Taylor Creek near Selleck, Wash.

Location.--Lat 47°22'20", long 121°48'20", in NE¼ sec.29, T.22 N., R.8 E., on left bank at upstream side of bridge, 1 mile upstream from mouth and 3 miles east of Selleck.

Drainage area.--3.16 sq mi.

Records available.--June 1956 to September 1960.

Gage.--Water-stage recorder and log control. Altitude of gage is 1,500 ft (from topographic map).

Extremes.--Maximum discharge during year, 522 cfs Dec. 15 (gage height, 4.17 ft); minimum, 2.5 cfs Aug. 9 (gage height, 0.83 ft).
1956-60: Maximum discharge, that of Dec. 15, 1959; minimum, 0.8 cfs Aug. 21, 1958; minimum gage height, 0.57 ft July 28, 1958.

Remarks.--Records good. No regulation or diversion above station.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 19, Sept. 26-30)

0.8	2.6	2.3	105
1.0	6.8	3.0	217
1.3	18	4.0	470
1.8	52		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	18.5	24	12.5	33	13	38	25	26	7.0	3.6	8.0
2	24	17	24	12.5	*30	12	44	24	24	6.8	3.6	7.0
3	19.5	41	23	12	25	12	44	22	22	6.5	3.4	6.2
4	16.5	*38	21	11.5	21	12	39	20	19.5	6.2	3.6	10.5
5	13.5	31	19.5	11.5	25	12.5	36	18.5	18	5.9	3.4	13.5
6	12	25	18.5	14	42	13	33	24	16.5	5.6	3.2	11
7	11.5	20	23	12.5	91	14	31	32	15	*5.5	3.1	8.9
8	15.5	17.5	21	12	63	13.5	32	31	14	5.4	2.8	6.8
9	14.5	15	*20	11.5	47	13	30	26	13.5	5.2	2.6	5.9
10	14	13	22	10.5	40	12.5	25	25	12.5	5.2	2.8	5.2
11	56	13.5	38	10.5	34	12.5	24	25	12	4.9	2.9	4.7
12	49	16	48	10.5	32	12.5	24	31	12	4.9	2.9	4.5
13	39	13	38	9.9	30	12.5	24	34	11	4.9	2.8	4.3
14	29	12	72	9.6	42	12.5	26	32	13.5	4.7	3.5	3.9
15	24	15.5	346	9.2	52	16.5	*26	29	14	4.3	4.5	3.9
16	20	11.5	150	9.2	42	15	25	31	29	4.3	3.7	3.6
17	17.5	20	82	9.2	34	26	30	31	22	4.1	*3.6	3.6
18	15	51	55	8.6	28	30	31	38	18	3.9	3.2	3.4
19	13.5	65	41	8.3	25	34	33	44	15.5	3.9	3.2	3.6
20	22	152	36	8.3	24	45	57	76	14	3.7	2.9	3.6
21	21	162	30	8.3	22	*54	49	57	12	3.7	3.4	3.2
22	42	108	a28	8.6	18.5	52	38	44	11	3.7	3.4	3.2
23	44	*131	a26	12.5	17.5	47	33	37	9.9	3.7	4.5	3.6
24	54	118	a26	25	17	44	30	*36	9.2	3.6	5.9	4.3
25	63	113	a23	30	16	43	28	33	8.9	3.6	6.8	5.4
26	45	74	a20	42	14.5	41	26	31	8.6	3.4	12.5	3.9
27	34	52	a18	35	14	36	25	30	8.0	3.4	8.9	3.6
28	33	40	a16	40	13.5	38	28	28	7.6	3.4	7.3	3.4
29	28	33	a15	91	13	41	30	25	7.0	3.4	8.0	3.4
30	25	28	*14	64	------	44	27	26	7.3	3.6	6.8	3.2
31	22	------	13.5	42	------	43	------	29	------	3.6	8.9	------
Total	868.0	1,464.5	1,351.5	612.2	906.0	827.0	966	994.5	431.5	142.0	141.7	159.3
Mean	28.0	48.8	43.6	19.7	31.2	26.7	32.2	32.1	14.4	4.58	4.57	5.31
Cfsm	8.86	15.4	13.8	6.23	9.87	8.45	10.2	10.2	4.56	1.45	1.45	1.68
In.	10.22	17.24	15.91	7.20	10.66	9.73	11.37	11.70	5.08	1.67	1.67	1.87
Ac-ft	1,720	2,900	2,680	1,210	1,800	1,640	1,920	1,970	856	282	281	316

Calendar year 1959: Max 346 Min 2.2 Mean 30.5 Cfsm 9.65 In. 130.81 Ac-ft 22,040
Water year 1959-60: Max 346 Min 2.6 Mean 24.2 Cfsm 7.66 In. 104.32 Ac-ft 17,580

Peak discharge (base, 130 cfs).--Nov. 20 (9 p.m.) 235 cfs (3.09 ft); Nov. 24 (8:30 p.m.) 152 cfs (2.61 ft); Dec. 15 (1:30 p.m.) 522 cfs (4.17 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.

1170. Taylor Creek near Selleck, Wash.

Location.--Lat 47°23'10", long 121°50'45", in NW¼NW¼ sec.19, T.22 N., R.8 E., on left bank half a mile upstream from mouth and 1½ miles northeast of Selleck.

Drainage area.--16.4 sq mi.

Records available.--June to October 1945, August 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 940 ft (from topographic map). June to October 1945 on right bank 350 ft downstream at different datum.

Extremes.--Maximum discharge during year, 2,170 cfs Dec. 15 (gage height, 5.20 ft); minimum, 25 cfs Sept. 30 (gage height, 2.54 ft).
1945, 1956-60: Maximum discharge, that of Dec. 15, 1959; minimum, 16 cfs Oct. 2-7, 1958.

Remarks.--Records excellent. No regulation or diversion above station.

Revisions.--WSP 1516: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 22-26)

Oct. 1 to Nov. 19		Nov. 20 to Sept. 30			
2.8	73	2.5	22	4.0	550
3.1	125	2.8	57	4.5	1,050
3.5	239	3.1	114	5.0	1,800
		3.5	246		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	132	113	161	117	149	84	161	130	122	62	35	42
2	115	109	164	114	*149	81	184	127	*117	59	35	39
3	105	170	161	110	132	77	174	122	110	57	33	35
4	100	148	146	105	119	77	164	117	103	56	33	52
5	95	132	135	103	140	77	158	112	96	54	33	65
6	90	123	132	119	198	81	152	119	92	51	32	50
7	86	115	143	110	328	82	152	155	88	*50	32	43
8	100	109	130	*101	251	86	152	140	84	50	31	38
9	100	103	*127	96	199	77	146	130	81	49	30	35
10	95	100	135	92	184	77	127	122	77	49	31	33
11	221	100	199	90	155	73	127	122	75	47	31	32
12	174	109	210	88	152	71	127	130	73	47	30	31
13	143	96	170	84	152	71	130	143	70	46	30	31
14	127	93	319	82	219	73	140	132	81	44	32	30
15	121	107	1,200	79	261	110	132	122	86	43	38	30
16	111	93	467	79	206	*101	124	127	157	42	33	30
17	103	109	362	75	174	117	135	130	107	41	33	29
18	96	208	290	73	155	117	*135	140	94	39	32	28
19	95	232	242	70	140	122	152	146	94	39	31	29
20	139	522	222	70	132	143	256	290	94	39	30	29
21	132	633	202	68	137	167	210	238	86	38	32	28
22	200	508	184	67	122	167	177	195	81	38	31	28
23	177	*577	177	77	114	161	155	170	77	38	39	30
24	200	467	177	124	110	152	143	161	75	37	*46	35
25	198	528	167	137	105	155	140	149	73	37	46	39
26	164	368	155	181	101	155	132	140	70	36	64	30
27	143	280	146	143	94	149	127	146	67	35	51	29
28	148	234	140	157	90	161	134	130	65	35	41	27
29	132	202	135	334	86	181	149	122	63	35	47	26
30	*125	174	132	238	------	188	132	127	63	35	38	25
31	119	------	124	181	------	181	------	135	------	35	47	------
Total	4,086	6,862	6,854	3,564	4,554	3,614	4,527	4,469	2,621	1,363	1,127	1,028
Mean	132	229	221	115	157	117	151	144	87.4	44.0	36.4	34.3
Cfsm	8.05	14.0	13.5	7.01	9.57	7.13	9.21	8.78	5.33	2.68	2.22	2.09
In.	9.27	15.56	15.54	8.08	10.33	8.20	10.27	10.13	5.94	3.09	2.56	2.33
Ac-ft	8,100	13,610	13,590	7,070	9,030	7,170	8,980	8,860	5,200	2,700	2,240	2,040

Calendar year 1959: Max 1,200 Min 32 Mean 143 Cfsm 8.72 In. 117.98 Ac-ft 103,200
Water year 1959-60: Max 1,200 Min 25 Mean 122 Cfsm 7.44 In. 101.30 Ac-ft 88,590

Peak discharge (base, 650 cfs).--Nov. 20 (9:30 p.m.) 886 cfs (4.36 ft); Nov. 22 (11:15 p.m.) 831 cfs (4.16 ft); Nov. 25 (12:30 a.m.) 702 cfs (4.03 ft); Dec. 15 (3:30 p.m.) 2,170 cfs (5.20 ft).

* Discharge measurement made on this day.

1175. Cedar River near Landsburg, Wash.

Location.--Lat 47°23'35", long 121°56'50", in NE¼SW¼ sec.17, T.22 N., R.7 E., on left bank 2 miles upstream from Landsburg and intake of Seattle water-supply system, 4¾ miles east of Maple Valley, 5 miles downstream from Taylor Creek, and 12 miles downstream from Chester Morse Lake.

Drainage area.--125 sq mi, excludes that of Rock Creek.

Records available.--July 1895 to September 1960 (prior to October 1948, flow of Rock Creek included). Monthly discharge only for some periods, published in WSP 1316. Published as "near Seattle" 1895-98, "near Maple Valley" 1902, and as "near Ravensdale" 1898-1901, 1903-12.

Gage.--Water-stage recorder. Altitude of gage is 600 ft (from river-profile map). Prior to Oct. 1, 1898, staff gage at site 2¼ miles downstream at different datum. Mar. 24, 1901, to May 15, 1913, staff gage at site 2 miles downstream at datum 535.84 ft above mean sea level (levels by city of Seattle). Apr. 30, 1914, to Oct. 22, 1928, water-stage recorder a quarter of a mile downstream at different datum.

Average discharge.--65 years, 694 cfs (502,400 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 4,840 cfs Nov. 24 (gage height, 6.00 ft); minimum, 198 cfs Sept. 29, 30 (gage height, 0.80 ft).
1895-98, 1901-60: Maximum discharge, 14,200 cfs Nov. 19, 1911 (gage height, 10.0 ft, from graph based on gage readings, site and datum then in use), from computation of peak flow over dam, peak caused by failure of flashboards at Chester Morse Lake; minimum observed, 83 cfs Sept. 19, 1898.

Remarks.--Records excellent. All diversions except Rock Creek returned to river above station. Rock Creek, which entered naturally just above station prior to 1932, has been diverted to enter river at a point about 2 miles downstream from Seattle municipal water-supply intake. Some regulation by Chester Morse Lake. Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Cooperation.--Gage-height record collected in cooperation with city of Seattle.

Revisions (water years).--WSP 313: 1895-98, 1902-9. WSP 1246: Drainage area. WSP 1286: 1912. WSP 1316: 1896-98(M), 1902-11(M).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

0.8	198	3.0	1,480
1.3	385	4.5	2,980
2.0	755	6.0	4,840

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,030	962	1,600	957	894	574	1,060	874	841	696	403	297
2	1,030	988	1,380	925	890	582	951	948	*841	660	584	290
3	779	1,090	1,110	917	912	534	1,060	918	802	684	532	282
4	772	1,080	1,030	934	924	467	1,120	956	911	462	341	317
5	896	994	992	919	900	430	1,120	986	904	458	333	333
6	920	1,060	1,090	981	*908	430	1,120	930	890	390	329	379
7	870	1,160	*1,140	970	992	488	994	990	869	353	325	459
8	800	1,050	1,070	*989	1,050	660	986	890	841	353	325	308
9	726	997	1,070	939	1,030	453	974	1,010	800	345	380	275
10	684	951	1,030	1,090	1,030	430	907	960	774	345	354	267
11	980	974	1,130	930	956	*421	1,090	916	755	353	321	263
12	1,070	972	1,160	957	1,100	412	1,090	715	742	421	400	398
13	938	1,120	1,050	963	1,010	416	1,000	1,030	729	452	321	301
14	866	925	1,260	868	1,090	533	1,060	910	742	392	321	287
15	862	912	3,300	878	1,130	583	1,040	1,030	755	521	374	378
16	1,190	964	3,720	627	1,090	580	975	905	841	576	346	267
17	722	1,000	3,210	486	1,060	767	960	762	814	498	324	249
18	672	1,130	2,620	781	968	778	1,020	799	800	535	309	249
19	732	1,210	2,150	546	944	518	1,030	792	788	*520	305	386
20	762	1,610	1,860	531	890	525	1,190	997	781	538	309	321
21	858	1,980	1,650	472	878	776	1,240	906	755	510	309	373
22	1,130	2,030	1,490	421	1,080	822	1,180	906	742	414	349	433
23	1,420	3,950	1,320	448	1,070	834	986	858	705	461	341	520
24	1,570	4,340	1,240	500	676	968	986	876	676	618	349	421
25	1,330	4,270	910	621	602	1,040	1,040	855	722	556	*329	388
26	1,550	3,380	993	751	687	912	*1,090	798	722	528	390	353
27	1,360	2,870	860	620	492	892	990	788	716	534	344	337
28	1,250	2,440	997	714	449	1,090	946	730	710	504	301	321
29	1,340	1,950	1,020	1,020	590	1,160	888	795	703	484	343	201
30	*1,260	1,800	1,010	801	-------	1,180	935	814	703	358	341	198
31	1,090	-------	1,000	734	-------	1,130	-------	834	-------	325	382	-------
Total	31,459	50,159	45,462	24,290	26,292	21,385	31,028	27,478	23,374	14,844	11,014	9,851
Mean	1,015	1,672	1,467	784	907	690	1,034	886	779	479	355	328
Ac-ft	62,400	99,490	90,170	48,180	52,150	42,420	61,540	54,500	46,360	29,440	21,850	19,540

Calendar year 1959: Max 4,340 Min 290 Mean 992 Ac-ft 718,300
Water year 1959-60: Max 4,340 Min 198 Mean 865 Ac-ft 628,000

* Discharge measurement made on this day.

1184. Rock Creek at State Highway 5A, near Ravensdale, Wash.

Location.--Lat 47°21'45", long 122°00'35", in NE¼SW¼ sec. 26, T.22 N., R.6 E., on left bank near upstream ends of culverts on State Highway 5A, 1½ miles northeast of Ravensdale.

Records available.--June 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 530 ft (from topographic map).

Extremes.--Maximum discharge during year, 114 cfs Dec. 16 (gage height, 2.89 ft); minimum, 5.9 cfs Sept. 29, 30 (gage height, 1.46 ft).
1956-60: Maximum discharge, that of Dec. 16, 1959; minimum, 2.7 cfs Sept. 13-15, 1958; minimum gage height, 1.07 ft Oct. 12, 14, 1956.

Remarks.--Records excellent except those for periods of no gage-height record, which are good. No regulation. Occasional diversion of 1 cfs above station during summer months by city of Kent.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 15				Dec. 16 to Sept. 30			
1.5	9.2	2.3	45	1.4	4.2	2.0	31
1.7	15	2.6	75	1.6	10.5	2.4	59
2.0	28			1.8	19.5	2.9	115

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.4	a13	41	38	33	26	23	24	22	12.5	8.4	6.7
2	9.8	a13.5	41	a37	32	25	23	24	22	12	8.4	6.7
3	10	14	*40	a36	32	24	23	23	21	12	8.4	6.7
4	10.5	14	*39	a35	*31	24	23	22	20	11.5	8.0	6.7
5	10.5	14	38	a35	31	23	23	22	20	11.5	8.0	6.7
6	11	14	37	a34	31	23	23	21	19.5	11	8.0	6.4
7	11	14	36	*33	34	22	23	21	19	10.5	8.0	6.4
8	11	14	35	32	37	22	22	20	18.5	*10.5	7.7	6.4
9	11	14	34	31	38	22	22	19.5	18	10.5	7.7	6.4
10	11.5	14	33	31	37	*22	22	19.5	18	10.5	7.7	6.2
11	12	13.5	33	31	36	22	21	19	17.5	10.5	7.7	6.2
12	12	13.5	35	30	35	22	20	19	17	10	7.4	6.4
13	11.5	13.5	35	29	34	23	*20	18.5	17	10	7.4	6.4
14	11.5	14	37	28	36	23	20	18	17	9.8	7.4	6.2
15	11.5	14	68	28	38	24	21	18	17	9.8	7.4	6.2
16	11.5	13.5	110	27	38	24	21	18	16	9.8	7.4	6.2
17	11.5	14	97	26	38	25	21	17.5	15.5	9.4	7.0	6.2
18	11.5	15.5	77	25	38	26	22	17.5	15	9.4	7.0	6.2
19	11.5	17.5	66	25	36	27	22	18	15	9.4	7.0	6.2
20	11.5	26	61	24	35	27	23	20	14.5	9.1	7.0	6.2
21	11.5	48	*58	24	34	27	24	21	14	9.1	7.0	6.2
22	11.5	60	55	23	34	26	26	22	14	9.1	7.0	6.2
23	*11.5	64	53	23	32	25	28	*23	14	8.8	7.0	6.2
24	12	*67	50	23	32	25	28	25	14	8.8	*7.0	6.2
25	12.5	71	50	24	31	24	28	25	14	8.8	7.0	6.2
26	13	67	45	25	29	24	28	25	13.5	8.8	7.0	6.2
27	13	58	44	24	29	23	27	25	13.5	8.4	7.0	6.2
28	13	51	42	25	28	23	27	24	13	8.4	6.7	6.2
29	13	45	41	29	27	23	26	24	13	8.0	7.0	5.9
30	13	*43	40	31	------	23	25	23	12.5	7.4	7.0	5.9
31	13	------	39	32	------	23	------	23	------	8.4	6.7	------
Total	358.7	867.5	1,510	898	976	742	705	659.5	495.0	303.7	229.4	189.1
Mean	11.6	28.9	48.7	29.0	33.7	23.9	23.5	21.3	16.5	9.80	7.40	6.30
Ac-ft	711	1,720	3,000	1,780	1,940	1,470	1,400	1,310	982	602	455	375

Calendar year 1959: Max 110 Min 7.1 Mean 23.0 Ac-ft 16,690
Water year 1959-60: Max 110 Min 5.9 Mean 21.7 Ac-ft 15,740

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for station near Maple Valley.

1185. Rock Creek near Maple Valley, Wash.

Location.--Lat 47°22'50", long 122°01'10", in NE¼ sec.22, T.22 N., R.6 E., on left bank 650 ft upstream from mouth and 2 miles southeast of Maple Valley.

Drainage area.--14.0 sq mi.

Records available.--June 1945 to September 1960.

Gage.--Water-stage recorder and woodbox culvert control. Altitude of gage is 425 ft (from topographic map). Prior to Mar. 16, 1953, at site 50 ft downstream at datum 0.82 ft higher.

Average discharge.--15 years, 21.7 cfs (15,710 acre-ft per year).

Extremes.--Maximum discharge during year, 131 cfs Dec. 17 (gage height, 2.64 ft); minimum, 5.3 cfs Sept. 12, 28, 29, 30; minimum gage height, 1.53 ft Sept. 8, 9, 12, 28, 29, 30. 1945-60: Maximum discharge, 165 cfs Feb. 11, 1951 (gage height, 4.26 ft, datum then in use, from recorded range in stage); minimum, 2.7 cfs Dec. 23, 24, 1952; minimum gage height, 0.19 ft Oct. 9-12, 14, 15, 1952, datum then in use.

Remarks.--Records good. No regulation or diversion above station.

Revisions.--WSP 1246: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 24 to Nov. 2)

Oct. 1 to Nov. 25		Nov. 26 to Sept. 30	
1.6	11	1.5	4.4
1.8	23	1.7	16
2.0	40	2.0	43
2.4	94	2.6	124

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13.5	17	54	42	40	29	26	28	26	13.5	7.9	6.3
2	13	17	52	41	40	29	26	27	25	13	7.9	6.3
3	13	18.5	50	40	39	28	26	26	24	13	7.9	6.3
4	13.5	18	48	39	38	27	26	26	24	13	7.9	6.8
5	13.5	18.5	46	39	37	26	25	25	23	12	7.9	6.8
6	13.5	18.5	45	39	*38	26	24	25	22	12	7.4	6.3
7	13.5	18.5	45	38	41	25	24	24	22	12	7.4	6.3
8	14	19.5	43	*38	41	25	24	23	22	*11.5	6.8	6.3
9	13.5	19.5	43	38	43	24	24	23	20	12	6.8	5.8
10	14	20	41	37	43	*25	24	23	19	12	6.8	5.8
11	15.5	20	41	36	41	24	24	24	19	12	6.8	5.8
12	14	20	44	36	40	25	23	22	19	11.5	6.8	5.8
13	14	19.5	45	35	40	25	23	22	18.5	11.5	6.8	5.8
14	14	19.5	48	34	40	25	24	22	18.5	11.5	6.8	5.8
15	14	20	75	33	42	26	25	21	17.5	11	7.4	5.8
16	14	20	118	32	43	26	24	21	17.5	11	7.4	5.8
17	13.5	22	119	31	43	27	24	21	17	11	*7.4	5.8
18	14	24	99	31	43	28	*24	*20	17	10	6.8	5.8
19	14	26	85	30	42	28	24	21	16	10	6.8	5.8
20	15.5	35	76	29	41	30	26	23	16	10	6.8	5.8
21	15.5	61	*69	27	40	30	28	24	15.5	10	6.8	5.3
22	15.5	76	62	26	39	30	29	25	15.5	9.6	6.8	5.3
23	15.5	82	60	26	37	29	31	26	15.5	9.6	7.4	5.8
24	15.5	84	59	26	36	29	33	28	15.5	9.6	6.8	5.8
25	15.5	88	55	26	34	28	33	28	15	9.6	6.8	5.8
26	16	85	52	27	34	27	32	28	15	9.0	6.8	5.8
27	15.5	75	50	28	33	26	32	28	14	9.0	6.8	5.8
28	15.5	69	48	29	32	26	30	28	14	8.4	6.3	5.8
29	*15.5	62	46	34	30	26	29	27	14	7.9	6.8	5.3
30	16	*59	46	38	------	26	29	26	13.5	7.4	6.8	5.3
31	17	------	44	39	------	26	------	26	------	7.9	6.8	------
Total	450.5	1,152.0	1,808	1,044	1,130	831	796	761	550.5	331.5	219.4	177.0
Mean	14.5	38.4	58.3	33.7	39.0	26.8	26.5	24.5	18.4	10.7	7.08	5.90
Cfsm	1.04	2.74	4.16	2.41	2.79	1.91	1.89	1.75	1.31	0.764	0.506	0.421
In.	1.20	3.06	4.80	2.77	3.00	2.21	2.11	2.02	1.46	0.88	0.58	0.47
Ac-ft	894	2,280	3,590	2,070	2,240	1,650	1,580	1,510	1,090	658	435	351

Calendar year 1959: Max 119 Min 6.7 Mean 28.1 Cfsm 2.01 In. 27.27 Ac-ft 20,360
Water year 1959-60: Max 119 Min 5.3 Mean 25.3 Cfsm 1.81 In. 24.56 Ac-ft 18,350

* Discharge measurement made on this day.

1190. Cedar River at Renton, Wash.

Location.--Lat 47°29'00", long 122°12'10", in NW¼ sec.17, T.23 N., R.5 E., on left bank 125 ft downstream from bridge on U.S. Highway 10 at Renton and 1½ miles upstream from mouth.

Drainage area.--197 sq mi (includes 4 sq mi in vicinity of Youngs Lake in Big Soos Creek basin).

Records available.--March 1901 to July 1903 (fragmentary), September 1906 to December 1907 (monthly discharge only), August 1945 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 15.20 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Jan. 1, 1908, staff gages within 1 mile of present site at datum 10.67 ft below mean sea level, unadjusted. Aug. 7, 1945, to Aug. 15, 1947, water-stage recorder at site 700 ft upstream at datum 20.13 ft above mean sea level and Aug. 16, 1947, to Dec. 7, 1950, at datum 19.13 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--15 years (1945-60), 722 cfs (522,700 acre-ft per year).

Extremes.--Maximum discharge during year, 5,860 cfs Dec. 15 (gage height, 8.78 ft); minimum, 40 cfs Aug. 12 (gage height, 2.72 ft).
1901-3, 1906-7, 1945-60: Maximum discharge not determined, probably occurred Feb. 11, 1951, during period of no gage-height record (discharge measurement of 6,640 cfs, gage height, 9.48 ft, made Feb. 10, 1951); minimum recorded, 37 cfs Sept. 5, 6, 11, 12, 1957 (gage height, 2.51 ft).

Remarks.--Records excellent except those for period Feb. 7-25, which are fair. Flow partly regulated by Chester Morse Lake for operation of powerplant. More than 250 cfs is diverted at Landsburg at times by city of Seattle for municipal use. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1246: Drainage area. WSP 1316: 1901-2.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 9-23)

Oct. 1-24		Oct. 25 to Sept. 30				
3.6	470	2.7	36	5.0	1,290
4.0	680	3.0	108	7.0	3,300
5.1	1,380	3.5	320	9.0	6,300
		4.0	610		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	928	807	1,510	922	942	608	1,200	961	803	538	70	228
2	880	814	1,230	880	1,010	575	1,080	1,000	810	556	258	172
3	706	904	1,050	939	1,020	588	1,170	980	748	550	357	161
4	572	960	819	746	1,000	492	1,220	1,010	855	425	146	197
5	682	838	736	842	957	485	1,210	1,030	855	305	88	241
6	746	880	878	889	1,010	455	1,200	990	836	193	73	202
7	695	966	933	910	1,490	466	1,070	1,050	*796	165	66	310
8	643	901	878	923	1,260	652	1,040	1,030	766	132	58	312
9	628	784	848	870	1,190	576	1,050	976	724	125	50	165
10	510	763	822	992	1,130	478	970	974	664	115	99	146
11	740	766	936	866	1,040	*455	1,140	1,040	646	108	63	139
12	922	798	1,100	897	1,140	431	1,130	957	622	139	50	155
13	873	926	963	900	1,100	419	1,070	1,130	592	193	115	268
14	779	725	1,060	813	1,180	478	1,150	961	604	*214	61	153
15	752	706	3,630	824	*1,290	620	1,170	1,040	622	174	63	165
16	972	762	5,130	713	1,230	638	1,090	1,010	694	402	108	236
17	754	798	4,280	472	1,160	722	1,060	776	736	255	68	132
18	510	1,020	3,430	562	1,060	812	1,110	810	736	305	58	118
19	592	1,170	2,780	624	1,030	714	1,130	796	730	279	54	137
20	598	1,800	1,940	456	968	274	1,320	1,020	730	310	78	240
21	702	2,840	2,060	440	943	676	1,470	1,010	706	310	115	202
22	884	2,490	1,650	384	1,110	820	1,410	976	682	237	122	264
23	1,170	*4,130	1,420	364	1,100	836	1,190	914	598	210	180	402
24	1,370	5,070	1,340	517	800	966	1,160	894	526	352	161	352
25	1,280	5,070	1,020	*600	676	1,050	1,180	881	562	352	189	269
26	1,350	4,350	1,010	795	683	951	1,220	829	556	310	214	260
27	*1,210	3,630	896	794	652	927	1,100	810	544	300	255	214
28	1,110	2,980	980	702	508	1,100	*2,000	754	526	274	169	197
29	1,150	2,270	*946	1,340	528	1,240	1,740	790	514	289	*180	150
30	1,120	1,920	980	1,260	-------	1,320	1,030	784	520	180	193	103
31	951	-------	966	911	-------	1,300	-------	810	-------	86	251	-------
Total	26,779	52,838	48,221	24,147	29,207	22,124	36,080	28,993	20,303	8,383	4,012	6,289
Mean	864	1,761	1,556	779	1,007	714	1,203	935	677	270	129	210
Ac-ft	53,120	104,800	95,640	47,890	57,930	43,880	71,560	57,510	40,270	16,630	7,960	12,470

Calendar year 1959: Max 5,130 Min 72 Mean 919 Ac-ft 665,300
Water year 1959-60: Max 5,130 Min 50 Mean 840 Ac-ft 609,700

* Discharge measurement made on this day.

1200. Mercer Creek near Bellevue, Wash.

Location.--Lat 47°36'10", long 122°10'55", in NW¼NW¼ sec.4, T.24 N., R.5 E., on left bank 40 ft upstream from Northern Pacific Railway trestle, 1 mile southeast of Bellevue, and 1½ miles upstream from mouth.

Drainage area.--12.0 sq mi.

Records available.--June to October 1945, June 1955 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map). Prior to June 5, 1959, at site 600 ft downstream at different datums.

Average discharge.--5 years, 20.8 cfs (15,060 acre-ft per year).

Extremes.--Maximum discharge during year, 210 cfs Dec. 15 (gage height, 7.04 ft); minimum daily, 4.3 cfs July 8, Sept. 9.
1945, 1955-60: Maximum discharge, 242 cfs Dec. 20, 1955 (gage height, 5.08 ft, site and datum then in use); minimum, 1.9 cfs Aug. 6, 1958 (gage height, 1.52 ft, site and datum then in use).

Remarks.--Records good except those for periods of doubtful or no gage-height record, which are poor. Many small diversions for irrigation and domestic use. No regulation.

Revisions.--WSP 1446: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 7-30)

Oct. 1 to Mar. 7				Mar. 7 to Sept. 30	
1.8	5.7	4.0	99	1.1	4.1
2.1	14	6.0	179	1.5	13.5
3.0	58			2.5	43

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.5	13	16	20	42	15	32	11	9.7	6.4	5.5	7.5
2	9.2	13	28	19	40	15	28	11	8.7	6.0	5	7
3	8.9	29	52	17	*34	14.5	23	11	8.7	5.8	5	7
4	8.6	27	30	16.5	28	18	20	11	8.5	5.6	5.5	14
5	8.3	18.5	22	*17	32	28	18.5	10.5	8.0	5.2	5	11
6	7.5	16	22	20	53	28	17.5	25	8	4.7	4.5	9
7	7.8	15	30	26	92	24	16.5	18	7.5	4.5	4.5	7.4
8	12.5	14	21	22	72	*37	15.5	13	7	4.3	4.5	4.9
9	11.5	13.5	19.5	18	69	30	15	11	7	4.5	4.5	4.3
10	9.9	13	21	17	50	29	14	12.5	6.5	4.5	4.5	4.5
11	32	13	*45	19	39	26	22	15	6.5	*4.7	5	4.9
12	14.5	15	88	20	42	22	*27	16	7	4.7	5.5	5.2
13	11	13	55	17.5	49	21	21	13	8.5	4.9	5	6.2
14	9.9	13	41	17	46	20	30	17.5	11.5	5.2	5.5	6.4
15	9.3	15	162	19	50	31	32	13.5	12.5		7	6.4
16	8.5	14	118	18.5	36	24	22	17.5	9.5		*3.5	6.7
17	8.2	23	67	16.5	31	24	22	17.5	8.0		6	6.9
18	8.0	52	52	15	28	21	22	*16.5	7.6		5.5	6.0
19	8.0	46	40	14	24	20	28	16.5	7.8		5	6.4
20	12.5	110	54	14.5	23	19.5	42	30	9.5		5	7.4
21	*13.5	140	46	14	30	18.5	29	31	8.3		7	6.0
22	17.5	80	34	14.5	23	18.5	22	18	7.1	4.5	7	6.4
23	18.5	*48	30	24	20	17.5	22	15	6.9		8	9.0
24	21	37	44	64	19	17	19.5	17.5	6.9		10	9.0
25	20	32	40	66	19	16.5	17	17	7.1		14	8.0
26	15.5	24	30	69	17	16.5	15	18	6.7		22	*7.1
27	14	20	26	52	16.5	16.5	13.5	16	6.4		10	6.4
28	23	19	23	50	15	22	12.5	12.5	5.6		8.5	6.0
29	17	19	21	110	15	39	12	11	5.6		9	5.8
30	15	17	32	71	------	41	11.5	11.5	6.2		8	5.8
31	13.5	------	24	52	------	38	------	11	------		8	------
Total	404.1	922.0	1,333.5	950.0	1,054.5	728.0	642.0	485.5	234.8	147.5	216.0	208.6
Mean	13.0	30.7	43.0	30.6	36.4	23.5	21.4	15.7	7.83	4.76	6.97	6.95
Cfsm	1.08	2.56	3.58	2.55	3.03	1.96	1.78	1.31	0.652	0.397	0.581	0.579
In.	1.25	2.86	4.13	2.94	3.27	2.26	1.99	1.50	0.73	0.46	0.67	0.65
Ac-ft	802	1,830	2,640	1,880	2,090	1,440	1,270	963	466	293	428	414

Calendar year 1959: Max 188 Min 3.5 Mean 23.1 Cfsm 1.92 In. 26.13 Ac-ft 16,700
Water year 1959-60: Max 162 Min 4.3 Mean 20.0 Cfsm 1.67 In. 22.71 Ac-ft 14,520

Peak discharge (base, 100 cfs).--Nov. 21 (time unknown) 170 cfs (5.78 ft); Dec. 12 (8:30 a.m.) 104 cfs (4.12 ft); Dec. 15 (4:30 to 6 p.m.) 210 cfs (7.04 ft); Jan. 29 (8 a.m.) 134 cfs (4.88 ft); Feb. 7 (1 a.m.) 133 cfs (4.86 ft).

* Discharge measurement made on this day.

Note.--Doubtful or no gage-height record Oct. 1-4, Nov. 20-22, May 11-13, June 6-12, July 15 to Sept. 6; discharge estimated on basis of 1 discharge measurement and records for nearby stations.

1210. Issaquah Creek near Issaquah, Wash.

Location.--Lat 47°28'55", long 122°02'10", in NW¼ sec.15, T.23 N., R.6 E., on left bank 3½ miles south of Issaquah and 4 miles upstream from East Fork Issaquah Creek.

Drainage area.--26.4 sq mi.

Records available.--June 1945 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 210 ft (from topographic map). Prior to Oct. 1, 1948, at datum 0.99 ft higher. Oct. 1, 1948, to July 6, 1952, at site 70 ft upstream at datum 0.41 ft lower.

Average discharge.--15 years, 70.3 cfs (50,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,130 cfs Dec. 15 (gage height, 4.03 ft); minimum, 15.5 cfs Sept. 13, 14, 15; minimum gage height, 0.75 ft Aug. 8, 9, 10.
1945-60: Maximum discharge, 2,610 cfs Feb. 9 or 10, 1951 (gage height, 6.08 ft, site and datum then in use); minimum, 9.4 cfs Aug. 21, 1958 (gage height, 0.58 ft).

Remarks.--Records excellent except those for period Nov. 22 to Dec. 14, which are good. Many small diversions for irrigation and domestic use. No regulation.

Revisions (water years).--WSP 1092: 1946. WSP 1286: 1950. WSP 1346: 1953(M). WSP 1446: Drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 7-13

0.7	12	2.0	250
.9	26	2.5	415
1.2	60	3.5	840
1.5	115		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	40	79	63	132	46	106	54	56	26	18.5	20
2	38	38	85	60	124	44	98	52	50	26	18.5	19.5
3	34	90	90	56	106	43	87	49	48	25	18	18.5
4	32	79	78	53	92	45	78	48	*43	24	18.5	40
5	30	62	71	54	*96	56	71	45	39	23	18.5	36
6	28	54	71	68	126	62	64	79	37	22	18	25
7	27	49	79	78	211	57	60	88	36	22	17.5	21
8	32	44	69	69	169	81	57	64	33	22	16.5	19.5
9	43	42	68	62	149	*73	59	54	31	22	16.5	18
10	36	39	73	60	132	76	53	53	30	22	16.5	17.5
11	102	38	*127	60	108	71	59	62	28	22	17.5	17.5
12	79	63	194	*59	111	64	56	66	27	*21	17.5	17.5
13	63	49	144	56	108	64	*52	76	26	22	17.5	18
14	52	45	172	56	144	68	85	64	31	22	17.5	17.5
15	46	49	*773	60	159	120	94	59	37	21	18.5	18
16	40	43	486	63	132	111	79	73	43	20	18.5	18
17	37	54	271	57	115	134	76	88	34	20	18.5	18
18	34	139	203	53	100	122	74	106	32	19.5	18	18
19	33	154	156	50	90	108	78	102	28	19.5	18	18.5
20	44	484	156	49	85	100	142	169	36	19.5	18	19.5
21	54	685	134	49	88	90	144	152	33	19.5	18.5	18
22	*53	324	111	49	76	79	127	124	30	19.5	21	17.5
23	53	250	100	66	71	73	111	104	29	19.5	21	18.5
24	84	280	106	122	64	64	98	104	29	18.5	25	19.5
25	92	317	100	149	62	60	88	*100	29	18.5	*26	19.5
26	71	208	88	183	56	60	78	90	27	18.5	33	18.5
27	59	156	81	149	53	57	68	85	26	18.5	33	*17.5
28	60	124	74	146	50	63	64	73	26	18	22	16
29	53	106	71	‡ 292	49	90	68	63	26	18	22	16
30	49	90	81	206	------	100	60	68	26	18	22	16
31	44	------	71	159	------	115	------	68	------	18	21	------
Total	1,545	4,195	4,462	2,756	3,058	2,396	2,434	2,482	1,006	645.0	621.0	592.5
Mean	49.8	140	144	88.9	105	77.3	81.1	80.1	33.5	20.8	20.0	19.8
Cfsm	1.89	5.30	5.45	3.37	3.98	2.93	3.07	3.03	1.27	0.788	0.758	0.750
In.	2.18	5.91	6.29	3.88	4.31	3.38	3.43	3.50	1.42	0.91	0.87	0.83
Ac-ft	3,060	8,320	8,850	5,470	6,070	4,750	4,830	4,920	2,000	1,280	1,230	1,180

Calendar year 1959: Max 773 Min 15 Mean 81.0 Cfsm 3.07 In. 41.68 Ac-ft 58,660
Water year 1959-60: Max 773 Min 16 Mean 71.6 Cfsm 2.71 In. 36.91 Ac-ft 51,960

Peak discharge (base, 400 cfs).--Nov. 21 (12:30 a.m.) 950 cfs (3.72 ft); Dec. 15 (3:30 p.m.) 1,130 cfs (4.03 ft).

* Discharge measurement made on this day.

1218. Pine Lake near Issaquah, Wash.

Location.--Lat 47°35'15", long 122°03'00", in NW¼ sec.9, T.24 N., R.6 E., on north shore 4¾ miles northwest of Issaquah.

Drainage area.--1.06 sq mi.

Records available.--May 1956 to September 1960.

Gage.--Staff gage read once daily at infrequent intervals. Altitude of gage is 390 ft (from topographic map).

Extremes.--Maximum gage height observed during year, 3.60 ft Feb. 15; minimum observed, 1.92 ft Sept. 21, 24, 27.
1956-60: Maximum gage height observed, 4.07 ft Jan. 25, 1959; minimum observed, 1.14 ft Oct. 7, 1958.

Remarks.--No regulation or diversion above station.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.33	-	-	-	-	-	-	-	-	-	-	2.00
2	-	2.40	-	3.21	-	-	-	-	3.27	-	-	-
3	-	-	-	3.20	-	-	-	-	-	-	2.24	2.04
4	-	-	-	-	3.50	-	3.22	-	-	2.88	-	-
5	2.29	-	-	-	3.46	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	2.20	2.05
7	2.28	-	-	-	-	3.15	3.16	-	3.27	-	-	-
8	-	-	-	-	3.48	-	-	-	-	-	-	-
9	-	2.46	-	-	-	3.16	-	-	-	-	2.13	-
10	-	-	-	-	-	-	-	-	-	-	-	2.02
11	-	-	3.37	-	-	-	-	-	3.24	-	2.10	-
12	2.36	-	-	3.13	3.52	-	-	3.08	-	-	-	-
13	-	2.00	-	-	-	-	-	-	3.14	-	2.08	1.99
14	-	-	-	-	-	3.20	-	3.05	-	-	-	-
15	-	-	-	-	3.60	-	-	-	-	-	2.06	1.98
16	-	2.38	-	3.10	3.56	-	-	3.06	-	-	-	-
17	2.34	-	-	-	3.54	3.16	-	-	-	-	-	1.96
18	-	-	-	-	-	-	3.13	3.06	3.13	2.58	2.02	-
19	2.30	-	-	3.08	-	-	-	-	-	-	-	1.93
20	-	-	-	-	-	-	3.24	-	-	2.55	-	-
21	-	3.00	-	-	-	-	-	-	3.08	-	2.04	1.92
22	-	-	-	3.02	3.38	3.07	3.26	3.26	-	2.50	-	-
23	2.37	3.25	3.58	-	-	-	-	-	-	-	-	-
24	2.50	-	-	-	3.40	-	-	3.30	-	-	2.06	1.92
25	-	-	-	-	-	-	-	3.29	-	2.41	-	-
26	-	-	3.48	-	3.20	3.06	3.18	-	-	-	-	-
27	2.54	3.40	-	3.26	-	3.04	-	3.31	-	2.39	2.06	1.92
28	-	-	3.46	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	3.20	-	-	-	2.01	-
30	-	-	-	-	-------	-	-	-	-	2.30	2.02	-
31	2.58	-------	-	-	-------	3.26	-------	-	-------	2.30	-	-------

1220. Sammamish Lake near Redmond, Wash.

Location.--Lat 47°38'40", long 122°06'10", in NE¼ sec.24, T.25 N., R.5 E., on west shore 0.6 mile upstream from outlet and 1.8 miles south of Redmond.

Drainage area.--97.7 sq mi.

Records available.--January 1939 to September 1960.

Gage.--Staff gage read once daily. Datum of gage is 24.04 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to June 22, 1942, staff gage 1,000 ft downstream at datum 1.00 ft higher. June 22, 1942, to Aug. 22, 1951, staff gage at present site at datum 1.00 ft higher.

Extremes.--Maximum gage height observed during year, 7.10 ft Dec. 18, 19; minimum observed, 1.84 ft Sept. 27, 30.

1939-60: Maximum gage height observed, 9.40 ft Feb. 12, 1951 (present datum); minimum observed, 1.09 ft Aug. 25-27, 1951.

A stage of 10.83 ft (present datum) was observed on Dec. 22, 1933, from information by Corps of Engineers.

Remarks.--Many small diversions from tributaries for irrigation and domestic use. Slight regulation on tributaries.

Revisions.--WSP 1446: Drainage area.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.37	2.66	5.21	5.97	5.50	4.98	4.33	4.10	4.21	3.34	2.35	1.99
2	2.36	2.66	5.21	5.88	5.52	4.87	4.38	4.07	4.18	3.23	2.32	1.98
3	2.35	2.67	5.22	5.76	5.53	4.75	4.37	4.03	4.15	3.23	2.29	1.98
4	2.33	2.74	5.17	5.64	5.49	4.69	4.35	3.97	4.12	3.24	2.26	2.02
5	2.31	2.75	5.12	5.51	5.46	4.65	4.33	3.93	4.10	3.21	2.24	2.06
6	2.31	2.75	5.05	5.42	5.47	4.60	4.28	3.92	4.05	3.18	2.22	2.04
7	2.30	2.74	5.02	5.31	5.72	4.56	4 25	3.92	4.00	3.15	2.20	2.02
8	2.30	2.73	4.98	5.28	5.86	4.54	4.21	3.92	3.96	3.11	2.18	2.01
9	2.34	2.71	4.91	5.18	5.94	4.54	4.16	3.90	3.93	3.07	2.16	1.99
10	2.34	2.70	4.90	5.12	6.02	4.52	4.11	3.89	3.89	3.0[illegible]	2.13	1.98
11	2.38	2.70	4.88	5.05	6.02	4.50	4.09	3.88	3.85	3.0[illegible]	2.10	1.97
12	2.43	2.69	5.13	4.97	5.98	4.46	4.06	3.88	3.81	2.98	2.07	1.97
13	2.45	2.68	5.25	4.88	6.03	4.43	4.03	3.89	3.78	2.95	2.05	1.97
14	2.48	2.68	5.31	4.80	6.04	4.43	4.05	3.87	3.75	2.90	2.03	1.96
15	2.48	2.67	5.77	4.76	6.08	4.42	4.10	3.87	3.76	2.85	2.03	1.95
16	2.47	2.66	6.64	4.78	6.10	4.42	4.08	3.87	3.75	2.87	2.03	1.94
17	2.47	2.70	6.94	4.68	6.08	4.41	4.08	3.86	3.72	2.80	2 01	1.93
18	2.46	2.75	7.10	4.57	6 00	4.41	4.07	3.87	3.69	2.76	1.99	1.92
19	2.45	2.88	7.10	4.48	5.95	4.40	4.10	3.88	3.66	2.73	1.97	1.91
20	2.47	3.17	7.06	4.42	5.88	4.39	4.16	3.98	3.63	2.69	1.95	1.90
21	2.48	4.06	7.02	4.35	5.81	4.38	4.24	4.12	3.60	2.66	1.95	1.89
22	2.49	4.68	6.98	4.28	5.73	4.34	4.29	4.16	3.57	2.63	1.93	1.88
23	2.50	4.93	6.92	4.28	5.64	4.29	4.31	4.20	3.55	2.59	1.94	1.87
24	2.54	5.04	6.83	4.28	5.54	4.25	4.32	4.22	3.53	2.57	1.96	1.86
25	2.58	5.23	6.76	4.40	5.45	4.21	4.32	4.26	3.49	2.55	1.97	1.86
26	2.64	5.36	6.67	4.55	5.36	4.16	4.30	4.30	3.47	2.51	1.99	1.85
27	2.64	5.38	6.55	4.67	5.25	4.12	4.27	4.30	3.44	2.48	2.00	1.84
28	2.65	5.37	6.44	4.80	5.16	4.09	4.23	4.28	3.41	2.46	2.00	1.85
29	2.66	5.34	6.33	5.00	5.07	4.12	4.21	4.26	3.38	2.42	2.00	1.85
30	2.67	5.27	6.23	5.35	------	4.23	4.17	4.26	3.36	2.39	1.99	1.84
31	2.67	------	6.10	5.46	------	4.28	------	4.24	------	2.37	1.99	------

Note.--Gage usually read between 7:20 and 11:45 a.m.

1230. Cottage Lake Creek near Redmond, Wash.

Location.--Lat 47°44'15", long 122°04'45", in NE¼SE¼ sec.18, T.26 N., R.6 E., on left bank 100 ft downstream from county road bridge, 2 miles upstream from mouth, and 4½ miles northeast of Redmond.

Drainage area.--11.0 sq mi.

Records available.--June to September 1945, June 1955 to September 1960. Prior to June 1955, at different datum.

Gage.--Water-stage recorder. Altitude of gage is 210 ft (from topographic map).

Average discharge.--5 years, 14.2 cfs (10,280 acre-ft per year).

Extremes.--Maximum discharge during year, 110 cfs Nov. 20 (gage height, 2.07 ft, from recorded range in stage); minimum, 4.4 cfs part of each day July 23, 27-31, Aug. 6-13, 19, 20 (gage height, 0.60 ft).
1945, 1955-60: Maximum discharge, 132 cfs Jan. 6, 1956, and on or about Feb. 26, 1957; maximum gage height, 2.19 ft Jan. 6, 1956; minimum discharge, 3.3 cfs Aug. 2, 1959; minimum gage height, 0.68 ft Aug. 19, 1956.

Remarks.--Records good except those for period Oct. 1 to Nov. 20, which are fair. Several small diversions for irrigation and domestic use above station. Some natural regulation in small lakes above station.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 15		Dec. 16 to Sept. 30	
0.7	4.4	0.6	4.4
.9	11.5	.8	10.5
1.1	20	1.1	24
1.4	37	1.6	62
1.7	62		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.3	8.0	*14.5	14	38	13.5	14.5	9.5	11	7.9	5.0	6.1
2	6.9	8.0	16.5	13	36	13	14	9.5	11	7.5	5.0	6.1
3	6.6	10.5	16.5	12.5	33	13	13.5	9.5	10.5	7.2	5.0	5.8
4	5.9	9.9	14.5	12.5	30	13	12.5	9.5	9.8	6.9	5.2	6.6
5	5.9	9.1	14	*12	29	14.5	11.5	9.5	9.5	6.6	5.2	6.6
6	5.9	8.4	14	13	37	16	11	11	9.2	6.4	5.0	6.4
7	5.9	8.8	14.5	16.5	47	16	11	11	8.5	6.1	4.7	6.1
8	7.3	9.1	13.5	16	50	17.5	11	10.5	8.2	6.1	4.7	5.8
9	6.9	9.1	13	16	*60	16.5	10.5	9.8	7.9	6.1	4.7	5.8
10	6.9	9.1	14.5	14	53	17	10	9.8	7.9	6.4	4.7	5.8
11	10.5	9.1	18.5	14	49	15	10.5	11	7.9	*6.1	4.7	5.5
12	8.8	10.5	24	*14	44	13.5	10.5	11	7.5	6.1	4.7	5.5
13	8.0	11.0	21	14	41	13	19.5	11	7.5	6.1	5.0	5.5
14	7.3	12.5	20	13.5	38	14.5	12	11	8.8	5.8	5.2	5.5
15	8.4	14	58	13.5	36	17	12.5	10.5	10.5	5.5	5.5	5.5
16	7.3	13.5	53	13.5	33	15.5	11.5	12	10	5.5	*5.5	5.5
17	7.3	16.5	44	13	30	15.5	11	12	10	5.2	5.5	5.5
18	6.9	21	43	12.5	27	*14	11.5	12.5	9.8	5.2	5.2	5.5
19	6.6	27	38	11.5	25	13.5	12.5	*12.5	10	5.2	4.7	5.8
20	*8.0	61	39	11.5	24	12.5	14.5	17	10.5	5.0	4.7	6.1
21	8.0	51	34	11	25	12.5	14	22	9.8	5.0	5.5	5.8
22	9.1	37	29	11	22	11.5	14	19.5	9.2	5.0	5.2	5.5
23	8.8	33	27	13	20	11	14	17.5	8.8	4.7	5.8	6.6
24	10.5	28	30	19.5	18.5	10.5	14	17	8.8	4.7	6.4	6.9
25	10.5	24	29	25	17.5	10.5	12.5	16.5	8.5	4.7	7.2	6.6
26	9.1	22	27	29	16.5	10	11.5	16.5	8.5	4.7	9.8	*6.4
27	8.4	19.5	23	27	15.5	10	*10.5	15	8.2	4.7	6.9	6.4
28	9.5	18	20	29	14	10.5	10	14	7.9	4.7	6.6	6.1
29	8.8	16.5	17.5	57	14	14	9.8	13	7.9	4.7	6.9	6.1
30	8.4	15	16.5	51	------	15	9.5	12.5	7.9	4.7	6.6	6.1
31	7.6	------	15	41	------	15.5	------	12	------	4.7	6.4	------
Total	243.3	550.1	772.0	583.0	923.0	425.0	356.3	395.6	271.5	175.2	173.2	179.5
Mean	7.85	18.3	24.9	18.8	31.8	13.7	11.9	12.8	9.05	5.65	5.59	5.98
Cfsm	0.714	1.66	2.26	1.71	2.89	1.25	1.08	1.16	0.823	0.514	0.508	0.544
In.	0.82	1.86	2.61	1.97	3.12	1.44	1.20	1.34	0.92	0.59	0.59	0.61
Ac-ft	483	1,090	1,530	1,160	1,830	843	707	785	539	348	344	356

Calendar year 1959: Max 68 Min 4.4 Mean 15.7 Cfsm 1.43 In. 19.41 Ac-ft 11,390
Water year 1959-60: Max 61 Min 4.7 Mean 13.8 Cfsm 1.25 In. 17.07 Ac-ft 10,020

* Discharge measurement made on this day.

1240. Evans Creek above mouth, near Redmond, Wash.

Location.--Lat 47°40'30", long 122°04'50", on line between secs.6 and 7, T.25 N., R.5 E., on right bank 25 ft upstream from county bridge, three-quarters of a mile upstream from mouth, and 2 miles east of Redmond.

Drainage area.--13.0 sq mi.

Records available.--June 1955 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 50 ft (from topographic map).

Average discharge.--5 years, 22.8 cfs (16,510 acre-ft per year).

Extremes.--Maximum discharge during year, 137 cfs Dec. 16 (gage height, 3.42 ft); minimum, 6.2 cfs July 21 (gage height, 1.58 ft).
1955-60: Maximum discharge, 145 cfs Dec. 22, 1955 (gage height, 3.49 ft); minimum, 5.3 cfs Aug. 8, 1959; minimum gage height, 1.46 ft Sept. 1, 2, 1957.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Several small diversions for irrigation and domestic use. No regulation.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 20, Sept. 1-5, 16-30)

1.6	6.1	2.5	62
1.8	11	3.5	146
2.0	19.5		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10.5	12.5	*23	25	59	21	28	16.5	17.5	9.5	7.5	9.2
2	10.5	12.5	27	24	52	20	27	17.5	16	9.0	7.5	8.7
3	10.0	18	41	22	*44	19.5	24	17	15.5	8.7	7.5	8.4
4	9.8	16	32	21	38	20	25	16.5	15	8.4	8.0	11.5
5	9.8	14	27	*22	37	24	22	15.5	16	*9.4	8.0	11.5
6	9.8	13.5	28	24	43	25	24	21	14.5	8.4	7.5	10
7	9.8	13.5	32	28	72	23	22	21	13.5	9.2	7.0	9.8
8	11	12.5	27	28	67	*31	20	17.5	13	7.9	7.0	9.5
9	11.5	12.5	26	25	67	29	19	17.5	12.5	7.6	7.0	9.5
10	11	13.5	25	24	58	28	17.5	16.5	12.5	7.6	7.0	9.5
11	15.5	13.5	34	24	53	26	21	19	12.5	7.6	7.0	9.5
12	12	13.5	53	24	48	25	*26	20	14.5	7.4	7.0	9.5
13	11.5	13.5	52	22	49	24	22	18.5	14.5	7.6	7.5	10
14	10.5	13	48	22	48	23	25	19	13.5	7.6	8.0	9.8
15	10.5	13.5	95	22	48	26	28	17.5	14	7.4	8.5	9.8
16	10.5	13.5	136	23	44	24	24	26	13.5	7.2	*8.4	9.5
17	10	16	116	22	40	25	22	23	13	7.0	7.9	9.5
18	9.5	25	94	21	36	23	22	23	11.5	7.0	7.6	9.0
19	9.5	24	72	21	32	22	24	*22	11.5	7.0	7.6	9.2
20	*11	52	61	21	30	21	33	35	13.5	6.8	7.6	9.8
21	11.5	90	57	20	33	20	30	42	11.5	6.8	8.2	9.8
22	12.5	75	48	19.5	30	19.5	27	36	11	7.0	8.4	9.2
23	12.5	60	43	22	28	22	25	31	10.5	7.0	9.0	9.5
24	13.5	50	44	34	26	21	23	30	10.5	7.0	10.5	9.5
25	16	40	42	38	25	20	21	37	10.5	6.8	11.5	9.8
26	12.5	35	38	47	24	19.5	20	26	10	6.5	13.5	*9.2
27	12	31	34	48	22	18.5	19	23	9.8	6.5	11.5	9.0
28	15	29	30	43	22	19.5	21	21	9.2	6.5	10	8.7
29	13.5	27	30	68	21	26	19.5	19	9.2	6.5	10.5	8.7
30	12.5	25	31	76	------	30	18	21	9.5	6.5	10	8.7
31	12	------	28	68	------	30	------	18.5	------	7.0	10	------
Total	357.7	798.0	1,474	948.5	1,196	725.5	699.0	704.0	379.7	231.4	264.2	285.3
Mean	11.5	26.6	47.5	30.6	41.2	23.4	23.3	22.7	12.7	7.46	8.52	9.51
Cfsm	0.885	2.05	3.65	2.35	3.17	1.80	1.79	1.75	0.977	0.574	0.655	0.732
In.	1.02	2.28	4.22	2.71	3.42	2.08	2.00	2.01	1.09	0.66	0.76	0.82
Ac-ft	709	1,580	2,920	1,880	2,370	1,440	1,390	1,400	753	459	524	566

Calendar year 1959: Max 136 Min 5.8 Mean 25.5 Cfsm 1.96 In. 26.60 Ac-ft 18,440
Water year 1959-60: Max 136 Min 6.5 Mean 22.0 Cfsm 1.69 In. 23.07 Ac-ft 15,990

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 21-30, July 26 to Aug. 15; discharge estimated on basis of recorded range in stage and records for nearby stations.

1260. North Creek near Bothell, Wash.

Location.--Lat 47°47'30", long 122°11'45", on line between secs.29 and 32, T.27 N., R.5 E., on left bank 2 miles north of Bothell and 2½ miles upstream from mouth.

Drainage area.--23.7 sq mi.

Records available.--June 1945 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 70 ft (from topographic map). Apr. 5, 1950, to Sept. 30, 1951, at datum 0.59 ft higher.

Average discharge.--15 years, 36.2 cfs (26,210 acre-ft per year).

Extremes.--Maximum discharge during year, 289 cfs Dec. 15 (gage height, 4.25 ft); minimum, 4.8 cfs July 17 (gage height, 0.73 ft).
1945-60: Maximum discharge, 680 cfs Mar. 5 or 6, 1950 (gage height, 7.0 ft, present datum, from high-water mark, from information by local resident); minimum, 1.0 cfs Aug. 10, 1946 (gage height, 0.45 ft, present datum).

Remarks.--Records good except those above 200 cfs, which are fair. Many samll diversions for irrigation and domestic use. Slight regulation for farm use.

Revisions (water years).--WSP 1286: 1950(M). WSP 1446: Drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-10)

0.7	4.4	2.0	90
.8	5.8	3.0	180
1.0	12	4.0	270
1.5	45		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.0	14.5	24	32	99	24	58	16	15.5	9.7	6.7	11
2	9.0	14.5	37	31	94	24	51	15.5	14.5	9.0	7.0	10
3	8.7	20	*42	28	77	24	41	15.5	*13.5	8.4	7.2	9.4
4	7.8	16	30	26	68	26	36	15	13.5	7.5	7.5	18
5	8.1	14.5	25	30	77	44	32	14.5	12	7.2	7.0	14.5
6	8.1	14	26	*37	124	50	30	27	12	6.7	6.7	10.5
7	8.1	13.5	32	54	177	43	26	24	11.5	6.2	6.4	9.0
8	12	13.5	27	49	169	63	24	19	10.5	6.2	6.0	8.4
9	11.5	13	25	41	*148	47	23	15	9.7	6.2	6.0	8.1
10	10	13.5	30	37	114	50	20	15	9.4	6.7	6.4	8.1
11	42	14	65	39	97	41	32	19	9.5	6.4	7.0	8.1
12	21	15.5	94	38	101	37	30	20	10	6.2	7.5	8.1
13	15.5	13.5	62	34	93	37	31	15.5	14	6.7	7.0	9.0
14	14.5	13	52	33	92	40	35	23	18	*6.2	8.4	9.4
15	18	15	207	36	93	42	36	19	24	6.0	11	9.4
16	14	13	171	37	77	37	30	39	19	5.8	10	9.0
17	12.5	23	111	34	68	37	32	41	17.5	5.7	9.4	9.0
18	12	48	103	28	62	*32	36	31	13.5	5.7	9.0	9.0
19	11.5	72	85	25	54	30	40	28	12.5	5.7	8.4	9.4
20	16	146	99	25	51	27	59	44	14.5	5.8	8.1	10
21	*15.5	182	85	24	57	26	42	47	11.5	5.7	9.4	8.7
22	24	107	71	24	47	25	37	41	10.5	5.8	9.4	9.0
23	18.5	85	64	45	40	24	42	30	9.7	6.0	11.5	11.5
24	33	64	89	83	37	23	43	28	10	5.8	14.5	11.5
25	32	50	81	93	36	22	32	28	11.5	5.8	16.5	10.5
26	19	40	64	89	31	21	27	32	9.7	5.8	52	9.4
27	16.5	34	55	71	30	20	*24	26	9.0	5.8	15	*8.4
28	24	32	49	88	28	23	21	26	8.4	5.7	11.5	8.1
29	18.5	30	44	242	25	70	19	20	8.7	5.7	*15	7.8
30	15	26	48	177	------	63	18	20	9.4	5.7	11.5	7.8
31	15	------	39	119	------	64	------	18	------	6.0	11.5	------
Total	500.3	1,170.0	2,036	1,749	2,266	1,136	1,007	772.0	373.0	197.8	328.5	290.1
Mean	16.1	39.0	65.7	56.4	78.1	36.6	33.6	24.9	12.4	6.38	10.6	9.67
Cfsm	0.679	1.65	2.77	2.38	3.30	1.54	1.42	1.05	0.523	0.269	0.447	0.408
In.	0.79	1.84	3.19	2.74	3.56	1.78	1.58	1.21	0.59	0.31	0.52	0.46
Ac-ft	992	2,320	4,040	3,470	4,490	2,250	2,000	1,530	740	392	652	575

Calendar year 1959: Max 305 Min 5.7 Mean 38.8 Cfsm 1.64 In. 22.25 Ac-ft 28,120
Water year 1959-60: Max 242 Min 5.7 Mean 32.3 Cfsm 1.36 In. 18.57 Ac-ft 23,450

Peak discharge (base, 250 cfs).--Nov. 21 (4 a.m.) 252 cfs (3.84 ft); Dec. 15 (12:30 p.m.) 289 cfs (4.25 ft); Jan. 29 (7:30 a.m.) 274 cfs (4.06 ft); Feb. 6 (10 p.m.) 250 cfs (3.80 ft).

* Discharge measurement made on this day.

1265. Sammamish River at Bothell, Wash.

Location.--Lat 47°45'20", long 122°11'35", in NW¼SE¼ sec.8, T.26 N., R.5 E., on left bank in Bothell, a quarter of a mile downstream from North Creek and 3½ miles upstream from mouth.

Drainage area.--209 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean lower low water at Seattle (Corps of Engineers bench mark), or 6.54 ft below mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Dec. 28, 1939, staff gages at same site and datum.

Average discharge.--21 years, 367 cfs (265,700 acre-ft per year).

Extremes.--Maximum discharge during year, 1,310 cfs Dec. 15, 16 (gage height, 29.93 ft); minimum, 107 cfs Aug. 10 (gage height, 23.22 ft).
1939-60: Maximum discharge, 1,910 cfs Jan. 6, 1956 (gage height, 32.22 ft), but may have been higher Feb. 12 or 13, 1951; minimum, 62 cfs Aug. 22, 23, 1951 (gage height, 22.92 ft).

Remarks.--Records excellent. Some small diversions from tributaries for irrigation and domestic use. Slight regulation on some tributaries. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions.--WSP 1446: Drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

23.2	105
24.0	197
25.0	335
27.0	686
30.0	1,320

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	165	206	542	699	840	538	545	373	318	169	122	129
2	162	205	561	675	820	522	534	365	308	167	122	127
3	161	228	*606	648	760	507	500	357	*298	179	119	125
4	160	233	567	629	722	502	484	349	292	176	119	146
5	161	223	540	620	737	533	467	338	277	173	118	150
6	161	219	536	*623	840	549	453	365	268	168	115	136
7	159	216	556	654	1,110	525	443	375	261	166	113	130
8	170	214	533	638	1,070	579	430	351	254	166	111	127
9	172	211	515	606	*1,070	547	418	332	245	164	108	126
10	170	210	520	581	980	543	402	329	239	166	107	124
11	239	210	603	574	930	520	423	345	235	165	109	125
12	206	215	764	561	890	498	431	351	230	161	111	126
13	192	210	690	545	850	489	421	332	223	160	108	126
14	187	210	661	525	820	491	440	338	224	*156	109	126
15	196	211	1,080	522	860	504	450	324	254	150	116	126
16	187	207	1,260	520	830	495	430	367	240	147	115	126
17	183	223	1,140	504	800	502	424	385	235	142	115	126
18	179	310	1,090	479	760	*489	430	369	222	149	112	125
19	177	385	1,040	458	740	481	455	353	223	142	111	125
20	189	661	1,050	450	710	470	507	431	235	137	110	127
21	*192	994	1,020	440	680	462	482	486	222	134	111	126
22	206	804	966	433	660	452	472	447	211	135	115	125
23	205	737	930	474	640	443	482	409	205	135	117	132
24	226	686	956	612	620	433	481	396	201	130	130	133
25	257	650	988	676	600	428	455	393	205	128	135	134
26	223	623	882	707	590	421	436	397	198	133	192	128
27	213	599	842	659	580	413	*419	375	194	129	149	*126
28	232	585	806	692	574	418	406	364	188	125	135	125
29	226	574	775	1,140	558	522	396	345	185	118	*138	124
30	215	558	766	1,080	------	549	385	341	187	117	135	126
31	210	------	735	914	------	556	------	332	------	120	133	------
Total	5,981	11,817	24,520	19,338	22,641	15,381	13,501	11,414	7,077	4,647	3,760	3,857
Mean	193	394	791	624	781	496	450	368	236	150	121	129
Cfsm	0.923	1.89	3.78	2.99	3.74	2.37	2.15	1.76	1.13	0.718	0.579	0.617
In.	1.06	2.10	4.36	3.44	4.03	2.74	2.40	2.03	1.26	0.83	0.67	0.69
Ac-ft	11,860	23,440	48,630	38,360	44,910	30,510	26,780	22,640	14,040	9,220	7,460	7,650

Calendar year 1959: Max 1,390 Min 116 Mean 453 Cfsm 2.17 In. 29.43 Ac-ft 328,100
Water year 1959-60: Max 1,260 Min 107 Mean 393 Cfsm 1.88 In. 25.61 Ac-ft 285,500

* Discharge measurement made on this day.

1330. South Fork Skykomish River near Index, Wash.

Location.--Lat 47°48'20", long 121°32'40", in NE¼ sec.29, T.27 N., R.10 E., on right bank 600 ft upstream from Sunset Falls, 1 mile southeast of Index, and 2 miles upstream from confluence with North Fork. Discharge measurements made about 2 miles upstream from gage.

Drainage area.--355 sq mi.

Records available.--October 1902 to September 1905, April 1911 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 574.80 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 15, 1934, at site 300 ft downstream. Oct. 6, 1902, to Sept. 30, 1905, staff gage at datum 0.39 ft higher and Apr. 26, 1911, to Sept. 30, 1913, at datum 1 ft higher. Oct. 1, 1913, to Sept. 13, 1920, staff gage, Sept. 14, 1920, to Oct. 1, 1921, water-stage recorder, and Jan. 23, 1922, to Mar. 14, 1934, staff gage, at present datum.

Average discharge.--52 years, 2,405 cfs (1,741,000 acre-ft per year).

Extremes.--Maximum discharge during year, 51,800 cfs Dec. 15 (gage height, 22.12 ft, from high-water mark in well); minimum, 424 cfs Sept. 22 (gage height, 1.54 ft).
1902-5, 1911-60: Maximum discharge, 55,000 cfs Dec. 12, 1921 (gage height, 22.8 ft, from high-water marks, site then in use), from rating curve extended above 14,000 cfs by logarithmic plotting; minimum, 165 cfs Nov. 29, 1952 (gage height, 1.35 ft).
Flood in 1897 reached a stage of about 5 ft higher than that of Dec. 12, 1921 (discharge, about 70,000 cfs).

Remarks.--Records excellent except those for periods of no gage-height record, which are good. Small diversion for domestic use. No regulation.

Revisions (water years).--WSP 512: 1903-5, 1911-14. WSP 572: Drainage area. WSP 792: 1934. WSP 1286: 1903-5(M), 1912(M), 1914-29(M), 1931-34(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 19		Nov. 20 to Sept. 30			
3.3	1,200	1.5	410	10.0	8,790
5.0	2,540	2.5	825	15.0	20,400
7.0	4,610	5.0	2,550	20.0	40,300
12.0	12,500	7.0	4,610		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,360	2,430	2,380	1,050	2,350	725	2,880	2,780	4,890	2,510	735	946
2	2,000	2,160	2,390	1,010	2,120	694	3,440	2,800	5,520	2,160	694	825
3	1,760	3,930	2,600	968	1,890	627	4,060	2,620	6,400	2,210	666	712
4	1,540	3,530	2,220	924	1,660	671	4,340	2,330	5,430	2,310	662	730
5	1,400	2,710	1,990	913	1,720	671	4,710	2,110	4,890	2,440	640	1,180
6	1,280	2,330	1,860	946	2,200	716	4,650	2,920	4,990	2,580	603	1,030
7	1,260	2,080	1,850	902	6,560	716	5,280	4,970	3,930	2,520	579	805
8	2,590	1,880	1,700	852	3,680	850	5,870	3,930	*3,390	*2,240	563	698
9	4,570	1,750	1,590	*810	2,700	790	5,430	3,280	3,520	1,960	563	*635
10	2,770	1,580	1,780	760	2,500	770	4,000	3,880	4,020	1,780	*555	587
11	6,760	1,560	2,950	755	2,200	735	3,260	5,130	4,320	1,660	547	551
12	7,540	2,030	3,640	720	2,010	707	2,870	6,560	4,110	1,560	523	539
13	4,750	1,610	2,690	680	*2,130	712	2,760	5,610	4,180	1,580	498	523
14	3,580	1,480	8,620	658	2,660	750	2,880	4,540	4,150	1,520	484	512
15	3,840	1,490	*38,200	653	3,280	1,240	2,600	3,680	4,780	1,460	498	490
16	2,930	1,280	a12,500	635	2,450	1,070	2,310	4,020	7,780	1,390	490	473
17	2,440	1,580	6,750	607	1,960	*964	2,200	3,690	5,560	1,360	583	459
18	2,110	6,210	4,750	571	1,680	979	2,000	3,280	4,040	1,360	559	442
19	1,880	5,160	3,660	559	1,470	1,040	2,040	3,100	3,400	1,330	515	445
20	2,460	23,100	3,000	563	1,330	1,320	2,810	6,020	3,200	1,240	487	501
21	3,670	14,600	2,570	551	1,470	2,040	*2,780	5,160	a2,840	1,150	470	466
22	10,700	18,800	a2,240	539	1,270	2,660	2,260	4,010	2,560	1,060	484	428
23	7,680	30,100	1,990	543	1,170	2,800	2,030	3,330	a3,000	979	531	466
24	*7,350	15,800	1,830	666	1,090	2,800	1,880	3,010	a3,380	902	716	559
25	8,990	*11,100	1,740	957	996	3,160	1,770	2,900	a3,150	852	952	780
26	5,430	6,490	1,580	1,560	924	3,930	1,750	3,070	a2,680	830	1,610	615
27	3,980	4,730	1,450	1,570	858	3,510	1,760	3,440	a2,750	858	1,190	523
28	3,780	3,790	1,360	1,540	815	3,300	1,950	*3,150	2,790	836	902	487
29	3,340	3,200	1,280	5,290	765	3,320	2,130	3,350	2,850	810	1,500	466
30	2,820	2,720	1,270	4,660	------	3,820	2,530	4,680	2,780	790	1,150	438
31	2,580	------	1,160	*2,960	------	3,230	------	6,300	------	770	1,030	------
Total	120,140	181,210	125,590	36,272	57,908	51,297	91,230	119,650	121,280	47,007	21,979	18,311
Mean	3,875	6,040	4,051	1,170	1,997	1,655	3,041	3,860	4,043	1,516	709	610
Cfsm	10.9	17.0	11.4	3.30	5.63	4.66	8.57	10.9	11.4	4.27	2.00	1.72
In.	12.59	18.98	13.16	3.80	6.07	5.37	9.56	12.53	12.71	4.92	2.30	1.92
Ac-ft	238,300	359,400	249,100	71,940	114,900	101,700	181,000	237,300	240,600	93,240	43,590	38,320

Calendar year 1959: Max 38,200 Min 575 Mean 3,599 Cfsm 10.1 In. 137.60 Ac-ft 2,606,000
Water year 1959-60: Max 38,200 Min 428 Mean 2,710 Cfsm 7.63 In. 103.91 Ac-ft 1,967,000

Peak discharge (base, 10,000 cfs).--Oct. 22 (2 p.m.) 17,000 cfs (13.81); Oct. 24 (11:30 p.m.) 13,000 cfs (12.18 ft); Nov. 20 (2:30 p.m.) 30,900 cfs (17.94 ft); Nov. 23 (1 a.m.) 49,700 cfs (21.76 ft); Dec. 15 (time unknown) 51,800 cfs (22.12 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of reconstructed gage-height graph based on high-water mark in well, recorded range in stage, and records for nearby stations.

1345. Skykomish River near Gold Bar, Wash.

Location.--Lat 47°50'15", long 121°40'00", in SW¼ sec.9, T.27 N., R.9 E., on right bank 2 miles southeast of Gold Bar and 5 miles upstream from Wallace River and Startup.

Drainage area.--535 sq mi.

Records available.--September 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 209.26 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--32 years, 3,899 cfs (2,823,000 acre-ft per year).

Extremes.--Maximum discharge during year, 78,800 cfs Nov. 23 (gage height, 20.20 ft), from rating curve extended above 33,000 cfs by logarithmic plotting; minimum, 722 cfs Sept. 19, 22, 30 (gage height, 3.44 ft).
1928-60: Maximum discharge, 88,700 cfs Dec. 21, 1933 (gage height, 21.3 ft), from rating curve extended above 32,000 cfs by logarithmic plotting; minimum, 315 cfs Nov. 29, 1952; minimum gage height, 2.73 ft Dec. 1, 1936.

Remarks.--Records good. No regulation. Some small diversions above station. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1316: 1932-35(M), 1944(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-21)

Oct. 1-21		Oct. 22 to Sept. 30					
5.0	2,050	3.4	690	6.0	4,100	13.0	28,300
6.0	3,670	4.0	1,210	8.0	8,600	16.0	46,000
8.0	8,300	5.0	2,440	10.0	14,800	19.0	68,000
10.0	14,800						

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,850	4,180	4,310	1,670	3,930	1,250	4,630	4,610	7,860	4,230	1,210	1,640
2	3,290	3,730	4,370	1,610	3,570	1,210	5,560	4,650	8,870	3,620	1,130	1,420
3	2,880	6,710	4,840	1,550	3,100	1,100	6,540	4,290	10,300	3,750	1,080	1,240
4	2,570	6,020	4,060	1,490	2,680	1,130	6,880	3,750	8,790	3,910	1,070	1,260
5	2,320	4,670	3,640	1,480	2,840	1,180	7,420	3,440	7,860	4,140	1,060	2,200
6	2,130	4,060	3,390	1,520	3,510	1,240	7,300	4,960	8,060	4,470	1,000	1,870
7	2,150	3,640	3,320	1,440	10,000	1,210	8,370	8,160	6,380	*4,390	966	1,440
8	4,970	3,500	3,020	1,390	6,000	1,380	9,280	6,380	5,540	3,840	939	1,230
9	8,180	3,060	2,840	*1,330	4,430	1,320	8,500	5,360	5,800	3,320	930	*1,090
10	4,810	2,840	3,250	1,270	4,020	1,290	6,220	6,510	6,600	3,010	*930	1,020
11	12,100	2,840	5,540	1,260	3,530	1,220	5,130	8,390	7,000	2,760	930	957
12	14,200	3,550	6,630	1,220	3,280	1,190	4,590	10,400	6,810	2,580	906	930
13	8,100	2,860	5,030	1,160	*3,510	1,190	4,390	8,710	6,900	2,520	858	898
14	6,180	2,670	14,100	1,120	4,310	1,240	4,590	7,130	6,720	2,550	826	882
15	6,680	2,680	61,600	1,120	5,410	1,870	4,100	5,890	7,740	2,440	842	842
16	4,870	2,310	21,200	1,090	4,060	1,640	3,690	6,670	13,100	2,330	818	818
17	4,070	3,120	10,300	1,060	3,230	1,500	3,510	6,200	9,060	2,290	939	778
18	3,530	11,800	7,300	993	2,740	*1,540	3,180	5,470	6,560	2,300	922	754
19	3,170	9,450	5,760	948	2,400	1,660	3,250	5,220	5,580	2,230	858	754
20	4,050	40,100	4,800	966	2,200	2,120	4,630	10,100	5,260	2,080	818	842
21	6,300	23,800	4,060	948	2,450	3,320	4,410	8,340	4,610	1,910	786	778
22	17,100	29,700	3,550	948	2,150	4,310	3,600	6,560	4,210	1,750	826	738
23	*11,600	48,500	3,200	975	1,960	4,510	3,180	5,470	5,070	1,610	866	802
24	12,800	*26,800	2,940	1,310	1,840	4,530	2,980	5,000	5,850	1,490	1,190	993
25	14,900	17,800	2,820	2,100	1,700	5,130	2,850	4,840	5,260	1,400	1,610	1,360
26	8,870	10,800	2,550	3,070	1,520	6,240	2,800	*5,220	4,370	1,380	2,990	1,090
27	6,670	7,960	2,340	2,860	1,430	5,580	*2,850	5,890	4,410	1,400	2,060	914
28	6,290	6,560	2,220	2,780	1,380	5,320	3,200	5,220	4,670	1,380	1,520	842
29	5,670	5,670	2,060	9,710	1,310	5,410	3,530	5,560	4,880	1,330	2,940	794
30	4,820	4,920	1,960	8,090	-------	6,200	4,200	8,090	4,730	1,300	2,040	738
31	4,410	-------	1,850	*5,150	-------	5,190	-------	10,500	-------	1,260	1,800	-------
Total	203,530	306,100	208,850	63,628	94,490	83,220	145,360	196,980	198,850	78,970	37,660	31,914
Mean	6,565	10,200	6,737	2,053	3,258	2,685	4,845	6,354	6,628	2,547	1,215	1,064
Cfsm	12.3	19.1	12.6	3.84	6.09	5.02	9.06	11.9	12.4	4.76	2.27	1.99
In.	14.15	21.28	14.52	4.42	6.57	5.78	10.10	13.69	13.82	5.49	2.62	2.22
Ac-ft	403,700	607,100	414,200	126,200	187,400	165,100	288,300	390,700	394,400	156,600	74,700	63,300

Calendar year 1959: Max 61,600 Min 989 Mean 5,873 Cfsm 11.0 In. 149.01 Ac-ft 4,252,000
Water year 1959-60: Max 61,600 Min 738 Mean 4,507 Cfsm 8.42 In. 114.63 Ac-ft 3,272,000

Peak discharge (base, 19,000 cfs).--Oct. 22 (1:30 p.m.) 27,600 cfs (12.86 ft); Oct. 24 (10 and 11 p.m.) 21,800 cfs (11.69 ft); Nov. 20 (1:30 and 3 p.m.) 54,800 cfs (17.26 ft); Nov. 23 (1:30 a.m.) 78,800 cfs (20.20 ft); Dec. 15 (12:30 p.m.) 78,600 cfs (20.18 ft).

* Discharge measurement made on this day.

1350. Wallace River at Gold Bar, Wash.

Location.--Lat 47°51'50", long 121°41'45", in NE¼ sec.6, T.27 N., R.9 E., on right bank 30 ft downstream from highway bridge, a quarter of a mile north of Gold Bar, and 1¼ miles upstream from Olney Creek.

Drainage area.--19.8 sq mi.

Records available.--October 1928 to September 1933, July 1946 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 200 ft (from topographic map). December 1928 to Sept. 30, 1933, staff gage 50 ft upstream at different datum.

Average discharge.--19 years, 161 cfs (116,600 acre-ft per year).

Extremes.--Maximum discharge during year, 3,220 cfs Dec. 14 (gage height, 8.22 ft), from rating curve extended above 1,000 cfs on basis of slope-area measurement of peak flow; minimum, 9.8 cfs Aug. 9 (gage height, 3.03 ft).
1928-33, 1946-60: Maximum discharge, that of Dec. 14, 1959; minimum recorded, 9.2 cfs Oct. 18, 19, 1952; minimum gage height observed, 0.32 ft Aug. 27, Sept. 3-5, 1930, site and datum then in use.

Remarks.--Records excellent. Some natural regulation in Wallace Lake. No diversion above station. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1062: Drainage area. WSP 1316: 1930(M), 1932-33(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 17		Nov. 17 to Sept. 30			
3.6	64	3.0	8	4.5	288
4.0	140	3.2	21	5.0	500
5.0	475	3.4	40	6.0	1,060
6.0	870	3.6	66	7.0	1,890
		4.0	142	8.0	2,960

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	131	118	106	60	195	47	152	179	260	82	15.5	87
2	108	102	207	56	184	44	260	231	281	69	14.5	69
3	91	462	159	53	144	38	243	166	260	69	16	59
4	78	248	120	51	122	44	260	135	212	69	18	89
5	70	171	102	50	179	45	253	131	198	76	14.5	198
6	66	140	96	56	216	55	240	302	184	76	13	127
7	78	122	102	53	422	50	284	381	140	*65	13	87
8	226	108	86	*50	212	55	281	215	124	53	13	71
9	240	94	77	48	176	46	264	198	144	46	11	*60
10	125	84	171	47	179	45	156	260	154	42	*11	52
11	458	105	312	46	154	42	140	281	138	40	11.5	48
12	557	152	234	45	154	41	140	320	131	38	11.5	44
13	240	96	152	42	*154	41	149	328	129	38	11	41
14	204	84	1,010	41	221	41	152	264	150	33	12	38
15	256	82	*2,560	41	209	45	116	198	243	30	18	35
16	152	70	689	40	159	42	104	344	499	29	21	31
17	120	407	332	38	131	*47	108	316	237	29	68	28
18	100	*1,100	234	35	114	52	106	267	144	28	33	26
19	85	496	192	34	102	63	122	351	149	27	23	28
20	308	1,990	171	35	95	124	206	972	227	25	19	37
21	326	*918	147	34	108	204	140	473	161	22	18	29
22	664	1,530	124	34	86	201	116	324	133	21	34	27
23	310	1,300	114	39	77	198	108	260	149	20	45	61
24	697	895	108	110	72	192	108	247	133	19.5	131	118
25	532	372	106	342	68	224	122	260	108	19	231	144
26	304	215	93	402	60	221	122	*292	95	18	356	66
27	*220	166	84	227	56	187	*144	247	89	17.5	147	48
28	223	159	77	305	53	192	161	215	91	17	100	40
29	180	144	74	972	48	243	166	231	93	16	267	37
30	148	122	69	*464	------	224	171	615	89	15.5	114	34
31	133	------	66	253	------	159	------	406	------	15.5	110	------
Total	7,430	12,052	8,174	4,103	4,150	3,252	5,094	9,409	5,145	1,165.0	1,220.5	1,859
Mean	240	402	264	132	143	105	170	304	172	37.6	62.0	62.0
Cfsm	12.1	20.3	13.3	6.67	7.22	5.30	8.59	15.4	8.69	1.90	3.13	3.13
In.	13.96	22.64	15.35	7.71	7.79	6.11	9.57	17.67	9.66	2.19	3.61	3.49
Ac-ft	14,740	23,900	16,210	8,140	8,230	6,450	10,100	18,660	10,200	2,310	3,810	3,690

Calendar year 1959: Max 2,560 Min 19 Mean 224 Cfsm 11.3 In. 153.78 Ac-ft 162,400
Water year 1959-60: Max 2,560 Min 11 Mean 174 Cfsm 8.79 In. 119.75 Ac-ft 126,400

Peak discharge (base, 1,350 cfs).--Oct. 22 (11 a.m.) 1,670 cfs (7.61 ft); Oct. 24 (7 p.m.) 1,490 cfs (7.32 ft); Nov. 18 (4:30 a.m.) 2,100 cfs (7.21 ft); Nov. 20 (8 a.m.) 2,750 cfs (7.82 ft); Nov. 22 (6 p.m.) 3,070 cfs (8.09 ft); Nov. 24 (7 p.m.) 1,980 cfs (7.09 ft); Dec. 14 (11 p.m.) 3,220 cfs (8.22 ft); May 20 (12:30 a.m.) 1,430 cfs (6.50 ft); June 16 (4 a.m.) 1,350 cfs (6.40 ft).

* Discharge measurement made on this day.

1375. Sultan River near Startup, Wash.

Location.--Lat 47°58'30", long 121°46'30", in NE¼ sec.28, T.29 N., R.8 E., on left bank 1½ miles upstream from intake of Everett water-supply system and 7½ miles north of Startup.

Drainage area.--74.5 sq mi.

Records available.--May 1934 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 750 ft (from topographic map). Prior to July 2, 1934, staff gage at same site and datum.

Average discharge.--26 years, 794 cfs (574,800 acre-ft per year).

Extremes.--Maximum discharge during year, 28,000 cfs Dec. 15 (gage height, 16.17 ft); minimum, 92 cfs Aug. 14 (gage height, 3.55 ft).
1934-60: Maximum discharge, 34,600 cfs Feb. 9, 1951 (gage height, 17.22 ft, from high-water mark in well), from rating curve extended above 5,000 cfs on basis of slope-area measurement of peak flow; minimum, 48 cfs Sept. 25, 27, 29, 30, 1942; minimum gage height, 3.32 ft Sept. 22, 23, 24, 1938, Oct. 19, 20, 1952.

Remarks.--Records excellent except those for periods of no gage-height record, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 1182: 1935, 1936(M), 1937-39, 1940(M), 1941, 1942(P), 1943-49. WSP 1216: Drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

3.5	85	6.0	840	11.0	7,100
4.0	160	7.0	1,460	13.0	13,000
4.5	270	8.0	2,260	15.0	21,500
5.0	410	9.0	3,400		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	552	500	548	213	895	200	928	830	1,290	508	140	430
2	456	428	866	202	895	185	1,460	884	1,310	438	140	350
3	395	2,030	895	187	720	160	1,330	740	1,310	442	140	340
4	350	1,110	668	181	568	181	1,330	618	1,090	470	150	460
5	312	710	556	181	846	194	1,300	552	956	524	140	1,000
6	300	556	516	200	1,380	229	1,210	1,210	950	564	120	650
7	504	473	516	198	2,780	224	1,360	1,880	710	*528	120	420
8	1,860	404	448	*183	1,260	265	1,400	1,180	604	438	120	*335
9	2,060	362	404	177	895	229	1,310	906	668	374	110	298
10	1,020	323	912	166	890	215	825	1,120	770	335	105	255
11	3,640	374	2,010	164	695	198	695	1,310	760	310	*101	227
12	3,700	512	1,700	157	*681	194	695	1,540	720	295	101	211
13	1,400	368	974	148	810	198	775	1,590	725	312	98	200
14	1,010	318	5,640	143	1,610	204	840	1,310	800	288	94	190
15	1,160	305	17,500	145	1,460	404	695	962	1,120	288	101	180
16	750	265	2,770	143	895	292	640	1,520	2,350	285	130	165
17	576	2,130	1,390	135	627	282	645	1,470	1,530	282	350	150
18	484	6,820	1,000	127	492	*295	604	1,180	968	280	190	150
19	417	3,060	775	124	417	338	676	1,300	830	272	140	150
20	1,080	13,900	658	126	410	600	1,330	3,670	1,130	243	110	200
21	1,500	4,120	548	121	584	1,060	*862	1,910	895	222	105	160
22	3,110	8,720	504	124	420	1,120	627	1,420	730	200	200	150
23	*1,580	7,480	424	158	353	1,070	544	1,110	795	181	260	310
24	4,320	4,050	407	676	315	1,040	512	968	810	166	740	620
25	2,980	2,250	420	2,120	282	1,160	532	986	640	157	1,350	800
26	1,390	1,290	365	2,210	250	1,240	544	1,140	540	155	2,000	340
27	922	890	332	1,340	229	1,050	596	*986	516	158	850	250
28	922	868	302	1,350	220	1,100	672	840	540	157	570	210
29	775	785	278	4,680	207	1,320	700	895	576	157	1,500	190
30	618	*668	258	2,260	------	1,420	790	2,040	532	152	650	180
31	548	------	234	1,220	------	1,000	------	1,930	------	145	630	------
Total	40,691	66,069	44,818	19,559	22,086	17,667	26,427	39,997	27,165	9,326	11,555	9,571
Mean	1,313	2,202	1,446	631	762	570	881	1,290	906	301	373	319
Cfsm	17.6	29.6	19.4	8.47	10.2	7.65	11.8	17.3	12.2	4.04	5.01	4.28
In.	20.31	32.98	22.37	9.76	11.03	8.82	13.19	19.97	13.56	4.66	5.77	4.78
Ac-ft	80,710	131,000	88,900	38,790	43,810	35,040	52,420	79,330	53,880	18,500	22,920	18,980

Calendar year 1959: **Max** 17,500 **Min** 130 **Mean** 1,179 **Cfsm** 15.8 **In.** 214.83 **Ac-ft** 853,600
Water year 1959-60: **Max** 17,500 **Min** 94 **Mean** 915 **Cfsm** 12.3 **In.** 167.20 **Ac-ft** 664,300

Peak discharge (base, 8,000 cfs).--Oct. 11 (11 p.m.) 10,800 cfs (12.33 ft); Oct. 24 (7 p.m.) 11,600 cfs (12.59 ft); Nov. 18 (3:30 a.m.) 10,300 cfs (12.18 ft); Nov. 20 (11 a.m.) 23,500 cfs (15.4 ft); Nov. 22 (9 p.m.) 22,400 cfs (15.19 ft); Dec. 15 (9:30 a.m.) 28,000 cfs (16.17 ft).

* Discharge measurement made on this day.
Note.--No gage-height record July 31 to Aug. 10, Aug. 17 to Sept. 7, Sept. 13-30; discharge estimated on basis of records for nearby stations.

1410. Woods Creek near Monroe, Wash.

Location.--Lat 47°52'20", long 121°55'10", in W½ sec.33, T.28 N., R.7 E., on right bank 0.4 mile downstream from West Fork and 2 miles northeast of Monroe.

Drainage area.--55.0 sq mi.

Records available.--July 1946 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 100 ft (from topographic map). Prior to June 6, 1957, at site 0.4 mile upstream at same datum.

Average discharge.--14 years, 156 cfs (112,900 acre-ft per year).

Extremes.--Maximum discharge during year, 2,220 cfs Nov. 21 (gage height, 6.60 ft); minimum, 16.5 cfs Aug. 9, 10 (gage height, 1.15 ft).
1946-60: Maximum discharge, that of Nov. 21, 1959; maximum gage height, 7.18 ft Feb. 26, 1950; minimum, 10.5 cfs Aug. 26, 1958 (gage height, 1.11 ft).

Remarks.--Records excellent except those for periods of no gage-height record, which are fair. Several small diversions above station for farm use. No regulation.

Revisions (water years).--WSP 1286: Drainage area. WSP 1636: 1958.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 21				Nov. 22 to Sept. 30			
1.6	59	5.0	1,480	1.1	13	2.5	340
2.0	118	6.5	2,180	1.4	39	3.0	605
3.0	480			1.7	84	5.0	1,510
				2.0	160		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	90	179	220	157	331	94	166	77	118	a36	19.5	35
2	78	160	255	139	295	90	154	84	108	a35	20	31
3	69	254	351	130	259	90	136	86	101	a34	20	28
4	66	288	279	122	217	88	128	80	90	a33	20	35
5	62	234	238	120	208	90	118	70	82	a33	19.5	40
6	59	197	224	163	254	94	112	79	73	*a32	18.5	35
7	59	173	238	*199	462	94	103	101	68	29	18	30
8	67	157	211	211	395	108	92	94	62	29	18	*28
9	108	143	190	193	462	108	92	88	56	28	*17	27
10	104	134	208	178	376	112	88	80	51	27	17	*26
11	188	132	326	169	*358	115	88	88	49	28	18	26
12	426	155	420	160	326	99	92	94	47	27	18	27
13	396	132	395	145	349	94	94	94	44	26	18	27
14	256	124	344	139	344	108	105	86	46	25	18.5	26
15	230	126	930	142	380	115	105	88	56	24	24	25
16	187	116	1,230	154	331	112	112	99	58	24	24	24
17	157	147	763	154	275	*110	122	353	75	24	22	24
18	143	551	526	142	238	105	125	340	60	23	24	23
19	128	1,120	376	133	208	101	139	267	57	23	22	22
20	126	1,330	349	128	193	99	202	457	73	22	19.5	23
21	134	*2,040	313	120	196	97	181	620	70	22	20	24
22	160	1,380	259	118	175	90	a160	520	60	21	22	24
23	*179	1,160	227	122	157	84	a150	362	51	21	23	26
24	224	*826	234	a130	145	82	a135	291	50	20	27	35
25	650	645	259	a200	139	79	a125	248	47	20	30	44
26	500	490	244	a450	133	79	*a115	214	44	20	75	38
27	338	376	220	a330	122	79	103	*187	40	19.5	46	38
28	313	326	205	a450	108	86	94	163	a37	18.5	37	37
29	304	304	187	a760	103	110	86	145	a37	18.5	43	35
30	245	255	187	*655	------	128	82	148	a37	18.5	38	33
31	203	------	175	425	------	136	------	136	------	18.5	37	------
Total	6,249	13,654	10,563	6,838	7,539	3,076	3,604	5,839	1,847	779.5	753.5	896
Mean	202	455	341	221	260	99.2	120	188	61.6	25.1	25.6	29.9
Cfsm	3.67	8.27	6.20	4.02	4.73	1.80	2.18	3.42	1.12	0.456	0.465	0.544
In.	4.23	9.23	7.14	4.62	5.10	2.08	2.44	3.95	1.25	0.53	0.54	0.61
Ac-ft	12,390	27,080	20,950	13,560	14,950	6,100	7,150	11,580	3,660	1,550	1,570	1,780

Calendar year 1959: Max 2,040 Min 25 Mean 209 Cfsm 3.80 In. 51.62 Ac-ft 151,400
Water year 1959-60: Max 2,040 Min 17 Mean 169 Cfsm 3.07 In. 41.72 Ac-ft 122,300

Peak discharge (base, 700 cfs).--Oct. 25 (1 p.m.) 700 cfs (3.38 ft); Nov. 21 (8:30 a.m.) 2,220 cfs (6.60 ft); Dec. 16 (1 a.m.) 1,440 cfs (4.84 ft); probably Jan. 26 (time unknown) 799 cfs (3.42 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage, 1 discharge measurement, and records for nearby stations.

1445. Snoqualmie River near Snoqualmie, Wash.

Location.--Lat 47°32'45", long 121°50'35", in SW¼SW¼ sec.19, T.24 N., R.8 E., on left bank an eighth of a mile downstream from Snoqualmie Falls, half a mile upstream from Tokul Creek, and 1½ miles northwest of Snoqualmie.

Drainage area.--375 sq mi.

Records available.--May 1898 to July 1899; August to September 1899 (monthly discharge only); January to July 1900, September 1902 to July 1904; August to September 1904 (monthly discharge only); October 1904 to September 1905 and November to December 1906 (gage heights only); August 1907 to May 1926 (monthly discharge only); June 1926 to September 1927; October 1927 to September 1932 (monthly discharge only); August 1958 to September 1960. Published as "near Snoqualmie Falls" 1904-6.

Gage.--Water-stage recorder. Altitude of gage is 120 ft (from river-profile map). Prior to Nov. 3, 1902, and Nov. 1 to Dec. 31, 1906, staff gages above and below Snoqualmie Falls at different datums. Nov. 3, 1902, to Sept. 30, 1905, staff gage at site 4 miles upstream and 300 ft downstream from South Fork at different datum.

Average discharge.--30 years (1898-99, 1902-4, 1907-32, 1958-60), 2,504 cfs (1,813,000 acre-ft per year).

Extremes.--Maximum discharge during year, 61,000 cfs Nov. 23 (gage height, 19.78 ft); minimum, 12 cfs Sept. 16 (gage height, -0.37 ft).
1898-1900, 1902-4, 1926-27, 1958-60: Maximum discharge, that of Nov. 23, 1959; minimum, that of Sept. 16, 1960.

Remarks.--Records excellent. Medium and low flows affected by powerplant above station. No diversion above station.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

1.2	82	6.0	2,150
2.0	175	8.0	4,750
3.0	380	10.0	8,900
4.0	735	13.0	18,800
5.0	1,320	18.0	47,800

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,630	2,630	2,610	1,340	2,810	988	3,080	2,870	4,750	2,090	a687	1,420
2	2,130	2,280	2,530	1,280	2,660	984	3,640	2,810	4,900	1,760	a655	1,150
3	1,920	4,380	3,370	1,220	2,440	925	4,360	2,640	5,630	1,730	a627	1,000
4	1,720	4,640	2,670	1,140	2,090	946	4,480	2,400	4,690	1,850	a567	1,090
5	1,610	3,240	2,340	1,110	*2,190	986	4,750	2,060	4,120	1,910	a615	1,600
6	1,450	2,650	2,150	1,270	2,940	1,120	4,580	2,620	4,200	1,960	599	1,730
7	1,380	2,310	2,440	1,240	9,100	1,130	5,000	a5,410	3,250	1,950	560	1,290
8	1,760	2,080	2,160	1,170	4,740	1,380	5,370	3,800	2,810	1,780	88	1,030
9	4,160	1,960	1,960	1,130	3,500	*1,290	4,940	2,900	2,820	1,420	486	902
10	2,570	1,730	2,090	1,090	3,240	1,230	3,540	3,560	3,130	1,380	434	811
11	7,000	1,560	4,160	1,030	2,850	1,190	2,810	a4,700	3,370	1,430	482	749
12	6,660	2,310	4,620	1,010	2,460	1,140	2,580	a5,700	3,240	1,180	*500	644
13	4,200	1,920	3,560	958	2,820	1,120	*2,630	a5,680	3,250	1,260	504	694
14	3,080	1,560	6,440	920	3,160	1,130	2,760	5,110	3,200	1,240	444	680
15	3,250	1,740	45,600	922	4,480	1,600	2,670	3,940	4,460	1,170	545	612
16	2,600	1,650	18,300	928	3,250	1,490	2,440	4,200	8,330	952	521	654
17	2,190	1,700	7,270	890	2,610	1,480	2,350	4,150	5,050	984	635	578
18	1,910	7,900	5,020	825	2,180	1,570	2,290	4,160	3,540	1,220	776	546
19	1,690	6,610	4,020	797	1,910	1,460	2,270	3,790	2,890	1,070	578	540
20	2,400	20,600	3,370	*800	1,650	2,140	3,550	8,450	3,130	1,000	532	636
21	5,870	21,100	2,840	788	1,920	3,370	3,480	6,390	2,930	936	512	592
22	*12,000	16,400	2,510	778	1,730	3,970	2,690	4,690	2,570	878	546	554
23	*8,940	43,300	2,280	820	1,640	3,730	2,320	3,800	2,680	598	579	581
24	6,420	17,100	2,130	1,180	1,450	3,520	2,160	3,340	3,060	820	952	786
25	9,850	13,000	2,020	2,170	1,360	3,960	2,220	*3,180	2,750	863	1,410	1,240
26	5,270	6,960	1,900	3,280	1,230	4,460	2,070	3,300	2,300	720	2,740	1,040
27	3,850	4,930	1,740	2,700	1,150	3,840	2,070	3,780	2,280	728	2,030	768
28	4,020	4,030	1,700	2,270	1,130	3,740	2,230	3,520	2,290	a728	1,410	696
29	3,720	3,480	1,540	6,900	1,070	3,820	2,330	3,540	2,300	a705	1,790	644
30	2,950	2,980	1,500	5,230	------	4,400	2,550	4,440	2,200	a628	*1,560	575
31	2,680	------	1,400	3,490	------	3,610	------	6,750	------	a630	1,330	------
Total	121,860	208,730	148,240	50,676	75,760	67,719	94,210	127,680	106,120	37,570	25,694	25,830
Mean	3,931	6,958	4,782	1,635	2,612	2,184	3,140	4,119	3,537	1,212	829	861
Ac-ft	241,700	414,000	294,000	100,500	150,300	134,300	186,900	253,200	210,500	74,520	50,960	51,230

Calendar year 1959: Max 45,600 Min 524 Mean 3,774 Ac-ft 2,732,000
Water year 1959-60: Max 45,600 Min 88 Mean 2,978 Ac-ft 2,162,000

* Discharge measurement made on this day.
a No gage-height record; discharge computed on basis of Puget Sound Power & Light Co. powerplant Bristol recorder chart.

1460. Patterson Creek near Fall City, Wash.

Location.--Lat 47°34'50", long 121°56'25", in SW¼NE¼ sec.8, T.24 N., R.7 E., 2 miles upstream from mouth and 2¾ miles northwest of Fall City.

Drainage area.--15.5 sq mi.

Records available.--February 1947 to October 1950, June 1955 to September 1960. Records for June to October 1945 at site 1¼ miles downstream not equivalent owing to intervening drainage area.

Gage.--Water-stage recorder. Altitude of gage is 70 ft (from topographic map). Prior to June 1955, at different datum.

Average discharge.--8 years, 34.7 cfs (25,120 acre-ft per year).

Extremes.--Maximum discharge during year, 258 cfs Dec. 15 (gage height, 6.46 ft), from rating curve extended above 150 cfs; minimum, 8.2 cfs Aug. 9, 10, 11 (gage height, 1.40 ft).

1947-50, 1955-60: Maximum discharge, 480 cfs Feb. 17, 1949 (gage height, 4.81 ft, datum then in use), from rating curve extended above 130 cfs; maximum gage height, that of Dec. 15, 1959; minimum discharge, 6.4 cfs July 22, 1956, July 26, 1958; minimum gage height, 1.12 ft July 22, 1956.

Remarks.--Records good. Many small diversions for irrigation and domestic use. No regulation.

Revisions.--WSP 1446: Drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 16, Nov. 24 to Dec. 10, Apr. 6 to May 23, June 21-29, July 24 to Aug. 24)

1.5	8.0	3.0	72
1.7	13.5	4.0	132
2.0	25	6.0	235
2.5	46		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	19.5	*30	34	82	23	58	26	20	11	8.8	10.5
2	10	18	47	31	68	23	51	25	18.5	10.5	9.2	10
3	9.8	42	64	30	*56	22	43	24	18	10	9.2	9.2
4	10	37	52	29	46	23	38	24	*17	10	9.2	18
5	9.8	26	42	29	46	31	34	23	16	10	9.0	16.5
6	9.5	23	42	*33	70	34	32	41	15.5	10	9.0	11.5
7	9.5	20	51	36	124	31	29	40	15	9.8	8.5	10
8	12.5	19	42	36	113	*45	28	30	14	9.8	8.5	9.5
9	20	18	37	33	97	42	28	26	14	9.5	8.5	9.2
10	14.5	16.5	37	32	78	40	26	25	13	9.5	8.5	9.0
11	31	17	72	32	62	38	27	30	13	*9.8	8.5	9.2
12	19	26	156	31	62	33	*31	31	12.5	9.8	9.0	9.0
13	14.5	21	131	29	69	31	30	31	12.5	9.8	8.8	9.2
14	13	18.5	118	28	73	30	45	30	12.5	9.8	8.8	9.2
15	12.5	21	224	31	86	39	53	29	14	9.8	9.8	9.2
16	12	18	230	32	69	35	43	37	14	9.8	*9.5	9.2
17	11.5	26	193	31	56	35	38	33	13	9.8	9.2	9.0
18	11	68	144	28	49	32	36	35	12.5	9.8	9.0	9.0
19	11	70	105	26	43	30	40	*34	12.5	9.5	9.0	9.2
20	*15	188	91	25	39	28	80	63	13	9.5	9.2	9.8
21	16.5	216	79	24	42	26	63	75	13	9.2	9.2	9.2
22	18	189	65	23	36	25	55	62	12.5	9.2	9.5	9.2
23	23	158	57	27	33	24	48	44	12	9.2	9.8	10
24	31	115	56	50	31	23	42	44	11.5	9.0	10	10.5
25	42	93	54	58	30	22	37	36	11.5	9.8	11	11.5
26	27	70	46	78	29	22	33	33	11.5	9.5	14.5	10
27	20	54	41	71	27	21	29	29	11.5	9.0	12.5	9.8
28	58	48	40	66	25	24	29	26	11	9.0	10	9.5
29	44	42	40	140	24	56	31	24	11	9.0	11	9.5
30	28	34	42	134	------	79	27	24	11	9.0	10	*9.5
31	23	------	38	109	------	66	------	22	------	9.0	11	------
Total	597.6	1,731.5	2,466	1,396	1,665	1,033	1,184	1,056	407.0	298.4	237.7	304.1
Mean	19.3	57.7	79.5	45.0	57.4	33.3	39.5	34.1	13.6	9.63	9.60	10.1
Cfsm	1.25	3.72	5.13	2.90	3.70	2.15	2.55	2.20	0.877	0.621	0.619	0.652
In.	1.43	4.15	5.92	3.35	3.99	2.48	2.84	2.53	0.98	0.72	0.71	0.73
Ac-ft	1,190	3,430	4,890	2,770	3,300	2,050	2,350	2,090	807	592	590	603

Calendar year 1959: Max 230 Min 8.6 Mean 37.2 Cfsm 2.40 In. 32.54 Ac-ft 26,900
Water year 1959-60: Max 230 Min 8.5 Mean 34.0 Cfsm 2.19 In. 29.83 Ac-ft 24,660

Peak discharge (base, 150 cfs).--Nov. 20 (11 p.m.) 238 cfs (6.06 ft); Dec. 12 (5:30 a.m.) 168 cfs (4.66 ft); Dec. 15 (3:30 p.m.) 258 cfs (6.46 ft); Jan. 29 (6:30 a.m.) 150 cfs (4.30 ft).

* Discharge measurement made on this day.

1470. Griffin Creek near Carnation, Wash.

Location.--Lat 47°37'00", long 121°54'15", in SW¼SW¼ sec.27, T.25 N., R.7 E., on left bank a quarter of a mile upstream from bridge on State Highway 15B, three-quarters of a mile upstream from mouth, and 2 miles south of Carnation.

Drainage area.--17.1 sq mi.

Records available.--June 1945 to September 1960. Prior to October 1951, published as "near Tolt."

Gage.--Water-stage recorder. Altitude of gage is 120 ft (from topographic map). Prior to Sept. 21, 1951, at site 1,000 ft downstream at different datum.

Average discharge.--15 years, 42.9 cfs (31,060 acre-ft per year).

Extremes.--Maximum discharge during year, 764 cfs Nov. 21 (gage height, 4.41 ft), from rating curve extended above 200 cfs; minimum, 2.2 cfs Aug. 9 (gage height, 1.29 ft). 1945-60: Maximum discharge, that of Nov. 21, 1959; maximum gage height, 5.03 ft Feb. 10, 1951 (site and datum then in use); minimum discharge, 1.1 cfs Aug. 14, 15, 21, 23, 25, 26, 1958; minimum gage height, 0.75 ft Aug. 22, 23, 1945 (site and datum then in use).

Remarks.--Records good. Some small diversions for irrigation and domestic use. No regulation.

Revisions.--WSP 1286: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 21, Nov. 23 to Dec. 14)

Oct. 1 to Nov. 21				Nov. 22 to Sept. 30			
1.7	11	2.8	150	1.3	2.4	2.5	94
2.0	29	3.3	291	1.5	6.6	3.0	186
2.4	74	4.1	650	1.7	14.5	4.0	477
				2.0	35		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	d38	52	34	93	25	54	25	33	6.6	3.2	4.8
2	20	d37	53	32	83	24	54	23	31	6.3	3.2	4.5
3	18	55	70	31	72	23	50	23	28	6.6	3.2	4.1
4	15	71	66	30	61	23	44	19	25	6.3	3.4	9.2
5	13	*67	60	29	57	27	40	18	23	5.5	3.2	8.2
6	12	57	59	33	64	29	37	24	20	5.0	2.8	5.5
7	11	50	65	40	117	29	33	35	17.5	4.8	2.8	4.5
8	12	44	*60	44	122	38	30	33	17	4.8	2.7	4.1
9	18	38	56	42	104	42	30	30	15.5	4.5	2.6	3.7
10	16.5	35	59	42	88	46	27	27	*14	4.3	2.6	3.7
11	25	34	87	40	77	46	27	28	13	4.5	2.8	3.4
12	29	44	197	40	71	44	26	28	12	4.5	2.8	4.8
13	28	41	208	38	71	42	26	31	11	4.3	2.7	3.5
14	27	38	163	35	72	42	32	38	12	3.9	2.8	3.4
15	26	39	312	*35	79	44	40	37	15	3.9	3.5	3.4
16	23	38	*414	36	76	44	46	48	16	3.7	3.4	3.2
17	21	41	243	36	*70	44	46	52	14.5	3.7	3.0	3.2
18	20	70	153	35	62	42	44	57	14.5	3.5	3.0	3.2
19	18.5	104	113	34	55	38	46	59	11	3.4	2.7	3.4
20	21	228	93	32	50	36	70	86	14	*3.4	2.7	4.1
21	24	620	80	31	50	33	72	126	13	3.4	3.2	3.7
22	29	378	68	31	44	*32	65	115	11	3.4	3.4	3.5
23	41	302	60	35	40	28	57	88	9.6	3.4	3.7	3.9
24	51	230	56	53	38	27	51	74	8.9	3.4	4.1	4.3
25	80	178	54	77	35	25	46	70	8.2	3.2	4.3	4.8
26	82	140	50	113	32	24	38	61	8.2	3.2	8.6	4.1
27	67	112	44	115	31	23	33	53	7.5	3.2	6.6	3.7
28	d55	88	42	100	29	26	32	48	7.2	d3.2	5.0	3.4
29	d58	74	38	141	27	35	*31	42	7.2	d3.2	4.8	3.4
30	d45	61	40	145	------	46	28	40	6.0	3.2	4.8	*3.4
31	d42	------	37	117	------	52	------	38	------	3.2	*5.0	------
Total	972.0	3,352	3,152	1,676	1,870	1,079	1,255	1,476	443.8	129.5	112.6	126.1
Mean	31.4	112	102	54.1	64.5	34.8	41.8	47.6	14.8	4.18	3.63	4.20
Cfsm	1.84	6.55	5.96	3.16	3.77	2.04	2.44	2.78	0.865	0.244	0.212	0.246
In.	2.11	7.29	6.86	3.65	4.07	2.35	2.73	3.21	0.97	0.28	0.24	0.27
Ac-ft	1,930	6,650	6,250	3,320	3,710	2,140	2,490	2,930	880	257	223	250

Calendar year 1959: Max 620 Min 2.5 Mean 55.1 Cfsm 3.22 In. 43.71 Ac-ft 39,880
Water year 1959-60: Max 620 Min 2.6 Mean 42.7 Cfsm 2.50 In. 34.03 Ac-ft 31,030

Peak discharge (base, 220 cfs).--Nov. 21 (8:30 a.m.) 764 cfs (4.41 ft); Dec. 12 (8:30 p.m.) 230 cfs (3.33 ft); Dec. 15 (12 p.m.) 491 cfs (4.07 ft).

* Discharge measurement made on this day.
d Doubtful gage-height record; discharge estimated on basis of records for nearby stations.

1475. North Fork Tolt River near Carnation, Wash.

Location.--Lat 47°42'40", long 121°47'35", in SE¼NW¼ sec.28, T.26 N., R.8 E., on right bank 2¾ miles upstream from confluence with South Fork and 7 miles northeast of Carnation.

Drainage area.--39.2 sq mi.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 600 ft above mean sea level (from river-profile map).

Average discharge.--8 years, 394 cfs (285,200 acre-ft per year).

Extremes.--Maximum discharge during year, 9,560 cfs Dec. 15 (gage height, 13.15 ft), from rating curve extended above 2,800 cfs; minimum, 70 cfs Aug. 14 (gage height, 3.74 ft). 1952-60: Maximum discharge, that of Dec. 15, 1959; minimum, 38 cfs Sept. 13, 14, 1958 (gage height, 3.53 ft), but may have been less sometime during period of no gage-height record in October 1952.

Remarks.--Records excellent. No regulation or diversion above station.

Revisions (water years).--WSP 1566: 1957.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 19		Nov. 20 to Sept. 30			
4.5	211	3.7	64	6.0	747
5.0	384	4.0	110	7.0	1,360
6.0	825	4.5	214	9.0	3,150
7.0	1,430	5.0	350	11.0	5,710
8.0	2,190				

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	318	356	350	244	430	214	473	379	531	212	90	197
2	283	314	569	236	423	204	699	392	543	197	88	162
3	260	943	496	226	366	200	592	344	523	197	87	139
4	244	533	382	219	320	200	601	*295	440	197	87	219
5	229	392	344	214	402	226	575	278	413	202	86	347
6	217	340	338	224	764	249	547	543	396	204	82	214
7	223	304	376	219	1,160	232	609	699	326	192	80	*166
8	*551	283	323	207	539	239	596	426	298	179	78	143
9	573	263	312	197	444	219	559	372	317	168	77	128
10	360	*244	520	190	484	209	372	462	332	160	75	117
11	962	284	808	188	426	202	341	511	314	153	74	110
12	815	408	704	183	440	202	366	580	300	149	72	103
13	469	287	455	177	492	200	406	662	*298	149	71	100
14	336	257	2,060	172	888	192	451	690	320	141	71	96
15	676	251	5,560	175	752	236	366	462	522	141	77	92
16	392	226	1,380	168	*496	219	335	667	1,060	138	80	88
17	322	682	808	162	413	260	363	622	535	132	138	86
18	280	1,840	658	158	360	257	344	631	376	128	96	82
19	260	1,090	563	153	329	268	382	648	323	126	81	93
20	670	3,580	515	149	320	414	609	1,490	379	121	74	110
21	708	1,660	458	147	369	588	434	808	326	115	75	93
22	1,420	2,380	420	145	306	547	347	640	295	114	84	86
23	716	2,160	389	170	287	*515	326	535	306	108	133	147
24	1,470	1,520	379	396	273	484	314	511	298	105	265	192
25	1,050	999	369	787	260	555	321	508	262	103	329	252
26	568	631	329	861	247	539	314	531	239	102	570	155
27	440	488	314	*519	236	455	329	481	232	100	268	121
28	554	462	*295	514	226	481	360	437	232	*96	197	105
29	486	423	281	1,490	219	648	392	448	234	95	514	96
30	396	385	273	787	------	622	363	858	222	93	239	90
31	376	------	257	508	------	458	------	845	------	92	244	------
Total	16,624	23,985	21,285	10,185	12,671	10,534	13,086	17,755	11,192	4,409	4,582	4,129
Mean	536	800	687	329	437	340	436	573	373	142	148	138
Cfsm	13.7	20.4	17.5	8.39	11.1	8.67	11.1	14.6	9.52	3.62	3.78	3.52
In.	15.77	22.76	20.19	9.66	12.02	9.99	12.42	16.84	10.62	4.18	4.35	3.92
Ac-ft	32,970	47,570	42,220	20,200	25,130	20,890	25,960	35,220	22,200	8,750	9,090	8,190

Calendar year 1959: Max 5,560 Min 92 Mean 535 Cfsm 13.6 In. 185.20 Ac-ft 387,200
Water year 1959-60: Max 5,560 Min 71 Mean 411 Cfsm 10.5 In. 142.72 Ac-ft 298,400

Peak discharge (base, 3,000 cfs).--Oct. 24 (7 p.m.) 3,260 cfs (9.11 ft); Nov. 20 (11 a.m.) 4,690 cfs (10.29 ft); Nov. 22 (4:30 p.m.) 4,180 cfs (9.90 ft); Dec. 15 (11 a.m.) 9,560 cfs (13.15 ft).

* Discharge measurement made on this day.

1476. South Fork Tolt River near Index, Wash.

Location.--Lat 47°42'25", long 121°35'55", in NE¼SW¼ sec.25, T.26 N., R.9 E., on left bank half a mile upstream from Phelps Creek, 8 miles south of Index, and 15 miles east of Carnation.

Drainage area.--5.34 sq mi.

Records available.--December 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,850 ft (from topographic map).

Extremes.--Maximum discharge during period, 1,780 cfs Dec. 14 (gage height, 6.28 ft), from rating curve extended above 120 cfs on basis of slope-area measurements at gage heights 5.5 and 6.28 ft; minimum, 4.7 cfs Aug. 14 (gage height, 0.29 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. No regulation or diversion above station.

Note.--Peak discharges (base, 550 cfs) for the water year 1959 have been determined as 1,330 cfs Jan. 23 (stage unknown) and 1,200 cfs Apr. 29 (gage height, 5.5 ft, from floodmarks), results of slope-area measurements.

Rating tables, Dec. 14, 1959, to Sept. 30, 1960 (gage height, in feet, and discharge, in cubic feet per second)

Dec. 14 to Apr. 8				Apr. 9 to Sept. 30			
0.3	9	2.5	255	0.3	4.5	1.5	76
.7	27	3.0	380	.6	11.5	2.0	155
1.1	52	4.0	700	.9	24	2.5	255
1.5	88	5.0	1,110	1.2	45	3.0	380
2.0	158						

Discharge, in cubic feet per second, December 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			a90	21	72	b18	76	84	114	39	6.8	36
2			a110	21	67	b17	148	88	126	39	6.5	27
3			a110	19	54	b14	138	*70	130	32	6.1	20
4			a90	18	45	b16	144	53	99	36	7.2	24
5			a80	18	71	b20	141	52	93	41	6.3	71
6			a80	20	131	b23	136	124	88	43	5.7	*43
7			a100	19	248	25	155	159	62	38	5.5	29
8			a85	17.5	96	25	153	92	54	29	5.3	22
9			a80	16	73	22	141	81	*66	25	5.1	16.5
10		†19	a130	15	79	20	76	108	77	22	5.1	14.5
11			a200	15	61	19	61	130	75	19.5	5.1	12.5
12	†134		a200	14.5	64	19	60	159	70	18.5	5.1	11
13			a120	14	64	17.5	65	146	70	19	4.9	10
14			*562	14	134	17	65	139	76	17	4.9	9.8
15			1,080	14	102	26	46	90	143	16.5	6.3	9.0
16			181	14	61	21	39	108	329	16	6.8	8.2
17			94	13	46	28	45	92	105	16	25	7.8
18		†413	75	b11.5	38	30	39	92	69	15	11	7.0
19			63	b12	33	45	49	137	61	13.5	7.5	11
20			56	b13	36	85	97	266	75	12	6.3	13.5
21	•		49	b12	44	118	54	119	60	11	6.3	9.5
22			42	b13	34	112	37	85	52	10	10.5	8.2
23			39	b15	30	109	34	72	64	9.0	24	33
24		†222	37	72	*29	105	36	72	63	8.5	49	39
25			37	141	26	127	41	77	49	8.0	68	44
26			32	144	24	*130	43	89	39	*8.0	102	24
27			30	*81	b22	110	54	89	39	8.2	56	16
28			28	78	b20	107	62	85	42	8.0	34	13
29			26	253	b19	128	66	90	45	7.8	109	11
30			26	155	------	117	76	200	43	7.5	49	9.8
31	------	------	24	88	------	83	------	203	------	7.2	47	------
Total			3,956	1,371.5	1,823	1,755.5	2,377	3,451	2,478	600.2	697.3	610.3
Mean			128	44.2	62.9	56.6	79.2	111	82.6	19.4	22.5	20.3
Cfsm			24.0	8.28	11.8	10.6	14.8	20.8	15.5	3.63	4.21	3.80
In.			27.55	9.55	12.70	12.23	16.55	24.03	17.26	4.18	4.86	4.25
Ac-ft			7,850	2,720	3,620	3,480	4,710	6,840	4,920	1,190	1,380	1,210

Calendar year	: Max	Min	Mean	Cfsm	In.	Ac-ft
Water year	: Max	Min	Mean	Cfsm	In.	Ac-ft

Peak discharge (base, 550 cfs).--Dec. 14 (11 p.m.) 1,780 (6.28 ft); Feb. 6 (12 p.m.) 560 cfs (3.60 ft); June 16 (4 a.m.) 648 cfs (3.87 ft).

* Discharge measurement made on this day.
† Result of discharge measurement.
a No gage-height record; discharge estimated on basis of records for station near Carnation.
b Stage-discharge relation affected by ice.

1480. South Fork Tolt River near Carnation, Wash.

Location.--Lat 47°41'20", long 121°42'35", in SW¼SW¼ sec.31, T.26 N., R.9 E., on left bank 7 miles upstream from confluence with North Fork and 10 miles northeast of Carnation.

Drainage area.--19.7 sq mi.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,300 ft (from river-profile map).

Average discharge.--8 years, 204 cfs (147,700 acre-ft per year).

Extremes.--Maximum discharge during year, 6,500 cfs Dec. 15 (gage height, 7.45 ft), from rating curve extended above 2,700 cfs; minimum, 19.5 cfs Jan. 19; minimum gage height, 1.03 ft Aug. 8, 9, 10, 11, 13-14.
1952-60: Maximum discharge, that of Dec. 15, 1959; maximum gage height, 7.62 ft Nov. 20, 1958 (backwater from debris); minimum discharge, 12.5 cfs Aug. 23-27, 1958 (gage height, 0.81 ft).

Remarks.--Records good except those for period Oct. 1 to Feb. 6, which are fair. No regulation except by coffer dam at reservoir site for a few days. No diversion above station.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Feb. 6)

1.0	21	4.0	900
1.2	33	5.0	1,750
1.5	59	6.0	3,220
2.0	125	7.0	5,480
3.0	400		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	175	123	243	69	157	64	235	175	282	98	27	137
2	153	243	359	65	159	56	344	192	270	91	27	112
3	139	615	358	62	122	39	318	161	267	85	27	103
4	127	269	291	59	103	66	318	*137	212	90	29	131
5	120	165	264	59	161	68	306	127	192	93	27	220
6	115	133	264	74	290	93	288	249	185	98	26	*135
7	114	114	312	66	613	96	315	354	145	93	25	106
8	*296	104	270	60	291	96	321	225	127	79	24	94
9	311	*98	258	56	218	80	303	180	133	70	23	79
10	155	93	395	53	258	74	185	232	145	65	23	71
11	540	98	665	52	208	70	161	267	145	61	23	64
12	436	141	625	50	227	68	170	324	135	57	24	61
13	228	104	393	47	240	70	195	372	*135	57	23	59
14	170	98	1,500	47	476	68	230	404	149	55	23	56
15	285	98	3,720	47	387	112	188	261	255	52	29	53
16	168	89	575	45	*238	88	155	334	628	50	30	52
17	131	344	309	41	172	115	168	312	255	48	64	49
18	111	1,800	246	35	141	119	159	324	178	47	45	47
19	102	681	198	37	120	133	182	369	157	47	34	56
20	460	2,570	172	40	120	228	321	807	202	44	28	63
21	488	928	151	39	155	334	235	424	165	41	31	52
22	1,080	1,290	131	41	120	306	170	306	139	39	39	47
23	399	1,270	120	64	106	*205	147	246	143	37	58	102
24	807	899	119	237	100	270	139	232	149	35	133	127
25	652	677	117	452	93	306	143	228	122	33	172	143
26	240	400	100	476	82	309	143	240	106	32	277	91
27	172	318	91	267	77	264	147	235	100	31	180	73
28	249	300	*88	237	72	282	159	215	98	*30	133	62
29	200	276	82	650	66	355	159	215	106	28	307	55
30	151	258	79	572	------	358	161	406	108	29	168	52
31	135	------	74	202	------	267	------	484	------	29	161	------
Total	8,909	14,596	12,569	4,301	5,572	5,059	6,465	9,037	5,433	1,744	2,240	2,552
Mean	287	487	405	139	192	163	216	292	181	56.3	72.3	85.1
Cfsm	14.6	24.7	20.6	7.06	9.75	8.27	11.0	14.8	9.19	2.86	3.67	4.32
In.	16.82	27.55	23.73	8.12	10.52	9.55	12.20	17.06	10.26	3.29	4.23	4.82
Ac-ft	17,670	28,950	24,930	8,530	11,050	10,030	12,820	17,920	10,780	3,460	4,440	5,060

Calendar year 1959: Max 3,720 Min 25 Mean 305 Cfsm 15.5 In. 210.47 Ac-ft 221,100
Water year 1959-60: Max 3,720 Min 23 Mean 214 Cfsm 10.9 In. 148.15 Ac-ft 155,600

Peak discharge (base, 2,000 cfs).--Oct.22 (3 p.m.) 2,280 cfs (5.83 ft); Nov. 18 (6 a.m. 3,300 cfs (6.26 ft); Nov. 20 (5:30 a.m.) 4,340 cfs (6.67 ft); Nov. 22 (6 p.m.) 2,460 cfs (5.63 ft); Dec. 15 (8 a.m.) 6,500 cfs (7.45 ft).

* Discharge measurement made on this day.

1485. Tolt River near Carnation, Wash.

Location.--Lat 47°41'45", long 121°49'30", in S½NE¼ sec.31, T.26 N., R.8 E., on right bank 500 ft downstream from the forks, a quarter of a mile upstream from Stossel Creek, and 5 miles northeast of Carnation.

Drainage area.--79.7 sq mi.

Records available.--August 1928 to January 1932, September 1937 to September 1960. Prior to October 1951, published as "near Tolt."

Gage.--Water-stage recorder. Datum of gage is 348 ft above mean sea level (river-profile survey). Prior to Oct. 31, 1928, staff gage and Oct. 31, 1928, to Jan. 3, 1932, water-stage recorder, at site 350 ft upstream at datum 7.1 ft higher (river-profile survey). Sept. 1 to Oct. 6, 1937, staff gage at present site at datum 1.64 ft higher.

Average discharge.--26 years (1928-31, 1937-60), 608 cfs (440,200 acre-ft per year).

Extremes.--Maximum discharge during year, 17,400 cfs Dec. 15 (gage height, 13.04 ft), from rating curve extended above 7,600 cfs on basis of slope-area measurement of peak flow; minimum, 116 cfs Aug. 13, 14 (gage height, 4.13 ft).
1928-32, 1937-60: Maximum discharge, that of Dec. 15, 1959; minimum, 53 cfs Sept. 22, 23, 1951 (gage height, 3.84 ft).

Remarks.--Records excellent. No regulation or diversion above station.

Revisions (water years).--WSP 1216: Drainage area. WSP 1286: 1929(M), 1930, 1938(M), 1939, 1943(M), 1945(M), 1951(M).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

4.1	112	7.0	1,650
4.5	180	8.0	2,900
5.0	315	10.0	6,680
5.5	515	12.0	12,900
6.0	810		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	555	609	668	380	784	322	852	614	915	340	139	322
2	479	535	1,000	361	771	302	1,160	*632	880	302	137	262
3	431	1,610	1,020	346	632	280	1,020	560	873	293	134	226
4	391	1,010	771	329	555	302	1,010	479	719	296	136	336
5	361	726	674	326	693	346	978	444	662	302	134	540
6	336	*592	650	368	1,210	407	901	802	638	309	129	357
7	*336	520	771	365	1,970	380	985	1,160	520	296	126	*277
8	779	470	638	340	1,020	411	978	758	*470	265	125	237
9	1,010	427	592	318	817	376	964	626	492	242	122	204
10	609	399	937	312	901	357	626	745	525	231	120	193
11	1,520	429	1,640	302	797	343	570	845	515	224	120	180
12	1,430	668	1,550	293	797	340	592	978	479	214	119	168
13	880	470	1,040	280	908	343	656	1,120	488	214	118	164
14	680	419	6,250	274	1,500	336	778	1,230	510	207	118	160
15	1,130	419	10,400	280	1,390	444	650	845	817	200	128	155
16	712	365	2,310	277	950	399	582	1,140	1,750	195	128	151
17	570	924	1,410	265	764	466	620	1,120	873	191	204	146
18	488	3,400	1,100	248	650	470	592	1,190	614	187	160	144
19	440	1,980	943	240	565	484	650	1,150	525	184	136	156
20	1,060	7,030	852	242	*535	700	1,040	2,590	644	176	126	184
21	1,440	3,480	758	234	638	1,010	810	1,610	540	170	128	160
22	2,490	4,310	*680	231	525	943	644	1,210	474	164	140	149
23	1,360	4,190	626	286	474	887	582	978	484	162	183	245
24	2,320	2,780	614	757	453	*824	535	915	484	156	387	312
25	1,960	1,990	604	1,400	423	915	545	887	423	153	502	407
26	1,050	1,290	535	1,570	395	929	530	901	380	151	848	256
27	804	1,020	502	1,010	376	790	535	831	361	*147	448	204
28	1,030	922	470	*790	354	838	576	745	350	146	315	182
29	901	817	448	2,350	336	1,030	620	745	365	142	820	*168
30	732	738	431	1,450	---	1,130	582	1,300	357	140	407	156
31	650	------	407	950	------	873	------	1,450	------	142	391	------
Total	28,934	44,539	41,291	17,174	22,183	17,977	22,163	30,600	18,127	6,541	7,228	6,801
Mean	933	1,485	1,332	554	765	580	739	987	604	211	233	227
Cfsm	11.7	18.6	16.7	6.95	9.60	7.28	9.27	12.4	7.58	2.65	2.92	2.85
In.	13.50	20.78	19.27	8.01	10.35	8.39	10.34	14.28	8.46	3.05	3.37	3.17
Ac-ft	57,390	88,340	81,900	34,060	44,000	35,660	43,960	60,690	35,950	12,970	14,340	13,490

Calendar year 1959: Max 10,400 Min 126 Mean 950 Cfsm 11.9 In. 161.75 Ac-ft 687,500
Water year 1959-60: Max 10,400 Min 118 Mean 720 Cfsm 9.03 In. 122.97 Ac-ft 522,800

Peak discharge (base, 3,400 cfs).--Oct. 22 (2 p.m.) 4,420 cfs (8.93 ft); Oct. 24 (8:30 p.m.) 5,240 cfs (9.35 ft); Nov. 18 (5 a.m.) 4,680 cfs (9.07 ft); Nov. 20 (12 m.) 9,160 cfs (10.92 ft); Nov. 22 (5:30 p.m.) 7,690 cfs (10.40 ft); Nov. 24 (8 p.m.) 4,660 cfs (9.06 ft); Dec. 15 (11 a.m.) 17,400 cfs (13.04 ft); Feb. 7 (12:30 a.m.) 3,970 cfs (8.68 ft).

* Discharge measurement made on this day.

1487. Stossel Creek near Carnation, Wash.

Location.--Lat 47°41'45", long 121°49'50", in SW¼NE¼ sec.31, T.26 N., R.8 E., on right bank 550 ft upstream from mouth and 5 miles northeast of Carnation.

Drainage area.--5.58 sq mi.

Records available.--July 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 340 ft (from topographic map).

Extremes.--Maximum discharge during year, 311 cfs Nov. 21 (gage height, 2.53 ft); minimum, 1.1 cfs Aug. 14 (gage height, 1.12 ft).
1957-60: Maximum discharge, that of Nov. 21, 1959; minimum, 0.2 cfs Sept. 6, 1958 (gage height, 0.81 ft).

Remarks.--Records good except those for January, which are fair. No regulation or diversion above station.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Jan. 19-28)

Oct. 1 to Jan. 28				Jan. 29 to Sept. 30			
1.2	4.2	2.0	73	1.1	0.9	1.7	26
1.4	9.9	2.2	135	1.2	1.8	1.9	53
1.6	22	2.5	290	1.3	3.2	2.1	100
1.8	42			1.5	9.7		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.9	19	29	19.5	45	13	27	10.5	15	3.6	1.3	2.7
2	8.3	17	34	19	41	12.5	27	*10.5	14.5	3.4	1.3	2.3
3	7.2	23	35	18	35	12	24	9.7	13	3.2	1.3	2.1
4	6.4	21	32	17	30	12.5	20	9.2	12	3.2	1.3	3.8
5	5.8	19.5	30	17	29	15	18.5	8.2	11	3.0	1.3	3.8
6	5.6	*17.5	30	18	38	15	17	12	9.7	2.7	1.3	*2.8
7	*5.4	16	32	19.5	73	13.5	16	15	9.2	2.5	1.3	2.4
8	6.6	14.5	30	19.5	85	18	14.5	12.5	*8.7	2.3	1.2	2.3
9	7.9	13	29	19	51	18	14.5	11	7.3	2.3	1.2	1.9
10	6.9	11.5	30	17	47	19.5	12.5	10.5	6.9	2.4	1.2	2.0
11	13.5	11.5	42	17	45	19.5	13.5	12.5	6.6	2.3	1.3	1.9
12	14.5	13	58	17	45	18.5	15	12.5	6.2	2.1	1.2	1.8
13	13.5	12	58	15.5	47	18.5	13.5	12.5	5.9	2.0	1.2	1.7
14	13	10.5	52	15.5	51	20	15	17	6.2	1.9	1.2	1.6
15	17	11.5	158	17	53	20	16	14.5	8.2	1.9	1.5	1.6
16	15	10.5	179	17.5	47	19.5	15	25	8.2	1.8	1.5	1.6
17	13	14.5	100	17	38	19.5	15	30	7.3	1.8	1.6	1.5
18	11.5	26	71	16	33	18.5	14.5	38	6.6	1.8	1.5	1.5
19	10.5	31	51	15	29	17	16	37	6.2	1.7	1.4	1.8
20	12.5	112	45	15	*28	16	25	69	6.6	1.7	1.3	1.9
21	13.5	248	39	13	27	15	24	95	5.6	1.7	1.5	1.8
22	18	140	*34	13.5	24	13.5	22	65	5.3	1.7	1.6	1.7
23	20	110	31	16	20	13	19.5	44	5.0	1.8	1.8	2.0
24	23	91	30	23	19.5	*12.5	18	35	4.5	1.8	2.7	2.3
25	29	73	30	28	18.5	12.5	16	30	4.5	1.7	3.2	2.0
26	27	60	29	36	17	12.5	14.5	27	4.3	1.6	6.2	1.9
27	25	49	26	34	15	12.5	13	24	4.3	*1.5	4.0	1.8
28	29	42	25	*31	14.5	14.5	13	20	3.8	1.4	3.0	1.8
29	28	35	24	78	13.5	18.5	12	18	3.6	1.3	3.8	*1.6
30	25	31	24	78	------	24	11	18.5	3.6	1.3	3.0	1.6
31	22	------	22	59	------	25	------	18	------	1.3	3.0	------
Total	461.5	1,303.5	1,439	755.5	1,037.0	509.5	512.5	771.6	219.8	64.7	60.2	61.5
Mean	14.9	43.4	46.4	24.4	35.8	16.4	17.1	24.9	7.33	2.09	1.94	2.05
Cfsm	2.67	7.78	8.32	4.37	6.42	2.94	3.06	4.46	1.31	0.375	0.348	0.367
In.	3.08	8.69	9.59	5.04	6.91	3.40	3.42	5.14	1.46	0.43	0.40	0.41
Ac-ft	915	2,590	2,850	1,500	2,060	1,010	1,020	1,530	436	128	119	122

Calendar year 1959: Max 248 Min 2.0 Mean 24.1 Cfsm 4.32 In. 58.61 Ac-ft 17,440
Water year 1959-60: Max 248 Min 1.0 Mean 19.7 Cfsm 3.53 In. 47.97 Ac-ft 14,280

* Discharge measurement made on this day.

1490. Snoqualmie River near Carnation, Wash.

Location.--Lat 47°39'55", long 121°55'30", in W½ sec.9, T.25 N., R.7 E., on left bank 40 ft downstream from highway bridge, 1 mile northwest of Carnation, and 2 miles downstream from Tolt River.
Drainage area.--608 sq mi.
Records available.--October 1928 to September 1960. Prior to October 1951, published as "near Tolt."
Gage.--Water-stage recorder. Datum of gage is at mean sea level, unadjusted. Prior to Dec. 20, 1933, chain or wire-weight gage on old bridge, 100 ft upstream at datum 42.96 ft higher. Dec. 20, 1933, to Sept. 30, 1939, water-stage recorder at present site at datum 42.96 ft higher than present datum. Auxiliary water-stage recorder 1½ miles upstream from base gage.
Average discharge.--32 years, 3,777 cfs (2,734,000 acre-ft per year).
Extremes.--Maximum discharge during year, 49,400 cfs Nov. 23 (elevation, 58.93 ft); minimum, 321 cfs probably Aug. 8 or 9 (elevation, 45.23 ft, from recorded range in stage); minimum daily, 480 cfs Aug. 8.
1928-60: Maximum discharge, 59,500 cfs Feb. 27, 1932 (elevation, 59.88 ft, from graph based on elevation readings); maximum elevation observed, 59.93 ft Nov. 13, 1932; minimum discharge, 239 cfs Aug. 21, 1945, but may have been less sometime during period of faulty intake action Sept. 13 or 14, 1949; minimum elevation recorded, 43.30 ft Sept. 11, 1930; minimum daily discharge, 396 cfs Sept. 24, 1938.
Remarks.--Records good. Several small diversions for irrigation and domestic use above station. Low flow diverted for operation of powerplant at Snoqualmie Falls but returned to river above station. Some pondage at Snoqualmie Falls and some diurnal fluctuation caused by powerplant.
Revisions (water years).--WSP 1246: Drainage area. WSP 1316: 1932-33(M). WSP 1446: 1934(M).

Rating tables, water year 1959-60 (elevation, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 19 to Jan. 29, Jan. 31 to Feb. 6, Feb. 9 to Apr. 7; backwater from return of overbank flow Nov. 21-26, Dec. 15-17)

Oct. 1 to Nov. 23				Nov. 24 to Sept. 30			
45.7	1,870	53.0	20,200	45.4	450	52.0	15,600
47.0	3,980	55.0	27,200	46.0	1,080	54.0	22,600
49.0	8,140	58.0	42,800	48.0	4,550	57.0	36,800
51.0	13,600			50.0	9,800		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,890	3,750	4,040	2,210	4,860	1,540	4,840	3,950	6,860	2,730	950	1,900
2	3,180	3,370	3,930	2,070	4,330	1,410	5,180	4,020	6,440	2,350	920	1,610
3	2,720	5,260	5,300	1,940	4,040	1,400	6,470	3,790	7,450	2,250	870	1,400
4	2,450	6,820	4,270	1,840	3,290	1,360	6,210	3,370	*6,370	2,320	830	1,510
5	2,260	*4,770	3,650	1,840	3,410	1,500	6,520	3,040	5,330	2,400	880	2,200
6	2,040	3,940	3,370	1,990	4,120	1,720	6,160	3,530	5,450	2,450	860	2,380
7	1,950	3,320	3,790	2,070	13,600	1,730	6,600	7,420	*4,460	2,480	820	1,800
8	2,220	2,960	*3,470	1,970	8,460	2,070	7,280	5,910	3,830	2,320	480	1,460
9	5,570	2,770	3,120	1,880	5,980	1,990	7,030	4,480	3,790	1,860	720	1,280
10	3,810	2,420	3,290	1,820	5,330	1,910	5,140	4,880	4,020	1,820	680	1,150
11	7,580	2,200	6,160	1,670	4,770	1,850	4,180	6,110	4,250	1,840	720	1,020
12	8,810	3,190	7,870	1,700	4,140	1,760	3,870	7,500	4,100	1,610	750	1,090
13	6,010	2,850	6,180	1,580	4,620	1,680	3,970	7,920	4,120	1,610	750	981
14	4,460	2,330	7,210	1,430	5,300	1,740	4,290	7,530	3,950	1,580	680	959
15	4,850	2,390	36,600	*1,600	7,780	2,320	4,270	5,660	5,450	1,500	800	893
16	3,960	2,310	*35,200	1,550	5,590	2,400	3,870	5,940	10,100	1,410	780	871
17	3,210	2,400	16,600	1,480	*4,350	2,350	3,770	6,240	7,340	1,320	900	827
18	2,730	10,100	10,500	1,400	3,590	2,470	3,690	6,390	4,790	1,480	1,100	827
19	2,450	9,750	7,700	*1,360	3,040	2,380	3,630	5,860	3,870	1,360	840	805
20	2,730	18,800	6,240	1,340	2,680	2,910	5,350	11,700	4,120	*1,340	790	904
21	7,840	33,600	5,250	1,400	3,010	4,590	5,840	10,800	3,910	1,260	770	904
22	9,840	21,500	4,460	1,320	2,730	*5,470	4,570	8,040	3,430	1,200	820	938
23	14,600	40,900	3,970	1,370	2,550	5,120	3,890	6,340	3,410	1,010	890	860
24	8,240	28,100	3,670	2,370	2,260	4,770	3,590	5,400	3,890	1,090	1,450	1,130
25	12,600	21,700	3,490	4,270	2,100	5,090	3,530	5,210	3,490	1,120	2,100	1,670
26	7,730	14,000	3,290	6,370	1,940	5,960	3,290	5,120	3,040	970	3,800	1,570
27	5,550	8,600	2,970	5,250	1,780	5,180	3,230	5,470	2,910	981	2,700	1,180
28	5,530	6,260	2,840	4,100	1,730	5,090	3,350	5,140	2,910	970	1,900	1,050
29	5,470	5,350	2,570	10,800	1,620	5,230	*3,510	4,950	2,910	992	2,600	959
30	4,490	4,640	2,550	9,940	------	6,810	3,630	6,010	2,820	901	2,150	*937
31	3,920	------	2,380	6,260	------	5,450	------	9,520	------	900	*1,800	------
Total	162,690	280,250	215,930	88,190	123,000	97,250	140,750	187,240	138,810	49,427	37,100	37,065
Mean	5,248	9,342	6,965	2,845	4,241	3,137	4,692	6,040	4,627	1,594	1,197	1,236
Cfsm	8.63	15.4	11.5	4.68	6.98	5.16	7.72	9.93	7.61	2.62	1.97	2.03
In.	9.95	17.14	13.21	5.39	7.52	5.95	8.61	11.45	8.49	3.02	2.27	2.27
Ac-ft	322,700	555,900	428,300	174,900	244,000	192,900	279,200	371,400	275,300	98,040	73,590	73,520

Calendar year 1959: Max 40,800 Min 788 Mean 5,363 Cfsm 8.82 In. 119.73 Ac-ft 3,883,000
Water year 1959-60: Max 40,800 Min 480 Mean 4,256 Cfsm 7.00 In. 95.27 Ac-ft 3,090,000

Peak discharge (base, 16,000 cfs).--Nov. 21 (8:30 a.m.) 37,300 cfs (57.09 ft); Nov. 23 (1:30 p.m.) 49,400 cfs (58.93 ft); Dec. 15 (9 p.m.) 49,200 cfs (58.91 ft).

* Discharge measurement made on this day.
Note.--No gage-height record July 31 to Aug. 31; discharge estimated on basis of recorded range in stage, 1 discharge measurement, and records for stations near Snoqualmie and Tolt River near Carnation.

1530. Little Pilchuck Creek near Lake Stevens, Wash.

Location.--Lat 48°02'00", long 122°03'00", in NW¼NW¼ sec.4, T.29 N., R.6 E., on right bank just downstream from highway crossing, 1½ miles northeast of Lake Stevens and 2 miles upstream from Stevens Creek.

Drainage area.--17.5 sq mi.

Records available.--June 1946 to September 1951, September 1952 to September 1960.

Gage.--Water-stage recorder and wooden control. Altitude of gage is 200 ft (from topographic map).

Average discharge.--13 years, 32.4 cfs (23,460 acre-ft per year).

Extremes.--Maximum discharge during year, 625 cfs Nov. 21 (gage height, 6.02 ft, from floodmarks), from rating curve extended above 180 cfs on basis of peak flow through culvert; minimum, 1.1 cfs Aug. 9, 10, 11; minimum gage height, 0.92 ft Oct. 5, 6, 7. 1946-60: Maximum discharge, that of Nov. 21, 1959; no flow for part of Aug. 31, 1959.

Remarks.--Records good except those for period of no gage-height record, which are fair. Several small diversions above station for farm use. No regulation.

Revisions.--WSP 1286: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 27 to Sept. 30)

Oct. 1 to Nov. 20				Nov. 21 to Sept. 30			
0.9	2.5	3.0	106	1.3	1.1	3.0	80
1.1	6.7	4.0	215	1.5	2.5	4.0	215
1.5	19	5.0	386	1.7	6.0	5.0	400
2.0	41			2.0	14.5	6.0	620
				2.5	39		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.3	27	a70	35	79	20	25	12.5	15.5	3.8	1.4	3.4
2	4.8	23	*84	32	73	19	24	12.5	14	3.7	1.5	3.0
3	4.2	48	91	28	69	18	22	13	12.5	3.4	1.7	2.4
4	4.0	56	73	*26	57	18.5	18.5	12.5	11	3.1	1.7	4.4
5	3.8	42	60	30	56	22	17	11.5	10	2.6	1.7	6.0
6	3.8	33	55	51	59	23	15.5	13	9.8	*2.3	1.6	4.6
7	4.0	27	52	*67	78	23	14.5	15	9.2	1.9	1.4	3.1
8	5.6	23	46	73	80	26	14	15	9.2	*2.0	1.3	*2.5
9	11	20	41	65	87	24	13.5	12.5	7.8	2.0	*1.2	2.3
10	8.5	18	47	56	86	24	12.5	10.5	6.0	2.0	1.1	2.3
11	29	19	68	52	*89	24	15	11	4.8	1.9	1.1	2.2
12	78	25	93	48	84	22	24	10.5	5.4	1.9	1.4	2.1
13	50	21	87	43	99	20	25	10.5	4.0	1.8	1.5	2.1
14	34	19	77	41	98	20	25	11	5.0	1.7	1.8	2.0
15	32	19.5	210	45	101	20	28	9.2	6.2	1.6	2.1	2.0
16	23	17	271	52	89	*19	32	34	9.9	1.7	2.0	2.0
17	18	41	164	52	71	19	35	66	13	1.6	1.7	2.0
18	15	185	105	45	60	17.5	35	50	9.5	1.5	1.5	2.0
19	13	267	81	39	50	16.5	34	44	9.2	1.5	1.5	2.0
20	14	321	83	36	43	16	42	91	14	1.6	1.5	2.1
21	*20	*570	72	33	40	15	37	74	11	1.5	1.5	2.0
22	26	a360	59	32	34	14.5	32	64	8	1.5	1.4	2.0
23	24	a260	51	35	31	14	28	44	6.8	1.6	1.4	2.0
24	51	a190	59	50	30	13.5	26	37	6.0	1.7	1.7	3.8
25	108	a140	81	78	28	13	22	35	6	1.8	6.6	6.6
26	76	a105	76	115	26	12.5	*19.5	*32	5.4	1.5	15.5	4.2
27	54	a80	62	96	24	12.5	17.5	28	5	1.4	6.6	3.2
28	67	a80	51	85	22	13	15.5	25	4.2	1.4	4.0	2.6
29	59	a90	45	180	21	17	14	22	3.7	1.3	4.8	2.4
30	42	a85	44	*170	----	18.5	13	20	3.7	1.3	4.0	2.3
31	33	------	40	106	------	25	------	18	------	1.3	4.8	------
Total	920.8	3,211.5	2,498	1,896	1,764	580.0	696.0	864.2	245.8	59.9	83.0	85.6
Mean	29.7	107	80.6	61.2	60.8	18.7	23.2	27.9	8.19	1.93	2.68	2.85
Cfsm	1.70	6.11	4.61	3.50	3.47	1.07	1.33	1.59	0.468	0.110	0.153	0.163
In.	1.96	6.82	5.31	4.03	3.75	1.23	1.48	1.84	0.52	0.13	0.18	0.18
Ac-ft	1,830	6,370	4,950	3,760	3,500	1,150	1,380	1,710	488	119	165	170

Calendar year 1959: Max 570 Min 0.4 Mean 43.9 Cfsm 2.51 In. 34.05 Ac-ft 31,780
Water year 1959-60: Max 570 Min 1.1 Mean 35.3 Cfsm 2.02 In. 27.43 Ac-ft 25,590

Peak discharge (base, 150 cfs).--Nov. 21 (about 10 a.m.) 625 cfs (6.02 ft); probably Dec. 15 (time unknown) about 350 cfs; Jan. 29 (6 p.m.) 210 cfs (3.97 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.

1555. Snohomish River at Snohomish, Wash.

Location.--Lat 47°54'45", long 122°06'30", in NE¼SW¼ sec.13, T.28 N., R.5 E., in right bank pier of bridge on State Highway 1A in Snohomish. Prior to Feb. 3, 1960, at site half a mile upstream.

Drainage area.--1,720 sq mi, approximately.

Records available.--February 1941 to September 1960 (high-water discharges only). High-water elevations prior to 1932 and high-water profiles on flood peaks since that time are available at the Seattle office of Corps of Engineers.

Gage.--Water-stage recorder. Datum of gage is 9.86 ft below mean sea level, datum of 1929. Prior to Feb. 3, 1960, at site half a mile upstream at datum 0.14 ft higher. Auxiliary water-stage recorder 2 miles downstream.

Extremes.--Maximum discharge during year, 113,300 cfs Nov. 23 (gage height, 30.89 ft, from graph based on gage readings).
1941-60: Maximum discharge, 136,000 cfs Feb. 10, 1951 (gage height, 30.12 ft). Maximum stage known, 35 ft at base gage and 31 ft at auxiliary gage in 1906, from flood profile furnished by Corps of Engineers.

Remarks.--Records good. Large diurnal fluctuation because of tides. No appreciable regulation or diversion at stages for which discharges are published. Discharge less than 10,000 cfs on days for which no discharge is shown. Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1152: 1948(M). WSP 1316: 1947(M), drainage area. WSP 1396: 1951(M).

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11,000	-	10,400	-	14,000	-	13,600	11,300	20,700	-		
2	-	-	-	-	11,600	-	14,000	12,100	18,000	-		
3	-	12,700	11,600	-	10,000	-	16,400	12,300	20,600	-		
4	-	15,000	10,100	-	-	-	16,100	10,700	19,500	-		
5	-	12,900	-	-	-	-	16,900	-	16,600	-		
6	-	10,400	-	-	-	-	16,300	10,400	16,900	10,100		
7	-	-	-	-	27,000	-	16,900	17,800	14,900	10,400		
8	-	-	-	-	21,400	-	19,000	17,900	12,700	-		
9	17,300	-	-	-	16,300	-	19,100	14,300	12,300	-		
10	11,900	-	10,000	-	13,200	-	15,500	14,000	13,000	-		
11	17,200	-	13,400	-	11,000	-	12,700	16,600	13,700	-		
12	31,800	-	16,200	-	10,000	-	12,100	20,400	13,600	-		
13	20,800	-	15,400	-	-	-	11,100	21,800	13,800	-		
14	14,300	-	13,900	-	10,300	-	12,400	19,700	13,300	-		
15	14,600	-	54,800	-	13,400	-	*12,100	16,600	15,400	-		
16	12,100	-	*102,000	-	16,100	-	11,500	16,100	22,800	-		
17	10,000	10,000	49,000	-	13,800	-	10,800	19,800	24,600	-		
18	-	22,000	39,100	-	11,300	-	10,400	17,200	16,500	-		
19	-	28,100	25,100	-	-	-	-	15,900	13,000	-		
20	-	43,700	18,000	-	-	-	13,100	27,200	12,700	-		
21	15,900	*61,700	13,900	-	10,100	-	14,800	32,300	12,100	-		
22	20,200	61,600	11,400	-	-	12,700	12,500	25,100	10,700	-		
23	33,100	*110,000	-	-	-	12,800	10,200	18,500	10,500	-		
24	25,000	106,000	-	-	-	13,000	-	25,800	12,000	-		
25	37,100	62,000	-	-	-	13,300	-	27,800	11,700	-		
26	*26,200	41,500	-	12,000	-	14,900	-	14,100	10,200	-		
27	17,100	26,000	-	10,800	-	14,800	-	14,700	-	-		
28	14,400	18,000	-	-	-	14,200	(*)	14,300	-	-		
29	15,300	14,200	-	25,800	-	14,300	10,100	14,000	-	-		
30	12,300	12,100	-	21,700	-------	17,600	10,400	16,400	10,200	-		
31	10,000	-------	-	17,000	-------	15,300	-------	24,200	-------	-		-------
Total	-	-	-	-	-	-	-	-	-	-	-	-
Mean	-	-	-	-	-	-	-	-	-	-	-	-
Ac-ft	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year	: Max	Min	Mean	Ac-ft
Water year	: Max	Min	Mean	Ac-ft

Peak discharge (base, 40,000 cfs).--Oct. 12 (1:30 p.m.) 32,500 cfs (23.31 ft); Oct. 23 (1:30 a.m.) 37,400 cfs (23.93 ft); Oct. 25 (11:30 a.m.) 38,200 cfs (24.70 ft); Nov. 23 (about 6:30 p.m.) 113,300 cfs (30.89 ft); Dec. 16 (about 2:30 to 4 p.m.) 103,500 cfs (30.05 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 30, 31, Nov. 3-6, 17, Nov. 25 to Dec. 1, Dec. 3, 4, 10, 20-22, Jan. 26, 27, Jan. 29 to Feb. 3, Feb. 7-12, 14, 15; discharge estimated on basis of total inflow above station, adjusted for time of concentration. Wire-weight gage used as base gage Nov. 18-24, Dec. 11-19.

1570. Quilceda Creek near Marysville, Wash.

Location.--Lat 48°06'20", long 122°09'40", in NE¼NE¼ sec.9, T.30 N., R.5 E., on right bank 300 ft downstream from Middle Fork and 3½ miles north of Marysville.

Drainage area.--13.9 sq mi.

Records available.--June 1946 to September 1960.

Gage.--Water-stage recorder and wooden control. Datum of gage is 28.2 ft above mean sea level (stadia traverse).

Average discharge.--14 years, 25.6 cfs (18,530 acre-ft per year).

Extremes.--Maximum discharge during year, 240 cfs Nov. 21 (gage height, 6.83 ft); minimum, 3.1 cfs Aug. 8, 9; minimum gage height, 1.96 ft Oct. 6, 7.
1946-60: Maximum discharge, that of Nov. 21, 1959; minimum, 2.2 cfs July 16, 1951; minimum gage height, 1.49 ft Sept. 19, 1953, July 29, Aug. 2, 1958.

Remarks.--Records fair prior to Apr. 6, good thereafter. Several diversions above station for irrigation and domestic use. Some regulation during low flow.

Revisions (water years).--WSP 1286: 1950, drainage area. WSP 1636: 1958.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 14-20, Nov. 18-20, Mar. 26 to Apr. 5)

Oct. 1 to Apr. 6				Apr. 6 to Sept. 30	
1.9	5.5	4.0	75	2.4	2.9
2.3	13.5	5.0	127	2.6	8.0
3.0	34	6.5	217	3.0	33
				3.5	53

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.2	19	49	36	59	20	22	13	12.5	8.5	3.9	6.1
2	7.0	17.5	61	33	60	20	23	14.5	12	7.7	4.1	6.1
3	6.5	30	68	30	54	19	21	13	11.5	7.4	4.1	5.5
4	6.5	30	53	28	45	19	19	12.5	11.5	7.1	4.1	7.1
5	6.2	24	45	35	45	24	17.5	12.5	10	6.8	*3.7	7.1
6	6.4	21	42	55	44	25	17	13.5	9.5	6.4	3.5	6.4
7	6.4	18.5	40	*64	58	26	*16.5	14.5	9.0	6.1	3.3	*5.8
8	7.6	17	36	60	59	28	16	13.5	8.0	6.4	3.1	5.8
9	15	16	34	55	59	25	15	12.5	7.7	6.1	*3.3	5.8
10	9.9	15.5	39	49	*60	25	14.5	11.5	7.7	6.1	3.3	*5.5
11	24	15.5	57	45	56	24	24	12.5	7.4	5.5	3.7	5.5
12	34	19	84	40	60	22	34	12	7.4	*5.5	3.5	5.5
13	18	17	65	36	118	21	29	11.5	7.1	5.2	3.7	5.5
14	14	16	59	34	88	20	28	11.5	7.7	5.2	3.7	5.5
15	15	16.5	158	33	103	21	32	11.5	9.0	4.9	4.7	5.8
16	12.5	15	153	37	75	*19.5	37	25	9.5	4.9	5.8	5.8
17	11.5	*23	95	35	57	20	38	41	11.5	4.5	4.7	5.8
18	10	*74	74	31	49	18.5	37	30	9.5	4.5	4.7	5.8
19	9.5	90	59	28	41	18	34	29	15.5	4.3	4.3	5.8
20	12	148	78	27	36	17	36	50	23	4.3	4.3	5.8
21	*15.5	215	65	26	36	16.5	39	39	14.5	4.3	4.7	5.8
22	19	189	53	25	32	16.5	32	30	12	4.3	4.7	5.8
23	17.5	167	48	32	29	16	28	25	11	4.1	4.7	6.1
24	34	114	60	44	28	15.5	25	22	10.5	4.1	5.5	5.8
25	49	89	84	68	27	*15	*21	*21	10.5	4.1	7.1	7.7
26	34	64	72	89	25	15.5	*19.5	20	9.5	3.9	12	6.8
27	28	53	57	64	24	15.5	18	18	*9.0	3.9	6.8	6.4
28	34	55	48	63	23	16	16	17	8.5	3.9	6.1	6.1
29	32	65	43	165	22	18	14.5	16	8.5	3.7	6.4	5.8
30	25	58	50	126	------	18.5	14.5	14.5	8.5	3.7	6.1	5.8
31	21	------	41	80	------	23	------	13.5	------	3.7	6.8	------
Total	548.2	1,711.5	1,970	1,573	1,472	618.0	738.0	601.0	309.5	161.3	150.6	180.1
Mean	17.7	57.0	63.5	50.7	50.8	19.9	24.6	19.4	10.3	5.20	4.86	6.00
Cfsm	1.27	4.10	4.57	3.65	3.65	1.43	1.77	1.40	0.741	0.374	0.350	0.432
In.	1.47	4.58	5.27	4.21	3.94	1.65	1.97	1.61	0.83	0.43	0.40	0.48
Ac-ft	1,090	3,390	3,910	3,120	2,920	1,230	1,460	1,190	614	320	299	357

Calendar year 1959: Max 215 Min 3.0 Mean 32.9 Cfsm 2.37 In. 32.12 Ac-ft 23,810
Water year 1959-60: Max 215 Min 3.1 Mean 27.4 Cfsm 1.97 In. 26.84 Ac-ft 19,900

Peak discharge (base, 110 cfs).--Nov. 21 (7 a.m.) 240 cfs (6.83 ft); Dec. 15 (9 p.m.) 188 cfs (6.02 ft); Jan. 29 (10:30 a.m.) 189 cfs (6.04 ft); Feb. 13 (5 a.m.) 143 cfs (5.27 ft); Feb. 15 (10 a.m.) 110 cfs (4.71 ft).

* Discharge measurement made on this day.

1575. Lake Goodwin near Silvana, Wash.

Location.--Lat 48°08'35", long 122°18'00", in NW¼SE¼ sec.28, T.31 N., R.4 E., on west shore of lake, 4.7 miles southwest of Silvana and 6 miles north of channel connecting Lake Goodwin and Lake Shoecraft.

Drainage area.--4.51 sq mi.

Records available.--April 1953 to September 1960.

Gage.--Staff gage read once daily. Altitude of gage is 321 ft (from topographic map). Prior to Feb. 15, 1955, at site 0.8 mile north. Datum of gage was 3.00 ft higher prior to Oct. 1, 1954, and at present datum thereafter.

Extremes.--Maximum gage height observed during year, 6.52 ft Jan. 30; minimum observed, 5.14 ft Sept. 19-23.
1953-60: Maximum gage height observed, 6.76 ft Jan. 6, 7, 1956; minimum observed, 4.58 ft Sept. 14, 1958.

Remarks.--Level of Lake Goodwin is controlled by flashboards in a wooden flume at mouth of Lake Shoecraft. No known diversion.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.30	5.52	6.08	6.20	6.48	6.12	6.08	6.08	6.04	5.86	5.40	5.22
2	5.30	5.52	6.11	6.18	6.48	6.12	6.06	6.10	6.02	5.84	5.38	5.20
3	5.28	5.54	6.12	6.16	6.48	6.12	6.06	6.10	6.02	5.82	5.38	5.20
4	5.28	5.54	6.10	6.14	6.44	6.12	6.06	6.08	6.00	5.80	5.36	5.22
5	5.28	5.54	6.10	6.18	6.42	6.12	6.06	6.08	6.00	5.78	5.36	5.24
6	5.26	5.54	6.10	6.20	6.40	6.12	6.04	6.08	6.00	5.78	5.34	5.21
7	5.26	5.54	6.10	6.24	6.40	6.12	6.04	6.08	5.98	5.76	5.34	5.22
8	5.26	5.54	6.10	6.24	6.38	6.12	6.04	6.08	5.96	5.74	5.31	5.20
9	5.30	5.52	6.10	6.26	6.38	6.12	6.02	6.08	5.94	5.72	5.30	5.20
10	5.32	5.52	6.10	6.28	6.38	6.12	6.02	6.08	5.94	5.72	5.30	5.18
11	5.36	5.52	6.14	6.28	6.36	6.10	6.04	6.06	5.92	5.70	5.28	5.18
12	5.38	5.52	6.24	6.26	6.32	6.10	6.08	6.06	5.90	5.68	5.28	5.18
13	5.40	5.52	6.24	6.24	6.38	6.10	6.08	6.06	5.88	5.68	5.26	5.18
14	5.40	5.52	6.28	6.24	6.40	6.10	6.08	6.06	5.86	5.66	5.24	5.18
15	5.40	5.52	6.40	6.24	6.44	6.10	6.10	6.04	5.88	5.66	5.22	5.18
16	5.38	5.50	6.40	6.24	6.44	6.10	6.12	6.10	5.92	5.64	5.24	5.16
17	5.38	5.50	6.40	6.22	6.42	6.10	6.12	6.12	5.92	5.64	5.26	5.16
18	5.38	5.56	6.40	6.22	6.38	6.08	6.12	6.12	5.90	5.62	5.26	5.16
19	5.38	5.62	6.40	6.22	6.34	6.08	6.14	6.14	5.92	5.60	5.26	5.14
20	5.38	5.74	6.42	6.20	6.32	6.08	6.18	6.14	5.92	5.58	5.24	5.14
21	5.41	5.90	6.40	6.20	6.28	6.08	6.20	6.12	5.90	5.56	5.24	5.14
22	5.44	5.96	6.36	6.20	6.24	6.06	6.18	6.12	5.90	5.54	5.22	5.14
23	5.44	5.98	6.34	6.20	6.22	6.06	6.18	6.10	5.88	5.52	5.22	5.14
24	5.52	6.02	6.38	6.20	6.20	6.06	6.16	6.08	5.80	5.52	5.24	5.18
25	5.52	6.04	6.36	6.26	6.18	6.04	6.16	6.08	5.88	5.50	5.24	5.18
26	5.52	6.04	6.34	6.28	6.18	6.02	6.16	6.08	5.86	5.48	5.24	5.18
27	5.52	6.04	6.34	6.30	6.16	6.02	6.14	6.08	5.88	5.48	5.24	5.18
28	5.52	6.06	6.30	6.36	6.16	6.04	6.12	6.08	5.86	5.46	5.22	5.16
29	5.52	6.08	6.28	6.46	6.14	6.06	6.10	6.06	5.86	5.44	5.22	5.16
30	5.52	6.08	6.26	6.52	-------	6.06	6.08	6.06	5.86	5.42	5.22	5.16
31	5.52	-------	6.24	6.50	-------	6.08	-------	6.06	-------	5.42	5.22	-------

Note.--Gage usually read between 12:20 and 7:40 p.m.

1580. Lake Shoecraft near Tulalip, Wash.

Location.--Lat 48°07'35", long 122°18'15", in SW¼ sec.33, T.31 N., R.4 E., on piling 12 ft shoreward from boathouse on southwest shore, a quarter of a mile east of outlet, and 4¼ miles north of Tulalip.

Drainage area.--5.57 sq mi.

Records available.--April 1953 to September 1960.

Gage.--Staff gage read once daily. Altitude of gage is 324 ft (from topographic map).

Extremes.--Maximum gage height observed during year, 2.25 ft Jan. 30; minimum observed, 0.94 ft Sept. 22.
1953-60: Maximum gage height observed, 2.48 ft Jan. 5, 1956; minimum observed, 0.45 ft Sept. 13-15, 1958.

Remarks.--Level of Lake Shoecraft is controlled by planks in wooden flume at outlet. No known diversion.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.11	-	1.89	1.96	2.21	1.96	1.88	1.90	1.84	1.65	1.22	1.04
2	1.10	1.32	1.91	1.94	-	1.96	1.88	1.91	1.83	1.64	1.21	1.04
3	1.10	1.34	1.93	1.96	-	1.94	1.87	1.91	1.82	1.63	1.20	1.04
4	1.09	1.36	1.92	1.96	-	1.94	1.86	1.90	1.81	1.62	1.19	1.07
5	1.08	1.36	1.92	2.00	2.16	1.94	1.86	1.90	1.80	1.61	1.18	1.07
6	-	1.35	1.92	2.01	2.13	1.94	1.85	1.89	1.80	1.60	1.17	1.04
7	-	1.35	1.92	2.04	2.13	1.94	1.85	1.90	1.79	1.59	1.16	1.04
8	-	1.35	1.91	2.06	2.12	1.94	1.84	1.90	1.77	1.58	1.14	1.04
9	1.14	1.34	1.90	2.08	2.11	1.94	1.84	1.89	1.76	1.56	1.14	1.03
10	1.16	1.34	1.95	2.08	2.10	1.94	1.84	-	1.74	1.54	1.12	1.03
11	1.18	1.35	1.95	2.08	2.09	1.94	1.86	-	1.73	1.53	1.10	1.02
12	1.19	1.35	2.04	2.08	2.07	1.94	1.86	-	1.72	1.51	1.09	1.01
13	1.20	1.36	2.05	2.06	2.15	1.92	-	-	-	1.50	1.08	1.00
14	1.21	1.34	2.05	2.06	2.13	1.92	-	1.88	-	1.49	1.06	.99
15	1.22	1.34	2.17	2.06	2.16	1.91	-	1.87	-	1.47	1.06	.98
16	1.21	1.34	2.19	2.06	2.16	1.92	-	1.92	-	1.46	1.08	.97
17	1.21	1.33	2.19	2.05	2.14	1.92	1.94	1.93	-	1.45	1.06	.97
18	1.20	1.39	2.19	2.04	2.12	1.92	1.95	1.91	-	1.44	1.06	.96
19	1.20	1.44	2.13	2.02	2.09	1.92	1.95	1.92	1.70	1.42	1.05	.97
20	1.20	-	2.13	2.01	2.06	1.90	1.97	1.95	1.74	1.40	1.04	.96
21	1.23	-	2.13	2.00	2.03	1.90	1.99	-	1.73	1.38	1.04	.95
22	1.27	-	2.11	2.00	2.00	1.90	1.99	-	1.72	1.36	1.04	.94
23	1.26	1.81	2.09	2.01	1.98	1.90	1.99	-	1.71	1.35	1.03	.95
24	-	1.82	2.09	2.03	2.00	1.90	1.98	-	1.71	1.33	1.05	.99
25	-	1.86	2.10	-	2.00	1.88	1.98	1.89	1.70	1.32	1.05	.99
26	-	1.86	2.10	-	1.98	1.88	1.96	-	1.69	1.30	1.06	.98
27	-	1.89	2.07	2.10	1.98	1.86	1.95	-	1.68	1.29	1.05	.97
28	-	1.87	2.06	2.10	1.98	1.84	1.93	-	1.68	1.28	1.05	.97
29	-	1.89	2.03	2.22	1.98	1.86	1.92	1.86	1.66	1.26	1.05	.97
30	-	1.89	2.01	2.25	-------	1.86	1.91	1.85	1.65	1.25	1.05	.97
31	-	-------	1.98	2.24	-------	1.86	-------	1.85	-------	1.24	1.05	-------

Note.--Gage usually read at 8 or 9 a.m.

1610. South Fork Stillaguamish River near Granite Falls, Wash.

Location.--Lat 48°06'10", long 121°56'40", in SW¼NW¼ sec.8, T.30 N., R.7 E., on right bank a quarter of a mile upstream from county road bridge, 1½ miles upstream from Canyon Creek, and 2 miles northeast of Granite Falls.

Drainage area.--119 sq mi.

Records available.--December 1902 to July 1903 (gage heights only), July 1928 to September 1960. Published as "at Robe" 1902-3.

Gage.--Water-stage recorder. Altitude of gage is 310 ft (from river-profile map). Prior to Aug. 31, 1928, staff gage at site 8 miles upstream at different datum.

Average discharge.--32 years, 1,062 cfs (768,900 acre-ft per year).

Extremes.--Maximum discharge during year, 24,800 cfs Dec. 15 (gage height, 17.17 ft); minimum, 129 cfs Aug. 14 (gage height, 3.49 ft).
1928-60: Maximum discharge, 38,800 cfs Feb. 26, 1932 (gage height, 19.7 ft, from graph based on gage readings), from rating curve extended above 15,000 cfs; minimum, 55 cfs Sept. 23, 24, 1938; minimum gage height, 2.99 ft Aug. 19-21, 1941.

Remarks.--Records excellent except those for periods of shifting control, which are good. Some small diversions for domestic use above station. No regulation. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 902: 1939. WSP 1286: 1929-31(M), 1932, 1933-34(M), 1935, 1937(M), 1938-39(P), 1940-41(M), 1943(P), 1944(M), 1945(P), 1946(M), 1947(P), 1948(M), 1951(M).

Rating tables, water year 1959-60, except periods of shifting control (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-11				Oct. 12 to Sept. 30			
4.1	340	7.0	2,770	3.5	131	6.0	1,680
4.5	530	8.0	4,250	4.0	280	8.0	4,400
6.0	1,620	9.0	6,010	4.5	510	10.0	8,000
				5.0	820	14.0	16,800

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	677	631	764	388	1,180	320	1,320	1,090	1,560	655	197	685
2	570	560	1,070	365	1,660	308	2,180	1,100	1,450	560	191	495
3	495	2,530	1,210	342	1,270	273	1,750	984	1,530	538	177	396
4	445	1,310	960	324	946	292	1,670	841	1,290	571	174	534
5	403	869	778	324	1,600	342	1,620	737	1,120	619	*168	1,760
6	367	711	730	*410	1,850	490	1,480	1,530	1,140	673	155	*925
7	485	601	724	406	3,780	435	1,620	2,420	911	661	155	613
8	2,010	521	637	365	*1,770	571	1,690	1,510	744	554	155	470
9	2,670	470	571	342	1,350	460	1,690	1,100	792	480	155	392
10	1,180	435	1,490	312	1,300	425	1,090	1,270	897	430	155	334
11	4,320	445	3,350	312	1,070	401	918	1,670	939	396	150	292
12	5,200	785	2,820	296	1,100	370	953	2,040	883	370	148	270
13	1,700	521	1,370	273	1,400	370	1,100	2,180	904	396	136	256
14	1,170	445	4,210	266	2,740	*383	1,320	1,670	890	383	133	242
15	1,430	430	16,400	270	2,670	762	1,000	2,250	1,260	365	145	225
16	960	365	3,880	266	1,510	510	1,010	2,000	2,760	360	145	215
17	771	2,850	1,820	256	1,050	465	1,020	1,970	2,240	356	316	203
18	643	8,860	1,350	219	827	485	953	1,460	1,250	356	222	191
19	*560	4,850	1,070	215	692	521	*1,150	1,510	1,030	347	174	200
20	1,360	*14,100	976	242	637	799	2,150	5,090	1,440	312	150	262
21	2,370	6,330	848	228	1,020	1,270	1,270	2,500	1,100	280	155	212
22	3,430	*8,790	730	228	692	1,390	925	1,940	869	262	228	191
23	1,780	8,820	673	296	577	1,380	785	1,430	883	242	234	238
24	4,550	6,660	704	1,140	516	1,330	737	1,190	968	219	619	593
25	3,940	3,420	827	3,670	470	1,500	820	*1,170	848	209	1,190	764
26	1,680	1,790	643	3,600	425	1,680	806	1,380	692	206	1,740	425
27	1,120	1,220	571	1,960	392	1,450	806	1,200	*655	206	925	312
28	1,140	1,170	532	1,710	365	1,510	883	1,070	643	209	695	256
29	984	1,100	485	7,600	334	2,240	953	1,050	718	209	2,060	228
30	778	925	460	3,360	------	2,020	1,040	2,740	704	206	911	206
31	679	------	420	1,640	------	1,470	------	2,550	------	203	946	------
Total	49,867	82,514	53,073	31,625	35,193	26,222	36,709	52,642	33,110	11,833	13,104	12,385
Mean	1,609	2,750	1,712	1,020	1,214	846	1,224	1,698	1,104	382	423	413
Cfsm	13.5	23.1	14.4	8.57	10.2	7.11	10.3	14.3	9.28	3.21	3.55	3.47
In.	15.58	25.79	16.59	9.88	11.00	8.19	11.47	16.45	10.35	3.70	4.10	3.87
Ac-ft	98,910	163,700	105,300	62,730	69,800	52,010	72,810	104,400	65,670	23,470	25,990	24,570

Calendar year 1959: Max 16,600 Min 168 Mean 1,462 Cfsm 12.3 In. 166.74 Ac-ft 1,058,000
Water year 1959-60: Max 16,400 Min 133 Mean 1,197 Cfsm 10.1 In. 136.97 Ac-ft 869,400

Peak discharge (base, 8,700 cfs).--Oct. 11 (11 p.m.) 13,300 cfs (12.34 ft); Oct. 24 (7:30 p.m.) 10,400 cfs (11.22 ft); Nov. 18 (3:30 a.m.) 11,400 cfs (11.68 ft); Nov. 20 (12:30 p.m.) 21,200 cfs (15.73 ft); Nov. 22 (10:30 p.m.) 23,100 cfs (16.50 ft); Dec. 15 (10:30 a.m.) 24,800 cfs (17.17 ft); Jan. 29 (2 a.m.) 10,100 cfs (11.07 ft).

* Discharge measurement made on this day.
Note.--Shifting-control method used Oct. 13 to Nov. 17, Dec. 16 to Jan. 25.

1650. Squire Creek near Darrington, Wash.

Location.--Lat 48°16'15", long 121°40'00", in SE¼ sec.8, T.32 N., R.9 E., on left bank 150 ft upstream from road crossing, a third of a mile upstream from Ashton Creek, and 3½ miles northwest of Darrington.

Drainage area.--18.8 sq mi.

Records available.--June 1950 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 490 ft (from topographic map).

Average discharge.--10 years, 188 cfs (136,100 acre-ft per year).

Extremes.--Maximum discharge during year, 4,490 cfs Nov. 20 (gage height, 9.89 ft, from high-water mark in well); minimum, 31 cfs Aug. 20, 21 (gage height, 2.15 ft).
1950-60: Maximum discharge, 6,440 cfs Feb. 10, 1951 (gage height, 10.52 ft), from rating curve extended above 700 cfs by logarithmic plotting; minimum, 7.3 cfs Oct. 20-24, 1952 (gage height, 0.57 ft).

Remarks.--Records good. No regulation or diversion above station.

Revisions.--WSP 1286: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 20				Nov. 21 to Sept. 30			
2.0	50	5.0	980	2.1	27	5.0	960
2.5	117	7.0	2,300	2.5	67	6.0	1,600
3.0	220	9.0	3,780	3.0	156	8.0	3,000
4.0	530			4.0	490		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	104	159	*133	63	211	60	192	180	256	146	53	102
2	89	140	198	61	211	57	284	178	316	129	48	83
3	80	381	170	57	182	55	270	156	322	148	50	71
4	70	206	137	55	150	54	274	141	249	161	47	89
5	64	164	121	*54	198	55	252	133	246	180	43	230
6	58	144	111	57	471	63	229	378	238	192	42	131
7	59	129	104	55	679	66	270	414	170	175	42	*101
8	380	117	91	53	316	81	288	252	161	139	42	84
9	294	109	83	51	*235	70	263	202	192	123	*41	74
10	161	100	185	48	200	67	175	284	217	113	42	66
11	1,680	107	603	47	170	63	150	368	217	108	41	60
12	728	126	418	44	182	60	150	434	205	113	40	57
13	293	96	232	43	202	60	170	354	200	108	36	55
14	325	88	1,120	42	379	63	208	266	211	104	34	51
15	273	82	2,540	42	403	*94	166	205	266	102	35	47
16	189	73	592	40	249	74	156	263	543	104	35	44
17	155	556	340	39	180	67	150	242	266	108	55	41
18	131	1,180	291	37	146	71	141	192	188	104	38	39
19	114	1,040	220	35	125	80	166	220	190	97	35	47
20	*258	3,030	190	35	115	115	*291	678	198	89	33	45
21	293	850	156	34	129	170	229	344	163	83	37	40
22	450	1,650	137	33	106	175	175	235	156	75	46	37
23	288	1,540	127	36	95	173	150	188	217	66	51	43
24	1,280	1,260	125	254	89	173	135	*170	202	61	83	63
25	705	559	121	692	81	202	139	173	173	61	125	67
26	336	340	104	454	75	238	131	226	143	62	230	52
27	251	246	95	280	70	205	135	192	143	61	141	45
28	243	220	87	469	66	195	148	166	*175	61	106	41
29	208	185	81	1,430	62	272	166	192	185	62	165	38
30	176	154	75	535	------	277	175	474	163	56	141	35
31	181	------	70	291	------	223	------	361	------	56	139	------
Total	9,916	15,031	9,057	5,468	5,777	3,678	5,828	8,261	6,571	3,247	2,096	1,978
Mean	320	501	292	176	199	119	194	266	219	105	67.6	65.9
Cfsm	17.0	26.6	15.5	9.36	10.6	6.33	10.3	14.1	11.6	5.59	3.60	3.51
In.	19.62	29.73	17.92	10.82	11.43	7.28	11.53	16.34	13.00	6.42	4.15	3.91
Ac-ft	19,670	29,810	17,960	10,850	11,460	7,300	11,560	16,390	13,030	6,440	4,160	3,920

Calendar year 1959: Max 3,030 Min 38 Mean 244 Cfsm 13.0 In. 176.04 Ac-ft 176,500
Water year 1959-60: Max 3,030 Min 33 Mean 210 Cfsm 11.2 In. 152.15 Ac-ft 152,600

Peak discharge (base, 2,200 cfs).--Oct. 11 (about 10 p.m.) 3,500 cfs (8.65 ft); Oct. 24 (7:30 p.m.) (3,130 cfs (8.19 ft); Nov. 18 (3 a.m.) 2,220 cfs (6.89 ft); Nov. 20 (about 8 a.m.) 4,490 cfs (9.89 ft); probably Nov. 22 (time unknown) 4,080 cfs (9.37 ft); Nov. 24 (about 5 p.m.) 2,500 cfs (7 .28 ft); Dec. 15 (about 3 a.m.) 4,080 cfs (9.37 ft).

* Discharge measurement made on this day.

1670. North Fork Stillaguamish River near Arlington, Wash.

Location.--Lat 48°15'40", long 122°02'50", in SE¼NW¼ sec.16, T.32 N., R.6 E., on right bank 6 miles northeast of Arlington, 7 miles upstream from mouth, and 8 miles downstream from Deer Creek.

Drainage area.--269 sq mi.

Records available.--July 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 89.34 ft above mean sea level, datum of 1929. Prior to Sept. 18, 1928, staff gage at same site and datum.

Average discharge.--32 years, 1,808 cfs (1,309,000 acre-ft per year).

Extremes.--Maximum discharge during year, 29,400 cfs Nov. 23 (gage height, 13.15 ft); minimum, 288 cfs Aug. 21 (gage height, 1.80 ft).
1928-60: Maximum discharge, 30,600 cfs Feb. 9, 1951; maximum gage height, 13.46 ft Feb. 10, 11, 1951; minimum discharge, 117 cfs Sept. 23, 1938; minimum gage height, 0.97 ft Sept. 10, 12, 1944.

Remarks.--Records excellent. No regulation. Small diversions for domestic use.

Revisions (water years).--WSP 832: Drainage area. WSP 1286: 1938-39.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 18				Nov. 19 to Sept. 30			
2.9	690	5.0	3,230	1.8	288	6.0	4,980
3.3	1,010	6.0	5,120	2.3	535	8.0	9,540
4.0	1,780	9.0	12,400	3.0	1,000	10.0	15,700
				4.0	1,980	12.0	23,900

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,310	1,310	2,140	1,030	3,100	862	2,800	2,160	2,250	1,020	385	1,100
2	1,120	1,170	2,440	985	3,390	841	4,460	2,130	2,290	925	*366	792
3	1,000	3,970	2,850	897	3,030	778	3,630	1,950	2,390	897	361	643
4	912	2,540	2,340	869	2,350	792	3,440	1,740	2,170	897	375	752
5	832	1,770	2,020	876	2,960	841	3,360	1,570	1,920	925	361	3,180
6	776	1,490	1,900	*1,060	3,320	992	2,940	2,740	1,940	962	346	*1,600
7	768	1,290	1,890	1,170	8,880	992	3,060	3,950	1,640	955	332	1,010
8	1,200	1,120	1,730	1,040	4,540	1,270	3,260	2,900	1,410	862	332	785
9	2,830	1,030	1,580	940	3,620	1,020	3,320	2,200	1,410	772	328	655
10	1,710	947	2,920	869	3,340	978	2,280	2,460	1,490	714	328	571
11	6,730	956	6,580	869	*2,810	925	1,980	3,060	1,550	674	328	513
12	7,110	1,470	5,880	834	2,830	897	1,980	3,260	1,490	643	323	470
13	3,250	1,030	3,660	772	3,660	890	2,640	4,340	1,450	662	314	445
14	2,440	920	5,830	740	4,860	918	3,020	3,220	1,390	643	306	430
15	2,890	904	19,700	752	5,790	1,560	2,400	2,420	1,750	625	314	400
16	1,990	753	8,390	752	3,990	*1,230	2,480	3,080	2,590	595	332	380
17	1,610	3,310	4,700	714	2,730	1,140	2,330	3,400	2,510	583	545	361
18	1,360	11,400	3,740	625	2,340	1,200	2,100	2,680	1,760	583	390	342
19	*1,190	7,820	4,770	589	1,940	1,220	2,310	2,470	1,650	577	328	371
20	1,390	*20,800	2,960	625	1,710	1,580	*4,040	7,760	2,970	553	301	480
21	2,620	11,900	2,570	601	2,210	2,340	3,680	4,090	2,310	518	297	370
22	3,120	*13,300	2,200	601	1,720	2,640	2,720	3,060	1,660	486	361	337
23	2,580	16,800	2,000	733	1,480	2,680	2,370	2,480	1,550	460	366	380
24	6,040	10,200	2,130	3,180	1,350	2,640	2,050	2,150	1,570	435	613	690
25	6,070	7,140	2,430	8,520	1,240	2,860	1,970	*2,050	1,430	425	1,640	904
26	3,210	4,450	1,920	7,990	1,090	3,180	1,860	2,290	1,230	415	2,670	589
27	2,310	3,340	1,670	4,900	1,000	2,810	1,800	2,100	*1,120	415	1,460	455
28	2,340	3,140	1,520	3,830	955	3,000	1,920	1,910	1,080	405	918	390
29	2,050	2,830	1,370	10,500	897	3,120	2,000	1,890	1,130	405	2,000	356
30	1,650	2,480	1,290	6,900	------	3,730	2,110	2,740	1,100	400	1,320	328
31	1,430	------	1,170	4,000	------	3,400	------	2,930	------	390	1,460	------
Total	75,638	141,580	108,290	68,763	83,132	53,326	80,310	87,180	52,200	19,821	20,100	20,079
Mean	2,440	4,719	3,493	2,218	2,867	1,720	2,677	2,812	1,740	639	648	669
Cfsm	9.07	17.5	13.0	8.25	10.7	6.39	9.95	10.5	6.47	2.38	2.41	2.49
In.	10.46	19.57	14.97	9.51	11.49	7.37	11.10	12.05	7.22	2.74	2.78	2.78
Ac-ft	150,000	280,800	214,800	136,400	164,900	105,800	159,300	172,900	103,500	39,310	39,870	39,830

Calendar year 1959: Max 20,800 Min 320 Mean 2,630 Cfsm 9.78 In. 132.71 Ac-ft 1,904,000
Water year 1959-60: Max 20,800 Min 297 Mean 2,214 Cfsm 8.23 In. 112.04 Ac-ft 1,607,000

Peak discharge (base, 11,500 cfs).--Oct. 12 (12:30 a.m.) 11,600 cfs (8.71 ft); Nov. 18 (4 a.m.) 14,100 cfs (9.57 ft); Nov. 20 (4 p.m.) 25,500 cfs (12.35 ft); Nov. 23 (1 a.m.) 29,400 cfs (13.15 ft); Dec. 15 (2 p.m.) 25,100 cfs (12.26 ft); Jan. 29 (12 m.) 12,100 cfs (8.89 ft); Feb. 7 (2:30 a.m.) 13,000 cfs (9.17 ft).

* Discharge measurement made on this day.

1685. Pilchuck Creek near Bryant, Wash.

Location.--Lat 48°16'00", long 122°09'45", in NE¼ sec.16, T.32 N., R.5 E., on right bank 500 ft upstream from highway bridge and 2 miles north of Bryant.

Drainage area.--49.7 sq mi.

Records available.--March 1929 to September 1931, June 1950 to September 1951, September 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 119.8 ft above mean sea level (stadia traverse). Prior to Oct. 1, 1931, staff gage at site 100 ft downstream at different datum.

Average discharge.--11 years, 280 cfs (202,700 acre-ft per year).

Extremes.--Maximum discharge during year, 6,030 cfs Nov. 22 (gage height, 7.49 ft), from rating curve extended above 3,900 cfs; minimum, 3.1 cfs Aug. 8-12 (gage height, 1.51 ft). 1929-31, 1950-60: Maximum discharge, 6,240 cfs Dec. 9, 1956 (gage height, 7.60 ft), from rating curve extended above 3,900 cfs; minimum observed, 0.5 cfs Aug. 29 to Sept. 1, 1931 (gage height, 0.90 ft, site and datum then in use).

Remarks.--Records good. No regulation or diversion above station. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1316: 1930-31(M), drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 21				Nov. 22 to Sept. 30			
2.1	80	4.0	1,150	1.5	2.8	3.0	430
2.5	200	5.0	2,160	1.7	13.5	4.0	1,150
3.0	435	6.0	3,510	2.0	52	5.0	2,160
				2.5	196	6.0	3,510

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	152	152	*298	133	468	109	604	178	167	45	3.4	126
2	126	132	380	120	910	97	1,110	167	150	43	3.4	74
3	109	590	430	103	750	90	564	178	140	40	3.4	52
4	96	385	330	97	474	90	414	160	117	34	3.4	128
5	89	241	287	103	584	97	345	140	103	31	3.8	208
6	83	230	236	*208	523	216	284	242	94	29	3.8	117
7	83	162	245	289	1,360	271	280	267	80	26	3.4	*74
8	104	139	220	262	666	380	254	182	72	22	*3.1	58
9	207	120	189	208	597	240	249	153	68	17	3.1	46
10	152	106	590	174	*652	228	182	167	68	12	3.1	37
11	752	216	1,650	160	558	220	216	178	60	11	3.1	31
12	639	441	1,310	146	737	208	312	160	54	9.8	3.1	43
13	293	211	604	129	972	192	564	515	52	9.2	3.4	42
14	244	162	1,250	117	1,270	192	545	267	46	8.5	3.4	40
15	337	155	2,550	117	1,160	*472	552	185	68	8.0	4.2	37
16	207	126	984	126	806	320	673	520	77	7.4	8.0	36
17	165	802	545	120	533	307	558	590	109	6.4	75	34
18	139	1,960	436	103	402	316	468	441	90	6.4	43	33
19	120	1,500	365	94	316	312	617	423	136	5.9	22	31
20	*129	2,950	509	92	271	370	1,190	1,470	444	5.4	14.5	48
21	332	2,270	414	84	436	402	980	509	240	5.0	11	40
22	357	2,860	307	82	312	335	590	370	133	5.0	12.5	34
23	254	2,070	258	118	249	312	452	298	94	5.0	13	69
24	950	1,200	335	662	216	298	355	*245	77	4.2	123	232
25	636	908	463	2,050	189	307	*307	220	70	4.2	373	200
26	327	564	316	2,130	164	294	267	216	66	4.2	343	106
27	271	419	249	1,050	146	236	240	196	58	3.8	183	74
28	396	452	212	752	129	617	228	189	*52	3.8	93	56
29	288	452	185	1,970	117	806	200	167	48	3.8	120	46
30	211	280	171	1,080	------	792	189	204	45	3.4	114	42
31	176	------	150	584	------	892	------	216	------	3.4	183	------
Total	8,404	22,235	16,448	13,463	15,967	10,018	13,789	9,413	3,078	422.8	1,785.1	2,194
Mean	271	741	531	434	551	323	460	304	103	13.6	57.6	73.1
Cfsm	5.45	14.9	10.7	8.73	11.1	6.50	9.26	6.12	2.07	0.274	1.16	1.47
In.	6.29	16.64	12.31	10.07	11.95	7.50	10.32	7.04	2.30	0.32	1.34	1.64
Ac-ft	16,670	44,100	32,620	26,700	31,670	19,870	27,350	18,670	6,110	839	3,540	4,350

Calendar year 1959: Max 2,930 Min 4.6 Mean 372 Cfsm 7.48 In. 101.66 Ac-ft 269,500
Water year 1959-60: Max 2,930 Min 3.1 Mean 320 Cfsm 6.44 In. 87.72 Ac-ft 232,500

Peak discharge (base, 2,500 cfs).--Nov. 18 (12:15 a.m.) 3,080 cfs (5.71 ft); Nov. 20 (1 p.m.) 3,820 cfs (6.20 ft); Nov. 22 (10 p.m.) 6,030 cfs (7.49 ft); Dec. 11 (9 a.m.) 3,070 cfs (5.70 ft); Dec. 14 (10 p.m.) 3,150 cfs (5.76 ft); Jan. 26 (4:30 p.m.) 2,760 cfs (5.48 ft); May 20 (5:30 a.m.) 2,660 cfs (5.40 ft).

* Discharge measurement made on this day.

1706. Skagit River at international boundary, near Hope, British Columbia

(International gaging station)

Location.--Lat 49°00'05", long 121°04'15", on left bank 300 ft upstream from international boundary and 31 miles southeast of Hope.

Drainage area.--381 sq mi.

Records available.--December 1953 to September 1960 (gage heights only).

Gage.--Water-stage recorder. Datum of gage is 1,583.44 ft above mean sea level, U. S. Coast and Geodetic Survey datum of 1929, supplementary adjustment of 1947; 1,582.53 ft above Geodetic Survey of Canada 1959 datum; 1,584.07 ft above city of Seattle 1936 datum; and 1,581.65 ft above city of Seattle Ross Dam datum (by water level transfer in 1955). Prior to Apr. 15, 1955, staff gage at site 300 ft downstream at international boundary at present datum.

Extremes.--Maximum gage height during year, 18.44 ft Aug. 1; minimum recorded, 4.54 ft Jan. 28.
1953-60: Maximum gage height, 18.48 ft Aug. 1, 1959; minimum observed, 1.25 ft Mar. 5, 1955.

Remarks.--No diversion above station. Gage height subject to backwater from Ross Reservoir.

Cooperation.--This station is maintained by Canada under agreement with the United States.

Daily mean gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17.52	10.00	-	5.23	5.14	4.78	-	6.55	7.81	12.43	18.26	12.86
2	17.52	9.70	-	5.13	5.10	4.73	-	6.69	9.05	13.14	18.02	12.46
3	17.55	9.51	-	5.10	5.06	4.69	-	6.77	9.67	13.97	17.91	12.23
4	17.60	9.45	-	5.04	5.03	4.68	-	6.83	9.57	14.98	17.83	12.27
5	17.56	9.26	-	5.05	5.02	4.69	-	6.89	9.08	15.76	17.77	12.49
6	17.35	9.02	-	5.04	5.02	4.70	-	7.13	8.89	16.41	17.83	12.49
7	17.05	8.80	-	5.00	5.23	4.68	-	7.45	8.62	17.09	18.04	12.08
8	16.70	8.71	6.10	4.97	5.37	4.69	-	7.38	8.27	17.47	16.15	11.75
9	16.47	8.60	6.01	4.93	5.34	4.67	-	7.22	8.18	17.64	17.98	11.56
10	16.22	8.22	5.93	4.89	5.30	4.64	-	7.42	8.31	17.64	17.87	11.30
11	16.10	7.95	6.00	4.88	5.26	4.62	-	8.10	8.42	17.75	17.75	11.20
12	16.56	7.61	6.05	4.85	5.25	4.60	7.35	8.72	8.47	17.83	17.58	11.04
13	16.88	7.17	5.92	4.82	5.32	4.60	7.13	8.70	8.44	18.14	17.54	10.75
14	17.15	6.96	5.94	4.78	5.30	4.58	6.99	8.34	8.40	18.38	17.56	10.56
15	17.30	6.81	6.55	4.77	5.36	4.60	6.81	7.83	8.33	18.31	17.49	10.61
16	16.66	-	6.60	4.73	5.32	4.59	6.69	7.71	8.57	18.36	17.16	10.53
17	15.87	-	6.42	4.71	5.27	-	6.58	7.46	8.59	18.35	-	10.50
18	14.82	-	6.29	4.64	5.22	-	6.47	7.21	8.26	18.35	16.70	10.56
19	13.72	-	6.05	4.57	5.17	-	6.41	7.01	8.07	18.36	16.50	10.65
20	12.73	-	6.05	4.55	5.13	-	6.38	7.01	7.91	18.24	16.40	10.82
21	11.65	-	5.95	4.56	5.12	-	6.33	6.92	7.72	18.24	16.45	10.94
22	10.86	-	5.85	4.57	5.08	-	6.28	6.75	7.64	18.07	16.22	10.97
23	10.29	-	5.78	4.56	5.03	-	6.21	6.65	7.79	18.00	15.80	10.87
24	10.32	8.82	5.71	4.58	5.00	-	6.12	6.59	8.25	18.20	15.40	10.89
25	11.35	9.64	5.64	4.58	4.97	-	6.09	6.60	8.70	18.30	15.10	10.95
26	11.58	9.47	5.57	4.60	4.93	-	6.16	6.64	9.04	18.34	14.60	10.99
27	11.21	9.02	5.51	4.56	4.83	-	6.21	6.70	9.57	18.27	14.23	11.11
28	10.47	8.50	5.45	4.55	4.81	-	6.17	6.67	10.14	18.31	14.10	11.24
29	10.20	-	5.38	4.69	4.77	-	6.10	6.75	10.86	18.28	13.98	11.37
30	10.00	-	5.35	5.15	-------	-	6.31	7.00	11.71	18.28	13.62	11.47
31	10.05	-------	5.30	5.22	-------	-	-------	7.47	-------	18.33	13.27	-------

1750. Ross Reservoir near Newhalem, Wash.

(International gaging station)

Location.--Lat 48°44'00", long 121°04'10", in SE¼ sec.35, T.38 N., R.13 E., at Ross Dam on Skagit River, 1 mile downstream from Ruby Creek and 9 miles northeast of Newhalem.

Drainage area.--980 sq mi, approximately.

Records available.--March 1940 to September 1960 (prior to October 1946, month-end elevations and contents only). Prior to October 1945, published as Ruby Reservoir near Newhalem.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (city of Seattle Ross Dam datum); 1.79 ft above mean sea level, U. S. Coast and Geodetic Survey datum of 1929, 1947 adjustment; and 0.88 ft above mean sea level, Geodetic Survey of Canada 1959 datum (by water level transfer of elevation from the international boundary). Prior to Sept. 24, 1940, staff gage on west shore at site just uplake from Ross Dam at same datum. Sept. 24, 1940, to June 28, 1943, water-stage recorder at present site and datum. June 29, 1943, to Apr. 29, 1948, staff gage on right bank at site 500 ft uplake from dam at present datum.

Extremes.--Maximum contents during year, 1,405,300 acre-ft part of each day July 14-21, July 25 to Aug. 1; maximum elevation, 1,600.02 ft July 21; minimum contents, 635,400 acre-ft Mar. 21, 22 (elevation, 1,519.18 ft).
1940-60: Maximum contents observed, 1,406,500 acre-ft Aug. 23, 1954 (elevation, 1,600.10 ft, from plant log); minimum not determined.

Remarks.--Reservoir is formed by concrete dam completed to elevation 1,615 ft in 1949; storage began Mar. 11, 1940. Capacity, 1,202,920 acre-ft between elevations 1,250 (lowest outlet) and 1,582 ft (spillway crest). Dead storage negligible. Water used for power and to supplement low flow of Skagit River through city of Seattle's Diablo and Newhalem powerplants. Figures given herein represent total contents.

Cooperation.--Elevation records collected in cooperation with city of Seattle. This station is maintained by the United States under agreement with Canada.

Capacity table, water year 1959-60 (elevation, in feet, and contents, in acre-feet)
(Prepared by Geological Survey on basis of 15 contour areas furnished by city of Seattle)

1,500	509,240	1,570	1,078,800
1,510	571,110	1,590	1,291,700
1,530	718,200	1,600	1,405,300
1,550	888,320		

Elevation, in feet, at 12 p.m., water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	599.05	590.95	585.35	573.45	550.21	532.73	524.90	532.39	556.18	594.16	599.60	594.12
2	599.03	590.60	584.30	572.72	549.39	531.62	525.40	532.35	558.56	595.01	599.49	593.70
3	599.05	590.56	583.68	572.52	548.76	530.77	526.07	532.49	561.75	596.04	599.42	593.70
4	599.15	590.41	583.21	571.32	548.10	529.63	526.56	532.42	564.39	597.01	599.34	593.80
5	598.94	590.13	583.01	570.48	547.48	529.14	527.04	532.68	566.59	597.62	599.3	594.10
6	598.65	589.84	583.02	569.77	547.48	528.79	527.70	533.38	568.16	598.31	599.5	593.72
7	598.34	589.66	582.49	568.96	547.70	527.47	528.50	534.90	569.52	598.81	599.7	593.29
8	598.02	589.68	581.88	568.05	547.09	526.45	529.55	536.34	570.57	599.17	599.5	593.12
9	597.78	589.16	581.12	567.61	546.64	525.67	530.73	536.77	571.65	599.18	599.4	592.81
10	597.52	588.78	580.65	566.93	546.02	524.86	532.14	537.48	573.01	599.32	599.3	592.65
11	597.85	588.38	580.34	565.87	545.49	523.84	532.52	539.36	574.80	599.33	599.2	592.62
12	598.24	587.72	580.44	564.99	544.86	523.36	532.65	542.54	576.71	599.47	599.0	592.25
13	598.52	587.06	580.29	564.08	544.64	523.05	532.78	544.48	578.10	599.87	599.0	591.93
14	598.77	586.86	579.94	563.12	544.60	522.14	533.18	546.12	579.27	599.95	599.1	592.03
15	598.52	586.50	580.15	562.15	543.78	521.43	533.31	547.54	580.46	599.99	598.8	592.02
16	597.85	585.44	580.14	561.62	543.35	520.69	533.57	547.93	582.00	599.98	598.4	591.86
17	596.80	584.92	579.96	561.20	542.62	520.02	533.93	548.21	583.12	599.94	598.2	591.95
18	595.77	584.66	579.87	560.03	541.93	519.58	533.39	548.90	583.82	599.97	598.0	592.06
19	594.67	584.35	579.76	558.83	541.22	519.32	533.23	548.91	584.54	599.95	597.8	592.22
20	593.56	584.74	579.73	557.80	541.02	519.29	533.27	549.18	584.75	599.80	597.8	592.35
21	592.45	585.00	579.11	556.78	540.72	519.19	533.10	549.84	585.08	599.73	597.8	592.44
22	591.84	585.61	578.52	555.72	540.27	519.45	532.60	550.52	585.72	599.52	597.4	592.28
23	591.29	586.68	577.96	555.23	539.25	519.68	532.74	550.65	586.56	599.69	596.9	592.27
24	592.16	588.32	577.58	554.87	538.20	520.44	532.86	550.71	587.74	599.90	596.7	592.38
25	592.92	589.61	577.48	553.79	537.11	521.30	532.67	550.70	588.86	599.91	596.2	592.41
26	592.71	589.47	577.31	552.82	536.16	522.21	532.37	550.82	589.98	599.92	595.8	592.53
27	592.17	588.83	577.23	551.93	535.46	523.12	531.85	551.18	590.76	599.98	595.5	592.67
28	591.39	587.91	576.35	551.03	535.13	524.16	531.58	552.02	591.56	599.82	595.5	592.79
29	591.16	587.38	575.42	550.54	533.66	525.05	531.30	552.87	592.52	599.80	595.2	592.91
30	591.17	586.40	574.56	550.69	-------	524.88	531.72	553.86	593.43	599.75	594.8	593.05
31	591.22	-------	573.72	550.80	-------	524.75	-------	555.05	-------	599.98	594.5	-------
(†)	1,305	1,251.9	1,116.7	895.5	748.2	677.4	731.9	933.7	1,329.7	1,405.3	1,342.7	1,325.8
(‡)	-88,700	-53,100	-135,200	-221,200	-147,300	-70,800	+54,500	+201,800	+396,000	+75,600	-63,10	-16,400

Calendar year 1959..... ‡ -51,300
Water year 1959-60..... ‡ -67,900

† Total contents, in thousands of acre-feet, at end of month.
‡ Change in contents, in acre-feet.
Note.--Add 1,000.00 ft to obtain elevation above mean sea level.

1754. Thunder Creek below McAllister Creek, near Newhalem, Wash.

Location.--Lat 48°38', long 121°03', in SE¼ sec.1, T.36 N., R.13 E. (unsurveyed), on right bank a quarter of a mile downstream from McAllister Creek, 4 miles upstream from mouth, and 10 miles east of Newhalem.

Drainage area.--96 sq mi, approximately.

Records available.--October 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,700 ft (from river-profile map). Prior to Mar. 22, 1959, at datum 0.99 ft higher.

Extremes.--Maximum discharge during year, 4,320 cfs Nov. 23 (gage height, 9.50 ft, from high-water mark in well), from rating curve extended above 2,300 cfs by logarithmic plotting; minimum, 82 cfs Mar. 14 (gage height, 0.73 ft).
1957-60: Maximum discharge, that of Nov. 23, 1959; minimum, that of Mar. 14, 1960.

Remarks.--Records excellent except those for periods of no gage-height record, which are good. No regulation or diversion above station.

Revisions (water years).--WSP 1636: 1958.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

0.7	79	6.0	2,010
1.2	139	8.0	3,250
2.0	295	10.0	4,720
4.0	1,030		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	459	466	*a470	146	219	100	*260	462	1,200	1,260	1,380	526
2	562	421	448	139	200	98	282	494	*2,260	1,150	1,230	452
3	532	498	421	138	184	94	361	470	2,400	1,190	1,290	512
4	470	400	361	135	172	94	430	436	1,860	1,340	1,170	786
5	412	358	331	131	167	94	490	448	1,470	1,520	1,070	834
6	364	352	310	128	184	93	508	658	1,540	1.740	1,110	529
7	322	313	290	125	288	92	618	826	1,150	1,830	1,200	439
8	433	298	268	122	260	91	782	658	1,000	1,570	1,290	400
9	*456	290	252	122	229	89	826	590	1,080	1,280	1,340	397
10	355	272	245	122	211	89	630	782	1,270	1,140	1,420	478
11	1,190	272	268	122	194	87	515	1,240	1,420	1.100	1,390	570
12	1,220	258	262	121	191	84	445	1,640	1,380	1,190	1,110	702
13	826	217	239	120	180	83	403	1,140	1,400	1,450	882	770
14	1,360	229	310	*120	184	82	370	794	1,320	*1,520	718	770
15	1,540	225	738	120	192	84	334	658	1,340	1,440	650	638
16	854	223	594	116	191	85	301	650	1,940	1,500	642	543
17	654	223	459	112	185	84	280	550	1,320	1,640	882	487
18	582	a500	391	106	165	83	265	494	978	1,830	970	484
19	501	a470	340	101	154	85	252	466	862	1,770	906	698
20	480	a1,020	307	104	148	102	260	554	738	1,560	774	590
21	456	a950	280	102	144	162	255	487	658	1.370	698	436
22	1,140	a1,400	255	101	136	223	248	433	694	1,200	566	397
23	806	a4,000	239	100	131	255	252	406	1,070	1,020	494	462
24	1,930	a3,300	227	100	128	280	243	406	1,580	906	462	566
25	1,650	a2,000	217	112	121	340	237	430	a1,200	934	*466	630
26	986	a1,200	200	115	111	418	235	470	a1,000	1,150	442	476
27	738	a900	189	107	*106	378	243	484	a1,100	1,380	385	433
28	*626	a750	180	111	105	352	*265	462	1,220	1,480	427	*415
29	529	a600	172	338	102	322	307	529	1,450	1,630	778	418
30	473	a500	160	361	------	301	385	874	1,460	1,500	634	445
31	484	------	154	250	------	280	------	1,140	------	1,460	698	------
Total	23,390	22,905	9,577	4,247	4,982	5,105	11,282	20,131	39,360	43.050	27,474	16,281
Mean	755	764	309	137	172	165	376	649	1,312	1.389	886	543
Cfsm	7.86	7.96	3.22	1.43	1.79	1.72	3.92	6.76	13.7	14.5	9.23	5.66
In.	9.06	8.87	3.71	1.65	1.93	1.98	4.37	7.80	15.25	16.68	10.64	6.31
Ac-ft	46,390	45,430	19,000	8,420	9,880	10,130	22,380	39,930	78,070	85.390	54,490	32,290

Calendar year 1959: Max 4,000 Min 100 Mean 681 Cfsm 7.09 In. 96.30 Ac-ft 493,100
Water year 1959-60: Max 4,000 Min 82 Mean 622 Cfsm 6.48 In. 88.25 Ac-ft 451,800

Peak discharge (base, 2,200 cfs).--Oct. 14 (9 p.m.) 2,770 cfs (7.27 ft); Oct. 24 (7 p.m.) 3,520 cfs (8.39 ft); Nov. 23 (time unknown) 4,320 cfs (9.50 ft); June 3 (7:30 p.m.) 2,550 cfs (6.90 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement, high-water mark in well, and records for station near Newhalem.

1755. Thunder Creek near Newhalem, Wash.

Location.--Lat 48°40'20", long 121°04'20", in SE¼ sec.23, T.37 N., R.13 E. (unsurveyed), on right bank half a mile upstream from high-water line of Diablo Reservoir at elevation 1,205 ft, 8 miles east of Newhalem, and 20 miles northeast of Marblemount.

Drainage area.--110 sq mi, approximately.

Records available.--October 1930 to September 1960. Published as "above Colonial Creek, near Marblemount" 1930-31.

Gage.--Water-stage recorder. Altitude of gage is 1,220 ft (from river-profile map).

Average discharge.--30 years, 620 cfs (448,900 acre-ft per year).

Extremes.--Maximum discharge during year, 5,880 cfs Nov. 23 (gage height, 9.91 ft); minimum, 100 cfs Mar. 13, 14, 18 (gage height, 2.00 ft).
1930-60: Maximum discharge, 10,800 cfs Oct. 25, 1955 (gage height, 12.68 ft), from rating curve extended above 2,900 cfs on basis of logarithmic plotting; minimum not determined, probably less than 50 cfs during periods of ice effect or no gage-height record in February 1936.

Remarks.--Records excellent. No regulation or diversion above station.

Revisions (water years).--WSP 1012: 1943. WSP 1286: 1931(M), 1932, 1933(M), 1935(M), 1938-39(M), 1941-42(M), 1944-46(M), 1950(M), 1952 (annual runoff in acre-feet). WSP 1566: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 26				Mar. 27 to Sept. 30	
2.0	100	5.0	1,050	2.9	276
2.5	175	7.0	2,450	4.0	610
3.0	275	9.0	4,610	6.0	1,690
4.0	595			8.0	3,410

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	492	506	485	175	249	120	320	522	1,230	1,350	1,470	540
2	595	450	*524	172	228	117	*345	550	*2,450	1,220	1,300	452
3	567	534	478	166	212	113	422	526	2,680	1,260	1,340	512
4	507	426	396	161	197	113	505	498	2,060	1,420	1,240	796
5	426	377	359	160	193	113	564	505	1,580	1,620	1,140	852
6	374	353	336	156	202	113	586	698	1,660	1,880	1,180	536
7	331	328	315	153	331	112	686	895	1,260	1,990	1,280	437
8	464	317	287	148	294	110	845	726	1,080	1,680	1,369	392
9	*474	304	275	144	253	108	905	650	1,160	1,390	1,410	392
10	359	285	271	140	232	108	706	806	1,360	1,260	1,480	467
11	1,340	282	299	139	212	105	596	1,280	1,520	1,200	1,470	572
12	1,450	271	292	136	210	101	526	1,750	1,460	1,280	1,180	702
13	900	232	262	133	204	100	491	1,220	1,490	*1,560	945	774
14	1,620	245	370	132	206	100	446	865	1,400	1,620	734	774
15	1,630	228	905	*132	216	104	398	722	1,420	1,540	670	638
16	945	216	707	128	210	101	365	714	2,210	1,600	662	558
17	728	275	530	126	208	101	342	622	1,440	1,760	915	488
18	659	530	446	120	186	100	320	561	1,060	1,960	1,020	484
19	567	513	380	117	172	104	300	522	940	1,890	955	693
20	530	1,120	350	119	165	121	318	618	794	1,680	794	582
21	510	1,000	317	116	156	172	312	550	706	1,460	714	434
22	1,220	1,490	289	114	152	226	302	491	758	1,290	596	389
23	850	4,220	273	114	145	262	308	455	1,100	1,070	*508	464
24	2,150	3,510	262	119	140	292	300	449	1,480	960	470	547
25	1,790	2,120	249	132	136	353	293	474	1,310	995	480	638
26	1,040	1,270	230	132	128	454	288	516	1,080	1,210	449	470
27	800	945	226	127	*126	434	293	526	1,150	1,440	386	428
28	687	769	214	130	124	404	*308	508	1,280	1,560	423	410
29	*583	639	206	336	123	374	325	582	1,530	1,740	790	*416
30	513	548	199	415	------	359	431	905	1,580	1,600	638	446
31	527	------	189	289	------	345	------	1,180	------	1,540	706	------
Total	25,628	24,303	10,921	4,881	5,610	5,839	13,146	21,886	42,208	46,025	28,705	16,283
Mean	827	810	352	157	193	188	438	706	1,407	1,485	926	543
Cfsm	7.52	7.36	3.20	1.43	1.75	1.71	3.98	6.42	12.8	13.5	8.42	4.94
In.	8.66	8.22	3.69	1.65	1.90	1.97	4.44	7.40	14.27	15.56	9.70	5.51
Ac-ft	50,830	48,200	21,660	9,680	11,130	11,580	26,070	43,410	83,720	91,290	56,940	32,300

Calendar year 1959: Max 4,220 Min 128 Mean 742 Cfsm 6.75 In. 91.53 Ac-ft 537,000
Water year 1959-60: Max 4,220 Min 100 Mean 671 Cfsm 6.10 In. 82.97 Ac-ft 486,800

Peak discharge (base, 2,400 cfs).--Oct. 14 (8:30 p.m.) 3,140 cfs (7.74 ft); Oct. 24 (7 p.m.) 4,140 cfs (8.63 ft); Nov. 23 (5:30 a.m.) 5,880 cfs (9.91 ft); June 3 (8 p.m.) 2,860 cfs (7.46 ft); June 16 (9 a.m.) 2,490 cfs (7.04 ft).

* Discharge measurement made on this day.

1775. Stetattle Creek near Newhalem, Wash.

Location.--Lat 48°43'30", long 121°09'20", in NE¼ sec.6, T.37 N., R.13 E., on left bank three-quarters of a mile upstream from mouth, 5½ miles northeast of Newhalem, and 18½ miles northeast of Marblemount.

Drainage area.--21.4 sq mi.

Records available.--December 1913 to November 1915 (fragmentary), September 1933 to September 1960. Published as "near Marblemount" 1913-15.

Gage.--Water-stage recorder. Altitude of gage is 925 ft (by barometer). Dec. 19, 1913, to Nov. 14, 1915, staff gage at site about half a mile downstream at different datum. Sept. 7 to Oct. 20, 1933, staff gage and Oct. 21, 1933, to Aug. 26, 1937, water-stage recorder, at site 750 ft (revised) upstream at datum 1.69 ft higher. Aug. 27, 1937, to Nov. 20, 1957, water-stage recorder at site 600 ft upstream at same datum.

Average discharge.--27 years (1933-60), 179 cfs (129,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,690 cfs Nov. 24 (gage height, 4.50 ft); minimum, 24 cfs Jan. 22, 23 (gage height, 0.96 ft).
1913-15, 1933-60: Maximum discharge, 8,580 cfs Nov. 26, 1949 (gage height, 9.70 ft), from rating curve extended above 1,600 cfs on basis of slope-area measurement of peak flow; minimum, 9 cfs Nov. 9-11, 1936.

Remarks.--Records good. No regulation or diversion above station.

Revisions (water years).--WSP 1316: 1935(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 23				Nov. 24 to Sept. 30			
1.3	52	2.5	390	0.9	20	2.5	390
1.6	97	3.0	650	1.2	45	3.0	650
2.0	191	4.0	1,300	1.6	105	4.0	1,300
				2.0	195		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	123	127	111	44	165	33	148	288	*545	332	178	117
2	118	140	168	42	139	33	190	260	830	292	158	87
3	112	223	*145	41	121	31	322	213	782	336	165	84
4	106	148	117	39	105	30	386	188	490	410	148	177
5	94	120	105	38	101	30	381	212	450	425	137	282
6	85	106	94	37	128	31	345	244	460	470	145	131
7	77	95	85	35	264	35	425	480	284	490	150	96
8	271	90	77	34	175	37	510	288	280	372	150	79
9	216	87	71	33	135	36	470	260	376	296	150	70
10	153	78	84	33	117	37	264	440	445	294	152	70
11	822	76	178	33	101	33	204	650	475	256	152	77
12	555	71	165	33	115	31	168	728	440	*292	131	85
13	321	61	127	*33	127	30	158	430	405	350	109	89
14	608	61	233	33	119	31	155	284	400	336	89	85
15	372	57	505	33	125	46	133	225	530	300	81	76
16	227	52	284	32	105	40	117	236	912	304	93	65
17	171	104	185	30	89	35	111	192	420	318	129	60
18	146	348	152	28	77	37	101	162	272	336	117	56
19	127	279	133	26	70	44	105	158	260	332	107	126
20	146	644	127	26	64	80	129	256	201	276	87	85
21	185	460	115	26	64	141	126	192	178	253	96	61
22	471	596	100	25	58	180	119	158	252	201	84	55
23	376	1,130	91	25	53	210	113	148	444	165	*77	77
24	988	1,240	85	33	50	225	103	148	490	145	70	94
25	614	640	81	77	45	284	105	172	358	132	106	82
26	330	314	71	87	*41	340	107	210	292	175	100	67
27	*223	210	65	76	39	256	115	210	332	198	91	*61
28	194	168	61	92	37	*228	141	190	400	210	113	51
29	156	143	57	500	36	216	*201	246	475	225	175	51
30	131	121	60	438	------	216	256	540	415	219	162	53
31	146	------	50	228	------	178	------	505	------	198	187	------
Total	8,664	7,989	3,982	2,290	2,865	3,214	6,208	8,913	12,893	8,878	3,889	2,649
Mean	279	266	128	73.9	98.8	104	207	288	430	287	125	88.3
Cfsm	13.0	12.4	5.98	3.45	4.62	4.86	9.67	13.5	20.1	13.4	5.84	4.13
In.	15.06	13.88	6.92	3.98	4.98	5.59	10.79	15.49	22.41	15.46	6.76	4.60
Ac-ft	17,180	15,850	7,900	4,540	5,680	6,370	12,310	17,680	25,570	17,630	7,710	5,250

Calendar year 1959: Max 1,320 Min 36 Mean 241 Cfsm 11.3 In. 152.63 Ac-ft 174,200
Water year 1959-60: Max 1,240 Min 25 Mean 198 Cfsm 9.25 In. 125.92 Ac-ft 143,700

Peak discharge (base, 1,100 cfs).--Oct. 11 (3 p.m.) 1,250 cfs (3.93 ft); Oct. 14 (3 p.m.) 1,280 cfs (3.97 ft); Oct. 24 (1:30 p.m.) 1,430 cfs (4.18 ft); Nov. 23 (5 a.m.) 1,470 cfs (4.22 ft); Nov. 24 (4:30 p.m.) 1,690 cfs (4.50 ft); June 16 (5 a.m.) 1,280 cfs (3.97 ft).

* Discharge measurement made on this day.

1780. Skagit River at Newhalem, Wash.

Location.--Lat 48°40'20", long 121°14'45", in SE¼ sec.21, T.37 N., R.12 E., on right bank a quarter of a mile upstream from Newhalem Creek, half a mile downstream from city of Seattle powerplant at Newhalem, 11 miles upstream from Bacon Creek, and 13 miles northeast of Marblemount.

Drainage area.--1,160 sq mi, approximately, of which 400 sq mi is in Canada.

Records available.--October 1908 to May 1914 and October 1920 to September 1960 in reports of Geological Survey. October 1908 to September 1953 (monthly discharge only) in State Water-Supply Bulletin 6. Published as "near Marblemount" 1908-14, 1920-31.

Gage.--Water-stage recorder. Datum of gage is 401.5 ft above mean sea level (river-profile survey). Prior to May 24, 1914, staff gages at site half a mile upstream at datum 91 ft higher. Nov. 15, 1920, to June 4, 1923, staff gage at site 500 ft upstream at same datum.

Average discharge.--52 years (1908-60), 4,430 cfs (3,207,000 acre-ft per year), adjusted for storage in Diablo Reservoir since October 1929, Ross Reservoir since March 1940, and Gorge Reservoir since June 1960.

Extremes.--Maximum discharge during year, 15,000 cfs Nov. 23 (gage height, 87.50 ft); minimum, 486 cfs July 16 (gage height, 79.72 ft); minimum daily, 1,150 cfs Sept. 29.
1908-14, 1920-60: Maximum discharge, 63,500 cfs Nov. 29, 1909 (gage height, 22.0 ft, from floodmark, site and datum then in use); minimum, 54 cfs Nov. 1, 1943 (gage height, 78.15 ft); minimum daily, 136 cfs Aug. 24, 1930.

Remarks.--Records excellent. Water is diverted 3 miles above station and is returned to river at Seattle powerplant just above station. Flow regulated for power at Gorge Dam since August 1924 and by Diablo, Ross, and Gorge Reservoirs (see p. 163,149,163), having a combined capacity of 1,280,000 acre-ft.

Cooperation.--Gage-height record collected in cooperation with city of Seattle.

Revisions (water years).--WSP 512: 1909-14. WSP 1012: 1929. WSP 1316: 1914(M).

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,060	4,990	10,400	4,650	5,560	5,260	4,890	3,400	5,180	5,830	4,710	4,510
2	3,740	5,200	8,880	3,890	5,370	5,540	4,030	4,540	6,420	3,670	4,940	4,900
3	2,820	5,080	*7,560	4,770	5,350	5,590	2,450	4,950	*7,490	3,090	4,620	2,660
4	2,800	5,390	6,230	5,320	5,190	5,820	3,900	5,250	5,600	2,430	4,760	1,980
5	3,880	5,650	5,370	6,600	5,060	4,980	4,320	5,060	4,070	5,300	4,600	2,550
6	4,200	5,170	5,760	6,540	4,030	3,510	5,120	4,980	5,440	7,480	2,650	3,530
7	4,190	3,840	5,840	6,000	3,410	4,210	5,160	3,650	5,810	7,910	2,280	4,450
8	5,180	3,250	6,260	5,880	4,980	4,820	5,210	4,160	5,970	8,190	2,750	4,920
9	5,080	5,320	5,630	5,380	5,250	4,810	4,990	4,210	5,050	8,870	5,620	4,140
10	5,200	5,820	5,550	2,560	5,140	5,050	4,670	5,210	5,180	6,160	1,560	2,770
11	5,350	5,370	5,920	6,580	5,240	4,690	4,460	4,870	4,740	7,560	4,780	2,360
12	5,210	5,440	5,090	6,530	4,960	4,040	4,970	5,430	3,810	*3,090	5,480	4,280
13	6,120	5,460	4,350	6,520	4,080	3,720	5,020	5,080	5,510	5,220	2,810	4,190
14	6,440	5,210	5,840	5,880	3,330	4,720	5,040	4,660	6,230	7,260	2,540	2,300
15	10,000	4,520	7,040	5,630	5,070	4,080	5,000	3,150	5,880	9,420	4,760	2,050
16	11,200	5,280	7,040	4,990	4,860	4,420	4,470	4,120	7,110	*5,960	3,650	1,490
17	10,800	5,950	6,180	4,060	4,780	3,080	2,840	5,080	5,700	5,570	4,690	1,700
18	10,900	5,790	5,910	5,300	5,260	2,440	4,040	5,270	6,540	8,740	4,230	1,190
19	10,900	5,910	3,870	6,190	5,340	1,230	4,990	5,310	5,940	8,580	4,630	1,950
20	10,500	6,230	3,780	6,610	4,590	1,420	5,210	5,330	5,830	8,630	2,800	1,650
21	10,300	5,890	5,640	6,450	2,890	2,790	4,920	5,180	4,580	8,080	2,620	1,390
22	10,200	6,000	5,970	6,500	4,170	3,430	5,010	3,760	3,660	6,030	4,450	1,210
23	7,030	10,000	5,990	4,860	4,910	2,120	4,160	5,000	4,010	3,530	4,570	1,380
24	6,490	10,600	4,820	3,700	5,440	1,570	2,820	4,620	4,550	1,320	5,260	1,170
25	8,640	10,400	2,950	5,090	5,340	1,640	4,500	4,690	4,080	3,920	4,670	1,260
26	9,400	10,900	3,610	6,030	*5,460	1,580	4,320	5,230	3,770	4,690	4,050	1,420
27	9,400	11,000	3,580	5,480	5,100	2,100	3,870	3,830	4,970	6,620	2,780	*1,270
28	9,130	10,500	5,420	5,630	4,660	*2,960	4,260	2,870	5,080	4,750	2,550	1,230
29	4,890	10,200	6,270	6,320	4,840	2,410	4,600	2,050	5,510	5,240	5,360	1,150
30	*5,180	10,500	6,570	4,610	-------	3,970	4,450	3,500	5,610	6,660	5,430	1,220
31	5,230	-------	6,500	3,250	-------	4,000	-------	4,910	-------	6,380	5,040	-------
Total	214,460	200,860	179,720	167,800	139,660	111,980	133,690	139,350	159,320	186,180	131,640	72,270
Mean	6,918	6,695	5,797	5,413	4,816	3,612	4,456	4,495	5,311	6,006	4,246	2,409
Ac-ft	425,400	398,400	356,500	332,800	277,000	222,100	265,200	276,400	316,000	369,300	261,100	143,300
(†)	-88,780	-53,100	-132,100	-224,400	-142,700	-70,610	+49,530	+196,600	+397,500	+76,720	-55,500	-20,460

Adjusted for change in reservoir contents

Mean Cfsm	5,474	5,803	3,650	1,765	2,335	2,464	5,289	7,693	11,990	7,253	3,344	2,064
In.												
Ac-ft	336,600	345,300	224,400	108,400	134,300	151,500	314,700	473,000	713,500	446,000	205,600	122,800

Observed

Calendar year 1959:	Max 11,500	Min 2,080	Mean 5,924	Ac-ft 4,289,000		
Water year 1959-60:	Max 11,200	Min 1,150	Mean 5,019	Ac-ft 3,644,000		

Adjusted

Calendar year 1959:	Mean 5,855	Cfsm	In.	Ac-ft 4,239,000		
Water year 1959-60:	Mean 4,927	Cfsm	In.	Ac-ft 3,577,000		

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Ross, Diablo, and Gorge Reservoirs.

1790. Skagit River above Alma Creek, near Marblemount, Wash.

Location.--Lat 48°36'25", long 121°21'35", in NE¼ sec.15, T.36 N., R.11 E., on right bank three-quarters of a mile upstream from Alma Creek and 7 miles north of Marblemount.

Drainage area.--1,260 sq mi, approximately, of which 400 sq mi is in Canada.

Records available.--October 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 358.8 ft above mean sea level (river-profile survey).

Average discharge.--10 years, 5,747 cfs (4,161,000 acre-ft per year).

Extremes.--Maximum discharge during year, 20,100 cfs Nov. 23 (gage height, 12.32 ft); minimum, 1,400 cfs Mar. 19 (gage height, 4.80 ft); minimum daily, 1,430 cfs Sept. 29.
1950-60: Maximum discharge, 29,400 cfs Oct. 25, 1955 (gage height, 14.64 ft); minimum, 990 cfs Dec. 29, 1957 (gage height, 4.55 ft); minimum daily, 1,360 cfs Mar. 18, 1956.

Remarks.--Records excellent. All diversions returned to river above gage. Flow partly regulated by powerplants on upper Skagit River and by Ross, Diablo, and Gorge Reservoirs (see p. 149, 163). Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22		Nov. 23 to Sept. 30	
6.2	3,150	4.8	1,400
7.0	4,600	5.5	2,150
9.0	9,700	7.0	4,900
11.0	15,600	9.0	9,700
		12.0	19,000

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,670	5,400	11,900	5,380	6,510	5,590	5,770	4,450	*7,210	6,910	5,190	4,850
2	4,340	5,580	9,950	4,180	6,220	5,840	4,960	5,590	9,420	4,830	5,480	5,170
3	3,430	5,920	8,700	5,180	6,080	5,860	3,710	6,150	10,100	4,220	5,200	3,110
4	3,160	5,920	*7,220	5,640	5,880	6,120	5,140	6,250	7,610	3,890	5,310	2,530
5	4,220	6,180	6,260	7,020	5,700	5,260	5,580	5,950	5,580	6,700	5,110	3,530
6	4,300	3,880	6,470	6,960	5,030	3,960	6,500	6,400	7,190	9,080	3,180	4,000
7	4,510	4,260	6,590	6,520	5,230	4,470	6,680	5,620	6,550	9,500	2,840	4,700
8	5,940	3,650	6,920	6,260	6,120	5,130	6,950	5,650	7,180	9,450	5,050	5,140
9	5,840	5,490	6,300	5,820	6,220	5,070	6,750	5,180	6,040	9,920	6,020	4,590
10	5,700	6,010	6,080	2,720	5,980	5,240	5,820	6,670	6,580	7,450	6,000	2,930
11	8,000	5,580	7,070	6,840	5,980	5,040	5,410	7,040	6,260	8,440	5,190	2,710
12	7,270	5,610	6,090	6,890	5,750	4,320	5,880	8,200	5,250	*4,210	5,840	4,480
13	7,000	5,580	5,190	*6,860	4,940	4,130	5,920	7,080	7,070	6,250	3,280	4,370
14	8,220	5,380	7,070	6,220	4,060	4,950	5,950	6,180	7,560	5,880	2,800	2,910
15	11,400	4,680	9,500	5,930	5,860	4,510	5,820	4,390	7,440	8,050	4,900	2,380
16	12,800	5,450	7,920	5,240	5,560	4,650	5,280	5,250	9,960	*7,240	3,890	1,840
17	12,200	6,260	7,420	4,400	5,470	3,580	3,550	6,150	7,300	6,700	4,930	1,940
18	12,200	7,080	7,220	5,510	5,890	2,810	4,660	6,180	7,690	9,950	4,480	1,500
19	12,100	6,950	4,920	6,320	5,870	1,600	5,620	6,220	7,110	9,700	4,890	2,270
20	11,900	9,000	4,730	6,880	5,160	1,770	5,980	6,750	6,570	9,620	3,110	2,000
21	11,600	8,000	6,450	6,830	3,550	3,400	5,660	6,300	5,790	9,100	2,920	1,680
22	12,200	8,690	6,780	6,740	4,560	3,940	5,470	4,810	4,460	7,090	4,540	1,520
23	8,520	15,800	6,690	5,210	5,330	3,190	4,820	5,950	5,260	4,350	4,670	1,700
24	9,330	18,300	5,700	4,220	5,800	2,340	3,530	5,440	5,900	2,080	5,340	1,630
25	11,100	13,900	3,630	5,600	5,730	2,500	5,080	5,590	5,320	4,340	4,950	1,640
26	11,000	13,200	4,020	6,750	5,820	2,630	4,970	6,150	4,700	5,180	4,440	1,740
27	*10,800	12,600	4,190	6,100	5,510	2,930	4,850	4,980	5,930	7,300	3,130	*1,560
28	11,000	12,000	5,610	6,260	5,080	*4,140	4,950	4,070	6,300	5,480	2,950	1,500
29	5,610	11,500	6,750	8,250	*5,080	3,370	*5,430	3,130	6,860	5,990	5,670	*1,430
30	5,650	11,700	7,090	6,550	-------	4,810	5,480	4,960	7,140	7,300	6,020	1,500
31	5,720	-------	6,980	4,420	-------	4,820	-------	6,980	-------	6,950	5,560	-------
Total	251,730	239,550	207,410	183,700	159,970	127,970	162,170	179,710	203,330	213,150	142,890	82,850
Mean	8,120	7,985	6,691	5,926	5,516	4,128	5,406	5,797	6,778	6,876	4,609	2,762
Ac-ft	499,300	475,100	411,400	364,400	317,300	253,800	321,700	356,400	403,300	422,800	283,400	164,300

Calendar year 1959: Max 18,300 Min 2,400 Mean 6,906 Ac-ft 5,000,000
Water year 1959-60: Max 18,300 Min 1,430 Mean 5,886 Ac-ft 4,273,000

* Discharge measurement made on this day.

1825. Cascade River at Marblemount, Wash.

Location.--Lat 48°31'25", long 121°23'00", in N½ sec.16, T.35 N., R.11 E., on right bank 1½ miles downstream from Boulder Creek, 2 miles east of Marblemount, and 2½ miles upstream from mouth.

Drainage area.--171 sq mi.

Records available.--September 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 380.3 ft above mean sea level (river-profile survey). Prior to Oct. 10, 1928, staff gage at same site at datum 0.76 ft higher.

Average discharge.--32 years, 1,017 cfs (736,300 acre-ft per year).

Extremes.--Maximum discharge during year, 10,600 cfs Nov. 23 (gage height, 8.90 ft), from rating curve extended above 5,600 cfs by logarithmic plotting; minimum, 272 cfs Jan. 23 (gage height, 1.84 ft).
1928-60: Maximum discharge, 17,800 cfs Nov. 27, 1949 (gage height, 11.47 ft), from rating curve extended above 5,000 cfs by logarithmic plotting; minimum, 118 cfs Nov. 30, 1952; minimum gage height, 1.11 ft Feb. 8, 1937.

Remarks.--Records excellent. No regulation or diversion above station. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 832: 1936. WSP 1286: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22				Nov. 23 to Sept. 30			
2.4	455	5.0	2,350	1.8	260	5.0	2,270
3.0	725	6.0	3,800	2.3	415	6.0	3,690
4.0	1,350	7.0	5,730	3.0	715	8.0	8,090
				4.0	1,350		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,050	934	1,060	446	892	353	850	1,150	2,100	1,960	1,330	782
2	1,040	869	1,140	443	792	344	982	1,190	3,910	1,720	1,160	645
3	940	1,070	1,100	426	705	332	1,160	1,140	3,870	1,830	1,260	602
4	836	940	946	415	625	332	1,340	1,050	3,010	2,130	1,180	984
5	760	830	880	408	615	326	1,420	988	2,470	2,390	1,040	1,530
6	689	775	832	404	728	335	1,410	1,450	2,540	2,720	1,040	976
7	640	725	792	394	1,500	329	1,650	2,030	1,910	2,720	1,120	745
8	1,010	684	730	374	1,060	329	1,940	1,550	1,680	2,260	1,170	620
9	1,180	658	690	371	880	323	1,860	1,360	1,900	1,930	1,190	570
10	880	626	710	382	798	320	1,430	1,720	2,230	1,770	1,180	584
11	3,410	622	922	356	705	314	1,200	2,500	2,390	1,660	1,160	606
12	3,700	626	934	*344	715	305	1,090	3,080	2,290	1,700	1,000	655
13	2,020	545	814	334	745	305	1,050	2,260	2,280	1,940	844	700
14	2,420	540	1,150	323	750	308	1,020	1,750	2,230	1,950	720	695
15	2,390	514	3,140	320	868	320	916	1,450	2,350	*1,890	660	630
16	1,560	464	2,000	317	755	314	826	1,530	3,600	1,910	695	570
17	1,280	737	1,460	311	670	311	798	1,350	2,400	2,010	952	530
18	1,100	2,020	1,240	293	606	320	745	1,200	1,780	2,160	850	490
19	970	1,820	1,100	287	562	350	720	1,130	1,610	2,050	832	610
20	946	4,000	1,020	284	530	458	856	1,600	1,480	1,830	715	570
21	934	3,570	916	281	526	690	856	1,430	1,330	1,640	680	474
22	2,080	3,860	826	278	486	856	809	1,240	1,280	1,450	640	443
23	1,430	2,980	765	272	462	916	798	1,120	1,840	1,260	588	518
24	3,290	6,060	710	353	443	940	755	1,070	2,230	1,150	*554	554
25	2,880	3,980	680	470	415	1,070	730	1,120	2,020	1,140	625	635
26	*1,760	2,460	625	574	390	1,220	715	1,200	1,650	1,310	725	490
27	1,380	1,880	597	522	374	1,080	740	1,200	1,800	1,440	630	478
28	1,260	1,580	562	510	*365	*1,010	787	1,130	2,030	1,500	596	450
29	1,100	1,350	538	1,640	359	952	*898	1,260	2,260	1,570	1,200	*450
30	982	*1,170	522	1,690	------	958	1,050	1,750	2,280	1,450	892	454
31	982	------	486	1,120	------	922	------	*2,190	------	1,360	964	------
Total	46,879	53,909	29,887	14,922	19,321	17,242	31,401	46,188	66,750	55,800	28,192	19,040
Mean	1,512	1,797	964	481	666	556	1,047	1,490	2,225	1,800	909	635
Cfsm	8.84	10.5	5.64	2.81	3.89	3.25	6.12	8.71	13.0	10.5	5.32	3.71
In.	10.20	11.72	6.50	3.25	4.20	3.75	6.83	10.05	14.52	12.14	6.13	4.14
Ac-ft	92,980	106,900	59,280	29,600	38,320	34,200	62,280	91,610	132,400	110,700	55,900	37,770

Calendar year 1959: Max 7,980 Min 312 Mean 1,379 Cfsm 8.06 In. 109.45 Ac-ft 998,100
Water year 1959-60: Max 7,980 Min 272 Mean 1,174 Cfsm 6.87 In. 93.43 Ac-ft 852,000

Peak discharge (base, 3,600 cfs).--Oct. 11 (10 p.m.) 5,730 cfs (7.00 ft); Oct. 14 (9:30 p.m.) 4,700 cfs (6.50 ft); Oct. 22 (11 a.m.) 3,730 cfs (5.96 ft); Oct. 24 (8:30 p.m.) 6,530 cfs (7.36 ft); Nov. 20 (3 p.m.) 5,230 cfs (6.76 ft); Nov. 23 (4 a.m.) 10,600 cfs (8.90 ft); Dec. 15 (10:30 a.m.) 4,050 cfs (6.20 ft); June 2 (8 a.m.) 4,240 cfs (6.30 ft); June 16 (1:30 p.m.) 4,030 cfs (6.19 ft).

* Discharge measurement made on this day.

1860. Sauk River above Whitechuck River, near Darrington, Wash.

Location.--Lat 48°10'00", long 121°27'45", in NW¼ sec.24, T.31 N., R.10 E., on right bank half a mile upstream from Whitechuck River and 9½ miles southeast of Darrington.

Drainage area.--152 sq mi.

Records available.--August to November 1910 (fragmentary gage heights only), October 1917 to September 1922, August 1928 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 930 ft (from river-profile map). Prior to Nov. 18, 1910, staff gage three-eighths of a mile downstream at different datum.

Average discharge.--37 years (1917-22, 1928-60), 1,136 cfs (822,400 acre-ft per year).

Extremes.--Maximum discharge during year, 14,700 cfs Dec. 15 (gage height, 9.95 ft); minimum, 231 cfs Sept. 22, 23; minimum gage height, 2.26 ft Sept. 22, 23, 30.
1917-22, 1928-60: Maximum discharge, 30,200 cfs Nov. 27, 1949 (gage height, 14.90 ft, in gage well), from rating curve extended above 15,000 cfs; minimum, 115 cfs Nov. 15, 16, 30, Dec. 1, 1936.

Remarks.--Records excellent except those for period Jan. 31 to Apr. 30, which are good. No regulation or diversion above station.

Revisions (water years).--WSP 752: 1932. WSP 1286: 1918(M), 1920(M), 1921, 1922(M), 1932(M), 1934(M), 1946-47(M), 1949.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 1-14)

Oct. 1 to Nov. 22				Nov. 23 to Sept. 30			
2.7	410	6.0	4,340	2.2	215	5.0	2,680
3.0	600	7.0	6,560	2.5	350	6.0	4,330
4.0	1,450	8.0	9,140	3.0	645	8.0	9,130
5.0	2,680			4.0	1,470	10.0	14,900

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,070	1,070	*1,160	485	1,260	305	1,120	1,220	2,350	1,780	736	593
2	932	964	1,220	461	1,030	296	1,270	1,300	2,640	1,510	638	515
3	852	1,440	1,260	438	892	288	1,380	1,230	3,140	1,570	626	428
4	756	1,300	1,080	428	750	296	1,520	1,130	2,900	1,750	632	485
5	684	1,060	980	*422	792	282	1,620	1,050	2,530	1,900	580	996
6	642	924	908	428	917	296	1,650	1,530	2,620	2,120	534	715
7	628	836	852	411	2,070	296	1,880	2,320	2,100	2,100	528	*548
8	1,680	764	785	395	1,380	320	2,260	1,870	1,810	1,800	560	450
9	2,420	719	743	390	*1,120	291	2,180	1,610	1,890	1,540	*574	395
10	1,440	656	822	365	956	291	1,710	1,890	2,170	1,400	567	375
11	3,290	656	1,410	360	838	268	1,440	2,530	2,400	1,280	560	360
12	4,820	719	1,560	345	792	255	1,320	3,040	2,360	1,240	497	370
13	2,640	586	1,160	330	830	255	1,270	2,530	2,430	1,390	438	380
14	2,160	544	1,760	315	1,090	273	1,260	2,040	2,310	1,360	385	370
15	2,370	524	9,500	315	1,300	*385	1,120	1,720	2,440	1,310	375	340
16	1,660	456	4,480	305	988	315	1,040	1,880	3,980	1,300	340	310
17	1,370	867	2,610	296	792	296	996	1,750	2,860	1,320	385	286
18	1,180	3,150	1,960	268	701	310	932	1,510	2,090	1,400	395	264
19	1,040	2,500	1,590	264	612	330	948	1,410	1,800	1,340	395	268
20	*1,120	7,750	1,360	264	567	455	*1,260	2,320	1,620	1,220	350	296
21	1,270	5,320	1,180	255	612	715	1,090	1,970	1,410	1,110	325	255
22	3,180	5,210	1,070	251	515	932	908	1,650	1,320	988	340	239
23	2,200	9,000	964	255	467	988	822	1,430	1,640	860	315	251
24	3,820	6,790	892	400	450	1,020	771	*1,330	2,040	764	345	296
25	4,160	4,670	830	729	422	1,150	757	1,400	1,880	729	497	385
26	2,510	2,880	757	932	375	1,390	750	1,430	1,600	778	785	315
27	1,870	2,140	694	822	355	1,310	764	1,450	1,610	838	593	278
28	1,650	1,760	652	849	340	1,260	845	1,340	*1,750	845	491	255
29	1,430	1,480	612	3,230	320	1,360	964	1,460	1,960	845	1,050	247
30	1,210	1,300	580	2,480	------	1,470	1,120	2,260	2,000	808	708	239
31	1,150	------	541	1,470	------	1,240	------	2,970	------	750	708	------
Total	57,204	68,035	45,972	18,958	23,533	18,918	36,967	54,570	65,650	39,845	16,252	11,504
Mean	1,845	2,268	1,483	612	811	610	1,232	1,760	2,188	1,289	524	383
Cfsm	12.1	14.9	9.76	4.03	5.34	4.01	8.11	11.6	14.4	8.48	3.45	2.52
In.	14.00	16.65	11.25	4.64	5.76	4.63	9.04	13.35	16.06	9.77	3.98	2.81
Ac-ft	113,500	134,900	91,180	37,600	46,680	37,520	73,320	108,200	130,200	79,030	32,240	22,820

Calendar year 1959: Max 9,500 Min 320 Mean 1,564 Cfsm 10.3 In. 139.69 Ac-ft 1,132,000
Water year 1959-60: Max 9,500 Min 239 Mean 1,250 Cfsm 8.22 In. 111.94 Ac-ft 907,400

Peak discharge (base, 4,000 cfs).--Oct. 8 (11:30 p.m.) 4,130 cfs (5.89 ft); Oct. 12 (5 a.m.) 6,660 cfs (7.04 ft); Oct. 22 (1 p.m.) 5,300 cfs (6.46 ft); Oct. 24 (9:30 p.m.) 7,480 cfs (7.37 ft); Nov. 20 (4 p.m.) 10,900 cfs (8.65 ft); Nov. 23 (4 a.m.) 12,400 cfs (9.15 ft); Dec. 15 (1 p.m.) 14,700 cfs (9.95 ft); June 16 (8 a.m.) 4,630 cfs (6.15 ft).

* Discharge measurement made on this day.

1895. Sauk River near Sauk, Wash.

Location.--Lat 48°25'15", long 121°34'00", in NW¼ sec.19, T.34 N., R.10 E., or left bank 5 miles upstream from mouth, 5 miles southeast of Sauk, and 8 miles downstream from Suiattle River.

Drainage area.--714 sq mi.

Records available.--August to October 1910 (fragmentary gage heights), March 1911 to August 1912, July 1928 to September 1960. Published as "near Suiattle Crossing, near Sauk" 1910-12.

Gage.--Water-stage recorder. Datum of gage is 266 ft above mean sea level (from river-profile survey). Prior to Aug. 4, 1912, staff or chain gages at several sites 1 mile downstream to 5 miles upstream from present site at various datums.

Average discharge.--32 years (1928-60), 4,304 cfs (3,116,000 acre-ft per year).

Extremes.--Maximum discharge during year, 44,600 cfs Nov. 23 (gage height, 12.80 ft); minimum, 1,410 cfs Sept. 30 (gage height, 3.15 ft).
1910-12, 1928-60: Maximum discharge, 82,400 cfs Nov. 27, 1949 (gage height, 16.93 ft); minimum, 572 cfs Dec. 5, 1929, but may have been less during period of ice effect Jan. 10-27, 1930.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation. Small diversion for millpond at Darrington and for domestic use.

Revisions (water years).--WSP 1286: 1929, 1937, 1939.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 20				Nov. 21 to Sept. 30			
3.8	2,250	8.0	15,100	3.1	1,350	8.0	15,800
5.0	4,700	10.0	26,000	4.0	2,640	10.0	26,300
6.0	7,500			5.0	4,820	12.0	39,000
				6.0	7,800		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,890	4,190	4,770	2,310	6,000	1,850	4,220	4,270	7,560	6,970	3,670	2,620
2	3,490	3,830	4,850	2,240	5,000	1,800	4,640	4,700	9,700	6,000	3,250	2,300
3	3,270	5,290	5,160	2,160	4,000	1,700	4,980	*4,500	*11,400	6,170	3,250	2,040
4	3,000	4,830	4,420	2,120	3,500	1,800	5,380	4,100	10,700	6,910	3,250	2,410
5	2,800	4,000	4,030	2,120	3,700	1,700	5,710	3,740	8,900	7,700	2,990	4,060
6	*2,600	3,630	3,810	2,130	4,500	1,800	5,630	5,160	9,370	8,570	2,860	3,210
7	2,530	*3,350	3,630	2,060	7,700	1,800	6,410	8,080	7,360	8,790	2,880	2,490
8	3,980	3,130	3,360	1,980	5,500	2,100	7,600	6,500	6,260	7,730	2,990	2,180
9	7,890	2,980	3,170	1,950	4,700	1,800	7,530	5,430	6,470	6,500	3,070	2,000
10	4,700	2,820	3,400	1,880	4,200	1,800	5,970	6,230	7,460	5,880	3,010	1,900
11	10,600	2,800	5,600	1,860	4,000	1,700	5,110	8,400	8,400	5,520	3,010	1,870
12	17,400	3,190	6,320	1,800	3,800	1,650	4,620	10,600	8,260	5,300	2,710	1,950
13	9,100	2,640	4,770	1,730	4,000	1,650	4,600	9,080	8,570	6,000	2,450	1,980
14	7,440	2,580	6,430	1,680	4,700	1,900	4,820	7,160	8,040	6,030	2,190	2,010
15	8,790	2,530	30,900	*1,660	5,400	2,200	4,150	5,970	8,640	*5,800	2,080	1,950
16	6,220	2,250	*18,200	1,630	4,300	1,900	3,940	6,500	11,900	5,740	1,930	1,790
17	5,090	3,890	9,960	1,600	3,700	1,850	3,810	6,200	10,100	5,880	2,360	1,700
18	4,380	11,800	7,730	1,520	*3,340	2,100	3,630	5,410	7,330	6,230	*2,340	1,610
19	3,910	10,000	6,500	1,480	2,990	1,900	3,670	4,950	6,350	6,110	2,340	1,640
20	4,000	25,900	5,830	1,480	2,750	2,300	4,770	8,610	5,830	5,570	2,140	1,740
21	4,860	22,200	5,110	1,470	2,930	3,200	4,440	7,230	5,240	4,950	2,010	1,550
22	8,640	17,800	4,500	1,460	2,700	3,800	3,740	6,000	4,740	4,470	1,940	*1,470
23	7,110	35,900	4,030	1,500	2,500	*4,010	3,440	5,220	5,690	3,920	1,810	1,510
24	9,860	25,300	3,740	1,800	2,300	4,030	3,190	4,770	7,490	3,500	1,840	1,660
25	15,800	18,900	3,550	3,500	2,200	4,340	3,090	4,620	7,200	3,360	2,250	2,000
26	9,030	11,400	3,210	4,000	2,400	5,130	3,070	4,900	5,970	3,570	3,250	1,740
27	6,940	8,790	3,030	3,500	2,100	4,820	3,050	4,900	6,140	3,900	2,490	1,590
28	6,160	7,300	2,900	4,000	2,050	4,570	3,190	4,540	6,660	4,010	2,130	1,520
29	5,330	6,230	2,750	10,500	1,950	4,620	3,480	4,800	7,390	4,100	3,960	1,470
30	4,620	5,350	2,640	8,500	------	5,350	3,940	6,690	7,730	3,980	2,920	1,460
31	4,350	------	2,490	6,500	------	4,670	------	9,040	------	3,670	2,930	------
Total	197,780	264,800	180,790	84,120	108,910	85,840	135,820	188,300	232,850	172,810	82,300	59,420
Mean	6,380	8,827	5,832	2,714	3,756	2,769	4,527	6,074	7,762	5,575	2,655	1,981
Cfsm	8.94	12.4	8.17	3.80	5.26	3.88	6.34	8.51	10.9	7.81	3.72	2.77
In.	10.30	13.79	9.42	4.38	5.67	4.47	7.07	9.81	12.13	9.00	4.29	3.09
Ac-ft	392,300	525,200	358,600	166,800	216,000	170,300	269,400	373,500	461,900	342,800	163,200	117,900

Calendar year 1959: Max 35,900 Min 1,750 Mean 5,844 Cfsm 8.18 In. 111.09 Ac-ft 4,231,000
Water year 1959-60: Max 35,900 Min 1,460 Mean 4,901 Cfsm 6.86 In. 93.42 Ac-ft 3,558,000

Peak discharge (base, 13,000 cfs).--Oct. 12 (3:30 a.m.) 24,600 cfs (9.77 ft); Oct. 22 (4 p.m.) 14,400 cfs (7.85 ft); Oct. 25 (1:30 a.m.) 24,600 cfs (9.77 ft); Nov. 20 (6 p.m.) 36,600 cfs (11.66 ft); Nov. 23 (6 to 7 a.m.) 44,600 cfs (12.80 ft); Dec. 15 (time unknown) 42,200 cfs (12.45 ft); probably Jan. 29 (time unknown) 13,000 cfs (7.37 ft); June 16 (3 p.m.) 13,900 cfs (7.57 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Jan. 14, Jan. 20 to Feb. 17, Feb. 22 to Mar. 22; discharge estimated on basis of recorded range in stage and records for station above Whitechuck River near Darrington.

1935. Baker River at Concrete, Wash.

Location.--Lat 48°32'35", long 121°44'35", on line between secs. 10 and 11, T.35 N., R.8 E., on left bank just upstream from fish barrier, 1,500 ft downstream from Baker River powerplant, a quarter of a mile northeast of Concrete, and three-quarters of a mile upstream from mouth.

Drainage area.--297 sq mi.

Records available.--September 1910 to March 1915, September 1943 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 5, 1915, staff gage at site half a mile downstream at different datum. Sept. 1, 1943, to Jan. 22, 1958, at site 700 ft upstream at datum 172.6 ft above mean sea level (river-profile survey). Supplementary water-stage recorder on left bank about 40 ft downstream from fish barrier and on tailrace of powerhouse at same datum.

Average discharge.--21 years (1910-14, 1943-60), 2,621 cfs (1,898,000 acre-ft per year), adjusted for storage in Lake Shannon since November 1925 and Baker Lake since July 1959.

Extremes.--Maximum discharge during year, 20,600 cfs Nov. 24 (elevation, 181.63 ft), from rating curve extended above 6,500 cfs by logarithmic plotting; minimum, 68 cfs Oct. 5 (elevation, 171.13 ft); minimum daily, 94 cfs June 23.

1910-15, 1943-60: Maximum discharge, 35,200 cfs Nov. 27, 1949 (gage height, 20.32 ft, from high-water mark, datum then in use), from rating curve extended above 16,000 cfs on basis of computation of peak flow over dam and through the powerplant by Puget Sound Power and Light Co.; minimum, 21 cfs Feb. 7, 1949 (gage height, 0.20 ft, datum then in use); minimum daily, 55 cfs Feb. 17, 1957.

Remarks.--Records excellent except those for period of no gage-height record, which are good. No diversions which are not returned to river above gage. Flow regulated by Baker River powerplant and by Baker and Shannon Lakes (see p. 163).

Revisions (water years).--WSP 1286: 1911-13(M), 1944(M), 1945-46, drainage area.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,120	1,320	2,330	2,050	4,890	2,660	2,520	1,980	705	4,190	2,610	2,470
2	1,260	1,900	2,090	1,750	4,670	2,650	2,520	2,170	1,140	4,110	2,620	2,920
3	505	4,720	3,450	1,800	4,710	2,640	2,520	2,060	1,190	3,760	2,620	2,950
4	710	2,470	3,600	1,940	5,100	2,620	2,510	2,040	436	2,770	2,620	2,160
5	563	*2,000	2,900	2,640	4,750	2,610	2,520	2,020	190	3,970	2,610	1,480
6	1,570	*2,350	2,830	2,640	5,540	2,590	2,520	2,020	2,780	4,930	2,130	1,930
7	1,490	2,190	3,350	2,650	7,050	1,970	2,540	2,020	2,780	5,230	2,170	1,770
8	1,430	1,810	2,710	2,660	5,170	997	2,550	1,970	2,800	4,980	1,980	2,290
9	1,670	2,030	2,710	2,660	5,550	2,590	2,560	1,900	2,780	4,740	1,890	1,860
10	1,610	2,040	*2,710	2,660	5,500	2,560	2,580	2,040	2,760	3,150	1,860	1,840
11	6,810	2,010	2,710	2,680	5,220	2,560	2,580	1,880	2,760	1,720	1,790	1,560
12	3,820	2,040	2,710	2,660	4,680	2,550	2,590	2,010	2,760	97	1,680	1,880
13	1,510	2,130	2,700	2,680	3,390	2,520	2,560	2,040	377	462	1,690	2,210
14	1,610	2,000	3,210	*2,660	2,900	2,510	2,590	4,340	737	1,040	1,550	2,280
15	1,490	1,920	6,150	2,660	4,240	2,490	3,200	5,350	2,570	3,570	1,520	2,620
16	1,530	2,240	4,180	2,660	5,720	2,490	2,980	5,040	2,650	5,880	1,690	2,620
17	1,140	2,100	3,280	2,650	a2,650	1,890	2,620	2,570	2,640	3,280	1,340	1,060
18	1,060	2,700	3,120	2,650	a2,650	2,250	2,620	2,180	2,620	3,570	1,480	898
19	1,720	2,700	2,700	2,640	a2,650	1,750	2,590	2,200	2,620	3,550	*1,430	1,960
20	1,300	5,830	2,490	2,620	a2,650	1,690	2,150	2,180	2,620	7,080	1,080	2,760
21	1,520	5,540	2,680	2,620	a2,650	1,830	2,620	2,740	2,620	3,230	510	2,160
22	1,620	6,660	2,680	2,620	a2,650	1,820	2,480	2,740	633	2,680	1,250	1,730
23	1,640	10,000	2,650	2,620	a2,650	*1,860	2,620	2,740	94	2,680	1,170	1,450
24	264	13,200	1,860	2,620	a2,490	1,830	2,610	2,740	1,810	2,650	1,510	1,510
25	411	8,790	762	2,620	a2,650	2,480	2,590	2,740	2,950	2,640	1,700	1,060
26	791	4,720	1,470	2,620	a2,650	2,490	2,590	2,640	2,410	2,650	1,520	1,970
27	1,450	4,380	1,200	2,620	a2,650	2,490	2,580	1,980	4,270	2,650	1,810	1,710
28	1,600	4,300	1,660	2,620	a2,650	2,510	2,560	365	4,910	2,640	1,050	1,250
29	1,500	4,120	1,840	2,640	a2,650	2,480	1,950	578	3,130	2,640	3,570	436
30	1,450	3,120	2,010	3,500	-------	2,520	1,950	1,470	3,250	2,650	2,820	1,020
31	265	-------	1,960	4,230	-------	2,520	-------	1,720	-------	2,360	1,810	-------
Total	46,429	113,330	82,702	81,340	113,370	71,417	76,370	72,463	65,992	101,529	56,680	55,814
Mean	1,498	3,778	2,668	2,624	3,909	2,304	2,546	2,338	2,200	3,275	1,828	1,860
Ac-ft	92,090	224,800	164,000	161,300	224,900	141,700	151,500	143,700	130,900	201,400	112,400	110,700
(†)	+89,620	+3,980	-9,580	-39,970	-83,610	-33,750	+15,040	+74,350	+126,000	+13,900	+3,990	-20,620

Adjusted for change in contents in Baker Lake and Lake Shannon

Mean Cfsm In.	2,955	3,845	2,511	1,973	2,457	1,756	2,798	3,545	4,317	3,502	1,893	1,514
Ac-ft	181,700	228,800	154,400	121,300	141,300	108,000	166,500	218,000	256,900	215,300	116,400	90,080

Observed

Calendar year 1959: Max 16,600 Min 158 Mean 2,814 Ac-ft 2,037,000
Water year 1959-60: Max 13,200 Min 94 Mean 2,561 Ac-ft 1,859,000

Adjusted

Calendar year 1959: Mean 3,102 Cfsm In. Ac-ft 2,246,000
Water year 1959-60: Mean 2,752 Cfsm In. Ac-ft 1,998,000

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Baker Lake and Lake Shannon.
a No gage-height record; discharge estimated on basis of gage below barrier and recorded range in stage.

1940. Skagit River near Concrete, Wash.

Location.--Lat 48°31'30", long 121°46'10", in NE¼ sec.16, T.35 N., R.8 E., on right bank at dalles, 1½ miles southwest of Concrete and 2½ miles downstream from Baker River.

Drainage area.--2,700 sq mi, approximately, of which 400 sq mi is in Canada.

Records available.--September 1924 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 130.0 ft above mean sea level, datum of 1929. Prior to Dec. 10, 1924, staff gage 200 ft upstream and Dec. 10, 1924, to Sept. 30, 1937, water-stage recorder at present site; both gages at datum 12.7 ft higher.

Average discharge.--36 years, 14,810 cfs (10,720,000 acre-ft per year).

Extremes.--Maximum discharge during year, 89,300 cfs Nov. 23 (gage height, 32.17 ft); minimum, 3,700 cfs Sept. 30 (gage height, 13.53 ft); minimum daily, 4,050 cfs Sept. 29.
1924-60: Maximum discharge, 154,000 cfs Nov. 27, 1949 (gage height, 40.8 ft); minimum, probably less than 2,160 cfs during period Oct. 1-24, 1925, when recorder was not operating and gates in Baker River Dam were first closed; minimum daily recorded, 2,610 cfs Nov. 14, 1936.
Maximum stage known, 69.3 ft, present datum, at site 200 ft upstream, from floodmarks (discharge, about 500,000 cfs), occurred about 1815. Records of other floods, at site 200 ft upstream, prior to establishment of station, are given in WSP 612.

Remarks.--Records excellent. Flow regulated by powerplants on Baker and upper Skagit Rivers, by Ross Reservoir (see p. 146), by Diablo and Gorge Reservoirs, Baker Lake, and Lake Shannon (see p. 163).

Revisions (water years).--WSP 1566: 1957.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

13.7	4,010	24.0	41,000
15.0	6,600	32.0	88,200
18.0	14,500		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*13,200	14,100	23,500	12,200	19,400	11,500	15,700	14,600	20,500	23,500	14,300	12,000
2	12,400	14,100	22,200	9,500	19,000	11,400	15,400	*15,400	29,000	20,400	13,400	11,800
3	10,400	19,400	22,700	10,800	17,900	11,400	15,600	16,300	*30,900	18,000	13,500	10,100
4	9,300	17,000	19,300	11,100	17,100	11,600	17,000	15,600	28,400	18,600	13,400	8,940
5	9,780	15,100	16,400	12,900	16,700	10,800	18,700	14,700	21,900	22,400	12,800	12,100
6	11,000	*14,400	16,300	13,000	17,300	10,200	19,400	17,100	26,400	28,700	10,900	11,400
7	10,700	12,400	16,400	12,800	29,700	9,230	20,700	22,900	22,200	29,900	9,870	10,300
8	13,100	11,100	15,600	12,000	22,300	9,350	23,600	19,800	22,000	28,300	11,000	10,800
9	20,900	12,500	14,900	11,600	21,300	10,700	23,700	16,600	20,200	26,100	12,800	10,100
10	15,300	13,000	14,900	9,720	19,800	10,800	19,700	19,600	22,600	22,500	12,700	7,870
11	30,000	12,500	19,600	11,300	18,600	10,600	17,100	24,200	24,100	18,600	12,400	7,380
12	39,000	13,000	20,300	12,300	17,400	9,710	16,600	29,400	22,800	14,500	11,700	8,770
13	24,100	12,300	17,000	12,300	16,400	9,480	16,600	26,300	22,300	16,100	9,820	9,820
14	22,500	11,900	18,900	11,800	14,600	10,000	17,000	24,100	22,000	19,000	8,200	8,930
15	28,100	11,000	52,800	11,300	21,900	10,500	16,500	21,000	25,600	*24,300	8,880	8,570
16	25,700	11,600	*40,200	*10,400	20,600	10,100	15,100	21,600	32,200	22,200	9,380	7,570
17	22,800	14,000	28,100	10,100	16,800	9,200	13,000	19,800	28,300	19,900	9,560	5,580
18	21,400	27,200	24,300	10,200	*15,600	8,740	13,100	17,900	23,400	24,300	10,100	4,930
19	21,100	27,200	19,200	11,000	14,200	6,830	14,300	16,900	21,000	24,300	*9,860	6,240
20	20,100	46,600	16,900	11,800	13,200	6,980	16,000	23,100	19,800	23,200	8,440	7,740
21	21,600	48,400	17,300	11,600	12,300	9,800	16,700	22,000	19,000	21,500	6,660	6,490
22	26,600	41,000	17,000	11,600	11,600	12,000	14,800	18,300	13,200	18,000	8,100	*5,510
23	24,200	77,500	16,300	10,500	12,400	*12,700	13,900	16,900	14,600	14,700	8,600	5,530
24	23,800	69,200	14,600	10,700	12,600	11,300	12,600	16,200	20,400	11,300	9,440	5,570
25	36,800	56,600	11,400	13,800	12,500	12,500	12,800	16,200	21,600	11,400	10,100	5,860
26	26,900	39,600	10,900	17,200	12,200	14,200	13,100	17,500	17,600	13,300	11,000	6,390
27	23,800	33,800	10,900	15,300	11,600	13,600	13,100	15,800	19,700	16,200	9,650	5,670
28	23,000	30,700	11,900	14,300	11,600	14,500	13,000	12,900	22,600	14,800	7,670	5,030
29	18,000	28,100	13,300	28,100	10,800	14,000	13,500	12,200	23,300	15,500	14,300	4,050
30	15,100	25,800	13,500	29,500	-------	15,900	14,600	17,100	24,200	16,600	13,800	4,700
31	13,600	-------	13,200	20,600	-------	15,700	-------	24,300	-------	15,600	12,400	-------
Total	634,280	781,100	589,800	411,320	477,400	345,320	482,900	586,300	681,800	613,600	334,730	235,740
Mean	20,460	26,040	19,030	13,270	16,460	11,140	16,100	18,910	22,730	19,790	10,800	7,858
Ac-ft	‡1,258	‡1,549	‡1,170	815,800	946,900	684,900	957,800	‡1,163	‡1,352	‡1,217	663,900	467,600

Calendar year 1959: Max 78,600 Min 8,630 Mean 19,700 Ac-ft 14,260,000
Water year 1959-60: Max 77,500 Min 4,050 Mean 16,870 Ac-ft 12,250,000

* Discharge measurement made on this day.
‡ Expressed in thousands.

1960. Alder Creek near Hamilton, Wash.

Location.--Lat 48°31'40", long 121°56'55", in NW¼NE¼ sec.18, T.35 N., R.7 E., on left bank 3 ft downstream from logging road culvert, a quarter of a mile upstream from highway bridge, three-quarters of a mile upstream from mouth, and 2 miles east of Hamilton. Prior to Jan. 14, 1960, at site 350 ft downstream.

Drainage area.--10.7 sq mi.

Records available.--August 1943 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 125 ft (by barometer). Prior to Jan. 14, 1960, at several sites within 350 ft downstream at various datums.

Average discharge.--17 years, 35.7 cfs (25,850 acre-ft per year).

Extremes.--Maximum discharge during year, 681 cfs Nov. 22 (gage height, 3.93 ft, in gage well, site and datum then in use, 4.66 ft, present site and datum, from floodmarks); minimum, 9.6 cfs Aug. 9-14; minimum gage height, 1.08 ft Dec. 9, 10, site and datum then in use.

1943-60: Maximum discharge, 714 cfs Dec. 9, 1956 (gage height, 5.28 ft, site and datum then in use); minimum, 4.3 cfs Sept. 16, 1956, site then in use; minimum gage height, that of Dec. 9, 10, 1959.

Remarks.--Records good except those for periods of shifting control or no gage-height record, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 1286: 1945(M), 1947, drainage area.

Rating tables, water year 1959-60, except period of shifting control (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 13				Jan. 14 to Sept. 30	
1.49	16.5	2.5	173	1.7	9.6
1.6	29	3.1	314	2.0	39
2.0	83			2.6	133

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*29	28	41	33	69	37	55	42	31	19	12	14.5
2	27	27	40	32	66	35	62	*39	*31	19	12	13.5
3	26	51	37	31	62	34	58	38	30	18	13.5	13.5
4	23	42	35	30	55	32	53	36	29	18	12	15.5
5	*21	*35	33	30	56	32	51	34	27	16	11	21
6	20	31	31	30	62	36	47	39	26	16	10.5	17
7	17.5	29	31	30	131	38	44	36	25	15.5	10.5	16
8	30	27	30	29	110	40	40	32	24	15.5	10.5	14.5
9	33	23	29	29	95	39	39	31	24	16	10	13.5
10	29	22	31	28	95	37	36	30	23	16	9.6	13.5
11	70	23	54	28	86	37	37	30	22	15.5	9.6	13.5
12	76	23	71	28	95	36	36	31	21	15.5	9.6	13.5
13	54	20	57	28	113	37	38	44	21	15.5	9.6	13.5
14	50	20	144	28	113	39	39	38	22	14.5	9.6	13.5
15	48	17.5	*300	*28	124	47	46	36	21	14.5	10.5	13.5
16	39	16.5	160	27	119	42	49	46	21	*14.5	13	13.5
17	34	40	120	26	90	42	49	46	20	13.5	13	13.5
18	29	97	100	23	*75	40	47	44	20	13.5	*11	13.5
19	26	104	90	22	69	39	52	47	22	13.5	10.5	14.5
20	26	190	75	21	65	40	69	66	27	13.5	10.5	13.5
21	26	198	65	20	62	42	80	63	24	13	11	13.5
22	33	*281	60	20	58	40	74	62	21	13	11	13.5
23	28	267	55	23	53	40	66	58	20	13	11	*14.5
24	41	151	50	47	51	*39	62	53	21	13	12	16
25	48	130	47	103	48	39	59	51	21	13	24	13.5
26	40	94	44	112	44	39	55	47	21	13	24	13
27	36	71	42	96	40	38	52	44	21	12	17	13
28	41	62	40	80	38	46	51	38	20	11.5	16	12
29	36	54	38	95	36	48	48	36	19	12	19	12
30	34	48	36	90	------	59	46	37	20	12	16	12
31	30	------	34	78	------	58	------	35	------	12	16	------
Total	1,100.5	2,222.0	2,020	1,324	2,182	1,247	1,540	1,309	695	450.5	395.5	421.5
Mean	35.5	74.1	65.2	42.7	75.2	40.2	51.3	42.2	23.2	14.5	12.8	14.0
Cfsm	3.32	6.93	6.09	3.99	7.03	3.76	4.79	3.94	2.17	1.36	1.20	1.31
In.	3.83	7.72	7.02	4.60	7.58	4.33	5.35	4.55	2.42	1.57	1.37	1.47
Ac-ft	2,180	4,410	4,010	2,630	4,330	2,470	3,050	2,600	1,380	894	784	836

Calendar year 1959: Max 300 Min 10.5 Mean 47.5 Cfsm 4.44 In. 60.23 Ac-ft 34,370
Water year 1959-60: Max 300 Min 9.6 Mean 40.7 Cfsm 3.80 In. 51.81 Ac-ft 29,570

Peak discharge (base, 140 cfs).--Nov. 22 (8:30 p.m.) 681 cfs (3.93 ft); Dec. 15 (1 p.m.) 344 cfs (2.39 ft); Feb. 7 (4 a.m.) 160 cfs (2.69 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 15 to Jan. 13; discharge estimated on basis of 1 discharge measurement and records for nearby stations. Shifting-control method used Nov. 22 to Dec. 14.

1965. Day Creek near Lyman, Wash.

Location.--Lat 48°30'05", long 122°02'45", in NW¼ sec.28, T.35 N., R.6 E., on left bank at highway bridge, 1 mile upstream from mouth and 1¾ miles southeast of Lyman.

Drainage area.--36.3 sq mi.

Records available.--July 1943 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 90 ft (from topographic map).

Average discharge.--17 years, 266 cfs (192,600 acre-ft per year).

Extremes.--Maximum discharge during year, 4,700 cfs Nov. 22 (gage height, 7.41 ft); minimum, 11.5 cfs Aug. 9 (gage height, 1.10 ft).
1943-60: Maximum discharge, 5,570 cfs Dec. 28, 1949 (gage height, 8.35 ft), from rating curve extended above 3,000 cfs on basis of logarithmic plotting; maximum gage height, 8.80 ft Dec. 9, 1956; minimum discharge, 5.9 cfs Feb. 1, 1945.

Remarks.--Records good. No regulation or diversion above station.

Revisions (water years).--WSP 1316: 1944(M), drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 11 to Nov. 16, May 25-29, June 23-26, July 5 to Sept. 30)

1.3	11	2.0	90	4.0	1,060
1.5	23	2.5	225	5.0	1,850
1.7	42	3.0	435	6.0	2,820

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	128	121	183	90	342	59	421	261	239	55	16.5	133
2	113	109	246	88	586	56	1,070	243	*243	52	16.5	83
3	96	919	247	77	425	53	609	*215	225	48	18	62
4	88	351	186	76	308	56	535	186	165	41	19.5	120
5	79	215	148	79	585	85	546	171	154	39	18	261
6	*74	162	140	103	844	180	551	500	133	36	16.5	123
7	72	*130	135	103	1,270	286	603	387	100	34	16	81
8	232	113	125	94	586	325	557	243	92	33	14.5	62
9	269	103	111	83	445	195	423	218	92	31	13	49
10	168	92	657	76	374	168	229	300	96	29	12.5	41
11	1,220	162	1,580	76	284	138	261	288	90	30	14.5	36
12	564	186	1,010	69	546	116	304	296	83	29	15	38
13	265	111	445	64	491	109	401	564	72	29	15.5	33
14	236	94	1,610	61	830	109	476	277	83	28	16.5	30
15	250	85	*2,070	*69	682	242	369	195	109	28	24	29
16	165	72	772	62	416	140	292	400	125	*25	29	27
17	135	1,300	435	59	*288	157	321	360	130	24	52	26
18	113	1,660	392	53	215	183	300	269	92	23	*33	25
19	105	1,240	321	50	165	189	645	625	275	23	24	58
20	220	2,680	497	50	161	296	1,120	1,370	374	23	19	50
21	378	1,450	304	49	280	440	580	450	202	23	20	34
22	374	2,430	225	49	180	430	374	313	133	22	34	29
23	250	1,430	212	110	138	*430	321	236	113	20	33	*60
24	1,280	1,180	400	992	123	445	280	195	94	19.5	210	159
25	580	688	356	1,850	105	540	288	212	83	19	619	116
26	284	387	218	1,360	86	597	261	284	75	17.5	406	69
27	243	277	171	663	76	440	261	308	72	16.5	215	50
28	284	338	148	647	70	714	292	292	67	16.5	130	39
29	229	296	135	1,790	64	961	277	247	64	16.5	212	33
30	168	236	121	818	------	792	280	411	59	16	165	29
31	140	------	103	430	------	540	------	346	------	16	215	------
Total	8,802	18,617	13,703	10,240	10,965	9,471	13,247	10,662	3,934	862.5	2,662.5	1,985
Mean	284	621	442	330	378	306	442	344	131	27.8	85.9	66.2
Cfsm	7.82	17.1	12.2	9.09	10.4	8.43	12.2	9.48	3.61	0.766	2.37	1.82
In.	9.02	19.07	14.04	10.49	11.23	9.70	13.57	10.92	4.03	0.88	2.73	2.03
Ac-ft	17,460	36,930	27,180	20,310	21,750	18,790	26,280	21,150	7,800	1,710	5,280	3,940

Calendar year 1959: Max 4,530 Min 20 Mean 320 Cfsm 8.82 In. 119.79 Ac-ft 231,900
Water year 1959-60: Max 2,680 Min 12.5 Mean 287 Cfsm 7.91 In. 107.71 Ac-ft 208,600

Peak discharge (base, 3,000 cfs).--Nov. 18 (12:30 a.m.) 3,800 cfs (6.78 ft); Nov. 20 (3 to 4 a.m.) 4,040 cfs (6.95 ft); Nov. 22 (8:30 p.m.) 4,700 cfs (7.41 ft); Dec. 11 (7 a.m.) 3,750 cfs (6.74 ft); Dec. 14 (5 p.m.) 3,780 cfs (6.76 ft); Feb. 6 (11 p.m.) 3,560 cfs (6.59 ft); May 20 (1:30 a.m.) 3,480 cfs (6.53 ft).

* Discharge measurement made on this day.

2005. Skagit River near Mount Vernon, Wash.

Location.--Lat 48°26'40", long 122°20'00", in SE¼ sec.7, T.34 N., R.4 E., on drawrest of and 150 ft downstream from bridge on U. S. Highway 99 and 1 mile north of Mount Vernon.

Drainage area.--3,060 sq mi, approximately, of which 400 sq mi is in Canada.

Records available.--October 1940 to September 1960. Monthly discharge only October 1940, published in WSP 1316.

Gage.--Water-stage recorder and crest-stage gage. Datum of gage is at mean sea level, datum of 1929. Supplementary water-stage recorder in bridge pier a quarter of a mile downstream from base gage.

Average discharge.--20 years, 16,340 cfs (11,830,000 acre-ft per year).

Extremes.--Maximum discharge during year, 91,600 cfs Nov. 24 (elevation, 31.58 ft); minimum, 4,230 cfs Sept. 30 (elevation, 9.84 ft).
1940-60: Maximum discharge, 144,000 cfs Feb. 11, 1951 (elevation, 36.85 ft); minimum, 2,740 cfs Oct. 26, 1942 (elevation, 7.37 ft).
Maximum stage known, 37 ft in 1906, from Great Northern Railway high-water profile.

Remarks.--Records excellent. Flow regulated by powerplants on Baker and upper Skagit Rivers, and by Ross Reservoir (see p. 149), by Diablo and Gorge Reservoirs, Baker Lake, and Lake Shannon (see following page). Small diversions for domestic and municipal use. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 24		Nov. 25 to Sept. 30	
12.9	10,300	10.1	4,670
17.0	20,400	13.0	10,400
23.0	41,200	17.0	20,400
31.0	87,200	23.0	41,200
		30.0	80,100

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14,500	14,600	24,100	13,600	19,900	12,000	17,200	15,900	22,100	22,300	14,500	12,800
2	*13,300	14,700	22,600	11,200	20,800	11,900	17,600	15,700	*24,000	20,900	13,500	12,200
3	12,100	17,400	24,500	10,900	20,100	11,900	18,300	17,000	29,300	18,200	13,300	11,100
4	10,700	20,700	20,700	11,600	18,400	12,000	17,600	*16,600	30,600	17,900	13,300	9,490
5	10,300	16,400	18,300	12,600	18,500	11,800	19,600	15,600	23,500	19,300	13,000	11,600
6	10,700	15,500	17,600	13,600	18,100	11,800	20,100	16,100	23,200	24,600	12,100	12,300
7	11,200	14,400	16,700	13,600	30,900	10,600	20,500	22,500	23,300	27,800	10,500	10,900
8	11,800	*12,700	16,900	12,900	25,800	10,300	22,800	21,000	21,800	27,200	10,100	10,900
9	19,400	12,100	16,000	12,600	23,600	11,500	23,900	17,900	20,100	25,000	12,200	10,600
10	16,800	13,500	15,800	11,800	21,900	11,700	21,200	18,700	20,900	23,200	12,600	9,380
11	22,200	13,200	20,900	10,400	20,600	11,500	18,400	22,100	22,700	18,700	12,500	8,170
12	42,700	14,000	23,900	12,700	19,100	10,900	17,600	26,700	22,600	16,900	11,900	7,930
13	28,200	13,300	20,200	12,700	19,800	10,400	17,700	28,400	21,200	14,500	11,300	9,590
14	22,700	12,700	*19,000	12,500	17,900	10,400	18,100	24,100	20,700	*17,200	9,000	10,000
15	26,400	12,300	46,800	11,900	21,300	11,400	17,900	23,300	23,500	20,200	8,330	8,650
16	26,000	11,800	60,900	11,400	23,000	11,200	17,300	21,200	26,800	22,600	9,800	8,400
17	23,200	13,400	35,000	*11,100	*19,100	10,600	15,400	21,500	31,000	18,800	9,440	6,810
18	21,400	27,600	27,300	10,400	18,400	9,940	14,200	19,200	24,000	20,700	10,200	6,150
19	20,600	32,500	23,100	11,200	15,900	8,940	15,600	18,000	21,500	22,800	10,100	5,880
20	20,100	41,300	20,100	11,700	14,900	8,350	17,200	23,700	20,600	21,900	*9,700	7,690
21	21,100	66,900	18,700	12,000	14,400	10,100	20,000	24,600	20,100	21,000	7,830	7,250
22	22,200	49,200	18,700	11,900	12,900	*13,000	17,500	20,900	16,000	18,700	7,550	6,420
23	28,100	77,200	17,900	11,600	13,300	14,300	16,200	18,200	14,400	15,800	8,880	*6,000
24	22,400	83,800	16,800	12,500	13,500	13,300	15,100	17,500	17,900	12,900	9,240	6,150
25	37,100	78,900	15,100	17,100	13,300	13,900	13,800	17,100	20,900	11,000	10,600	6,470
26	30,000	52,700	12,400	22,000	13,100	15,500	14,700	17,700	18,700	12,800	12,100	6,470
27	24,800	38,300	12,400	19,700	12,600	15,500	14,500	18,000	17,600	14,800	11,300	6,620
28	23,300	32,800	12,300	16,900	12,400	15,500	14,200	15,000	20,800	14,900	9,050	5,840
29	21,200	29,700	13,800	26,000	11,600	16,000	14,500	13,500	21,900	14,800	10,500	4,990
30	16,700	26,800	14,300	35,000	-------	18,000	15,400	14,900	22,400	15,700	15,100	4,740
31	15,300	-------	14,100	25,200	-------	17,900	-------	22,100	-------	15,400	12,900	-------
Total	646,500	880,400	656,900	450,300	525,100	382,130	524,100	604,700	664,100	588,500	342,420	251,490
Mean	20,850	29,350	21,190	14,530	18,110	12,330	17,470	19,510	22,140	18,980	11,050	8,383
Ac-ft	‡1,282	‡1,746	‡1,303	893,200	‡1,042	757,900	‡1,040	‡1,199	‡1,317	‡1,167	679,200	498,800

Calendar year 1959: Max 83,800 Min 9,350 Mean 21,160 Ac-ft 15,320,000
Water year 1959-60: Max 83,800 Min 4,740 Mean 17,810 Ac-ft 12,930,000

Peak discharge (base, 55,000 cfs).--Nov. 21 (8 a.m.) 70,200 cfs (28.51 ft); Nov. 24 (12:30 a.m.) 91,600 cfs (31.58 ft); Dec. 16 (5 a.m.) 70,200 cfs (28.51 ft).

* Discharge measurement made on this day.
‡ Expressed in thousands.

Reservoirs in Skagit River basin, Wash.

1750. Ross Reservoir.--See page 149.

1765. Diablo Reservoir.--Lat 48°43'00", long 121°08'00", in SE¼ sec.5, T.37 N., R.13 E. (unsurveyed), in Diablo Dam on Skagit River, 1 mile downstream from Thunder Creek and 6 miles northeast of Newhalem. Drainage area, 1,100 sq mi, approximately. Records available, October 1929 to September 1960. October 1929 to September 1938, monthly change in reservoir contents published with records for Skagit River at Newhalem. Gage, water-stage recorder. Datum of gage is at mean sea level, subject to adjustment to datum of 1929. Maximum contents during year, 90,270 acre-ft Oct. 19 (elevation, 1,206.14 ft); minimum, 77,490 acre-ft May 27 (elevation, 1,191.34 ft). Maximum contents during period 1929-60, 90,600 acre-ft July 14, 1933 (elevation, 1,206.5 ft).
Reservoir is formed by concrete dam, completed in 1930; storage began in October 1929. Usable capacity, 76,220 acre-ft between elevations 1,040 (bottom of outlet pipes) and 1,205 ft (top of taintor gates). Dead storage, 13,000 acre-ft. Crest of spillway is at elevation 1,187 ft. Water is used by city of Seattle for power development at Diablo and Newhalem powerplants. Gage-height record collected in cooperation with city of Seattle. Figures given herein represent total contents.

1777. Gorge Reservoir.--Lat 48°41'55", long 121°12'20", in N½NW¼ sec.14, T.37 N., R.12 E., on Skagit River 2 miles upstream from city of Seattle Gorge powerplant at Newhalem. Drainage area, 1,110 sq mi, approximately. Records available, June to September 1960. Gage, reference point on Gorge Dam. Datum of gage is at mean sea level, Gorge High Dam datum, and 1.792 ft below mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Corps of Engineers). Maximum contents observed during period, 1,621 acre-ft Aug. 10 (elevation, 820.6 ft).
Reservoir is formed by concrete dam, completed Dec. 27, 1960; storage began June 27, 1960. Usable capacity, 6,700 acre-ft between elevations 820 and 875 ft (storage between normal operating elevations of 870 and 875 ft, 1,033 acre-ft). Dead storage, 7,235 acre-ft. Crest of spillway is at elevation 825 ft. Water is used by city of Seattle for power development at Gorge powerplant. Gage-height record furnished by city of Seattle. Figures given herein represent total contents.

1916. Baker Lake.--Lat 48°38'55", long 121°41'25", in NW¼SW¼ sec.31, T.37 N., R.9 E., at upper Baker Dam on Baker River near center of dam, 0.3 mile upstream from Sulphur Creek and 8 miles north of Concrete. Drainage area, 215 sq mi, approximately. Records available, July 1959 to September 1960. Gage, water-stage recorder. Datum of gage is at mean sea level, datum of 1929, adjustment of 1947. Maximum contents during year, 286,520 acre-ft Aug. 29 (elevation, 724.21 ft); minimum, 101,470 acre-ft Mar. 14 (elevation, 674.33 ft). Maximum contents during period 1959-60, that of Aug. 29, 1960.
Reservoir is formed by concrete dam, completed in June 1959; storage began July 9, 1959. Usable capacity, 220,630 acre-ft between elevations 724 (normal full pool) and 655 ft (minimum operating pool). Dead storage, 64,840 acre-ft. Crest of spillway is at elevation 694 ft. Water is used by Puget Sound Power & Light Co. for power development. Gage-height record collected in cooperation with Puget Sound Power & Light Co. Figures given herein represent total contents.

1930. Lake Shannon.--Lat 48°32'55", long 121°44'25", in SW¼ sec.2, T.35 N., R.8 E., at Baker Dam on Baker River near left bank, half a mile north of Concrete and 1 mile upstream from mouth of Baker River. Drainage area, 297 sq mi. Records available, November 1925 to September 1960. Gage, water-stage recorder; prior to Nov. 11, 1959, water-stage indicator in powerplant. Datum of gage is at mean sea level, datum of 1929, adjustment of 1947. Prior to March 1959, at datum 1.72 ft lower. Maximum contents during year, 160,780 acre-ft Nov. 24 (elevation, 439.19 ft); minimum, 91,530 acre-ft Mar. 21, 25 (elevation, 404.06 ft). Maximum contents during period 1925-60, that of Nov. 24, 1959.
Reservoir is formed by concrete dam, completed in June 1927. Capacity, 142,600 acre-ft between elevations 355 and 438.6 ft (lowest and normal elevation, respectively, for capacity operation). Dead storage unknown. Water is used by Puget Sound Power & Light Co. for power development. Prior to Nov. 11, 1959, gage-height record furnished by Puget Sound Power & Light Co. from powerplant log. Figures given herein represent contents above elevation 341.7 ft (center line of outlet tunnel).

Reservoirs in Skagit River basin, Wash.--Continued

Month-end elevation and contents, water year October 1959 to September 1960

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
	Diablo Reservoir			Gorge Reservoir		
Sept.30	1,199.5	84,320	-	-	-	-
Oct. 31	1,199.4	84,240	-80	-	-	-
Nov. 30	1,199.4	84,240	0	-	-	-
Dec. 31	1,202.9	87,320	+3,080	-	-	-
Calendar year 1959	-	-	+1,500	-	-	-
Jan. 31	1,199.3	84,150	-3,170	-	-	-
Feb. 29	1,204.5	88,760	+4,610	-	-	-
Mar. 31	1,204.7	88,950	+190	-	-	-
Apr. 30	1,199.1	83,980	-4,970	-	-	-
May 31	1,192.9	78,750	-5,230	0	0	-
June 30	1,194.5	80,060	+1,310	783.0	183	+183
July 31	1,194.3	79,900	-160	818.0	1,464	+1,280
Aug. 31	1,203.6	87,950	+8,050	809.5	1,013	-451
Sept.30	1,198.3	83,290	-4,660	820.4	1,609	+596
Water year 1959-60	-	-	-1,030	-	-	+1,610
	Baker Lake			Lake Shannon		
Sept.30	685.05	130,090	-	436.41	154,650	-
Oct. 31	708.72	214,890	+84,800	438.60	155,470	+4,820
Nov. 30	710.29	221,610	+6,720	437.36	156,730	-2,740
Dec. 31	710.79	223,780	+2,170	431.89	144,980	-11,750
Calendar year 1959	-	-	+223,800	-	-	-15,150
Jan. 31	696.89	168,640	-55,140	438.91	160,150	+15,170
Feb. 29	675.03	103,150	-65,490	430.48	142,030	-18,120
Mar. 31	676.57	106,960	+3,810	411.06	104,470	-37,560
Apr. 30	675.50	104,300	-2,660	420.52	122,170	+17,700
May 31	691.96	151,670	+47,370	433.86	148,150	+26,980
June 30	723.59	283,440	+131,800	431.11	143,340	-5,810
July 31	723.72	284,080	+640	437.30	156,600	+13,260
Aug. 31	723.86	284,780	+700	438.79	159,890	+3,290
Sept.30	720.48	268,220	-16,560	436.95	155,830	-4,060
Water year 1959-60	-	-	+138,100	-	-	+1,180

† Elevation at 12 p.m. except Gorge Reservoir which is daily mean of reference point readings.

2015. Samish River near Burlington, Wash.

Location.--Lat 48°32'45", long 122°20'15", in SE¼ sec.6, T.35 N., R.4 E., on left bank 500 ft downstream from bridge on U. S. Highway 99, half a mile downstream from Friday Creek, and 5 miles north of Burlington.

Drainage area.--87.8 sq mi.

Records available.--July 1943 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 45 ft (from topographic map). Prior to Dec. 1, 1948, at site 500 ft upstream at different datum. Dec. 1, 1948, to Jan. 7, 1949, staff gage 200 ft upstream at datum 3.14 ft higher than present datum.

Average discharge.--17 years, 244 cfs (176,600 acre-ft per year).

Extremes.--Maximum discharge during year, 2,690 cfs Dec. 15 (gage height, 8.40 ft); minimum, 26 cfs Aug. 1, 23 (gage height, 2.72 ft).
1943-60: Maximum discharge, 5,830 cfs Dec. 28, 1949 (gage height, 11.89 ft); minimum recorded, 11 cfs July 10, 1951 (gage height, 2.01 ft).

Remarks.--Records good except those for period of no gage-height record, which are fair. State fish hatchery on Friday Creek diverts about 4 cfs, which is returned above station. There is evidence of slight regulation and there may be some pumping for irrigation. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1216: Drainage area. WSP 1286: 1944(M), 1945.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-20, Dec. 4-13)

2.7	27	5.0	667
3.0	66	6.0	1,180
3.5	161	8.5	2,760
4.0	284		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	112	197	412	250	474	190	293	206	240	71	27	52
2	101	183	420	230	527	181	324	199	216	69	29	44
3	94	293	402	220	578	176	296	204	204	69	31	41
4	85	290	349	210	446	174	267	190	190	69	31	62
5	*78	233	314	250	424	185	251	179	172	66	30	69
6	73	*206	299	320	450	278	230	199	159	63	30	56
7	69	190	308	360	1,030	287	220	216	148	58	29	47
8	76	179	284	340	695	327	216	208	140	52	29	44
9	103	170	262	320	539	302	296	185	130	51	29	41
10	97	157	259	290	569	324	240	179	124	42	29	37
11	252	187	*363	290	502	284	287	179	118	48	30	35
12	308	243	458	280	466	251	293	190	112	43	30	32
13	213	185	380	260	531	233	281	211	96	39	29	32
14	199	170	803	280	636	235	276	185	96	*39	29	34
15	267	176	2,600	300	885	363	363	168	130	38	29	34
16	208	150	900	*270	798	327	349	223	128	38	41	32
17	176	358	600	248	591	290	343	235	124	36	*47	31
18	157	1,030	470	220	*486	276	343	195	116	35	37	30
19	140	784	440	199	412	262	363	221	120	34	30	32
20	140	1,190	540	192	366	264	380	561	140	34	*29	41
21	161	1,400	500	183	366	278	502	431	132	32	29	*36
22	168	1,330	450	176	327	273	450	346	116	31	30	34
23	168	1,630	400	195	293	259	380	281	103	32	29	37
24	674	1,240	490	405	273	*251	340	246	94	30	35	48
25	695	1,130	490	895	256	251	308	220	88	30	44	52
26	424	794	400	1,210	235	251	284	206	88	30	71	46
27	324	622	350	1,020	220	233	*256	264	85	30	63	42
28	336	636	310	676	206	264	238	243	83	34	48	41
29	281	596	290	945	197	264	225	213	78	32	52	39
30	240	490	280	813	------	377	216	220	74	30	50	39
31	216	------	260	582	------	343	------	*278	------	28	57	------
Total	6,635	16,439	15,083	12,429	13,778	8,253	9,110	7,281	3,844	1,333	1,133	1,240
Mean	214	548	487	401	475	266	304	235	128	43.0	36.5	41.3
Cfsm	2.44	6.24	5.55	4.57	5.41	3.03	3.46	2.68	1.46	0.490	0.416	0.470
In.	2.81	6.96	6.39	5.26	5.84	3.50	3.86	3.08	1.63	0.56	0.48	0.53
Ac-ft	13,160	32,610	29,920	24,650	27,330	16,370	18,070	14,440	7,620	2,640	2,250	2,460

Calendar year 1959: Max 2,600 Min 25 Mean 306 Cfsm 3.49 In. 47.26 Ac-ft 221,300
Water year 1959-60: Max 2,600 Min 27 Mean 264 Cfsm 3.01 In. 40.90 Ac-ft 191,500

Peak discharge (base, 1,100 cfs).--Oct. 24 (4:30 p.m.) 1,170 cfs (5.99 ft); Nov. 18 (12 m.) 1,150 cfs (5.96 ft); Nov. 22 (12 p.m.) 1,960 cfs (7.34 ft); Dec. 15 (2 p.m.) 2,690 cfs (8.40 ft); Jan. 28 (6 to 7 p.m.) 1,360 cfs (6.33 ft); Feb. 7 (6 a.m.) 1,280 cfs (6.19 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 16 to Jan. 15; discharge estimated on basis of recorded range in stage and records for nearby stations.

2050. Nooksack River below Cascade Creek, near Glacier, Wash.

Location.--Lat 48°54'20", long 121°50'30", in SE¼SW¼ sec.36, T.40 N., R.7 E., on right bank a quarter of a mile downstream from Cascade Creek, half a mile downstream from Dead Horse Creek, 4½ miles east of Glacier, and 6 miles upstream from Glacier Creek.

Drainage area.--105 sq mi.

Records available.--October 1937 to September 1960. Prior to October 1958, published as "above Cascade Creek, near Glacier."

Gage.--Water-stage recorder. Altitude of gage is 1,245 ft (from river-profile map). Supplementary water-stage recorder on left bank at datum 1.19 ft lower, revised (used as principal gage prior to Oct. 1, 1953, and Oct. 8, 1958, to Sept. 30, 1959).

Average discharge.--23 years, 755 cfs (546,600 acre-ft per year).

Extremes.--Maximum discharge during year, 4,810 cfs Nov. 23 (gage height, 7.80 ft); minimum, 174 cfs Jan. 19 (gage height, 2.28 ft).
1937-60: Maximum discharge, 10,300 cfs Nov. 26, 1949 (gage height, 10.50 ft, supplementary gage), from rating curve extended above 2,900 cfs on basis of contracted-opening measurement at gage height 8.13 ft (supplementary gage); minimum, 73 cfs Feb. 16, 1949.

Remarks.--Records good. No diversion above station. Some regulation at low flow by powerplant at Excelsior.

Revisions (water years).--WSP 1092: 1946.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

2.2	150	4.0	1,080
2.5	245	5.0	1,890
3.0	460	6.5	3,330

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	618	684	600	296	750	210	542	654	*1,830	1,360	989	570
2	600	678	714	288	648	207	648	702	2,680	1,210	858	460
3	576	*1,010	612	276	548	210	804	702	2,570	1,280	864	476
4	526	708	504	270	471	210	905	636	2,090	1,440	816	708
5	476	606	466	270	570	204	1,020	624	1,750	1,630	756	834
6	445	542	440	262	762	214	975	1,200	1,840	1,840	780	537
7	420	498	425	248	1,750	234	1,090	1,450	1,440	1,960	840	455
8	808	460	*396	242	1,020	242	1,330	1,000	1,260	1,640	898	420
9	672	440	378	234	774	217	1,430	870	1,360	1,360	947	420
10	526	410	425	231	660	207	1,020	1,240	1,590	1,240	961	455
11	1,770	466	928	228	559	198	840	1,810	1,700	1,190	912	504
12	1,540	430	708	*214	744	192	732	2,200	1,630	*1,320	774	582
13	982	374	532	210	660	189	684	1,630	1,630	1,440	666	588
14	1,370	374	892	210	612	186	726	1,210	1,530	1,440	570	554
15	1,140	352	1,520	207	618	186	600	1,010	1,610	1,350	510	471
16	840	334	975	204	504	180	526	1,030	2,330	1,400	*588	430
17	726	455	708	195	*435	180	526	940	1,550	1,460	738	388
18	672	846	756	183	396	183	476	834	1,170	1,480	732	388
19	612	696	678	180	365	192	504	750	1,090	1,440	678	743
20	660	1,480	708	183	338	245	624	905	961	1,270	570	*554
21	690	1,090	576	189	329	356	542	762	852	1,100	564	401
22	989	1,630	515	183	304	450	460	666	884	996	482	356
23	750	3,210	482	177	284	*515	440	606	1,320	858	440	440
24	2,560	3,080	515	266	276	612	410	618	1,610	786	425	510
25	1,800	2,130	466	445	252	732	396	708	1,430	816	564	435
26	1,130	1,320	410	406	238	891	*392	891	1,160	919	570	370
27	891	1,030	392	338	228	786	396	940	1,160	1,020	445	347
28	864	877	365	402	220	744	425	828	1,380	1,090	491	338
29	738	756	342	2,160	217	810	488	898	1,570	1,190	822	352
30	648	660	342	1,910	------	828	600	1,400	1,520	1,110	618	365
31	738	------	320	1,000	------	648	------	1,720	------	1,070	816	------
Total	27,777	27,626	18,090	12,107	15,532	11,458	20,551	31,434	46,517	39,705	21,684	14,451
Mean	896	921	584	391	536	370	685	1,014	1,551	1,281	699	482
Cfsm	8.53	8.77	5.56	3.72	5.10	3.52	6.52	9.66	14.8	12.2	6.66	4.59
In.	9.84	9.78	6.41	4.29	5.50	4.06	7.28	11.13	16.48	14.06	7.68	5.12
Ac-ft	55,090	54,800	35,880	24,010	30,810	22,730	40,760	62,350	92,270	78,750	43,010	28,660

Calendar year 1959: Max 3,620 Min 190 Mean 882 Cfsm 8.40 In. 114.00 Ac-ft 638,400
Water year 1959-60: Max 3,120 Min 177 Mean 784 Cfsm 7.47 In. 101.63 Ac-ft 569,100

Peak discharge (base, 3,600 cfs).--Oct. 24 (5 p.m.) 4,180 cfs (7.27 ft); Nov. 23 (2 a.m.) 4,810 cfs (7.80 ft); Nov. 24 (6 p.m.) 4,190 cfs (7.28 ft).

* Discharge measurement made on this day.

2090. South Fork Nooksack River near Wickersham, Wash.

Location.--Lat 48°39'50", long 122°07'50", in lot 2, SW¼ sec.26, T.37 N., R.5 E., on left bank three-quarters of a mile upstream from Skookum Creek and 4 miles east of Wickersham.

Drainage area.--103 sq mi.

Records available.--October 1933 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 385 ft (from river-profile map). Prior to July 9, 1934, staff gage at same site and datum.

Average discharge.--27 years, 731 cfs (529,200 acre-ft per year).

Extremes.--Maximum discharge during year, 10,800 cfs Nov. 22 (gage height, about 9.88 ft, from high-water mark in well); minimum, 109 cfs Aug. 15, 16 (gage height, 2.12 ft).
1933-60: Maximum discharge, 19,300 cfs Nov. 3, 1955 (gage height, 13.40 ft), from rating curve extended above 11,000 cfs; minimum, 66 cfs Oct. 9, 1940, Sept. 11-13, 1944; minimum gage height, 1.91 ft Aug. 26, 27, 1958.

Remarks.--Records excellent except those for period of no gage-height record, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 832: 1935-36.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-24				Oct. 25 to Sept. 30			
2.7	277	4.0	1,020	2.1	104	4.0	1,050
3.0	403	5.0	1,900	2.5	212	5.0	1,950
3.5	673	6.0	3,080	3.0	410	7.0	4,650
				3.5	690		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	446	526	618	374	870	280	818	a930	*1,070	564	178	370
2	408	488	774	356	892	266	1,280	a920	1,380	471	164	292
3	385	1,080	811	329	776	252	1,340	870	1,480	504	175	245
4	367	*783	624	308	636	262	1,340	769	1,150	548	184	337
5	337	559	548	296	825	266	1,310	729	975	594	161	1,140
6	312	476	520	316	1,480	304	1,170	1,510	975	618	150	482
7	296	415	504	316	3,430	399	1,220	1,400	769	588	148	342
8	757	396	460	292	1,380	504	1,420	990	703	498	145	276
9	822	370	*435	273	1,150	406	1,430	892	783	440	143	238
10	545	352	705	266	1,110	370	968	1,120	878	392	137	212
11	1,900	398	1,630	259	938	338	825	1,280	885	365	135	196
12	1,490	520	1,500	252	1,130	320	797	1,450	832	*370	130	181
13	800	365	930	*238	1,120	316	804	1,520	804	388	122	173
14	822	334	2,210	232	1,280	334	848	1,120	736	374	116	167
15	919	320	4,380	228	1,340	542	776	900	855	352	111	159
16	619	304	1,780	225	982	401	696	1,080	1,140	342	152	153
17	529	838	1,210	212	790	378	736	968	818	342	*466	148
18	451	2,540	1,060	193	*636	396	696	811	648	338	219	143
19	417	1,460	938	206	542	420	862	804	666	320	164	185
20	446	4,080	1,190	203	515	554	a980	2,240	908	296	140	196
21	649	2,410	885	196	600	825	1,020	1,340	783	270	143	*159
22	942	4,380	710	193	493	855	832	1,050	630	248	212	148
23	716	4,150	660	273	440	a910	762	885	755	225	203	242
24	2,570	3,050	736	1,360	410	*982	696	790	804	206	276	374
25	1,630	1,850	722	2,850	374	1,140	690	825	690	203	853	320
26	960	1,200	606	2,140	334	1,240	710	a900	594	203	1,030	235
27	818	968	537	1,220	316	1,070	*722	a1,000	559	206	520	193
28	900	982	498	960	300	1,130	832	a1,000	806	206	365	173
29	755	840	460	2,870	288	1,170	908	a850	672	212	717	156
30	618	696	435	1,780	------	1,380	a920	a900	636	203	510	150
31	564	------	401	1,050	------	1,030	------	a1,000	------	184	504	------
Total	24,190	37,130	29,477	20,266	25,377	19,040	28,408	32,843	25,184	11,070	8,673	7,785
Mean	780	1,238	951	654	875	614	947	1,059	839	357	280	260
Cfsm	7.57	12.0	9.23	6.35	8.50	5.96	9.19	10.3	8.15	3.47	2.72	2.52
In.	8.73	13.41	10.64	7.32	9.16	6.87	10.26	11.86	9.09	4.00	3.13	2.81
Ac-ft	47,980	73,650	58,470	40,200	50,330	37,770	56,350	65,140	49,950	21,960	17,200	15,440

Calendar year 1959: Max 8,900 Min 144 Mean 873 Cfsm 8.48 In. 115.04 Ac-ft 632,000
Water year 1959-60: Max 4,380 Min 111 Mean 736 Cfsm 7.15 In. 97.28 Ac-ft 534,400

Peak discharge (base, 4,800 cfs).--Oct. 24 (6:30 p.m.) 4,820 cfs (7.15 ft); Nov. 20 (4.30 a.m.) 5,610 cfs (7.55 ft); Nov. 22 (9:30 p.m.) 10,400 cfs (about 9.75 ft); Dec. 14 (10:30 p.m.) 5,570 cfs (7.53 ft); Feb. 7 (1:30 a.m.) 6,530 cfs (8.03 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.

2095. Skookum Creek near Wickersham, Wash.

Location.--Lat 48°40'20", long 122°08'25", in NE¼ sec.27, T.37 N., R.5 E., on left bank 100 ft upstream from private road crossing, 500 ft upstream from mouth, and 3½ miles northeast of Wickersham.

Drainage area.--23.1 sq mi.

Records available.--July 1948 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 400 ft (from river-profile map).

Average discharge.--12 years, 134 cfs (97,010 acre-ft per year).

Extremes.--Maximum discharge during year, 1,180 cfs Nov. 22 (gage height, 5.79 ft), from rating curve extended above 530 cfs by logarithmic plotting; minimum, 26 cfs Aug. 15, 16 (gage height, 2.14 ft).
1948-60: Maximum discharge, 3,050 cfs Nov. 27 or Dec. 1, 1949 (gage height, 9.0 ft, from floodmark), from rating curve extended above 400 cfs by logarithmic plotting; minimum, 17 cfs Feb. 9, 10, 1949, Sept. 23, 24, 1951; minimum gage height, 1.70 ft Oct. 19, 20, 1952.

Remarks.--Records good. No regulation or diversion above station.

Revisions (water years).--WSP 1182: 1949. WSP 1286: 1950(M), drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22		Nov. 23 to Sept. 30			
2.4	46	2.1	22	3.0	146
2.8	102	2.4	48	4.0	430
3.5	275	2.7	89	5.0	815
4.5	610				

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	82	80	110	63	167	46	136	153	*189	92	44	77
2	74	74	141	60	176	43	230	142	241	86	40	59
3	69	205	125	55	142	40	224	131	255	89	42	50
4	64	*127	104	54	123	43	230	117	196	94	41	106
5	60	95	92	56	158	56	222	112	167	103	38	154
6	56	84	91	64	274	67	199	233	164	106	35	82
7	53	76	88	59	427	107	224	202	131	101	35	63
8	111	70	82	54	232	99	227	140	125	91	35	53
9	95	65	*77	52	182	73	222	138	133	83	34	47
10	79	61	154	49	174	68	144	216	144	77	34	43
11	317	97	311	49	140	59	131	216	138	71	34	40
12	303	98	235	46	216	55	123	230	133	*76	33	38
13	117	66	146	*43	186	54	129	214	123	74	29	36
14	160	62	373	43	236	66	142	146	129	71	28	35
15	144	56	630	42	224	70	123	125	146	73	27	34
16	102	60	320	42	158	58	110	179	238	70	48	33
17	85	188	216	40	125	60	123	140	155	71	*89	32
18	76	344	199	35	*108	66	117	119	121	71	44	31
19	69	232	176	34	94	80	148	150	139	70	35	45
20	76	451	238	35	91	127	232	308	174	66	31	40
21	95	326	164	35	94	160	172	189	142	61	33	*33
22	100	570	133	34	80	165	140	158	119	56	44	31
23	91	490	127	51	73	169	136	136	127	52	39	53
24	421	406	169	269	70	*179	127	131	125	48	47	78
25	257	290	140	374	61	216	121	142	117	46	125	54
26	149	194	110	296	55	216	121	160	104	46	174	43
27	119	155	98	192	52	174	*127	241	99	46	101	36
28	127	167	89	203	49	186	142	179	101	47	87	34
29	110	140	82	536	47	256	153	167	104	47	136	31
30	94	121	77	305	------	243	160	199	99	47	89	30
31	88	------	88	199	------	167	------	224	------	45	109	------
Total	3,843	5,450	5,165	3,469	4,214	3,468	4,835	5,337	4,378	2,176	1,760	1,521
Mean	124	182	167	112	145	112	161	172	146	70.2	56.8	50.7
Cfsm	5.37	7.88	7.23	4.85	6.28	4.85	6.97	7.45	6.32	3.04	2.46	2.19
In.	6.19	8.77	8.32	5.58	6.78	5.58	7.78	8.59	7.05	3.50	2.83	2.45
Ac-ft	7,620	10,810	10,240	6,880	8,360	6,880	9,590	10,590	8,680	4,320	3,490	3,020

Calendar year 1959: Max 928 Min 35 Mean 145 Cfsm 6.28 In. 85.13 Ac-ft 104,900
Water year 1959-60: Max 630 Min 27 Mean 125 Cfsm 5.41 In. 73.42 Ac-ft 90,480

Peak discharge (base, 850 cfs).--Nov. 22 (7 p.m.) 1,180 cfs (5.79 ft).

* Discharge measurement made on this day.

2105. Nooksack River at Deming, Wash.

Location.--Lat 48°48'40", long 122°12'15", in lot 12, sec.6, T.38 N., R.5 E., on left bank 800 ft downstream from South Fork and 1 mile southeast of Deming.

Drainage area.--580 sq mi.

Records available.--September 1910 to March 1911 (gage heights only), July 1935 to September 1957, October 1957 to September 1960 (discharges above 3,500 cfs only). Published as "near Deming" 1910-11.

Gage.--Water-stage recorder. Datum of gage is 203.6 ft above mean sea level, datum of 1929. Prior to Dec. 5, 1910, staff gage at site 1 1/8 miles downstream at different datum. Dec. 5, 1910, to Mar. 31, 1911, staff gage at site 5 miles downstream at different datum. July 20 to Sept. 19, 1935, staff gage at same site and datum.

Average discharge.--22 years (1935-57), 3,244 cfs (2,349,000 acre-ft per year).

Extremes.--Maximum discharge during year, 25,700 cfs Nov. 23 (gage height, 12.84 ft). 1935-60: Maximum discharge, 43,200 cfs Feb. 10, 1951 (gage height, 15.69 ft), from rating curve extended above 25,000 cfs; minimum recorded, 502 cfs Nov. 29, 1952 (gage height, 3.72 ft).

Remarks.--Records good. No diversion. Slight regulation by powerplant at Excelsior. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1286: 1951. WSP 1446: 1937(M).

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	3,920	-	4,610	-	-	-	5,860	4,320	-	
2	-	-	4,490	-	4,400	-	3,940	-	7,610	3,930	-	
3	-	*5,910	4,490	-	4,100	-	4,530	-	7,930	4,020	-	
4	-	4,200	3,810	-	3,650	-	4,510	-	7,060	4,260	-	
5	-	-	3,520	-	3,900	-	4,550	-	5,860	4,660	-	4,210
6	-	-	-	-	4,430	-	4,200	4,240	5,890	4,980	-	
7	-	-	-	-	11,800	-	4,350	5,470	5,150	5,090	-	
8	-	-	-	-	6,360	-	5,000	4,160	4,570	4,570	-	
9	-	-	-	-	5,000	-	5,630	3,590	4,700	4,100	-	
10	-	-	-	-	4,900	-	4,280	4,100	5,150	3,810	-	
11	6,310	-	5,880	-	4,180	-	3,720	5,720	5,320	3,640	-	
12	7,980	-	5,580	-	4,350	-	-	6,200	5,170	3,680	-	
13	4,150	-	4,130	-	4,700	-	-	6,180	5,170	4,000	-	
14	4,440	-	8,160	-	4,570	-	-	4,940	4,920	3,990	-	
15	4,920	-	18,900	-	5,260	-	-	4,200	5,380	3,870	-	
16	-	-	9,860	-	4,260	-	-	4,480	6,820	3,900	-	
17	-	-	6,460	-	3,680	-	-	4,320	5,650	4,000	-	
18	-	*8,430	5,580	-	-	-	-	3,900	4,610	4,050	-	
19	-	5,450	5,070	-	-	-	-	3,810	4,370	3,960	-	
20	-	12,200	6,060	-	-	-	3,740	6,630	4,680	3,740	-	
21	-	10,000	4,940	-	-	-	3,590	5,240	4,420	-	-	
22	-	12,000	4,250	-	-	-	-	4,550	3,940	-	-	
23	-	18,400	3,930	-	-	-	-	4,100	4,510	-	-	
24	10,800	14,000	4,130	3,820	-	3,510	-	3,900	5,170	-	-	
25	10,600	11,300	3,940	7,990	-	3,840	-	4,130	4,840	-	-	
26	5,960	7,470	3,550	7,250	-	4,260	-	4,370	4,280	-	4,120	
27	4,460	5,840	-	5,130	-	3,870	-	4,900	4,070	-	-	
28	4,570	5,430	-	4,050	-	3,920	-	4,510	4,330	-	-	
29	3,960	4,880	-	11,600	-	3,880	-	4,400	4,720	-	4,390	
30	-	4,260	-	9,900	------	4,590	-	5,110	4,840	-	-	
31	-	------	-	5,740	------	3,720	------	6,280	------	-	3,710	------
Total	-	-	-	-	-	-	-	-	156,990	-	-	-
Mean	-	-	-	-	-	-	-	-	5,233	-	-	-
Cfsm	-	-	-	-	-	-	-	-	9.02	-	-	-
In.	-	-	-	-	-	-	-	-	10.07	-	-	-
Ac-ft	-	-	-	-	-	-	-	-	311,400	-	-	-

Calendar year	: Max	Min	Mean	Cfsm	In.	Ac-ft
Water year	: Max	Min	Mean	Cfsm	In.	Ac-ft

Peak discharge (base, 13,000 cfs).--Oct. 24 (7:30 p.m.) 21,700 cfs (11.95 ft); Nov. 20 (7 p.m.) 14,400 cfs (10.13 ft); Nov. 23 (1:30 a.m.) 25,700 cfs (12.84 ft); Nov. 24 (9 p.m.) 17,900 cfs (11.04 ft); Dec. 15 (2 a.m.) 21,100 cfs (11.80 ft); Jan. 29 (11 p.m.) 14,800 cfs (10.23 ft); Feb. 7 (4:30 a.m.) 17,400 cfs (10.91 ft).

* Discharge measurement made on this day.

2115. Nooksack River near Lynden, Wash.

Location.--Lat 48°55'10", long 122°29'10", in NE¼NE¼ sec.36, T.40 N., R.2 E., on right bank 150 ft downstream from bridge on State Highway 1B, 1½ miles upstream from Fishtrap Creek, 2 miles southwest of Lynden, and 12 miles upstream from mouth.

Drainage area.--636 sq mi.

Records available.--October 1944 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 24.4 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Average discharge.--16 years, 3,728 cfs (2,699,000 acre-ft per year).

Extremes.--Maximum discharge during year, 27,900 cfs Nov. 23 (gage height, 19.10 ft); minimum, 1,190 cfs Sept. 18 (gage height, 5.74 ft).
1944-60: Maximum discharge, 46,200 cfs Feb. 10, 1951 (gage height, 21.76 ft); minimum, 595 cfs Nov. 30, 1952 (gage height, 5.01 ft).

Remarks.--Records excellent. No diversion above station. Slight regulation by powerplant at Excelsior.

Revisions (water years).--WSP 1286: 1945(P), 1947-48(P), 1950-51(P), 1953(M).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

5.7	1,160	10.0	6,080
6.5	1,780	13.0	11,500
8.0	3,300	18.0	23,300

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,580	3,150	3,640	2,080	5,180	1,590	3,650	3,470	6,200	3,910	2,510	2,660
2	2,360	*2,870	3,800	1,990	4,630	1,540	4,130	3,470	7,780	3,470	2,170	2,000
3	2,220	5,220	4,560	1,900	4,420	1,480	5,450	3,430	8,680	3,480	2,130	1,740
4	2,050	5,060	3,580	1,840	3,670	1,510	5,320	3,220	7,880	3,710	2,080	2,120
5	1,900	3,670	3,170	1,810	3,700	1,490	5,420	2,940	5,930	4,100	1,960	3,600
6	1,770	3,170	2,990	2,070	3,950	1,700	4,980	3,740	5,930	4,530	1,890	2,660
7	1,660	2,790	*2,980	2,020	12,500	1,740	4,950	6,570	5,070	4,830	1,990	1,990
8	1,780	2,550	2,730	1,920	7,720	2,640	5,770	4,830	4,260	4,[illegible]40	2,100	1,700
9	3,840	2,360	2,550	1,830	5,770	2,240	6,450	3,860	4,200	3,780	2,250	1,550
10	2,510	2,170	2,680	1,750	5,130	2,040	4,900	4,380	4,700	3,380	2,260	1,480
11	4,850	2,120	5,330	*1,760	4,550	1,890	4,100	6,590	5,040	*3,110	2,300	1,500
12	9,080	2,880	6,130	1,700	4,300	1,770	3,710	7,070	4,880	3,050	2,030	1,580
13	4,810	2,170	4,360	1,610	5,200	1,690	3,600	7,200	4,910	3,430	1,780	1,610
14	4,100	2,030	5,440	1,590	4,630	1,690	3,790	5,490	4,530	3,470	1,580	1,590
15	5,890	1,920	21,700	1,570	6,200	2,100	3,550	4,410	5,240	3,300	*1,430	1,450
16	3,940	1,820	12,800	1,570	*4,900	1,960	3,270	4,390	6,780	3,300	[illegible],430	1,340
17	3,260	2,320	7,740	1,510	4,020	1,820	3,150	4,590	5,770	3,420	2,430	1,260
18	2,860	8,860	5,910	1,400	3,480	1,880	3,140	3,860	4,320	3,520	2,220	1,210
19	2,570	6,560	5,250	1,310	3,080	1,920	3,310	3,480	3,780	3,420	1,970	1,550
20	2,460	11,000	6,220	1,310	2,790	2,190	3,990	6,860	4,020	3,190	1,690	*2,290
21	2,760	11,200	5,340	1,310	2,880	2,950	4,030	5,530	4,100	2,870	1,560	1,510
22	3,410	9,360	4,330	1,280	2,570	*2,800	3,470	4,420	3,410	2,640	1,590	1,300
23	3,350	21,900	3,830	1,360	2,360	3,590	3,240	3,790	3,770	2,380	1,490	1,430
24	8,010	14,100	3,990	3,090	2,220	3,710	3,020	3,410	4,710	2,110	1,470	1,740
25	13,000	13,400	3,980	8,350	2,050	4,120	*2,920	3,620	4,530	2,060	1,840	2,000
26	6,350	8,190	3,380	9,020	1,990	4,770	2,820	3,830	3,890	2,140	3,640	1,570
27	4,560	6,100	3,060	6,620	1,780	4,340	2,750	4,420	3,550	2,350	2,800	1,380
28	4,490	5,280	2,830	4,560	1,720	4,290	2,870	4,420	3,730	2,460	2,000	1,290
29	4,070	4,760	2,590	11,100	1,660	3,960	3,020	4,040	4,200	2,660	3,830	1,240
30	3,440	4,080	2,490	12,600	------	5,770	3,280	4,730	4,260	2,710	2,850	1,240
31	3,190	------	2,280	7,020	------	4,370	------	*6,660	------	2,530	3,090	------
Total	123,120	173,160	151,660	100,850	119,050	81,550	118,050	142,720	150,050	99,700	66,360	51,580
Mean	3,972	5,772	4,892	3,253	4,105	2,631	3,935	4,604	5,002	3,216	2,141	1,719
Cfsm	6.25	9.08	7.69	5.11	6.45	4.14	6.19	7.24	7.86	5.06	3.37	2.70
In.	7.20	10.13	8.87	5.90	6.96	4.77	6.90	8.35	8.77	5.83	3.88	3.02
Ac-ft	244,200	343,500	300,800	200,000	236,100	161,800	234,100	283,100	297,600	197,800	131,600	102,300

Calendar year 1959: Max 31,700 Min 1,510 Mean 4,509 Cfsm 7.09 In. 96.25 Ac-ft 3,265,000
Water year 1959-60: Max 21,900 Min 1,210 Mean 3,765 Cfsm 5.92 In. 80.58 Ac-ft 2,733,000

Peak discharge (base, 15,000 cfs).--Oct. 25 (1 a.m.) 22,100 cfs (17.60 ft); Nov. 23 (10 a.m.) 27,900 cfs (19.10 ft); Dec. 15 (7 p.m.) 23,300 cfs (17.99 ft); Jan. 30 (1 a.m.) 16,100 cfs (15.21 ft); Feb. 7 (10:30 a.m.) 18,000 cfs (15.99 ft).

* Discharge measurement made on this day.

2120. Fishtrap Creek at Lynden, Wash.

Location.--Lat 48°57'50", long 122°26'00", on north line of sec.16, T.40 N., R.3 E., on right bank on downstream side of bridge on State Highway 1A, 1 mile north of Lynden.

Drainage area.--24.1 sq mi, of which 18.5 sq mi is in Canada.

Records available.--July 1948 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 110 ft (from topographic map).

Average discharge.--12 years, 35.8 cfs (25,920 acre-ft per year).

Extremes.--Maximum discharge during year, 432 cfs Dec. 15 (gage height, 5.96 ft); minimum, 1.8 cfs Aug. 9 (gage height, 1.09 ft).
1948-60: Maximum discharge, 550 cfs Feb. 11, 1951 (gage height, 6.59 ft); minimum, 0.4 cfs Sept. 10, 1949 (gage height, 1.00 ft).

Remarks.--Records good. Small diversions for irrigation and domestic use above station. Regulation from unknown source.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 20 to Jan. 23)

Oct. 1 to Nov. 20				Nov. 21 to Sept. 30			
1.3	7.8	3.0	80	1.2	3.8	3.0	79
1.7	20	4.0	153	1.5	11	4.0	149
2.2	40			2.0	29	5.5	341

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10.5	21	43	38	84	34	59	23	37	14	6.0	12.5
2	9.8	*21	43	35	89	31	58	22	31	14	5.8	10.5
3	9.6	52	43	32	92	30	58	23	27	13.5	5.6	9.7
4	8.8	73	38	31	74	30	49	23	24	15.5	5.8	11
5	8.8	46	34	35	75	32	43	23	21	12	5.2	11
6	8.6	36	34	57	87	52	39	26	23	12	5.0	10
7	8.8	30	*38	62	138	68	36	102	18.5	11	5.0	9.1
8	10.5	26	35	60	110	109	34	94	16.5	11	4.8	9.4
9	13.5	24	32	51	103	105	38	56	15	10.5	4.2	9.1
10	12	22	40	47	92	88	34	44	14.5	10.5	4.4	9.1
11	20	21	78	*49	79	73	42	46	14	*10.5	4.8	8.8
12	32	21	83	*50	77	61	44	59	13.5	9.4	4.4	8.8
13	26	19.5	58	44	72	54	42	56	16	9.4	4.4	8.6
14	22	18.5	132	48	101	54	47	44	19	9.1	4.6	8.8
15	33	18	331	53	124	63	52	38	44	8.6	*5.1	8.8
16	27	25	171	60	*89	56	56	39	33	8.3	5.6	9.1
17	20	29	113	56	72	51	47	42	26	8.0	5.6	9.1
18	17	104	88	46	64	48	43	37	22	8.0	5.4	9.1
19	15.5	120	76	40	58	44	48	36	20	7.3	5.4	10.5
20	16.5	148	113	36	54	42	46	98	34	7.3	5.4	*10.5
21	23	109	98	35	57	39	43	96	41	7.3	6.3	9.7
22	34	113	72	33	52	*37	40	76	31	6.8	6.6	9.7
23	34	168	62	36	48	36	36	58	24	6.8	6.6	10.5
24	37	111	73	78	46	34	33	44	20	7.0	7.8	11.5
25	52	100	77	158	44	33	*35	38	19	7.0	8.3	12
26	40	85	62	197	40	33	33	33	18	6.8	10	11
27	32	70	54	187	38	35	30	32	17	6.6	10	10.5
28	34	60	49	117	36	37	27	31	16	6.3	9.7	10.5
29	32	56	45	189	35	46	25	29	15	6.0	12.5	10.5
30	27	48	44	160	------	62	23	34	15	5.8	11.5	10.5
31	23	-------	42	104	-------	62	------	*46	-------	6.0	13.5	-------
Total	697.9	1,795.0	2,301	2,224	2,130	1,579	1,240	1,448	685.0	282.3	205.3	299.9
Mean	22.5	59.8	74.2	71.7	73.4	50.9	41.3	46.7	22.8	9.11	6.62	10.0
Ac-ft	1,380	3,560	4,560	4,410	4,220	3,130	2,460	2,870	1,360	560	407	595

Calendar year 1959: Max 331 Min 5.5 Mean 43.8 Ac-ft 31,740
Water year 1959-60: Max 331 Min 4.2 Mean 40.7 Ac-ft 29,510

Peak discharge (base, 220 cfs).--Dec. 15 (5:30 a.m.) 432 cfs (5.96 ft); Jan. 27 (2 a.m.) 230 cfs (4.75 ft); Jan. 29 (8 p.m.) 242 cfs (4.84 ft).

* Discharge measurement made on this day.

KOOTENAI RIVER BASIN

3000. Kootenay River at Newgate, British Columbia

(International gaging station)

Location.--Lat 49°01', long 115°10', on left bank at old highway bridge site, 0.7 mile northwest of Newgate and 0.9 mile north of international boundary.

Drainage area.--7,660 sq mi, approximately.

Records available.--October 1930 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,310.23 ft above mean sea level (datum of Geodetic Survey of Canada, adjustment of 1945). Prior to Oct. 1, 1940, staff gage at same site at datum 1.00 ft higher. Oct. 1, 1940, to Apr. 30, 1947, staff gage at present site and datum.

Average discharge.--30 years, 10,320 cfs (7,471,000 acre-ft per year).

Extremes.--Maximum discharge during year, 55,800 cfs June 5 (gage height, 11.19 ft); minimum daily, 1,910 cfs Mar. 2.
1930-60: Maximum discharge, 98,200 cfs May 28, 1948 (gage height, 15.02 ft); minimum observed, 994 cfs Feb. 7, 1936; minimum gage height observed, 0.21 ft Jan. 11, 1944.

Remarks.--Records excellent except those for periods of ice effect, which are fair. Records give total flow of main channel and slough.

Cooperation.--This station is maintained by Canada under agreement with the United States.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	2,220	4.0	7,600	8.0	27,100
2.0	2,720	5.0	11,200	10.0	44,500
3.0	4,800	6.0	15,300	12.0	63,500

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12,200	9,300	6,280	3,820	4,000	2,280	7,920	7,480	27,700	34,600	*11,900	6,030
2	11,600	9,280	6,420	3,950	3,820	b1,910	7,270	8,650	33,700	35,600	12,200	5,970
3	11,100	9,570	6,480	3,820	3,690	b2,020	7,180	9,950	42,900	34,700	13,100	6,030
4	10,700	8,940	6,280	3,710	3,590	b2,210	7,980	10,700	53,400	32,400	13,500	6,110
5	10,500	8,340	5,780	3,670	3,490	b2,380	9,490	11,200	54,100	30,100	13,900	7,120
6	*10,300	8,110	5,500	4,000	3,470	b2,460	11,800	11,900	46,400	28,200	13,800	8,870
7	9,980	8,140	5,580	4,350	3,510	b2,510	12,500	12,400	42,700	27,600	13,000	9,300
8	9,760	8,050	5,360	4,080	3,590	b2,550	12,800	15,000	*42,400	28,300	12,000	8,340
9	9,950	7,950	4,950	3,950	3,510	b2,600	13,700	16,100	38,400	28,000	10,900	7,480
10	9,790	7,730	4,750	4,000	3,430	b2,630	15,800	16,300	35,200	27,100	10,200	6,850
11	9,410	7,210	*4,850	4,060	3,370	*b2,650	16,100	19,200	35,600	24,600	9,790	6,500
12	9,120	6,730	5,180	4,060	3,330	b2,670	15,200	28,600	39,000	22,500	9,490	6,250
13	8,980	5,750	5,200	4,060	3,310	b2,680	14,100	39,500	41,300	21,400	9,230	5,970
14	9,010	5,500	4,950	3,910	3,310	b2,680	13,200	40,800	43,800	21,200	9,080	5,830
15	10,100	4,730	b4,620	3,710	3,330	b2,700	12,200	33,400	44,800	21,600	8,900	5,660
16	11,800	4,750	b4,960	b3,500	3,290	b2,760	11,200	26,600	43,300	21,500	8,650	5,640
17	12,100	5,120	5,120	b3,240	3,310	b2,890	10,500	23,200	43,200	20,600	8,210	5,610
18	11,400	5,580	5,100	b2,990	3,210	3,040	9,760	*21,000	42,300	19,600	7,860	5,500
19	10,700	6,280	5,080	*b2,750	3,080	3,230	9,300	19,200	35,200	18,900	7,480	5,440
20	10,400	7,000	5,100	b2,690	2,970	3,430	8,900	17,900	31,400	18,500	7,270	5,280
21	*10,100	7,240	5,100	b2,710	3,060	3,730	8,690	18,100	30,100	18,300	7,300	5,380
22	9,870	7,360	4,980	b2,890	3,120	4,110	*8,580	17,900	27,300	17,600	7,270	5,890
23	9,760	7,540	4,920	3,160	3,060	4,640	8,180	17,000	24,800	16,500	7,000	5,690
24	9,570	8,580	4,950	3,550	3,040	5,200	7,820	16,100	24,900	*15,600	6,820	5,410
25	10,800	8,830	4,980	3,840	2,850	5,940	7,600	15,400	30,000	14,600	6,560	5,280
26	12,300	7,790	4,880	4,020	3,080	7,300	7,240	15,000	34,900	13,500	6,500	5,200
27	12,100	6,850	4,530	3,930	2,970	8,870	7,000	15,800	34,600	12,500	6,310	5,050
28	11,400	6,140	3,930	3,950	2,690	9,910	*6,850	16,800	31,600	12,000	6,220	4,950
29	10,900	6,000	3,630	3,980	2,550	9,950	6,820	17,100	31,000	11,900	6,250	4,800
30	10,200	6,200	3,390	4,000	------	9,680	6,940	18,100	32,600	11,900	6,250	4,710
31	9,600	------	3,450	4,170	------	8,940	------	21,200	------	11,900	6,200	------
Total	325,500	216,570	156,280	114,500	95,030	130,550	302,420	577,580	‡1,118.6	674,300	283,140	182,140
Mean	10,500	7,220	5,040	3,690	3,280	4,210	10,100	18,600	37,300	21,800	9,130	6,070
Cfsm	1.37	0.94	0.66	0.48	0.43	0.55	1.32	2.43	4.87	2.85	1.19	0.79
In.	1.58	1.05	0.76	0.55	0.46	0.63	1.47	2.80	5.43	3.29	1.37	0.88
Ac-ft	645,600	429,600	310,000	227,100	188,500	258,900	599,800	‡1,146	‡2,219	‡1,337	561,600	361,300

Calendar year 1959: Max 66,300 Min 1,580 Mean 14,100 Cfsm 1.84 In. 24.90 Ac-ft 10,170,000
Water year 1959-60: Max 54,100 Min 1,910 Mean 11,400 Cfsm 1.49 In. 20.27 Ac-ft 8,284,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
b Stage-discharge relation affected by ice.

3013. Tobacco River near Eureka, Mont.

Location.--Lat 48°54', long 115°06', in SW¼ sec.9, T.36 N., R.27 W., on right bank 2½ miles northwest of Eureka and 6 miles upstream from mouth.

Drainage area.--440 sq mi.

Records available.--September 1958 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,518.85 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Extremes.--Maximum discharge during year, 1,590 cfs May 14 (gage height, 5.88 ft); maximum gage height recorded, 5.92 ft Jan. 22 (backwater from ice); minimum discharge recorded, 56 cfs Feb. 26 (gage height, 2.29 ft).
1958-60: Maximum discharge, 1,700 cfs June 6, 1959 (gage height, 6.10 ft); minimum, 54 cfs Oct. 7, 1958 (gage height, 2.28 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Numerous small diversions for irrigation of hay meadows upstream.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 5-10)

2.5	93	4.0	600
3.0	222	5.0	1,080
3.5	390	6.0	1,630

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	285	341	268	130	140	70	780	466	950	686	213	155
2	268	341	*259	130	135	80	690	532	1,070	654	268	148
3	252	344	255	135	135	90	694	650	*1,280	609	246	142
4	240	334	246	140	130	95	762	717	1,330	582	240	152
5	234	316	240	145	130	105	885	744	1,140	560	225	173
6	259	306	231	150	130	120	1,080	744	1,070	550	216	160
7	272	282	225	140	135	110	1,160	771	1,080	514	208	150
8	259	278	216	135	135	110	*1,140	910	980	490	205	145
9	272	268	199	130	130	110	1,260	*895	*920	466	199	142
10	265	265	216	130	130	110	1,530	875	925	438	193	142
11	259	259	213	130	125	100	1,300	1,050	975	422	186	135
12	272	213	208	130	120	100	1,110	1,360	990	398	182	130
13	275	179	202	125	115	100	1,000	1,540	1,030	390	173	128
14	288	170	193	120	115	100	930	1,270	*1,060	380	173	130
15	438	160	216	120	110	100	890	1,050	1,110	358	173	128
16	474	185	259	125	110	105	805	935	1,140	338	173	122
17	426	200	228	125	100	110	730	855	1,110	327	171	122
18	386	210	219	125	95	125	690	790	945	310	168	118
19	362	220	210	120	*90	140	650	762	850	299	162	115
20	352	230	202	120	95	160	622	726	800	282	160	113
21	*362	245	193	115	100	*180	636	766	762	268	158	113
22	352	255	193	*120	95	220	600	730	699	255	152	111
23	362	265	187	125	90	270	564	676	654	246	155	*111
24	372	288	187	130	90	327	532	672	658	237	160	111
25	474	358	190	135	85	406	502	650	722	*231	160	115
26	506	338	185	135	75	524	482	636	717	228	173	113
27	470	320	173	140	70	650	466	681	681	219	173	108
28	438	302	160	135	70	830	454	708	681	213	165	106
29	410	302	145	135	70	920	442	699	694	208	*162	106
30	380	282	135	140	------	940	446	730	694	205	179	108
31	355	------	130	145	------	920	------	840	------	208	168	------
Total	10,619	8,056	6,383	4,060	3,150	8,327	23,832	25,430	27,717	11,571	5,738	3,852
Mean	343	269	206	131	109	269	794	820	924	373	185	128
Cfsm	0.780	0.611	0.468	0.298	0.248	0.611	1.80	1.86	2.10	0.848	0.420	0.291
In.	0.90	0.68	0.54	0.34	0.27	0.70	2.01	2.15	2.34	0.98	0.48	0.33
Ac-ft	21,060	15,980	12,660	8,050	6,250	16,520	47,270	50,440	54,980	22,950	11,380	7,640

Calendar year 1959: Max 1,660 Min 65 Mean 391 Cfsm 0.889 In. 12.05 Ac-ft 282,800
Water year 1959-60: Max 1,540 Min 70 Mean 379 Cfsm 0.861 In. 11.72 Ac-ft 275,200

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 14-23, Dec. 30 to Mar. 23 (no gage-height record Jan. 18-21, Jan. 24 to Feb. 18; discharge estimated on basis of weather records and records for nearby stations).

3020. Fisher River near Jennings, Mont.

Location.--Lat 48°14'40", long 115°17'10", in NW¼SE¼ sec.27, T.29 N., R.29 W., on right bank 80 ft downstream from bridge, 1 mile downstream from Wolf Creek, 9 miles upstream from mouth, and 9 miles southeast of Jennings.

Drainage area.--780 sq mi.

Records available.--December 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,443.23 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--9 years (1951-60), 571 cfs (413,400 acre-ft per year).

Extremes.--Maximum discharge during year, 3,360 cfs Apr. 10 (gage height, 5.52 ft); minimum, 101 cfs Sept. 21 (gage height, 1.20 ft).
1950-60: Maximum discharge, 6,320 cfs Apr. 17, 1956 (gage height, 7.32 ft); minimum daily, 60 cfs Nov. 30, 1952.
Maximum discharge known, 6,560 cfs about May 22, 1948, from slope-area measurement of peak flow at site 7½ miles downstream.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are poor.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	99	3.0	800
1.5	172	4.0	1,530
2.0	340	5.5	3,330
2.5	535		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	272	311	515	220	295	155	1,880	872	1,610	463	184	135
2	252	304	475	220	290	160	1,630	988	1,550	432	*266	131
3	235	318	459	230	285	165	1,550	1,150	1,820	408	232	126
4	225	396	424	235	280	180	1,680	1,310	*1,740	393	209	133
5	218	344	400	245	280	200	2,020	1,470	1,450	377	196	150
6	215	336	370	260	285	220	2,600	1,550	1,270	*370	184	148
7	215	322	360	255	290	210	2,780	1,650	1,390	355	181	*138
8	215	311	344	245	285	200	2,690	1,890	1,110	351	181	135
9	333	300	340	240	285	200	3,020	1,740	1,000	333	169	131
10	340	297	360	230	280	200	3,220	*1,660	950	311	161	128
11	318	290	*340	*225	275	185	*2,670	1,940	962	297	153	123
12	*400	280	322	220	270	180	2,200	2,320	950	286	150	121
13	432	260	311	220	265	175	1,910	2,480	938	283	143	121
14	416	250	294	215	260	175	1,780	2,030	*908	286	140	117
15	467	240	329	210	*249	*175	1,670	1,630	914	272	138	114
16	447	265	503	210	238	170	1,490	1,410	980	259	138	112
17	396	300	479	220	225	170	1,360	1,310	980	249	138	112
18	362	340	451	220	205	180	1,290	1,180	776	238	135	108
19	329	380	428	220	200	205	1,210	1,080	690	228	133	108
20	308	420	408	215	210	228	1,180	1,040	668	222	126	103
21	315	440	389	205	225	262	1,180	1,080	836	212	123	103
22	318	470	370	225	215	322	1,120	1,030	562	205	121	106
23	366	650	355	240	178	467	1,130	962	527	193	126	106
24	347	*842	344	250	170	668	1,110	962	540	187	138	110
25	428	1,380	336	270	160	1,050	1,030	962	566	181	140	110
26	428	1,130	315	280	160	1,550	968	950	548	175	148	108
27	396	908	262	285	150	1,880	932	1,160	511	172	161	108
28	385	746	240	280	150	2,270	902	1,300	495	169	153	106
29	377	652	230	280	150	2,320	860	1,240	487	167	145	103
30	347	586	230	290	-------	2,440	842	1,280	475	164	143	103
31	333	------	225	300	-------	2,270	------	1,540	-------	167	138	------
Total	10,435	14,048	11,208	7,460	6,810	19,232	49,904	43,146	28,003	8,475	4,893	3,557
Mean	337	468	362	241	235	620	1,663	1,392	933	271	158	119
Cfsm	0.432	0.600	0.464	0.309	0.301	0.795	2.13	1.78	1.20	0.347	0.203	0.153
In.	0.50	0.67	0.53	0.36	0.32	0.92	2.38	2.06	1.34	0.40	0.23	0.17
Ac-ft	20,700	27,860	22,230	14,800	13,510	38,150	98,980	85,580	55,540	16,670	9,710	7,060

Calendar year 1959: Max 3,180 Min 138 Mean 725 Cfsm 0.929 In. 12.62 Ac-ft 524,900
Water year 1959-60: Max 3,220 Min 103 Mean 566 Cfsm 0.726 In. 9.88 Ac-ft 410,800

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 13-23, Dec. 6, 7, 9-11, Dec. 28 to Jan. 15, Feb. 19, 20, 24-29, Mar. 1-18. No gage-height record Jan. 16 to Feb. 14 (stage-discharge relation probably affected by ice most of period); discharge estimated on basis of weather records and records for nearby stations.

3030. Kootenai River at Libby, Mont.

Location.--Lat 48°24'00", long 115°33'10", in SE¼SW¼ sec.34, T.31 N., R.31 W., on right bank 1,800 ft downstream from highway bridge at Libby and 1 mile downstream from Libby Creek.

Drainage area.--10,240 sq mi, approximately.

Records available.--October 1910 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 2,041.54 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Apr. 28, 1931, staff, chain, and wire-weight gages 1,800 ft upstream at different datum.

Average discharge.--50 years, 11,950 cfs (8,651,000 acre-ft per year).

Extremes.--Maximum discharge during year, 64,600 cfs June 5 (gage height, 14.15 ft); minimum, 2,120 cfs Mar. 3 (gage height, 0.79 ft).
1910-60: Maximum discharge, 121,000 cfs June 21, 1916 (gage height, 20.7 ft, present datum, derived from gage-relation study); minimum observed, 895 cfs Jan. 11, 1930 (discharge measurement).

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 14,500 acres from tributaries above station in Canada and United States.

Revisions (water years).--WSP 1042: 1933. WSP 1246: 1912(M), 1915(M), 1916, 1918-19(M), 1924-27(M).

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 17 to Mar. 19)

0.8	2,140	6.0	16,500
1.0	2,450	8.0	25,300
2.0	4,570	11.0	42,200
4.0	9,840	14.0	63,500

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13,600	10,900	8,190	b3,700	5,780	2,940	14,400	10,300	31,900	38,000	12,500	6,870
2	12,900	10,600	7,950	3,380	5,630	b2,500	12,800	11,300	39,400	39,100	*13,000	6,710
3	12,200	10,500	8,170	a3,300	5,480	b2,400	12,100	13,300	47,000	38,200	13,400	6,650
4	11,800	10,900	8,000	a3,400	5,350	b2,700	12,700	14,800	*59,400	35,700	14,200	6,790
5	11,400	10,600	7,380	a4,300	5,220	3,210	15,000	15,900	63,500	33,300	14,500	7,000
6	11,300	9,900	7,060	a4,400	5,120	3,320	18,900	16,500	55,000	*31,300	14,700	8,300
7	11,100	9,570	7,220	a4,600	5,300	3,650	21,200	17,300	48,000	30,300	14,400	*9,650
8	10,900	9,350	6,980	a5,200	5,380	3,650	21,400	19,800	47,800	30,900	13,400	9,570
9	11,000	9,380	6,330	a4,900	5,320	3,720	23,100	21,900	44,000	31,500	12,200	8,710
10	11,200	9,160	6,020	a4,500	5,120	3,690	25,200	22,300	39,900	30,100	11,500	8,000
11	10,800	9,080	*6,380	*4,500	4,860	3,630	*25,200	*24,600	39,400	27,400	10,900	7,440
12	*10,700	8,730	6,280	4,640	4,670	3,610	23,200	33,200	42,600	25,000	10,500	7,090
13	10,600	7,330	6,410	4,520	4,570	3,520	21,200	44,900	45,600	23,700	10,200	6,900
14	10,500	6,380	6,300	4,190	4,520	3,500	19,700	50,400	*48,500	23,300	10,000	6,630
15	11,000	6,170	6,170	3,830	*4,430	*3,540	18,500	42,900	50,200	23,500	9,840	6,460
16	12,600	5,050	7,540	b3,600	4,570	3,610	16,900	35,300	49,300	23,600	9,600	6,330
17	13,500	4,740	8,570	b3,400	4,520	3,760	15,500	30,800	48,000	22,700	9,350	6,280
18	13,000	4,910	7,680	b3,000	4,470	4,010	14,500	27,700	47,800	21,600	8,950	6,230
19	12,200	5,320	7,090	2,340	4,260	4,330	13,800	24,800	41,200	20,700	8,650	6,120
20	11,700	6,380	6,820	2,260	4,030	4,790	13,400	23,300	35,800	20,200	8,250	6,070
21	11,500	7,900	6,650	2,600	4,010	5,220	13,100	a23,000	34,100	19,800	8,110	5,910
22	11,200	8,600	6,520	b2,900	4,080	5,730	12,600	a22,500	31,700	19,300	8,110	6,120
23	11,300	9,880	6,460	3,080	4,120	6,630	12,200	21,800	28,800	18,000	8,060	6,460
24	11,100	10,400	6,330	3,250	3,890	7,760	11,800	20,500	27,600	17,000	7,790	6,230
25	11,500	*12,000	6,280	3,540	3,800	9,250	11,300	19,600	31,500	15,900	7,600	6,070
26	13,000	12,300	6,200	4,360	3,080	11,300	10,900	19,100	37,900	14,500	7,410	5,910
27	13,700	10,800	5,990	4,880	3,000	13,600	10,500	19,500	38,200	13,500	7,360	5,780
28	13,200	9,380	5,280	5,050	b3,000	16,500	10,200	a20,500	34,800	12,700	7,110	5,630
29	12,700	8,490	4,810	5,220	2,980	17,400	9,950	a22,000	34,200	12,500	7,060	5,500
30	12,100	8,250	4,430	5,550	------	17,400	9,950	a23,500	35,600	12,500	7,030	5,380
31	11,500	------	b4,000	5,760	------	16,600	------	25,800	------	12,400	7,030	------
Total	366,800	262,950	205,490	124,150	130,560	197,470	471,200	739,100	‡1,258.7	738,200	312,710	202,790
Mean	11,830	8,765	6,629	4,005	4,502	6,370	15,710	23,840	41,960	23,810	10,090	6,760
Cfsm	1.16	0.856	0.647	0.391	0.440	0.622	1.53	2.33	4.10	2.33	0.985	0.660
In.	1.33	0.95	0.75	0.45	0.47	0.72	1.71	2.68	4.57	2.68	1.14	0.74
Ac-ft	727,500	521,600	407,600	246,200	259,000	391,700	934,600	‡1,466	‡2,497	‡1,464	620,300	402,200

Calendar year 1959: Max 75,300 Min 2,000 Mean 16,560 Cfsm 1.62 In. 21.96 Ac-ft 11,990,000
Water year 1959-60: Max 63,500 Min 2,260 Mean 13,690 Cfsm 1.34 In. 18.19 Ac-ft 9,938,000

Peak discharge (base, 37,000 cfs).--May 14 (3 to 4 a.m.) 51,100 cfs (12.33 ft); June 5 (4 to 6 a.m.) 64,600 cfs (14.15 ft); 10 p.m. June 26 to 2 a.m. June 27, 39,700 cfs (10.60 ft).

* Discharge measurement made on this day.
‡ Expressed in thousands.
a No gage-height record; discharge estimated on basis of weather records and records for nearby stations.
b Stage-discharge relation affected by ice.

3042. Yaak River near Yaak, Mont.

Location.--Lat 48°50', long 115°49', in NE¼ sec.1, T.35 N., R.33 W., or right bank 300 ft upstream from Whitetail Creek and 4½ miles west of Yaak.

Drainage area.- 493 sq mi.

Records available.--April 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,895 ft (river profile survey).

Extremes.--Maximum discharge during year, 4,400 cfs May 13 (gage height, 10.26 ft); minimum, 76 cfs Sept. 30 (gage height, 1.13 ft).
1957-60: Maximum discharge, 4,660 cfs May 5, 1957 (gage height, 10.34 ft); minimum daily, 40 cfs Jan. 2, 1958.
Flood in May 1956 reached a discharge of 6,650 cfs at site 4½ miles upstream.

Remarks.--Records good except those for periods of ice effect, which are poor.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Jan. 31 to Feb. 23)

1.0	61	2.0	191	6.0	1,690
1.2	82	3.0	430	8.0	2,800
1.5	118	4.0	780	11.0	4,950

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	246	368	451	b270	250	b140	1,670	1,170	2,050	500	142	103
2	229	358	427	b260	248	b140	1,380	1,440	2,170	469	*195	97
3	219	370	427	b265	246	b145	1,360	1,840	2,460	433	193	91
4	215	382	415	285	237	b150	1,800	2,130	*2,530	412	188	106
5	213	318	378	300	237	163	2,460	2,250	2,150	390	188	134
6	225	365	375	308	235	169	3,090	2,310	1,850	372	169	141
7	252	338	370	290	250	168	3,240	2,360	1,780	*350	152	*124
8	258	332	348	275	250	168	3,180	2,670	1,560	335	144	108
9	376	332	312	272	240	166	3,560	2,480	1,420	315	138	101
10	392	320	328	262	233	162	3,810	*2,430	1,320	295	131	98
11	340	312	342	268	223	160	3,300	3,010	1,330	278	124	94
12	325	246	*345	*260	219	157	*2,740	3,890	1,310	260	121	91
13	*332	169	330	244	223	152	2,370	4,330	1,280	250	118	89
14	372	b150	310	231	219	151	2,140	3,860	1,260	246	114	88
15	478	b140	466	b200	219	150	1,910	2,930	*1,240	237	113	86
16	469	b170	1,200	b205	*215	*146	1,660	2,470	1,300	225	109	85
17	403	202	1,010	b210	200	145	1,490	2,320	1,200	215	110	83
18	375	233	804	b210	191	145	1,450	2,030	992	209	110	83
19	365	252	686	b200	186	151	1,400	1,800	888	202	105	82
20	352	272	620	b180	196	160	1,360	1,710	832	191	104	81
21	380	315	567	b175	204	175	1,400	1,840	760	183	100	80
22	382	312	528	b200	198	213	1,290	1,690	686	177	98	80
23	392	348	497	b210	180	298	1,190	1,500	644	170	98	81
24	395	*469	475	b230	183	460	1,100	1,460	665	164	100	82
25	532	880	466	b240	181	792	1,020	1,440	690	162	99	83
26	532	852	427	b250	168	1,370	964	1,430	620	156	110	82
27	463	665	382	258	b160	1,910	928	1,680	578	152	127	81
28	430	542	b360	246	b150	2,360	924	1,700	564	152	118	79
29	412	518	330	248	b145	2,420	932	1,620	550	145	110	78
30	390	478	b310	265	------	2,520	1,000	1,660	525	139	110	76
31	382	------	b290	262	------	2,180	------	1,870	------	139	109	------
Total	11,126	11,008	14,576	7,579	6,086	17,786	56,118	67,320	37,204	7,923	3,947	2,767
Mean	359	367	470	244	210	574	1,871	2,172	1,240	256	127	92.2
Cfsm	0.728	0.744	0.953	0.495	0.426	1.16	3.80	4.41	2.52	0.519	0.258	0.187
In.	0.84	0.83	1.10	0.57	0.46	1.34	4.23	5.08	2.81	0.60	0.30	0.21
Ac-ft	22,070	21,830	28,910	15,030	12,070	35,280	111,300	133,500	73,790	15,720	7,830	5,490

Calendar year 1959: Max 4,170 Min 100 Mean 724 Cfsm 1.47 In. 19.94 Ac-ft 524,000
Water year 1959-60: Max 4,330 Min 76 Mean 665 Cfsm 1.35 In. 18.37 Ac-ft 482,800

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

3045. Yaak River near Troy, Mont.

Location.--Lat 48°33'45", long 115°58'05", in N½SE¼SE¼ sec.5, T.32 N., R.34 W., on right bank 400 ft upstream from bridge on U. S. Highway 2, a quarter of a mile upstream from mouth, and 7½ miles northwest of Troy.

Drainage area.--766 sq mi.

Records available.--October 1910 to September 1916 (fragmentary record), March 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,850 ft (river-profile survey). Oct. 15, 1910, to Sept. 30, 1916, staff gage at several sites within 11 miles of present site at various datums.

Extremes.- Maximum discharge during year, 7,680 cfs May 12 (gage height, 8.26 ft in gage well, 8.70 ft from outside gage); minimum, 125 cfs Sept. 21, 22, 30 (gage height, 3.07 ft).

1956-60: Maximum discharge, 12,100 cfs May 21, 1956 (gage height, 9.70 ft in gage well, 10.8 ft from outside gage); minimum daily, 80 cfs Jan. 19, 1957, Jan. 2, 1958.

Flood in May to June 1948 reached a stage of 11.0 ft, from floodmarks (discharge, 12,500 cfs). Flood in May 1954 reached a stage of 11.4 ft from floodmarks (discharge, 13,400 cfs).

Remarks.--Records good except those for periods of ice effect, which are poor.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Feb. 6-26)

3.0	110	4.0	460	6.0	2,500
3.3	180	4.5	780	7.0	4,370
3.6	280	5.0	1,230	8.5	8,400

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	576	772	896	b480	445	b270	2,830	1,980	4,390	932	207	166
2	522	748	844	495	445	b280	2,380	2,420	4,890	860	270	156
3	495	812	828	500	435	b300	2,280	2,950	5,320	788	*292	146
4	480	869	796	516	420	b320	2,910	3,400	5,040	732	280	170
5	465	740	732	540	405	356	4,110	3,630	*4,330	679	276	248
6	495	724	693	588	410	360	5,110	3,750	3,940	630	252	224
7	546	724	686	540	455	340	5,200	4,000	3,630	*594	228	*207
8	552	679	644	500	465	336	5,130	4,480	3,140	564	210	183
9	942	665	582	505	460	328	5,810	4,170	2,900	528	201	168
10	932	651	582	465	450	316	5,910	*4,300	2,760	495	192	158
11	788	624	630	490	445	308	5,060	5,650	2,840	460	186	154
12	796	546	624	*480	435	296	*4,330	6,930	2,810	435	175	149
13	*844	356	588	465	430	288	3,750	7,230	2,760	415	168	144
14	930	b320	558	410	425	292	3,450	6,200	2,650	405	196	142
15	1,190	b300	819	b380	435	284	3,110	4,920	*2,700	380	193	139
16	1,120	380	2,170	b390	*425	*280	2,710	4,240	2,650	356	161	137
17	950	415	1,860	b400	400	288	2,420	3,940	2,290	340	161	134
18	860	475	1,500	b400	370	300	2,350	3,450	1,940	328	166	132
19	812	540	1,290	b380	380	328	2,270	3,120	1,740	312	161	130
20	788	594	1,160	b360	390	365	2,240	3,160	1,640	296	151	128
21	869	658	1,060	b340	405	435	2,310	3,440	1,500	280	149	125
22	923	630	986	b400	395	576	2,150	3,030	1,340	270	149	125
23	959	732	932	b450	352	812	1,980	2,700	1,280	259	154	130
24	923	1,020	887	b460	365	1,090	1,840	2,590	1,330	245	161	134
25	1,210	1,910	860	b460	348	1,710	1,710	2,560	1,340	242	163	137
26	1,200	1,690	788	b460	304	2,680	1,600	2,620	1,210	234	186	137
27	1,050	1,350	700	465	b290	3,590	1,540	3,270	1,120	228	224	132
28	968	1,130	b620	435	b280	4,370	1,540	3,200	1,080	220	195	130
29	941	1,050	570	450	b280	4,260	1,560	3,120	1,050	217	180	128
30	869	968	b520	495	------	4,260	1,670	3,400	995	210	178	125
31	812	------	b500	470	------	3,670	------	4,130	------	204	173	------
Total	25,809	23,072	26,905	14,169	11,544	33,688	91,260	117,980	76,605	13,138	5,987	4,518
Mean	833	769	868	457	398	1,087	3,042	3,806	2,554	424	193	151
Cfsm	1.09	1.00	1.13	0.597	0.520	1.42	3.97	4.97	3.33	0.554	0.252	0.197
In.	1.25	1.12	1.31	0.69	0.56	1.64	4.43	5.73	3.72	0.64	0.29	0.22
Ac-ft	51,190	45,760	53,370	28,100	22,900	66,820	181,000	234,000	151,900	26,060	11,660	8,960

Calendar year 1959: Max 6,290 Min 201 Mean 1,305 Cfsm 1.70 In. 23.12 Ac-ft 944,700
Water year 1959-60: Max 7,230 Min 125 Mean 1,215 Cfsm 1.59 In. 21.60 Ac-ft 881,900

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

3050. Kootenai River at Leonia, Idaho

Location.--Lat 48°37', long 116°03', in NW¼NW¼ sec.20, T.33 N., R.34 W., on right bank at Leonia, 450 ft east of Montana-Idaho State line and half a mile upstream from Boulder Creek.

Drainage area.--11,740 sq mi, approximately.

Records available.--March 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,700.25 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Nov. 13, 1928, chain gage on bridge 250 ft upstream at datum 0.41 ft lower.

Average discharge.--32 years, 13,770 cfs (9,969,000 acre-ft per year).

Extremes.--Maximum discharge during year, 71,900 cfs June 5 (gage height, 116.05 ft); minimum daily, 2,900 cfs Mar. 3.
1928-60: Maximum discharge, 123,000 cfs May 28, 1948 (gage height, 123.40 ft); minimum, 996 cfs Dec. 9, 1936; minimum gage height, 97.56 ft Dec. 10, 1939.
Floods in June 1894 and 1916 reached stages of 124.6 and 121.6 ft, respectively, from information by Great Northern Railway.

Remarks.--Records excellent except those for periods of ice effect, which are good. Diversions above station for irrigation of about 14,600 acres.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

101	3,860	106	19,100
101.5	4,700	109	30,800
102	5,750	112	45,200
103	8,550	116	71,500
104	11,800		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14,800	12,700	9,940	4,500	6,900	3,500	20,800	12,900	37,700	39,300	13,200	7,220
2	14,100	12,200	*9,680	4,100	6,850	3,100	18,000	14,700	45,800	40,400	13,800	7,050
3	13,400	12,200	9,910	4,000	6,530	2,900	16,700	17,500	55,700	39,600	14,100	6,910
4	12,800	12,800	9,550	4,100	6,120	3,400	17,900	20,000	67,000	37,300	14,800	7,080
5	12,400	12,400	8,920	4,500	5,970	3,800	22,000	21,700	70,900	35,000	15,100	7,280
6	12,200	11,600	8,580	5,000	5,820	3,900	27,500	22,700	63,700	33,100	15,300	7,850
7	12,200	11,100	8,580	6,100	5,940	4,100	30,200	23,900	56,300	31,800	15,000	9,230
8	11,900	10,800	8,330	6,000	6,120	4,300	30,400	26,900	*54,500	31,900	14,200	9,710
9	12,900	10,700	8,030	5,800	6,090	4,500	32,900	28,700	50,800	32,500	13,100	8,950
10	13,000	10,500	7,340	5,700	5,970	4,500	35,200	29,400	46,200	31,700	12,200	8,210
11	12,400	10,300	7,550	5,700	5,770	4,500	34,000	33,400	45,200	29,200	11,500	7,810
12	12,300	10,000	7,610	5,800	5,660	4,450	31,000	42,400	48,100	27,000	11,000	7,280
13	12,300	8,950	7,640	5,600	5,660	4,450	28,200	56,000	51,200	25,500	10,600	7,080
14	12,300	8,120	7,550	5,300	5,540	4,450	26,500	61,000	53,800	24,800	10,400	6,850
15	13,000	7,200	8,030	4,800	5,500	4,450	24,800	52,900	55,600	24,800	10,200	6,660
16	*14,400	6,500	9,050	4,400	5,390	4,450	22,500	43,400	55,100	*25,000	9,970	6,550
17	15,400	5,600	11,600	4,100	5,320	4,540	20,400	38,000	53,200	24,300	9,750	6,450
18	15,100	5,900	10,600	3,700	5,340	4,700	19,200	33,700	52,400	23,100	9,360	6,400
19	14,200	6,580	9,460	3,200	5,240	4,910	18,200	30,800	45,800	22,100	9,050	6,340
20	13,500	7,170	8,950	*3,000	5,110	5,170	17,500	29,200	39,700	21,500	8,640	6,270
21	13,300	8,770	8,700	3,300	5,050	5,590	17,300	28,700	37,300	20,900	8,300	6,160
22	13,200	9,750	8,330	3,500	5,070	6,140	16,600	28,200	35,100	20,500	8,300	6,140
23	13,300	10,700	8,150	3,700	5,010	7,340	15,900	27,000	32,200	19,400	*8,270	6,470
24	13,100	13,000	8,000	3,900	5,010	*8,860	*15,100	25,800	30,800	18,200	8,120	6,450
25	13,900	15,000	7,880	4,300	4,890	11,300	14,300	24,700	33,600	17,200	7,970	6,240
26	15,200	16,000	7,730	5,200	3,800	15,400	13,500	24,100	39,300	15,800	7,790	6,090
27	16,000	14,000	7,430	5,800	*3,600	19,400	13,000	25,200	40,600	14,700	7,760	6,020
28	15,600	12,000	6,800	6,000	3,600	24,100	12,500	*26,600	37,300	13,900	7,520	5,890
29	14,800	10,900	6,200	6,300	3,600	25,500	12,600	27,200	36,300	13,400	7,370	5,800
30	14,200	10,400	5,400	6,700	------	26,000	12,300	28,200	37,300	13,400	7,310	*5,640
31	13,300	------	5,000	6,900	------	24,400	------	32,100	------	13,300	7,280	------
Total	420,500	313,840	256,520	151,000	156,470	258,100	637,000	937,000	‡1,408.5	780,600	327,260	207,880
Mean	13,560	10,460	8,275	4,871	5,396	8,326	21,230	30,230	46,950	25,180	10,560	6,929
Cfsm	1.16	0.891	0.705	0.415	0.460	0.709	1.81	2.57	4.00	2.14	0.899	0.590
In.	1.33	0.99	0.81	0.48	0.50	0.82	2.02	2.97	4.46	2.47	1.04	0.66
Ac-ft	834,000	622,500	508,800	299,500	310,400	511,900	‡1,263	‡1,859	‡2,794	‡1,548	649,100	412,300

Calendar year 1959 : Max 86,800 Min 2,400 Mean 19,150 Cfsm 1.63 In. 22.14 Ac-ft 13,860,000
Water year 1959-60 : Max 70,900 Min 2,900 Mean 16,000 Cfsm 1.36 In. 18.55 Ac-ft 11,610,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
Note.--Stage-discharge relation affected by ice Nov. 15-18, 24-26, Dec. 28 to Feb. 1, Feb. 26 to Mar. 13.

3055. Boulder Creek near Leonia, Idaho

Location.--Lat 48°36', long 116°06', in NE¼ sec.32, T.61 N., R.3 E., on right bank three-quarters of a mile downstream from McGinty Creek, three-quarters of a mile upstream from building of the Idamont Lead-Zinc Mines Co., 2½ miles southwest of Leonia, and 2¾ miles upstream from mouth.

Drainage area.--53 sq mi, approximately.

Records available.--April 1928 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 2,600 ft (from topographic map). Prior to Nov. 20, 1928, staff gage at site 1 mile downstream at different datum. Nov. 20, 1928, to Nov. 29, 1933, and Oct. 13, 1934, to Sept. 27, 1946, water-stage recorder, and Dec. 30, 1933, to Oct. 12, 1934, staff gage, at site a quarter of a mile upstream at different datum.

Average discharge.--32 years, 116 cfs (83,980 acre-ft per year).

Extremes.--Maximum discharge during year, 1,140 cfs May 11 (gage height, 5.30 ft); maximum gage height, 5.91 ft Jan. 17 (ice jam); minimum, 10 cfs Sept. 19 (gage height, 2.73 ft).

1928-60: Maximum discharge, 2,700 cfs Oct. 19, 1947 (gage height, 7.85 ft), from rating curve extended above 970 cfs on basis of contracted-opening measurement of peak flow; minimum, 2 cfs Aug. 25, Sept. 5, 1931.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No regulation or diversion.

Revisions (water years).--WSP 1396: 1936(M).

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.7	9.0	3.7	152
2.8	14	4.0	263
3.0	30	4.5	550
3.3	71	5.5	1,260

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	84	*85	63	54	25	209	216	732	106	20	16
2	57	82	85	60	45	23	190	282	942	97	24	15
3	52	154	82	60	41	22	220	321	970	89	22	14
4	49	140	78	70	39	27	286	326	767	85	29	34
5	48	112	85	85	37	27	452	370	599	80	24	28
6	54	102	78	90	34	32	524	409	592	75	21	18
7	60	95	71	75	45	36	504	627	504	68	19	16
8	70	87	68	65	50	37	511	620	*420	61	18	14
9	225	85	62	50	47	35	676	564	398	57	17	13
10	118	78	65	45	43	32	585	697	392	51	16	13
11	110	78	69	50	41	30	452	914	404	48	16	13
12	133	65	66	42	41	26	382	970	392	47	14	13
13	130	45	58	35	41	25	338	837	387	44	14	12
14	124	58	63	*31	41	25	321	592	348	41	14	12
15	120	60	261	30	45	27	277	504	354	38	15	12
16	104	60	257	29	42	31	237	492	414	*35	16	11
17	95	65	166	28	40	35	216	446	286	32	16	11
18	87	70	138	26	38	40	213	365	233	30	15	11
19	82	80	122	25	36	50	202	343	213	28	14	11
20	98	100	114	24	35	70	205	518	213	27	13	11
21	110	150	106	24	36	85	*198	492	187	25	13	11
22	*150	130	100	29	33	110	180	382	164	24	14	11
23	126	140	95	33	30	130	164	338	164	24	*15	12
24	132	163	91	37	32	160	152	316	180	23	20	13
25	198	180	89	42	28	220	145	321	168	22	18	12
26	135	130	78	50	23	286	140	409	145	22	26	12
27	118	114	76	54	24	365	138	465	138	21	25	11
28	110	108	72	50	25	433	136	*446	135	20	20	11
29	100	100	70	60	25	360	145	466	126	20	18	11
30	95	91	68	80	------	376	168	592	118	20	18	*11
31	89	------	66	65	------	268	------	781	------	20	16	------
Total	3,239	3,006	2,984	1,507	1,091	3,448	8,568	15,421	11,085	1,380	560	413
Mean	104	100	96.3	48.6	37.6	111	286	497	370	44.5	18.1	13.8
Cfsm	1.96	1.89	1.82	0.917	0.709	2.09	5.40	9.38	6.98	0.840	0.342	0.260
In.	2.27	2.11	2.09	1.06	0.77	2.42	6.01	10.8	7.78	0.97	0.39	0.29
Ac-ft	6,420	5,960	5,920	2,990	2,160	6,840	16,990	30,590	21,990	2,740	1,110	819

Calendar year 1959: Max 1,060 Min 13 Mean 158 Cfsm 2.98 In. 40.39 Ac-ft 114,200
Water year 1959-60: Max 970 Min 11 Mean 144 Cfsm 2.72 In. 36.96 Ac-ft 104,500

Peak discharge (base, 800 cfs).--May 11 (7:30 p.m.) 1,140 cfs (5.30 ft); June 2 (7 p.m.) 1,120 cfs (5.32 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice most days Nov. 13-23, Dec. 9, 10, Dec. 27-31, Jan. 1-6, 10, 11, 15-17. No gage-height record Jan. 7-9, 12-14, Jan. 18 to Mar. 25 (stage-discharge relation affected by ice part of period); discharge estimated on basis of 1 discharge measurement, engineers' notes, weather records, and records for Deep Creek near Moravia, Idaho, and Yaak River near Troy, Mont.

3065. Moyie River at Eastport, Idaho

(International gaging station)

Location.--Lat 49°00', long 116°11', in SE¼ sec.10, T.65 N., R.2 E., on left bank at Eastport, 1,000 ft downstream from international boundary.

Drainage area.--570 sq mi, approximately.

Records available.--August 1929 to September 1960 in reports of Geological Survey. January 1915 to December 1916 and discharge measurements 1914 and 1917 in reports of Water Resources Division, Department of Northern Affairs and National Resources, Canada.

Gage.--Water-stage recorder. Datum of gage is 2,620.06 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. January 1915 to December 1916 staff gage at site 0.2 mile upstream at different datum.

Average discharge.--31 years, 701 cfs (507,500 acre-ft per year).

Extremes.--Maximum discharge during year, 6,120 cfs May 13 (gage height, 8.93 ft); minimum, 79 cfs Sept. 29-30 (gage height, 3.56 ft).
1929-60: Maximum discharge, 9,400 cfs May 20, 1954 (gage height, 10.55 ft); minimum, 23 cfs Nov. 7, 1936 (gage height, 3.20 ft).

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. No regulation or diversion above station.

Cooperation.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.5	64	5.5	1,260
3.7	117	6.0	1,790
4.0	225	7.0	3,080
4.5	481	8.0	4,560
5.0	810	9.0	6,250

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	533	652	557	290	260	*164	1,460	1,440	3,190	780	152	100
2	510	639	539	220	248	150	1,320	1,830	3,650	735	170	95
3	493	679	533	200	230	150	1,470	2,310	4,000	686	184	92
4	470	672	510	210	225	160	1,980	2,400	3,900	646	200	103
5	453	632	487	230	225	165	2,750	2,490	3,520	606	192	152
6	470	639	465	260	221	170	3,070	2,720	3,330	570	173	136
7	487	600	459	260	230	175	3,020	3,290	3,080	533	166	117
8	475	594	430	250	225	180	a3,080	3,490	2,750	498	159	114
9	600	*576	*410	250	221	*180	a3,500	3,250	2,530	464	148	111
10	557	557	410	230	221	180	a3,200	3,590	2,370	431	145	109
11	539	545	414	250	213	180	3,010	4,780	*2,330	403	139	106
12	545	470	409	260	213	165	2,740	5,640	2,250	382	132	106
13	563	420	393	230	213	165	2,420	5,610	2,230	366	126	103
14	626	420	382	250	209	155	2,250	4,530	2,150	345	123	100
15	758	370	447	*240	209	155	2,010	3,800	2,180	324	120	100
16	721	340	665	200	200	152	1,750	3,600	2,130	304	117	97
17	686	370	594	200	200	152	1,600	*3,230	1,960	285	114	97
18	665	400	576	190	190	155	1,530	*2,860	1,740	270	109	95
19	646	410	557	190	190	173	1,460	2,630	1,580	256	106	92
20	*639	420	539	190	195	213	1,410	2,590	1,480	243	100	89
21	652	420	522	180	196	280	*1,390	2,700	1,370	230	97	86
22	665	431	498	200	196	398	1,320	2,360	1,260	*213	100	86
23	679	453	487	220	190	588	1,230	2,140	1,200	204	100	86
24	672	533	475	240	192	707	1,140	2,030	1,180	192	97	86
25	810	750	470	260	160	1,050	1,070	1,970	1,140	184	97	86
26	765	707	436	280	150	1,570	993	2,030	1,030	180	*103	84
27	742	672	410	310	150	1,890	958	2,590	966	170	106	84
28	735	639	390	310	150	2,090	966	2,440	924	166	100	82
29	735	606	370	350	150	1,960	1,000	2,400	882	159	100	79
30	707	576	360	324	-------	1,950	1,160	2,620	834	155	111	79
31	686	-------	340	280	-------	1,700	-------	3,020	-------	152	106	-------
Total	19,284	16,192	14,534	7,554	5,872	17,522	56,257	92,380	63,136	11,132	3,992	2,952
Mean	622	540	469	244	202	565	1,875	2,980	2,105	359	129	98.4
Cfsm	1.09	0.947	0.823	0.428	0.354	0.991	3.29	5.23	3.69	0.630	0.226	0.173
In.	1.26	1.06	0.95	0.49	0.38	1.14	3.67	6.03	4.12	0.73	0.26	0.19
Ac-ft	38,250	32,120	28,830	14,980	11,650	34,750	111,600	183,200	125,200	22,080	7,920	5,860

Calendar year 1959: Max 5,260 Min 100 Mean 955 Cfsm 1.68 In. 22.76 Ac-ft 691,600
Water year 1959-60: Max 5,640 Min 79 Mean 849 Cfsm 1.49 In. 20.28 Ac-ft 616,400

Peak discharge (base, 2,900 cfs).--Apr. 9 (time and discharge unknown); May 13 (1 a.m.) 6,120 cfs (8.93 ft); June 4 (12:45 a.m.) 4,220 cfs (7.78 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 staff-gage reading and records for station at Eileen.
Note.--Stage-discharge relation affected by ice Nov. 12-21, Dec. 6, 8-10, Dec. 27 to Jan. 29, Feb. 1, 17-20, 23, Feb. 25 to Mar. 13, Mar. 16.

3075. Moyie River at Eileen, Idaho

Location.--Lat 48°46', long 116°10', in NE¼ sec.35, T.63 N., R.2 E., on right bank an eighth of a mile downstream from Skin Creek, a quarter of a mile southeast of Eileen, and 4 miles upstream from mouth.

Drainage area.--755 sq mi.

Records available.--October 1925 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,124.5 ft (river-profile survey). Prior to June 1, 1928, staff gage and June 1, 1928, to Sept. 30, 1944, water-stage recorder, at same site at datum 1.0 ft higher.

Average discharge.--35 years, 868 cfs (628,400 acre-ft per year).

Extremes.--Maximum discharge during year, 8,020 cfs May 12 (gage height, 6.16 ft); minimum, 118 cfs Sept. 29-30 (gage height, 1.97 ft).
1925-60: Maximum discharge, 11,000 cfs May 20, 1954 (gage height, 6.99 ft); minimum, 40 cfs Nov. 27, 1936; minimum gage height, 0.50 ft Feb. 22, 1944, present datum.

Remarks.--Records excellent except those for periods of ice effect, which are fair. No regulation or diversion above station.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 13-24)

1.8	79	4.0	1,960
2.0	133	4.5	2,810
2.2	215	5.0	3,970
2.5	380	5.5	5,590
3.0	770	6.0	7,410
3.5	1,310		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	672	860	725	450	370	225	2,190	1,890	4,030	1,010	220	156
2	640	830	*698	310	360	210	1,990	2,300	4,670	950	240	148
3	608	900	698	280	350	210	2,050	2,890	5,210	890	240	144
4	592	910	664	290	326	220	2,640	3,010	5,070	840	270	167
5	576	830	640	320	326	230	3,520	3,200	4,380	790	276	202
6	592	830	616	360	309	235	4,090	3,340	4,170	725	250	197
7	624	790	600	360	320	240	3,940	3,890	3,810	680	230	175
8	632	780	576	350	309	250	4,000	4,510	*3,340	640	220	167
9	850	752	540	350	314	250	4,640	4,090	3,070	592	215	160
10	790	716	560	320	304	250	4,670	4,480	2,890	560	206	156
11	734	698	544	340	292	250	4,000	6,120	2,790	513	202	152
12	734	624	544	360	292	225	3,520	7,410	2,770	478	193	152
13	761	580	528	310	292	211	3,090	6,920	2,720	471	184	148
14	830	580	499	320	292	225	2,950	5,560	2,620	450	180	148
15	1,020	500	592	*330	298	220	2,660	4,700	2,700	415	175	141
16	970	460	981	280	287	202	2,360	4,140	2,620	394	175	141
17	920	500	890	270	270	220	2,190	*3,700	2,390	*374	171	137
18	880	540	830	260	260	225	2,150	3,220	2,130	356	167	133
19	850	550	780	260	260	250	2,040	3,010	1,960	338	160	130
20	850	560	752	260	270	304	1,990	3,030	1,860	326	156	130
21	860	560	725	250	287	387	*1,980	3,290	1,740	309	152	130
22	870	580	689	270	260	544	1,860	2,870	1,590	298	146	124
23	900	616	664	300	245	780	1,750	2,620	1,500	282	156	127
24	890	707	648	320	250	1,050	1,640	2,460	1,470	270	156	127
25	1,060	1,060	640	360	220	1,500	1,550	2,410	1,440	260	156	127
26	*1,020	992	600	380	210	2,160	1,470	2,460	1,320	250	175	124
27	981	920	560	430	210	2,510	1,420	3,140	1,240	240	*171	121
28	970	870	544	429	210	2,890	1,420	2,970	1,180	230	163	121
29	970	830	506	457	215	2,830	1,450	2,950	1,140	225	163	118
30	930	770	500	430	------	2,890	1,590	3,180	1,080	220	167	118
31	900	------	470	410	------	2,550	------	3,730	------	220	163	------
Total	25,476	21,695	19,803	10,416	8,208	24,743	76,770	113,490	78,900	14,596	5,908	4,321
Mean	822	723	639	336	283	798	2,559	3,661	2,630	471	191	144
Cfsm	1.09	0.958	0.846	0.445	0.375	1.06	3.39	4.85	3.48	0.624	0.253	0.191
In.	1.25	1.07	0.98	0.51	0.40	1.22	3.78	5.59	3.89	0.72	0.29	0.21
Ac-ft	50,530	43,030	39,280	20,660	16,280	49,080	152,300	225,100	156,500	28,950	11,720	8,570

Calendar year 1959: Max 6,880 Min 120 Mean 1,232 Cfsm 1.63 In. 22.16 Ac-ft 892,100
Water year 1959-60: Max 7,410 Min 118 Mean 1,105 Cfsm 1.46 In. 19.91 Ac-ft 802,000

Peak discharge (base, 3,500 cfs).--Apr. 9 (11:30 p.m.) 5,040 cfs (5.34 ft); May 12 (11:30 a.m.) 8,020 cfs (6.16 ft); June 4 (1:30 a.m.) 5,520 cfs (5.54 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-22, Dec. 9, Dec. 30 to Jan. 27, Jan. 30 to Feb. 2, Feb. 18, 19, Feb. 24 to Mar. 12.

3085. Kootenai River at Boom Camp, near Bonners Ferry, Idaho

Location.--Lat 48°42'05", long 116°14'30", in NW¼ sec.29, T.62 N., R.2 E., on left bank 600 ft east of Boom Camp, 3½ miles upstream from Bonners Ferry, and 4 miles downstream from Moyie River.

Drainage area.--12,950 sq mi, approximately.

Records available.--October 1927 to September 1960 (elevations only) in reports of Geological Survey (discontinued). April 1925 to September 1927 (gage heights only) in reports of Department of Northern Affairs and National Resources, Canada.

Gage.--Water-stage recorder. Datum of gage is 1,700.00 ft above mean sea level, levels by Topographic Branch in 1928. Gage readings have been reduced to elevations above mean sea level. Datum of 1929, supplementary adjustment of 1947, is 0.04 ft higher. Prior to Aug. 23, 1934, staff gage at same site. Datum of gage was 54.08 ft higher prior to Oct. 8, 1934.

Extremes.--Maximum elevation during year, 1,772.99 ft June 5; minimum, 1,757.22 ft Mar. 3. 1927-60: Maximum elevation recorded, 1.781.38 ft May 24, 1956; minimum, 1,755.53 ft Dec. 9, 1936.

Remarks.--Elevations affected by backwater from Kootenay Lake May 12-19, June 2 to July 11. None of the drainage district dikes failed during year.

Elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61.30	60.81	61.81	58.89	59.06	57.84	62.88	61.13	65.90	65.93	60.69	58.92
2	61.11	60.70	61.52	58.50	58.89	57.70	62.30	61.58	67.27	66.17	60.83	58.85
3	60.92	60.70	61.29	58.52	58.81	57.44	62.01	62.23	69.11	66.17	60.94	58.79
4	60.78	60.86	60.67	58.58	58.69	57.47	62.30	62.76	71.42	65.74	61.13	58.89
5	60.65	60.75	60.20	58.58	58.61	57.70	63.14	63.09	72.84	65.26	61.20	59.00
6	60.63	60.55	60.02	58.67	58.57	57.75	64.14	63.30	72.45	64.87	61.25	59.20
7	60.63	60.40	59.95	58.88	58.62	57.82	64.61	63.57	71.01	64.56	61.20	59.67
8	60.56	60.30	59.82	59.06	58.70	57.93	64.66	64.17	70.09	64.52	61.00	59.86
9	60.86	60.26	59.94	59.04	58.67	57.93	65.07	64.40	69.42	64.61	60.70	59.61
10	60.88	60.20	59.61	59.09	58.63	58.00	65.52	64.55	68.35	64.52	60.45	59.35
11	60.74	60.15	59.50	58.77	58.55	57.92	65.35	65.39	67.91	64.10	60.24	59.13
12	60.71	60.04	59.45	58.95	58.48	57.89	64.83	67.01	68.20	63.65	60.10	58.99
13	60.72	59.77	59.37	59.11	58.44	57.91	64.30	69.19	68.84	63.33	60.00	58.91
14	60.72	59.39	59.28	59.05	58.41	57.82	63.97	70.46	69.35	63.17	59.93	58.82
15	60.92	59.10	59.43	58.88	58.41	57.83	63.64	69.61	69.82	63.16	59.88	58.74
16	61.24	58.90	60.41	58.56	58.33	57.88	63.18	67.72	69.94	63.18	59.80	58.68
17	61.45	59.12	60.66	58.61	58.41	57.85	62.78	66.40	69.68	63.06	59.74	58.65
18	61.39	60.61	60.35	58.37	58.42	57.93	62.54	65.49	69.39	62.83	59.63	58.64
19	61.19	61.13	60.00	58.28	58.36	58.04	62.31	64.86	68.42	62.63	59.50	58.61
20	61.02	60.77	59.83	58.35	58.23	58.19	62.18	64.52	67.02	62.51	59.36	58.57
21	60.97	61.21	59.74	58.30	58.12	58.44	62.13	64.49	66.24	62.40	59.25	58.52
22	60.96	61.37	59.64	58.32	58.14	58.74	61.97	64.30	65.68	62.35	59.26	58.52
23	60.98	61.38	59.55	58.29	58.25	59.24	61.79	64.04	65.00	62.11	59.25	58.68
24	60.93	62.00	59.49	58.31	58.07	59.78	61.61	63.79	64.62	61.85	59.23	58.67
25	61.15	63.50	59.46	58.56	58.14	60.57	61.42	63.57	64.93	61.66	59.17	58.57
26	61.42	65.27	59.38	58.66	58.04	61.63	61.22	63.45	65.87	61.36	59.13	58.51
27	61.61	63.84	59.27	58.80	57.74	62.51	61.08	63.71	66.34	61.09	59.13	58.48
28	61.54	62.83	59.18	58.82	57.78	63.41	60.99	63.97	65.84	60.84	59.04	58.41
29	61.36	62.47	59.02	58.85	57.82	63.72	60.90	64.09	65.51	60.72	58.99	58.37
30	61.20	62.21	58.97	58.99	-------	63.81	60.93	64.26	65.59	60.71	58.96	58.30
31	61.00	-------	58.95	59.03	-------	63.53	-------	64.94	-------	60.70	58.96	-------

Note.--Add 1,700 ft to obtain elevation above mean sea level.

3095. Kootenai River at Bonners Ferry, Idaho

Location.--Lat 48°42'00", long 116°18'45", in NE¼ sec.27, T.62 N., R.1 E., near right bank on downstream side of highway bridge at Bonners Ferry.
Drainage area.--13,000 sq mi, approximately.
Records available.--May to October 1904, October 1927 to September 1960 (gage heights only prior to March 1928), discontinued. Gage heights collected in this vicinity since 1904 are contained in reports of U. S. Weather Bureau.
Gage.--Wire-weight gage read once daily. Water-stage recorder with pressure recording bubbler system 800 ft across channel from wire-weight gage at same datum, used as supplementary gage. Datum of gage is 1,743.00 ft above mean sea level with respect to Geological Survey bench mark V-3-1929 at elevation 1,777.08 ft. Gage readings have been reduced to elevations above mean sea level. Datum of 1929, supplementary adjustment of 1947, is 0.02 ft higher. May 1 to Oct. 15, 1904, staff gage on railroad bridge three-quarters of a mile downstream at different datum. Oct. 1, 1927, to Nov. 30, 1929, staff gage near left bank. Dec. 1, 1929, to June 12, 1933, chain or wire-weight gages on old highway bridge 40 ft downstream. Datum of gages Oct. 1, 1927, to Jan. 2, 1931, was about 0.23 ft lower.
Average discharge.--32 years (1928-60), 14,870 cfs (10,770,000 acre-ft per year).
Extremes.--Maximum discharge during year, 75,700 cfs June 5; maximum elevation, 1,770.69 ft June 6; minimum daily discharge, 3,100 cfs Mar. 3; minimum elevation observed, 1,744.14 ft Mar. 20.
1927-60: Maximum discharge, 139,000 cfs May 27, 1948 (affected by dike breakage downstream); maximum elevation, 1,780.09 ft May 24, 1956; minimum daily discharge, 1,300 cfs Feb. 8, 1936; minimum elevation, 1,741.14 ft Dec. 5, 1929, Dec. 29, 1930, datum then in use.
Flood in June 1894 reached a stage of 1,777.2 ft, present datum.
Revisions.--The figure of maximum elevation for the water year 1959 has been revised to 1,775.69 ft June 7, superseding that published in WSP 1636.
Remarks.--Records excellent except those for periods of ice effect, which are good. Backwater from Kootenay Lake usually present at Bonners Ferry. Discharge for periods of backwater at Boom Camp from Kootenay Lake May 12-19, June 2 to July 11, computed on basis of fall between gages at Boom Camp near Bonners Ferry; that for remainder of year on basis of stage-discharge relation for station at Boom Camp. Discharge measurements made at station near Bonners Ferry. None of the drainage district dikes failed during year.

Elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50.49	49.72	53.18	49.17	49.28	45.82	53.13	49.20	60.47	61.69	50.29	46.29
2	50.12	49.50	52.91	48.66	49.21	45.60	51.77	49.96	62.72	62.12	50.32	46.28
3	49.82	49.48	52.85	48.65	48.95	45.98	50.92	51.19	65.50	62.13	50.42	46.29
4	49.56	49.79	52.52	47.61	48.73	46.22	51.24	52.42	68.44	61.68	50.65	46.43
5	49.35	49.63	52.01	48.77	48.67	46.46	52.74	53.23	70.34	60.93	50.77	46.79
6	49.28	49.37	51.79	49.14	48.59	46.51	55.08	53.89	70.25	60.25	50.81	47.17
7	49.34	49.11	51.74	49.08	48.60	46.35	56.59	54.51	68.75	59.66	50.71	47.79
8	49.40	48.92	51.32	49.17	48.68	46.44	57.08	55.96	67.57	59.44	50.40	48.13
9	49.70	48.76	50.92	49.13	48.72	46.22	57.80	56.77	66.80	59.46	49.88	47.93
10	49.81	48.70	50.76	49.02	48.55	46.11	59.03	57.26	65.57	59.31	49.39	47.68
11	49.60	48.63	50.83	49.03	48.30	46.04	59.06	58.82	65.01	58.55	48.95	47.47
12	49.50	48.55	50.72	49.25	48.12	45.85	58.23	61.70	65.21	57.66	48.58	47.32
13	49.51	48.65	50.52	49.08	47.91	45.74	57.12	65.14	65.98	56.90	48.29	47.28
14	49.47	49.42	49.76	48.83	47.80	45.60	56.27	67.32	66.61	56.41	48.05	47.22
15	49.81	50.25	49.61	48.80	47.65	45.30	55.60	66.66	67.15	56.21	47.90	47.24
16	50.31	48.98	50.50	48.75	47.36	45.11	54.63	64.49	67.39	56.14	47.71	47.19
17	50.69	49.04	50.54	48.68	47.20	44.95	53.72	62.38	67.14	55.92	47.61	47.12
18	50.72	49.15	49.85	48.68	47.01	44.75	53.09	60.81	66.78	55.47	47.34	47.04
19	50.40	49.63	49.18	48.87	46.87	44.39	52.52	59.54	65.82	54.99	47.13	46.99
20	50.12	49.93	48.77	48.96	46.78	44.17	52.10	58.70	64.13	54.67	46.90	47.06
21	49.98	50.66	48.43	49.16	46.66	44.19	51.97	58.55	62.92	54.35	46.72	47.04
22	49.92	51.22	48.18	49.35	46.52	44.53	51.67	58.21	62.03	54.09	46.59	47.04
23	49.95	51.48	48.05	49.31	46.30	45.09	51.23	57.68	60.98	53.63	46.52	47.14
24	49.88	52.95	48.03	49.15	46.35	45.80	50.79	57.10	60.18	53.18	46.48	47.20
25	50.26	56.69	48.01	49.26	45.96	46.99	50.32	56.53	60.30	52.72	46.38	47.14
26	50.69	57.12	47.92	49.23	45.78	48.70	49.87	56.16	61.55	52.13	46.37	47.08
27	51.04	56.00	47.79	49.27	45.63	50.99	49.50	56.55	62.44	51.55	46.31	47.02
28	51.00	54.85	47.51	49.30	45.94	52.89	49.19	57.00	61.90	51.09	46.22	46.97
29	50.73	53.95	47.95	49.34	45.98	54.22	48.96	57.25	61.31	50.70	46.18	46.91
30	50.40	53.42	48.71	49.29	-------	54.68	48.92	57.54	61.28	50.51	46.17	46.87
31	50.02	-------	48.78	49.30	-------	54.44	-------	58.64	-------	50.37	46.19	-------

Note.--Add 1,700 ft to obtain elevation above mean sea level.

3095. Kootenai River at Bonners Ferry, Idaho--Continued

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15,400	13,400	10,600	5,000	7,300	3,700	23,000	14,700	42,100	39,700	13,500	7,350
2	14,600	13,000	10,400	4,300	7,140	3,300	20,000	16,600	48,700	40,800	14,000	7,140
3	13,800	13,000	10,600	4,250	6,960	3,100	18,600	19,600	57,800	40,800	14,500	6,960
4	13,200	13,600	10,400	4,300	6,680	3,700	20,000	22,400	70,000	38,200	15,300	7,140
5	12,800	13,100	9,800	4,700	6,480	4,000	24,400	24,200	75,100	35,700	15,600	7,410
6	12,700	12,300	*9,500	5,500	6,370	4,100	30,600	25,400	69,700	33,900	15,800	7,950
7	12,700	11,800	9,400	6,500	6,510	4,300	33,600	27,000	61,700	32,300	15,600	9,290
8	12,400	11,400	9,200	6,400	6,700	4,500	33,900	30,800	58,400	32,400	14,800	9,880
9	13,600	11,300	8,700	6,200	6,620	4,700	36,600	32,300	*55,000	33,000	13,600	9,110
10	13,600	11,100	8,000	6,000	6,540	4,800	39,500	33,200	49,400	32,500	12,500	8,340
11	13,100	10,900	8,300	5,900	6,310	4,700	38,400	38,700	47,400	30,300	11,700	7,790
12	13,000	10,500	8,400	6,200	6,160	4,600	35,000	48,300	49,600	27,600	11,200	7,380
13	13,000	9,200	8,410	6,200	6,080	4,600	31,600	59,500	53,100	25,800	10,900	7,200
14	13,000	8,450	8,140	5,700	6,000	4,600	*29,500	65,000	55,600	25,000	10,600	6,990
15	13,800	7,690	8,580	5,300	6,000	4,690	27,400	58,000	57,700	25,000	10,400	6,820
16	15,100	7,000	11,800	*4,900	5,820	4,700	24,700	47,900	57,900	25,200	10,100	6,650
17	*16,000	6,200	12,800	4,500	5,700	4,730	22,500	42,000	56,000	*24,600	9,920	6,590
18	15,800	6,500	11,600	4,100	5,700	4,930	21,200	37,700	54,800	23,300	9,540	6,560
19	14,900	7,300	10,300	3,800	5,600	5,170	20,000	34,900	48,900	22,200	9,110	6,480
20	14,200	8,200	9,810	3,400	5,500	5,500	19,400	33,000	42,200	21,600	8,650	6,370
21	14,000	10,000	9,500	3,600	5,340	6,080	19,200	32,800	39,300	21,000	8,310	6,260
22	13,900	11,200	9,220	3,900	5,400	6,820	18,400	31,600	36,800	20,800	8,340	6,260
23	14,000	12,500	8,930	4,100	5,300	8,080	17,600	30,000	33,600	19,600	8,310	6,650
24	13,800	15,000	8,750	4,400	5,220	9,470	16,700	28,300	32,100	18,400	8,240	6,620
25	14,800	17,000	8,650	4,900	5,100	12,400	15,900	27,000	34,300	17,600	*8,040	6,370
26	15,900	17,500	8,410	5,600	4,000	16,800	15,000	26,300	39,400	16,300	7,950	6,240
27	16,700	16,000	8,140	6,200	3,800	21,000	14,400	27,900	41,600	15,100	7,950	6,160
28	16,400	13,500	7,800	6,500	3,800	26,100	14,000	29,500	38,700	14,100	7,690	*6,000
29	15,600	12,000	7,000	6,700	3,800	27,900	13,700	*30,300	37,000	13,600	7,530	5,900
30	14,900	11,200	6,000	7,000	------	28,500	13,800	31,400	37,700	13,600	7,440	5,740
31	14,100	------	5,500	7,300	------	26,800	------	35,700	------	13,600	7,440	------
Total	440,800	341,840	282,640	163,150	167,930	278,370	708,600	‡1,042	‡1,481.6	793.600	334,560	211,600
Mean	14,220	11,390	9,117	5,263	5,791	8,980	23,620	33,610	49,390	25.600	10,790	7,053
Cfsm	1.09	0.876	0.701	0.405	0.445	0.691	1.82	2.59	3.80	1.97	0.830	0.543
In.	1.26	0.98	0.81	0.47	0.48	0.80	2.03	2.98	4.24	2.27	0.96	0.61
Ac-ft	874,300	678,000	560,600	323,600	333,100	552,100	‡1,405	‡2,067	‡2,939	‡1,574	663,600	419,700

Calendar year 1959: Max 91,600 Min 2,700 Mean 20,420 Cfsm 1.57 In. 21.32 Ac-ft 14,780,000
Water year 1959-60: Max 75,100 Min 3,100 Mean 17,070 Cfsm 1.31 In. 17.89 Ac-ft 12,390,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
Note.--Stage-discharge relation affected by ice Nov. 13, Nov. 16 to Dec. 12, Dec. 28 to Feb. 1, Feb. 17-20, 23, Feb. 25 to Mar. 14, Mar. 16.

3100. Kootenai River near Bonners Ferry, Idaho

Location.--Lat 48°41'55", long 116°20'40", in NW¼ sec.28, T.62 N., R.1 E., on left bank 1.6 miles downstream from highway bridge at Bonners Ferry.

Drainage area.--13,000 sq mi, approximately.

Records available.--May 1928 to September 1960 (gage heights only, fragmentary prior to May 1929).

Gage.--Water-stage recorder. Datum of gage is 1,700.00 ft above mean sea level, levels by Topographic Division in 1928. Gage readings have been reduced to elevations above mean sea level. Datum of 1929, supplementary adjustment of 1947, is 0.02 ft higher at Bonners Ferry. May 17 to July 20, 1928, water-stage recorder at same site at datum 43.42 ft higher. July 21 to Oct. 22, 1928, and for elevations below 1,742 ft prior to Jan. 2, 1931, staff gage at same site and datum.

Extremes.--Maximum elevation during year, 1,770.06 ft June 6; minimum, 1,743.56 ft Mar. 21. 1928-60: Maximum elevation, 1,778.94 ft May 24, 1956, from graph based on gage readings; minimum, 1,740.16 ft Mar. 29, 1944.

Remarks.--Elevations affected by backwater from Kootenay Lake. None of the drainage district dikes failed during year.

Elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50.65	49.40	d49.35	f47.35	46.45	44.14	52.51	48.60	f59.30	61.18	50.05	46.00
2	49.80	49.17	d49.26	f47.00	46.44	43.91	51.46	49.35	f61.90	61.59	50.00	46.01
3	49.52	49.15	d49.06	f46.87	46.39	43.78	50.62	50.50	64.82	61.62	50.10	46.03
4	49.26	49.45	d49.03	f46.83	46.30	43.83	50.46	51.75	67.80	61.22	50.35	46.16
5	49.06	49.33	f48.85	f46.80	46.18	44.02	51.42	52.57	69.69	60.53	50.45	46.55
6	48.95	49.09	48.78	46.92	46.13	44.18	53.26	53.28	69.66	59.84	50.52	46.93
7	49.00	48.82	48.67	47.11	46.15	44.29	54.85	53.88	68.24	59.25	50.48	47.51
8	48.93	48.63	48.60	47.15	46.25	44.43	55.69	55.30	67.04	59.03	50.20	47.85
9	49.40	48.51	f48.32	47.18	46.25	44.47	56.30	56.10	66.29	59.06	49.70	47.68
10	49.53	48.43	48.24	47.07	46.23	44.41	57.37	56.62	65.10	58.95	49.20	47.45
11	49.30	48.35	48.21	46.97	46.15	44.34	57.82	58.10	64.48	58.23	48.79	47.27
12	49.21	48.28	48.32	46.98	46.04	44.25	d57.39	61.00	64.65	57.38	48.42	47.15
13	49.19	47.91	48.33	46.98	45.98	44.11	d56.55	64.52	65.39	56.61	48.10	47.10
14	49.19	47.69	48.25	46.80	45.95	43.96	f55.77	66.57	66.01	d56.10	47.83	47.05
15	49.48	47.66	f48.39	46.61	45.91	43.92	55.08	66.09	66.58	d55.85	47.66	47.09
16	49.95	46.97	49.33	46.58	45.86	43.85	54.15	63.86	66.82	d55.75	47.49	47.05
17	50.30	46.84	50.00	46.47	45.72	43.82	53.17	61.88	66.62	d55.54	47.30	46.97
18	50.34	46.92	f49.80	46.25	45.54	43.79	52.56	f60.31	66.26	55.13	47.10	46.87
19	50.05	47.21	49.08	46.05	45.41	43.69	52.00	59.05	65.36	54.67	46.86	46.85
20	49.76	47.73	48.67	45.90	45.31	43.59	51.59	58.22	63.74	54.35	46.68	46.92
21	49.60	48.48	48.43	f45.82	45.26	43.66	51.43	58.09	62.55	54.02	46.40	46.91
22	49.55	49.05	48.23	45.80	45.25	d43.94	51.17	57.75	61.70	53.79	46.28	46.91
23	49.62	49.55	48.06	45.81	45.09	d44.50	50.71	57.25	60.70	53.36	d46.13	46.97
24	49.53	50.27	47.97	45.88	45.08	f45.07	50.27	56.65	59.85	52.90	d46.06	47.05
25	49.85	d51.48	47.92	46.00	44.90	f46.15	49.79	56.10	59.78	52.46	45.97	47.00
26	50.28	d51.93	47.89	46.20	44.56	f47.96	49.33	55.72	61.08	51.88	45.98	46.95
27	50.65	d51.62	47.78	46.31	44.23	49.21	48.94	56.08	61.88	51.30	45.99	46.90
28	50.64	d50.63	47.60	46.34	44.20	50.83	48.63	56.48	61.42	50.82	45.91	46.84
29	50.39	d49.92	47.59	46.38	44.25	52.31	48.37	56.72	60.87	50.44	45.90	46.79
30	50.06	d49.46	47.68	46.48	-------	52.93	48.33	56.91	60.82	50.27	45.89	46.76
31	49.69	-------	47.57	46.51	-------	53.15	-------	57.63	-------	50.10	45.90	-------

d Doubtful gage-height record.
f Gage-height partly estimated.
Note.--Add 1,700 ft to obtain elevation above mean sea level.

3110. Deep Creek at Moravia, Idaho

Location.--Lat 48°38', long 116°24', in sec.18, T.61 N., R.1 E., on left bank 50 ft downstream from highway bridge, 1 mile downstream from Ruby Creek, and 1 mile southwest of Moravia.

Drainage area.--133 sq mi.

Records available.--May 1928 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 1,800 ft (from topographic map). May 1928 to Sept. 19, 1959, staff gages 50 ft upstream. Prior to Aug. 2, 1949, at datum 2.00 ft higher.

Average discharge.--32 years, 143 cfs (103,500 acre-ft per year).

Extremes.--Maximum discharge observed during year, 1,240 cfs Mar. 30 (gage height, 7.25 ft), from rating curve extended above 510 cfs; minimum, 13 cfs July 28 (gage height, 4.00 ft). 1928-60: Maximum discharge, 1,670 cfs May 18, 1954 (gage height, 7.40 ft, from graph based on gage readings); minimum observed, 5 cfs Aug. 14, 22, 1940.

Remarks.--Records excellent except those for periods of ice effect, which are poor. Small diversions above station for irrigation. Occasional regulation above station at migratory waterfowl refuge near Elmira.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 11				May 12 to Sept. 30			
4.1	26	5.5	299	4.0	13	5.5	281
4.3	44	6.0	478	4.2	26	6.0	449
4.6	86	6.5	714	4.5	61	6.5	685
5.0	169	7.1	1,110	5.0	155	7.0	1,000

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	35	57	99	90	130	64	605	389	441	90	18	22
2	34	56	95	88	100	60	506	446	508	84	18	20
3	33	83	95	86	95	*55	510	486	522	77	19	19
4	32	106	86	86	90	70	596	486	457	71	33	37
5	31	81	88	100	86	70	782	498	397	66	25	44
6	33	78	83	120	78	110	882	514	383	61	21	28
7	37	70	81	110	137	124	856	657	353	57	19	25
8	44	67	78	100	144	126	806	662	311	54	18	24
9	114	64	73	94	128	110	909	558	*299	49	18	23
10	68	63	*83	85	110	83	862	620	293	45	16	22
11	66	60	81	90	100	73	698	794	296	43	16	22
12	80	43	95	80	97	70	631	884	284	40	16	21
13	75	30	90	72	99	66	586	806	270	*38	14	20
14	78	45	83	*62	97	64	646	641	250	36	14	19
15	76	56	226	65	112	68	586	530	256	34	14	18
16	64	56	293	65	102	70	*510	540	248	31	14	18
17	58	62	216	60	97	78	462	517	218	28	16	17
18	56	70	181	52	88	97	486	445	191	26	18	17
19	54	80	160	52	95	120	454	415	179	25	18	17
20	61	110	146	50	86	137	466	535	179	24	18	18
21	73	180	137	50	91	155	478	620	177	22	18	18
22	80	160	128	60	88	191	427	504	155	22	18	18
23	76	170	122	70	76	234	382	438	147	20	19	19
24	70	200	122	80	83	285	357	419	144	20	21	20
25	84	252	131	90	70	378	357	404	136	19	23	20
26	71	174	116	110	60	531	318	*434	126	18	31	19
27	67	137	110	100	62	641	308	494	118	18	*32	19
28	68	126	104	100	62	782	311	449	110	17	25	18
29	64	118	100	140	64	776	321	438	103	17	25	19
30	*60	110	96	200	------	1,100	347	449	95	16	22	19
31	58	------	92	170	------	818	------	470	------	18	22	------
Total	1,900	2,964	3,690	2,797	2,727	7,606	16,425	16,542	7,646	1,186	619	640
Mean	61.3	98.8	119	90.2	94.0	245	548	534	255	38.3	20.0	21.3
Cfsm	0.461	0.743	0.895	0.678	0.707	1.84	4.12	4.02	1.92	0.288	0.150	0.160
In.	0.53	0.83	1.03	0.78	0.76	2.13	4.59	4.63	2.14	0.33	0.17	0.18
Ac-ft	3,770	5,880	7,320	5,550	5,410	15,090	32,580	32,810	15,170	2,350	1,230	1,270

Calendar year 1959: Max 1,060 Min 14 Mean 173 Cfsm 1.30 In. 17.69 Ac-ft 125,600
Water year 1959-60: Max 1,100 Min 14 Mean 177 Cfsm 1.33 In. 18.10 Ac-ft 128,400

Peak discharge (base, 410 cfs).--Nov. 21 (4 a.m.) 610 cfs (6.30 ft); Mar. 30 (9 a.m.) 1,240 cfs (7.25 ft); Apr. 10 (1 a.m.) 944 cfs (6.83 ft); May 12 (3 a.m.) 979 cfs (6.93 ft); May 20 (11 p.m.) 707 cfs (6.54 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-24, 28, 29, Dec. 29 to Feb. 3, Feb. 25 to Mar. 6, Mar. 13.

3140. Kootenai River at Klockmann Ranch, near Bonners Ferry, Idaho

Location.--Lat 48°47'40", long 116°22'50", in SE¼ sec.19, T.63 N., R.1 E., on right bank 0.3 mile downstream from dike of drainage district No. 5 and 8 miles north of Bonners Ferry.

Drainage area.--13,300 sq mi, approximately.

Records available.--May to July, September to November 1928, April to September, December 1929, April 1930 to September 1960 (gage heights only, fragmentary prior to April 1930).

Gage.--Water-stage recorder. Datum of gage is 1,700.00 ft above mean sea level, levels by Topographic Branch in 1928. Gage readings have been reduced to elevations above mean sea level. Datum of 1929, supplementary adjustment of 1947, is about 0.03 ft higher. Prior to Sept. 12, 1928, several staff gages within 300 ft at different datums.

Extremes.--Maximum elevation during year, 1,767.60 ft June 6; minimum, 1,742.46 ft Mar. 17.
1928-60: Maximum elevation, 1,775.89 ft May 24, 1956; minimum, 1,738.76 ft Apr. 1, 1944.

Remarks.--Elevations affected by backwater from Kootenay Lake. None of the drainage district dikes failed during year.

Elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48.95	48.37	48.07	46.58	45.56	43.27	50.20	47.21	57.90	59.54	49.15	45.37
2	48.65	48.18	47.96	46.32	45.52	43.20	49.00	47.77	59.94	59.92	49.11	45.41
3	48.42	48.15	47.98	46.32	45.43	43.12	48.10	48.76	62.52	59.98	49.17	45.46
4	48.21	48.41	47.95	46.25	45.33	43.10	48.10	49.93	65.28	59.61	49.31	45.62
5	48.05	48.32	47.81	46.24	45.22	43.15	49.70	50.71	67.14	58.93	49.36	45.97
6	47.94	48.15	47.65	46.43	45.17	43.16	51.40	51.37	67.36	58.31	49.38	46.31
7	48.00	47.91	47.59	46.57	45.18	43.21	52.90	51.99	66.19	57.77	49.30	46.78
8	47.96	47.75	47.52	46.53	45.24	43.24	53.60	53.35	65.08	57.52	49.02	47.05
9	48.33	47.64	47.36	46.58	45.18	43.26	54.50	54.16	64.39	57.52	48.60	46.98
10	48.47	47.59	47.26	46.43	45.13	43.14	55.40	54.68	63.35	57.39	48.15	46.83
11	48.28	47.52	47.30	46.43	45.02	43.06	55.80	56.02	62.77	56.74	47.82	46.69
12	48.18	47.46	47.41	46.43	44.92	42.95	55.40	58.77	62.89	55.97	47.47	46.60
13	48.16	47.02	47.38	46.36	44.87	42.80	54.60	61.99	63.56	55.28	47.21	46.60
14	48.17	46.77	47.27	46.14	44.82	42.67	54.00	64.07	64.13	54.81	46.94	46.57
15	48.44	46.75	47.41	46.03	44.77	42.59	53.33	63.82	64.64	54.56	46.81	46.63
16	48.78	46.36	48.48	46.01	44.72	42.52	52.52	62.00	64.91	54.46	46.63	46.59
17	49.08	46.25	48.98	45.90	44.61	42.48	51.65	60.09	64.78	54.23	46.47	46.53
18	49.14	46.33	48.76	45.72	44.45	42.48	51.05	58.60	64.43	53.83	46.25	46.46
19	48.92	46.49	48.23	45.60	44.34	42.52	50.55	57.43	63.69	53.42	46.02	46.42
20	48.69	46.89	47.82	45.50	44.27	42.56	50.10	56.65	62.21	53.12	45.84	46.51
21	48.55	47.41	47.58	45.43	44.25	42.67	49.93	56.52	61.06	52.82	45.62	46.50
22	48.47	47.87	47.37	45.40	44.21	42.90	49.68	56.18	60.21	52.60	45.49	46.51
23	48.54	48.29	47.25	45.40	44.08	43.15	49.26	55.72	59.25	52.21	45.39	46.56
24	48.47	48.83	47.22	45.42	44.07	43.60	48.85	55.11	58.50	51.81	45.30	46.60
25	48.75	49.80	47.23	45.56	43.91	44.20	48.42	54.58	58.49	51.39	45.24	46.59
26	49.09	50.35	47.18	45.65	43.71	45.60	48.02	54.22	59.43	50.88	45.24	46.54
27	49.41	49.96	47.02	45.66	43.50	47.00	47.65	54.50	60.24	50.36	45.27	46.49
28	49.41	49.12	46.83	45.64	43.41	48.80	47.36	54.86	59.79	49.95	45.22	46.46
29	49.22	48.49	46.64	45.68	43.37	50.00	47.13	55.07	59.25	49.58	45.20	46.42
30	48.92	48.17	46.64	45.70	-------	51.00	47.03	55.32	59.21	49.39	45.22	46.39
31	48.62	-------	46.75	45.64	-------	51.10	-------	56.26	-------	49.23	45.26	-------

Note.--Add 1,700 ft to obtain elevation above mean sea level. Gage height estimated or partly estimated on basis of records for other Kootenai River stations Jan.17-24, Mar. 2-5, Mar. 20 to Apr. 15.

3168. Mission Creek near Copeland, Idaho

Location.--Lat 48°56'40", long 116°19'30", in NW¼ sec.34, T.65 N., R.1 E., on left bank 0.1 mile upstream from bridge crossing, 4 miles northeast of Copeland, and 17 miles north of Bonners Ferry.

Drainage area.--23 sq mi, approximately.

Records available.--September 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,800 ft (from topographic map).

Extremes.--Maximum discharge during year, 371 cfs May 11 (gage height, 4.86 ft); minimum, 4.2 cfs Sept. 28-30 (gage height, 1.95 ft).
1958-60: Maximum discharge, that of May 11, 1960; minimum, 2.2 cfs Sept. 2, 1958 (gage height, 1.95 ft).

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are poor. No regulation or diversion above station.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.9	3.2	3.0	62
2.0	4.5	3.5	132
2.2	8.5	4.0	212
2.4	16	5.0	384
2.7	34		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	26	20	b14	26	9.0	66	79	185	34	8.3	6.0
2	15	25	20	b14	21	b8.4	59	104	209	32	12	5.5
3	15	28	20	b15	b16	b8.8	63	135	235	30	8.9	5.4
4	15	28	19	b17	b14	b10	87	142	225	28	17	12
5	14	27	*18	b19	12	b12	128	143	196	26	10	11
6	15	24	17	19	11	b14	142	146	177	24	8.5	7.6
7	16	23	17	17	12	b16	145	186	159	22	7.8	6.4
8	17	22	16	18	11	b17	158	190	142	21	7.4	6.0
9	24	22	b16	18	11	b16	190	182	126	20	7.1	5.7
10	19	21	b16	18	11	b14	182	215	117	19	6.9	5.5
11	19	20	16	17	11	b13	153	294	*110	18	6.4	5.4
12	19	b17	16	17	11	12	134	332	106	17	6.2	5.2
13	20	b15	15	16	11	12	114	301	102	16	6.2	5.2
14	22	b17	14	a15	11	11	*106	236	98	15	6.2	4.8
15	25	b19	22	a14	11	10	93	198	98	14	6.2	4.8
16	22	b20	27	a14	10	9.6	78	185	93	14	6.2	4.8
17	22	b21	25	a14	b9.5	9.6	69	166	84	13	6.4	4.8
18	22	b25	22	a13	b9.5	11	68	145	74	12	6.2	4.7
19	22	b30	21	a12	b9.5	12	63	138	66	12	5.7	4.7
20	*24	b40	21	*b12	b10	b13	62	154	66	11	5.5	4.8
21	26	b48	20	b12	11	b15	60	*166	64	11	5.5	4.7
22	28	44	20	b13	b9.5	b20	55	140	58	*10	5.7	4.5
23	29	58	b19	b14	b9.5	b28	51	128	52	9.9	5.7	4.8
24	27	46	19	b15	b10	40	47	120	50	9.9	6.0	4.8
25	30	37	19	b17	b9.5	58	44	120	48	9.6	6.2	4.8
26	29	32	b17	b19	b8.2	87	42	130	45	9.6	*8.9	4.5
27	28	b28	17	b20	b8.2	112	43	153	43	9.2	8.3	4.5
28	28	b25	b16	b18	b8.5	134	45	142	40	8.5	6.4	4.2
29	28	b23	b16	b32	*b8.5	120	50	142	39	8.3	7.4	4.2
30	27	21	b15	b45	------	108	62	151	37	8.3	7.6	4.2
31	26	------	b15	35	------	82	------	169	------	8.3	6.4	------
Total	688	832	569	553	331.4	1,042.4	2,659	5,230	3,144	509.6	229.2	165.5
Mean	22.2	27.7	18.4	17.8	11.4	33.6	88.6	169	105	16.1	7.39	5.52
Cfsm	0.965	1.20	0.800	0.774	0.496	1.46	3.85	7.35	4.57	0.700	0.321	0.240
In.	1.11	1.35	0.92	0.89	0.54	1.69	4.30	8.46	5.08	0.81	0.37	0.27
Ac-ft	1,360	1,650	1,130	1,100	657	2,070	5,270	10,370	6,240	993	455	328

Calendar year 1959: Max 298 Min 5.5 Mean 43.3 Cfsm 1.88 In. 25.54 Ac-ft 31,300
Water year 1959-60: Max 332 Min 4.2 Mean 43.6 Cfsm 1.90 In. 25.79 Ac-ft 31,620

Peak discharge (base, 170 cfs).--May 11 (7:30 p.m.) 371 cfs (4.86 ft); June 3 (9 p.m.) 245 cfs (4.12 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby streams.

3185. Kootenai River near Copeland, Idaho

(International gaging station)

Location.--Lat 48°54'45", long 116°25'00", in NW¼NW¼SW¼ sec.12, T.64 N., R.1 W., on right bank at Andrews Ranch, three-quarters of a mile downstream from Mission Creek and 1½ miles northwest of Copeland.

Drainage area.--13,400 sq mi, approximately.

Records available.--October 1927 to September 1960 (gage-height records only prior to May 1929). April 1925 to September 1927 (gage heights only) in reports of Department of Northern Affairs and National Resources, Canada.

Gage.--Water-stage recorder. Datum of gage is 1,700.00 ft above mean sea level, referred to bench mark T-10-1914, elevation, 1,791.49 ft (datum of 1929, supplementary adjustment of 1947, is about 0.04 ft higher). Prior to Nov. 20, 1929, staff or recording gage at site three-quarters of a mile upstream; datum 40.77 ft higher prior to Apr. 18, 1929. Gage readings have been reduced to elevations above mean sea level.

Average discharge.--31 years, 15,490 cfs (11,210,000 acre-ft per year).

Extremes.--Maximum daily discharge during year, 76,000 cfs June 5; maximum elevation, 1,763.70 ft June 6; minimum daily discharge, 3,500 cfs Mar. 3; minimum elevation, 1,741.90 ft Mar. 18.
1929-60: Maximum daily discharge, 124,000 cfs May 30, 1948; maximum elevation, 1,771.78 ft May 28, 1956; minimum daily discharge, 1,350 cfs Feb. 8, 1936; minimum elevation, 1,738.52 ft Apr. 2, 3, 1944.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record at Klockmann Ranch, which are good. Stage-discharge relation affected by backwater from Kootenay Lake. Discharge computed from slope and conveyance of the reach between stations at Klockmann Ranch and at Porthill, and discharge measurements made at station near Copeland. None of the drainage district dikes failed during year.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47.70	47.34	47.10	46.21	45.07	43.05	48.22	45.64	55.10	57.14	48.22	44.93
2	47.51	47.19	47.05	46.06	45.02	42.95	47.27	45.99	56.78	57.43	48.13	45.00
3	47.35	47.19	47.05	46.05	44.96	42.86	46.63	46.69	59.09	57.49	48.15	45.09
4	47.21	47.38	47.07	46.00	44.88	42.84	46.67	47.63	61.45	57.25	48.19	45.26
5	47.09	47.33	47.01	46.00	44.80	42.85	47.62	48.31	63.16	56.73	48.22	45.69
6	47.02	47.23	46.93	46.12	44.73	42.80	49.35	48.90	63.61	56.23	48.19	45.90
7	47.08	47.06	46.88	46.18	44.72	42.82	50.72	49.47	62.89	55.78	48.11	46.23
8	47.06	46.95	46.84	46.21	44.75	42.84	51.30	50.63	61.97	55.55	47.88	46.43
9	47.33	46.84	46.74	46.23	44.70	42.82	51.85	51.35	61.43	55.48	47.56	46.43
10	47.43	46.81	46.70	46.26	44.63	42.69	52.93	51.84	60.59	55.35	47.23	46.36
11	47.28	46.78	46.73	46.27	44.54	42.60	53.19	53.13	60.10	54.84	46.93	46.30
12	47.20	46.73	46.79	46.13	44.44	42.48	52.70	55.55	60.06	54.20	46.63	46.24
13	47.17	46.47	46.75	46.05	44.41	42.33	51.94	58.33	60.65	53.64	46.38	46.26
14	47.19	46.28	46.62	45.90	44.35	42.18	51.32	60.24	61.14	53.21	46.16	46.26
15	47.37	46.19	46.73	45.80	44.31	42.09	50.86	60.29	61.57	52.98	46.02	46.33
16	47.62	46.00	47.32	45.75	44.25	42.00	50.25	58.93	61.83	52.84	45.83	46.31
17	47.81	45.95	47.73	45.64	44.16	41.93	49.23	57.33	61.80	52.65	45.69	46.27
18	47.86	46.00	47.59	45.46	44.03	41.91	49.04	56.11	61.52	52.33	45.51	46.20
19	47.74	46.10	47.28	45.34	43.93	41.92	48.63	55.12	60.97	51.97	45.34	46.15
20	47.58	46.30	47.02	45.28	43.86	41.96	48.24	54.46	59.82	51.73	45.21	46.26
21	47.46	46.60	46.88	45.24	43.85	42.05	48.09	54.32	58.81	51.44	45.00	46.26
22	47.41	47.00	46.77	45.22	43.80	42.18	47.84	54.02	58.07	51.22	44.84	46.28
23	47.44	47.40	46.69	45.21	43.71	42.37	47.48	53.61	57.19	50.91	44.76	46.30
24	47.40	47.70	46.69	45.23	43.68	42.58	47.13	53.10	56.64	50.58	44.73	46.32
25	47.60	48.20	46.72	45.33	43.53	43.02	46.77	52.63	56.52	50.23	44.67	46.34
26	47.83	48.60	46.69	45.35	43.41	44.14	46.44	52.10	56.96	49.80	44.69	46.30
27	48.05	48.25	46.55	45.30	43.27	45.73	46.14	52.51	57.69	49.36	44.74	46.26
28	48.06	47.90	46.41	45.26	43.20	47.28	45.86	52.73	57.44	48.99	44.70	46.24
29	47.92	47.50	46.28	45.27	43.17	47.52	45.67	52.84	56.99	48.70	44.71	46.22
30	47.70	47.20	46.25	45.22	-------	49.05	45.56	53.03	56.90	48.47	44.75	46.21
31	47.50	-------	46.30	45.13	-------	49.06	-------	53.75	-------	48.33	44.80	-------

Note.--Add 1,700 ft to obtain elevation above mean sea level. Elevations estimated on basis of records for nearby Kootenai River stations Nov. 16 to Dec. 3.

3185. Kootenai River near Copeland, Idaho--Continued

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16,000	14,200	11,000	5,600	7,400	4,000	26,000	16,600	41,700	41,500	13,800	7,370
2	15,000	13,700	10,800	4,500	7,300	3,750	22,000	18,300	48,600	42,900	14,200	7,250
3	14,300	13,500	11,000	4,400	7,200	3,500	21,000	21,100	57,300	43,100	14,600	6,990
4	13,600	14,300	*10,600	4,400	7,000	4,000	23,000	24,100	68,100	41,300	15,300	6,970
5	13,200	13,900	10,300	5,200	6,700	4,300	28,000	26,100	76,000	38,400	15,800	7,270
6	12,800	13,200	10,000	6,100	6,600	4,400	33,000	27,600	75,400	36,200	16,100	7,690
7	12,800	12,600	9,800	7,100	6,800	*4,600	35,000	29,000	68,000	34,300	16,000	9,160
8	12,700	12,100	9,700	7,000	7,100	*4,800	36,000	32,700	62,800	33,800	15,400	9,930
9	13,800	11,900	9,300	6,700	6,900	5,000	38,000	34,800	59,400	34,200	14,100	9,440
10	14,200	*11,800	8,600	6,400	6,800	5,000	42,000	36,000	*54,400	34,100	12,900	8,630
11	13,700	11,400	8,600	6,200	6,600	4,900	40,000	39,500	51,900	31,800	12,300	7,920
12	13,400	11,200	8,700	6,600	6,500	4,800	38,000	47,900	52,500	29,200	11,600	7,430
13	13,500	9,420	8,800	6,700	6,400	4,800	35,000	58,900	55,700	27,100	11,200	7,340
14	13,500	8,700	8,700	6,000	6,400	4,800	33,000	66,400	58,000	26,000	10,800	7,010
15	14,200	8,100	10,000	5,800	6,300	4,800	*31,400	64,200	60,100	25,700	10,800	6,870
16	15,400	7,300	12,400	5,300	6,400	4,900	28,700	55,700	61,000	25,800	10,500	6,760
17	16,400	6,700	14,200	4,800	6,300	5,000	26,200	48,400	59,600	25,300	10,300	6,640
18	16,500	7,000	13,300	4,400	6,100	5,200	24,500	43,000	58,200	*24,200	9,990	6,480
19	*15,800	8,000	11,500	*4,000	6,100	5,500	23,200	38,800	54,600	23,000	9,340	6,590
20	15,000	9,000	10,400	3,600	6,100	5,800	22,100	35,800	47,800	22,200	9,050	6,470
21	14,700	10,500	9,900	3,800	5,900	6,500	21,700	35,700	43,600	21,700	8,680	6,280
22	14,500	12,000	9,600	4,000	6,000	7,400	21,200	34,800	40,800	21,300	8,630	6,280
23	14,800	13,500	9,300	4,400	5,700	8,800	20,300	33,400	37,400	20,200	8,450	6,490
24	14,600	16,000	9,200	4,900	5,800	11,000	19,400	*31,700	35,000	19,100	8,210	6,730
25	15,300	17,500	9,000	5,500	5,500	15,000	18,500	30,100	35,700	18,100	*8,140	6,540
26	16,400	18,500	8,800	6,100	4,700	19,000	17,600	28,900	40,600	17,000	7,950	6,390
27	17,500	17,500	8,500	6,600	4,000	25,000	16,800	29,800	44,200	15,700	7,940	6,210
28	17,500	15,000	7,900	6,700	4,000	28,000	16,400	31,200	41,800	14,700	7,850	6,130
29	16,900	13,200	7,300	7,100	4,000	30,000	15,900	*31,900	39,700	13,900	7,560	*5,990
30	16,000	12,000	6,700	7,400	------	31,000	15,900	32,800	40,000	14,000	7,540	5,790
31	15,100	------	6,200	7,500	------	29,000	------	36,100	------	13,800	7,510	------
Total	459,100	363,720	300,100	174,800	178,600	304,550	789,800	‡1,121.3	‡1,569.9	829,600	342,540	213,040
Mean	14,810	12,120	9,681	5,639	6,159	9,824	26,330	36,170	52,330	26,760	11,050	7,101
Cfsm	1.11	0.904	0.722	0.421	0.460	0.733	1.96	2.70	3.91	2.00	0.825	0.530
In.	1.27	1.01	0.83	0.49	0.50	0.85	2.19	3.11	4.36	2.30	0.95	0.59
Ac-ft	910,600	721,400	595,200	346,700	354,200	604,100	‡1,567	‡2,224	‡3,114	‡1,645	679,400	422,600

Calendar year 1959: Max 91,300 Min 2,900 Mean 21,040 Cfsm 1.57 In. 21.30 Ac-ft 15,230,000
Water year 1959-60: Max 76,000 Min 3,500 Mean 18,160 Cfsm 1.36 In. 18.45 Ac-ft 13,180,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
Note.--Slope-conveyance discharge relation affected by ice Nov. 15 to Mar. 20 (no gage-height record at Klockmann Ranch Jan. 17-23, Mar. 2-5, Mar. 20 to Apr. 14; discharge estimated on basis of 1 discharge measurement and records for upstream Kootenai River stations using inflow and channel storage between Bonners Ferry and Copland as a guide).

3210. Smith Creek near Porthill, Idaho

Location.--Lat 48°57'40", long 116°33'20", in NE¼ sec.26, T.65 N., R.2 W., on right bank at U. S. Forest Service bridge, 1 mile south of Smith Creek ranger station and 4 miles southwest of Porthill.

Drainage area.--70 sq mi, approximately.

Records available.--May 1928 to November 1960 (discontinued); no winter records 1928-30. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 1,770 ft (from topographic map). Prior to Apr. 20, 1929, staff gage at site 40 ft downstream at datum 0.98 ft lower. Apr. 20, 1929, to Sept. 30, 1956, water-stage recorder at present site at datum 1.69 ft higher.

Average discharge.--30 years (1930-60), 191 cfs (138,300 acre-ft per year).

Extremes.--1959-60: Maximum discharge during water year, 1,690 cfs June 3 (gage height, 7.12 ft); minimum, 18 cfs Aug. 21 (gage height, 2.30 ft).
1960: Maximum discharge during period October to November, 303 cfs Oct. 24 (gage height, 4.42 ft); minimum, 18 cfs Oct. 6 (gage height, 2.28 ft).
1928-60: Maximum discharge, 3,810 cfs June 23, 1955 (gage height, 9.34 ft, present datum), from rating curve extended above 1,600 cfs by logarithmic plotting; minimum daily, 3 cfs Nov. 29, 30, 1952.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No regulation or diversion above station.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	182	168	102	b80	55	b34	156	185	1,020	396	41	32
2	168	*164	99	b78	54	*b34	150	270	1,340	341	38	29
3	158	200	98	b80	52	b34	171	320	1,490	306	35	28
4	148	187	*93	b84	50	b35	210	355	1,230	284	79	70
5	140	164	92	b90	50	b35	301	400	1,040	260	51	150
6	146	156	88	b92	49	b36	353	440	1,100	238	41	82
7	148	145	86	b84	52	b38	350	660	955	224	36	59
8	151	142	82	77	51	b38	368	680	805	200	33	50
9	301	136	80	72	50	36	487	590	790	175	31	44
10	206	128	80	72	48	34	459	720	*692	154	29	39
11	191	124	79	69	46	34	372	1,100	955	138	28	37
12	206	101	79	64	47	33	327	1,300	950	126	26	34
13	218	80	73	b63	47	33	295	1,250	995	118	25	33
14	272	101	76	b62	46	32	272	900	910	110	24	31
15	369	102	b160	b60	46	32	*243	750	920	*101	22	29
16	267	b75	314	59	44	32	224	700	975	92	22	27
17	228	b76	186	b55	41	33	214	660	765	85	24	27
18	208	b80	158	*b48	41	37	197	570	567	77	22	25
19	197	b86	142	b46	b42	42	179	530	575	71	21	24
20	197	b90	132	b45	44	50	172	660	519	66	20	25
21	210	b19	124	b44	43	60	167	670	427	60	19	24
22	281	93	118	b46	41	75	160	490	379	55	22	23
23	267	118	112	b47	38	82	154	*430	452	51	23	28
24	267	156	114	b48	38	96	148	410	595	48	27	31
25	385	175	110	b50	38	122	142	406	551	46	30	28
26	272	134	93	52	33	177	140	563	420	43	*47	26
27	236	122	94	54	b32	224	142	741	424	41	55	24
28	216	118	93	58	b32	240	146	587	452	40	40	22
29	202	112	90	60	b33	216	154	579	452	37	45	*22
30	189	106	b88	76	------	220	166	728	438	36	45	21
31	178	------	b86	61	------	180	------	1,050	------	36	36	------
Total	6,804	3,730	3,421	1,976	1,283	2,404	7,015	19,694	23,183	4,055	1,037	1,122
Mean	219	124	110	63.7	44.2	77.5	234	635	773	131	33.5	37.4
Cfsm	3.13	1.77	1.57	0.910	0.631	1.11	3.34	9.07	11.0	1.87	0.479	0.534
In.	3.61	1.98	1.82	1.05	0.68	1.28	3.73	10.5	12.3	2.15	0.55	0.60
Ac-ft	13,500	7,400	6,790	3,920	2,540	4,770	13,910	39,060	45,980	8,040	2,060	2,230

Calendar year 1959: Max 1,820 Min 20 Mean 243 Cfsm 3.47 In. 47.12 Ac-ft 176,000
Water year 1959-60: Max 1,490 Min 19 Mean 207 Cfsm 2.96 In. 40.25 Ac-ft 150,200

Peak discharge (base, 1,400 cfs).--June 3 (9:30 p.m.) 1,690 cfs (7.12 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Jan. 26-28, Apr. 19 to May 23; discharge estimated on basis of 1 discharge measurement, weather records, recorded range in stage, and records for Boundary Creek near Porthill.

Discharge, in cubic feet per second, 1960

Day	Oct.	Nov.	Day	Oct.	Nov.	Day	Oct.	Nov.	Day	Oct.	Nov.	Day	Oct.	Nov.
1	20	131	7	33	75	13	47	57	19	47	-	25	153	-
2	20	107	8	106	60	14	41	*64	20	46	-	26	159	-
3	19	94	9	55	62	15	40	-	21	50	-	27	170	-
4	18	82	10	46	73	16	42	-	22	106	-	28	153	-
5	18	84	11	42	71	17	48	-	23	104	-	29	132	-
6	18	72	12	49	63	18	50	-	24	207	-	30	108	-
												31	99	-
Total													2,246	-
Mean													72.5	-
Cubic feet per second per square mile													1.04	-
Runoff in inches													1.19	-
Runoff in acre-feet													4,450	-

* Discharge measurement made on this day.

3215. Boundary Creek near Porthill, Idaho

(International gaging station)

Location.--Lat 48°59'50", long 116°34'05", in SW¼ sec. 11, T.65 N., R.2 W., on left bank near mouth of canyon, 0.2 mile south of international boundary and 3 miles west of Porthill.

Drainage area.--97 sq mi, approximately.

Records available.--May 1928 to September 1960 (no winter records 1929-30).

Gage.--Water-stage recorder. Altitude of gage is 1,770 ft (from topographic map). Prior to Apr. 24, 1929, staff gage at site 140 ft upstream at different datum.

Average discharge.--30 years (1930-60), 191 cfs (138,300 acre-ft per year).

Extremes.--Maximum discharge during year, 1,730 cfs May 12 (gage height, 4.43 ft); minimum, 19 cfs Sept. 28, 29 (gage height, 0.75 ft).
1928-60: Maximum discharge, 3,280 cfs June 23, 1955 (gage height, 5.80 ft), from rating curve extended above 2,000 cfs; minimum, 5 cfs sometime between Nov. 10 and Dec. 3, 1936; minimum gage height, 0.24 ft Nov. 22, 1952.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are poor. No regulation or diversion above station.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Revisions (water years).--WSP 1396: 1943(M), 1945(M), 1950(M), 1953(M). WSP 1446: 1930(M).

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	14	2.5	366
.8	27	3.0	585
1.0	43	3.5	900
1.3	77	4.0	1,310
1.6	127	4.5	1,800
2.0	212		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	140	148	100	b78	58	32	200	268	942	341	40	34
2	133	*146	100	b78	56	*32	185	334	1,210	296	40	31
3	125	174	97	b80	54	b32	200	359	1,400	262	42	28
4	118	156	92	b84	52	b33	251	389	1,180	245	72	63
5	111	144	*90	b90	52	b36	352	434	986	227	51	114
6	113	144	88	b92	52	b40	417	464	1,040	210	42	61
7	116	127	86	b87	54	41	434	682	872	198	38	45
8	120	133	84	b81	54	*b42	468	694	748	178	35	38
9	198	127	82	76	52	43	545	618	718	159	34	34
10	152	120	82	76	50	42	535	781	*760	144	33	31
11	144	120	80	74	47	42	468	1,200	*844	131	32	31
12	148	*88	80	69	47	41	405	1,430	851	120	31	28
13	165	62	72	68	46	40	355	1,370	858	111	30	28
14	200	113	74	67	45	40	330	942	781	102	29	27
15	259	b120	111	65	45	40	*299	774	781	94	28	26
16	212	b100	191	64	43	39	271	724	830	86	28	24
17	189	b100	163	60	40	40	254	682	646	80	30	24
18	178	b105	133	*b52	40	41	240	596	522	*74	30	23
19	171	b110	120	b49	40	47	230	575	512	70	28	22
20	174	b120	113	b47	42	56	227	802	499	65	26	20
21	189	b140	111	b46	41	68	217	809	430	61	26	20
22	234	b160	107	b47	40	88	205	612	389	57	28	20
23	224	194	104	b48	37	97	194	*535	426	54	29	24
24	217	222	106	b49	37	118	185	526	499	52	32	26
25	248	212	104	51	37	156	178	522	459	50	37	25
26	205	146	86	53	32	224	171	618	378	48	*45	22
27	187	b135	b85	55	31	284	174	788	366	45	47	20
28	180	b120	b84	59	31	313	180	670	386	43	38	19
29	171	113	b84	62	31	280	191	658	386	41	50	*20
30	159	106	b84	78	-------	280	222	754	366	40	49	20
31	154	------	b82	63	-------	227	------	928	-------	40	37	------
Total	5,334	4,005	3,075	2,048	1,286	2,934	8,583	21,538	21,065	3,724	1,137	948
Mean	172	134	99.2	66.1	44.3	94.6	286	695	702	120	36.7	31.6
Cfsm	1.77	1.38	1.02	0.681	0.457	0.975	2.95	7.16	7.24	1.24	0.378	0.326
In.	2.05	1.54	1.18	0.79	0.49	1.12	3.29	8.26	8.08	1.43	0.44	0.36
Ac-ft	10,580	7,940	6,100	4,060	2,550	5,820	17,020	42,720	41,780	7,390	2,260	1,880

Calendar year 1959: Max 1,680 Min 30 Mean 239 Cfsm 2.46 In. 33.49 Ac-ft 173,300
Water year 1959-60: Max 1,430 Min 19 Mean 207 Cfsm 2.13 In. 29.03 Ac-ft 150,100

Peak discharge (base, 1,300 cfs).--May 12 (10:30 p.m.) 1,730 cfs (4.43 ft); June 2 (10 p.m.) 1,540 cfs (4.24 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Jan. 9-17, Jan. 25 to Mar. 2, Mar. 7 (stage-discharge relation affected by ice most of periods); discharge estimated on basis of weather records, 3 discharge measurements, and records for Smith Creek near Porthill.
b Stage-discharge relation affected by ice.

3220. Kootenai River at Porthill, Idaho

(International gaging station)

Location.--Lat 49°00'00", long 116°30'10", in SW¼ sec.8, T.65 N., R.1 W., on right bank 300 ft south of international boundary at Porthill.

Drainage area.--13,700 sq mi, approximately.

Records available.--May to July 1904 and October 1927 to March 1928 (gage heights only), and April 1928 to September 1960 in reports of Geological Survey. October 1924 to September 1927 (gage heights only) in reports of Department of Northern Affairs and National Resources, Canada.

Gage.--Water-stage recorder. Datum of gage is 1,700.00 ft above mean sea level, referred to bench mark "10-M-1928" at elevation 1,767.68 ft. Gage readings have been reduced to elevations above mean sea level. Datum of 1929, supplementary adjustment of 1947, and datum of Geodetic Survey of Canada, Pub. 24, 1951 edition, are 0.03 ft higher. Prior to May 17, 1928, staff gages at approximately same site. Datum of gage prior to July 28, 1928, 38.34 ft higher, except in 1904 when different datum was used.

Average discharge.--32 years, 15,810 cfs (11,450,000 acre-ft per year).

Extremes.--Maximum daily discharge during year, 77,500 cfs June 6; maximum elevation, 1,759.65 ft June 6; minimum daily discharge, 3,620 cfs Mar. 3; minimum elevation, 1,741.51 ft Mar. 19.
1928-60: Maximum daily discharge, 125,000 cfs June 1, 1948; maximum elevation, 1,767.53 ft June 5, 1956; minimum daily discharge, 1,380 cfs Feb. 8, 1936; minimum elevation, 1,738.21 ft Apr. 3, 1944.
Maximum elevation known, 1,772.7 ft in June 1894, present datum.

Remarks.--Records excellent except those for period Nov. 15 to Mar. 20, which are good. Daily discharge represents entire flow passing international boundary, and is computed by adding tributary inflow for intervening area to flow at station near Copeland and correcting for channel storage between stations near Copeland and at Porthill. Boundary dike of Reclamation Farm and U. S. Forest Service roadway dike (south side of Boundary Creek) remained intact and flow of river was confined throughout year to main channel on which gage is located. Elevations affected by backwater from Kootenay Lake. No drainage district dike failed during year.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46.85	46.62	46.49	45.88	44.68	42.80	46.32	44.67	52.70	55.11	47.59	44.55
2	46.73	46.52	46.45	45.78	44.65	42.72	45.63	44.90	54.02	55.31	47.45	44.62
3	46.63	46.53	46.45	45.77	44.59	42.65	45.20	45.40	55.92	55.38	47.44	44.73
4	46.53	46.67	46.47	45.72	44.52	42.61	45.25	46.09	57.81	55.23	47.44	44.90
5	46.44	46.64	46.44	45.72	44.45	42.60	45.93	46.60	59.09	54.89	47.40	45.23
6	46.40	46.59	46.40	45.80	44.38	42.59	47.21	47.10	59.61	54.52	47.36	45.53
7	46.46	46.46	46.36	45.85	44.37	42.59	48.28	47.61	59.34	54.19	47.28	45.77
8	46.44	46.37	46.34	45.87	44.37	42.54	48.81	48.55	58.74	53.95	47.09	45.93
9	46.64	46.28	46.28	45.89	44.32	42.47	49.32	49.13	58.40	53.85	46.86	45.95
10	46.71	46.26	46.27	45.85	44.27	42.34	50.26	49.60	57.89	53.71	46.58	45.93
11	46.61	46.25	46.28	45.88	44.18	42.25	50.53	50.64	57.58	53.32	46.32	45.91
12	46.55	46.22	46.34	45.82	44.09	42.13	50.22	52.63	57.60	52.84	46.07	45.89
13	46.52	46.06	46.29	45.73	44.06	41.97	49.68	54.94	57.93	52.38	45.85	45.91
14	46.52	45.92	46.15	45.61	44.00	41.84	49.25	56.49	58.30	52.00	45.63	45.93
15	46.68	45.85	46.25	45.52	43.97	41.75	48.90	56.66	58.62	51.77	45.48	46.01
16	46.82	45.67	46.66	45.46	43.90	41.66	48.48	55.78	58.84	51.61	45.32	45.99
17	46.94	45.68	46.84	45.35	43.81	41.59	47.96	54.57	58.92	51.41	45.18	45.95
18	47.00	45.78	46.79	45.21	43.70	41.55	47.60	53.70	58.68	51.14	45.00	45.89
19	46.92	45.85	46.58	45.11	43.61	41.54	47.28	53.00	58.32	50.87	44.88	45.84
20	46.82	45.99	46.38	45.05	43.54	41.54	46.98	52.58	57.56	50.66	44.73	45.95
21	46.71	46.23	46.27	45.02	43.54	41.57	46.84	52.42	56.79	50.39	44.56	45.97
22	46.66	46.40	46.19	44.98	43.47	41.62	46.65	52.16	56.18	50.18	44.42	45.98
23	46.68	46.67	46.16	44.96	43.40	41.71	46.33	51.85	55.55	49.94	44.34	46.00
24	46.65	46.82	46.20	44.98	43.37	41.84	46.03	51.42	55.04	49.68	44.29	46.01
25	46.83	47.13	46.27	45.05	43.25	42.15	45.74	51.03	54.88	49.38	44.24	46.03
26	46.98	47.32	46.26	45.05	43.15	42.91	45.47	50.77	55.14	49.00	44.28	46.00
27	47.11	47.25	46.14	44.99	43.01	44.01	45.20	50.89	55.51	48.64	44.32	45.97
28	47.13	46.94	46.05	44.93	42.95	45.20	44.94	50.99	55.37	48.35	44.28	45.95
29	47.03	46.65	45.95	44.91	42.91	46.27	44.76	51.05	55.07	48.06	44.32	45.93
30	46.87	46.55	45.93	44.85	------	46.72	44.64	51.17	54.95	47.83	44.35	45.92
31	46.73	------	45.96	44.75	------	46.84	------	51.70	------	47.69	44.40	------

Note.--Add 1,700 ft to obtain elevation above mean sea level.

3220. Kootenai River at Porthill, Idaho--Continued

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16,500	14,700	11,300	5,860	7,580	4,140	26,900	17,300	43,200	42,200	14,000	7,380
2	15,400	14,200	11,100	4,770	7,470	3,870	22,900	19,000	50,400	43,500	14,400	7,290
3	14,700	14,000	11,300	4,620	7,370	3,620	21,800	21,700	58,800	43,700	14,700	7,000
4	14,000	14,600	10,800	4,650	7,180	4,100	23,700	24,700	68,700	42,100	15,500	7,050
5	13,600	14,300	10,600	5,440	6,880	4,390	28,500	26,900	76,800	39,400	15,900	7,380
6	13,100	13,600	10,300	6,300	6,770	4,510	33,300	28,500	77,500	37,100	16,200	7,710
7	13,100	13,000	10,100	7,300	6,950	4,700	35,500	30,500	70,900	35,200	16,100	9,120
8	13,000	12,500	9,940	7,210	7,230	4,910	36,900	33,900	65,600	34,500	15,600	9,930
9	14,200	12,300	9,560	6,890	7,060	5,130	39,100	36,100	61,800	34,700	14,300	9,520
10	14,600	12,100	8,840	6,800	6,960	5,170	42,800	37,800	57,100	34,600	13,100	8,730
11	14,200	11,700	8,800	6,390	6,770	5,060	41,100	41,900	54,500	32,500	12,500	8,010
12	13,800	11,500	8,880	6,840	6,670	4,920	39,300	49,800	54,700	29,900	11,800	7,520
13	14,000	9,700	9,010	6,930	6,530	4,980	36,300	60,000	57,400	27,800	11,400	7,390
14	14,000	9,090	8,970	6,250	6,540	4,970	34,200	67,000	59,600	26,600	11,000	7,060
15	14,800	8,470	10,200	6,020	6,430	4,940	32,400	66,100	61,700	26,100	10,900	6,890
16	15,900	7,670	12,700	5,500	6,540	5,040	29,700	58,700	62,900	26,100	10,700	6,820
17	16,800	6,980	14,500	5,010	6,450	5,140	27,300	51,500	61,300	25,600	10,400	6,720
18	17,000	7,250	13,700	4,620	6,260	5,320	25,300	45,400	59,900	24,600	10,200	6,570
19	16,300	8,250	12,000	4,190	6,250	5,620	24,000	41,000	56,500	23,400	9,480	6,660
20	15,500	9,240	10,800	3,750	6,240	5,940	22,900	38,300	50,100	22,500	9,180	6,460
21	15,300	10,700	10,300	3,930	6,000	6,650	22,400	37,900	45,600	22,000	8,840	6,310
22	15,200	12,300	9,940	4,140	6,130	7,590	21,900	36,600	42,500	21,600	8,770	6,320
23	15,400	13,800	9,620	4,530	5,830	8,990	21,000	35,100	39,200	20,500	8,560	6,530
24	15,200	16,500	9,480	5,010	5,910	11,200	20,100	33,400	36,800	19,400	8,310	6,780
25	15,900	17,900	9,250	5,580	5,660	15,200	19,200	31,700	37,000	18,400	8,260	6,590
26	16,900	18,700	9,040	6,230	4,830	19,100	18,200	30,700	41,300	17,300	8,050	6,460
27	17,900	18,000	8,800	6,780	4,150	25,000	17,400	31,700	44,600	16,000	8,030	6,270
28	18,000	15,500	8,190	6,880	4,100	28,100	17,000	32,900	43,000	15,000	7,960	6,180
29	17,400	13,700	7,590	7,270	4,090	30,400	16,500	33,600	41,100	14,200	7,670	6,040
30	16,500	12,400	6,940	7,640	------	31,200	16,600	34,700	41,100	14,200	7,650	5,840
31	15,600	------	6,400	7,720	------	29,600	------	38,100	------	14,000	7,580	------
Total	473,800	374,650	308,950	180,850	182,830	309,500	814,200	‡1,172.5	‡1,621.6	844,700	347,040	214,530
Mean	15,280	12,490	9,966	5,834	6,304	9,984	27,140	37,820	54,050	27,250	11,190	7,151
Cfsm	1.12	0.912	0.727	0.426	0.460	0.729	1.98	2.76	3.95	1.99	0.817	0.522
In.	1.29	1.02	0.84	0.49	0.50	0.84	2.21	3.18	4.40	2.29	0.94	0.58
Ac-ft	939,800	743,100	612,800	358,700	362,600	613,900	‡1,615	‡2,326	‡3,216	‡1,675	688,300	425,500

Calendar year 1959: **Max** 93,200 **Min** 3,040 **Mean** 21,650 **Cfsm** 1.58 **In.** 21.46 **Ac-ft** 15,680,000
Water year 1959-60: **Max** 77,500 **Min** 3,620 **Mean** 18,700 **Cfsm** 1.36 **In.** 18.58 **Ac-ft** 13,580,000

‡ Expressed in thousands.
Note.--Discharge estimated on basis of records for upstream stations Nov. 15 to Mar. 20.

3225. Kootenay Lake at Kuskonook, British Columbia

(International gaging station)

Location.--Lat 49°18', long 116°40', on east shore of lake at Kuskonook.

Records available.--April 1936 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,735.20 ft above mean sea level, Geodetic Survey of Canada, datum of Pub. 24, 1951 edition, which is the same at Porthill as datum of 1929, supplementary adjustment of 1947, and 0.03 ft higher than datum in use at station Kootenai River at Porthill. Gage heights have been reduced to elevations above datum in use at station Kootenai River at Porthill. Prior to Apr. 25, 1938, staff gage at same site at datum 3.00 ft higher.

Extremes.--Maximum elevation during year, 1,754.08 ft June 17; minimum, 1,740.55 ft Mar. 26.
1936-60: Maximum elevation, 1,762.16 ft June 5, 1956; minimum daily, 1,737.86 ft Apr. 5, 6, 1944.

Remarks.--Elevation is subject to partial regulation by Corra Linn Dam below outlet. Diversions for irrigation of about 14,600 acres above Kootenay Lake.

Cooperation.--This station is maintained by Canada under agreement with the United States.

Elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45.55	45.56	45.60	45.54	44.20	-	42.27	43.10	47.91	51.85	46.78	44.13
2	45.55	45.52	45.61	45.48	44.17	-	42.40	43.04	48.30	51.91	46.66	44.25
3	45.53	45.59	45.64	45.45	44.12	-	42.46	43.06	49.05	51.96	46.60	44.38
4	45.51	45.64	45.67	45.40	44.05	-	42.49	43.15	49.98	51.95	46.51	44.59
5	45.48	45.66	45.70	45.42	44.00	-	42.60	43.30	50.87	51.86	46.42	44.90
6	45.49	45.66	45.73	45.46	43.95	-	42.80	43.50	51.65	51.74	46.34	45.16
7	45.57	45.60	45.70	45.49	43.93	-	43.09	43.75	52.39	51.61	46.24	45.30
8	45.60	45.55	45.69	45.52	43.89	42.19	43.43	44.05	52.77	51.50	46.11	45.39
9	45.65	45.50	45.71	45.51	43.83	42.09	43.79	44.36	52.96	51.36	45.93	45.46
10	45.63	45.49	45.73	45.52	43.79	41.95	44.17	44.67	53.04	51.17	45.75	45.51
11	45.61	45.53	45.76	45.54	43.71	41.86	44.53	45.09	53.09	50.96	45.56	45.53
12	45.56	45.57	45.75	45.44	43.65	41.73	44.85	45.76	53.12	50.71	45.38	45.55
13	45.53	-	45.68	-	43.62	41.58	45.07	46.66	53.24	50.45	45.19	45.59
14	45.52	-	45.58	-	43.56	41.56	45.21	47.52	53.41	50.21	45.01	45.64
15	45.58	-	45.64	-	43.53	41.36	45.29	48.29	53.59	50.01	44.85	45.72
16	45.60	-	45.68	-	43.45	41.26	45.25	48.77	53.81	49.84	44.69	45.72
17	45.61	-	45.69	-	43.37	41.15	45.17	49.08	54.01	49.66	44.56	45.67
18	45.65	-	45.70	-	43.29	41.07	45.07	49.19	54.04	49.49	44.42	45.63
19	45.68	-	45.65	-	43.21	41.00	44.92	49.15	53.95	49.34	44.32	45.61
20	45.67	-	45.57	-	43.14	40.94	44.79	49.06	53.77	49.17	44.20	45.65
21	45.60	-	45.51	-	43.12	40.91	44.64	48.94	53.47	48.99	44.06	45.70
22	45.54	45.81	45.49	-	43.05	40.87	44.49	48.83	53.09	48.81	43.94	45.72
23	45.54	45.86	45.51	-	43.01	40.79	44.42	48.65	52.72	48.64	43.87	45.72
24	45.54	45.89	45.57	-	42.96	40.68	44.14	48.45	52.41	48.41	43.80	45.72
25	45.62	45.85	45.64	-	42.88	40.63	43.97	48.23	52.24	48.22	43.77	45.74
26	45.67	45.79	45.66	44.69	42.84	40.66	43.82	48.02	52.06	47.94	43.81	45.73
27	45.67	45.76	45.58	44.61	-	40.81	43.64	47.90	51.95	47.68	43.85	45.70
28	45.68	45.66	45.57	44.55	-	41.06	43.46	47.75	51.89	47.47	43.85	45.69
29	45.63	45.59	45.55	44.51	-	41.40	43.31	47.66	51.84	47.21	43.90	45.68
30	45.59	45.59	45.55	44.37	-------	41.76	43.18	47.61	51.83	47.06	43.95	45.68
31	45.58	-------	45.55	44.23	-------	42.06	-------	47.71	-------	46.91	44.01	-------

Note.--Add 1,700 ft to obtain elevation above mean sea level.

3230. Columbia River at Birchbank, British Columbia

(International gaging station)

Location.--Lat 49°11', long 117°43', on right bank at Birchbank, British Columbia, 7 miles upstream from Trail, 11 miles downstream from Kootenay River, and 17 miles upstream from international boundary.

Drainage area.--34,000 sq mi, approximately.

Records available.--April 1913 to September 1960. Published as "at Trail, British Columbia" 1913-37.

Gage.--Water-stage recorder. Datum of gage is 1,329.90 ft above mean sea level, 1947 International joint adjustment, published as 1,338.00 ft prior to October 1948. Prior to Oct. 1, 1937, chain or wire-weight gage on highway bridge at site 7 miles downstream at datum 16.27 ft lower.

Average discharge.--47 years, 70,700 cfs (51,180,000 acre-ft per year).

Extremes.--Maximum discharge during year, 237,000 cfs July 4 (gage height, 37.73 ft); minimum, 17,500 cfs Mar. 5 (gage height, 5.64 ft).
1913-60: Maximum discharge, 370,000 cfs June 11, 1948 (gage height, 50.62 ft); minimum observed, 8,940 cfs Feb. 3, 1937 (gage height, 6.27 ft, site and datum then in use).

Remarks.--Many small diversions above station for irrigation of about 25,000 acres. Fluctuation at low flow caused by powerplant on Kootenay River. Flow affected by internationally controlled storage in Kootenay Lake, as well as by natural and controlled regulation in other lakes.

Cooperation.--This station is maintained by Canada under agreement with the United States.

Revisions (water years).--WSP 982: 1942. WSP 1216: 1949.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

5.8	18,200
15.0	62,800
25.0	128,000
38.0	240,000

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	84,900	64,100	38,500	26,300	22,200	19,900	42,400	57,100	117,000	224,000	139,000	58,000
2	80,900	62,900	38,200	25,500	23,100	19,400	43,700	57,200	121,000	229,000	137,000	56,000
3	78,300	60,400	36,100	24,200	24,800	19,500	44,400	57,300	130,000	233.000	137,000	53,400
4	76,200	59,900	35,900	23,600	25,200	*18,800	45,900	58,500	143,000	236,000	136,000	51,600
5	72,900	59,900	34,500	22,700	22,200	18,300	47,400	*59,200	154,000	236.000	135,000	50,400
6	67,500	61,900	35,200	22,000	23,800	18,300	49,200	61,500	165,000	234,000	133,000	52,400
7	63,200	60,500	36,900	21,900	24,000	19,000	51,100	65,200	175,000	233.000	131,000	59,000
8	63,900	58,600	33,700	21,900	23,400	20,900	53,400	67,600	181,000	233.000	129,000	58,900
9	65,900	56,500	32,200	21,300	24,000	23,100	56,500	70,000	184,000	233.000	126,000	58,600
10	65,000	52,600	30,900	20,600	24,700	23,400	59,400	73,300	186,000	232,000	123,000	58,000
11	64,800	48,400	32,800	24,700	24,400	23,200	62,300	78,800	189,000	228.000	119,000	57,200
12	63,700	48,300	35,900	27,100	23,600	24,000	64,500	86,200	192,000	223.000	117,000	55,100
13	58,600	48,800	37,600	25,900	23,700	23,800	66,600	93,300	196,000	218.000	113,000	54,600
14	61,600	47,400	35,400	26,100	23,800	23,100	68,100	99,200	202,000	212.000	112,000	49,400
15	61,500	47,300	32,500	26,000	24,200	22,900	69,700	108,000	209,000	210.000	110,000	49,400
16	61,900	43,000	35,100	25,700	24,500	21,800	70,600	116,000	216,000	208.000	107,000	52,700
17	61,800	38,500	35,800	25,500	24,700	20,900	71,200	121,000	222,000	207,000	104,000	52,400
18	61,900	*38,000	36,700	24,500	23,400	20,700	71,200	124,000	225,000	206.000	*100,000	51,400
19	61,800	37,200	38,500	*22,800	22,600	20,300	70,400	125,000	225,000	205.000	97,800	49,900
20	63,500	36,600	38,000	19,800	22,400	20,300	70,000	126,000	223,000	203.000	95,000	48,700
21	*65,000	36,100	36,100	20,500	22,700	21,100	69,500	127,000	218,000	200.000	92,900	49,600
22	63,600	35,700	31,500	21,600	20,700	24,100	68,400	126,000	212,000	197,000	88,400	52,000
23	61,300	38,800	29,900	19,200	20,100	30,500	67,500	124,000	207,000	193.000	85,900	54,200
24	61,500	46,400	28,700	18,700	21,300	31,600	66,100	a123,000	204,000	188.000	82,100	54,900
25	62,300	50,800	28,900	20,900	21,500	32,600	64,000	a121,000	205,000	181,000	78,200	55,700
26	64,600	48,200	31,700	24,200	21,600	33,300	*63,000	a119,000	206,000	172,000	74,500	56,300
27	67,200	49,600	33,600	24,400	20,500	34,700	61,400	a118,000	209,000	163.000	71,300	56,200
28	69,200	48,500	27,200	24,300	19,700	35,900	60,200	a118,000	*212,000	156.000	68,500	54,800
29	69,600	43,700	*26,700	27,300	19,500	37,700	58,800	a115,000	215,000	149.000	65,600	52,200
30	66,300	40,600	26,500	31,200	------	40,100	57,400	114,000	*218,000	144,000	62,900	51,000
31	64,400	------	26,200	26,400	------	41,200	------	116,000	------	140,000	59,700	------
Total	‡2,054.8	‡1,469.2	‡1,037.4	736.800	662,100	784,400	‡1,814.3	‡3,025.4	‡5,761	‡6.326	‡5,230.8	‡1,614
Mean	66,300	49,000	33,500	23,800	22,800	25,300	60,500	97,600	192,000	204.000	104,000	53,800
Cfsm	1.95	1.44	0.99	0.70	0.67	0.74	1.78	2.87	5.65	6.00	3.06	1.58
In.	2.25	1.61	1.14	0.81	0.72	0.85	1.99	3.31	6.31	6.92	3.53	1.76
Ac-ft	‡4,076	‡2,914	‡2,058	‡1,461	‡1,313	‡1,556	‡3,599	‡6,001	‡11,430	‡12,550	‡6,408	‡3,201

Calendar year 1959: Max 299,000 Min 17,800 Mean 87,600 Cfsm 2.58 In. 34.99 Ac-ft 63,440,000
Water year 1959-60: Max 236,000 Min 18,300 Mean 77,900 Cfsm 2.29 In. 31.20 Ac-ft 56,570,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
a No gage-height record; discharge estimated.

3235. German Gulch Creek near Ramsay, Mont.

Location.--Lat 46°00'50", long 112°47'30", in SE¼NW¼ sec.13, T.3 N., R.10 W., half a mile upstream from mouth and 6½ miles west of Ramsay.

Drainage area.--41 sq mi, approximately.

Records available.--April 1955 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 5,200 ft (by barometer). Prior to July 13, 1956, staff gage at site 300 ft upstream from mouth at different datum.

Extremes.--Maximum discharge during year, 135 cfs May 12 (gage height, 2.72 ft); maximum gage height, 2.83 ft Dec. 27 (backwater from ice); minimum daily discharge, 3.5 cfs Jan. 20.

1955-60: Maximum discharge observed, 187 cfs May 28, 1956 (gage height, 2.60 ft, site and datum then in use); minimum observed, 1.4 cfs Oct. 26-30, 1955 (gage height, 0.78 ft, site and datum then in use).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Some small diversions for irrigation of hay meadows above station.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 18 to June 12)

1.6	5.0	2.2	46
1.7	8.6	2.5	84
1.8	14	3.0	174
2.0	27		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	9.1	6	5	6.1	5	9.7	19	112	21	14	8.2
2	10	9.7	7	5	6.1	5	8.6	21	114	21	12	8.2
3	*11	*11	6	5	6.1	5	9.7	23	119	20	10	8.2
4	10	9.1	5	5	5.7	5.5	*13	24	115	18	9.7	9.7
5	10	8	*5	5.5	5.7	6	19	24	108	*18	9.1	8.6
6	11	9.5	5.5	6	5.7	7	23	27	100	17	9.1	8.2
7	14	10	6	6	5.7	6.5	24	37	94	18	9.7	8.2
8	11	9.1	6	6	*5.7	5.7	25	44	84	17	9.1	7.9
9	11	9.1	6	6	5.7	5.5	27	46	78	16	9.1	7.9
10	11	9.1	6	*6.4	5.7	5.5	28	*61	70	16	9.1	7.9
11	11	8.2	7	5.7	5.7	5.5	23	78	66	16	8.6	7.5
12	12	6	7	5.7	5.7	5.7	22	107	61	15	7.9	*7.5
13	11	4	6.8	5.0	5.7	5.7	19	97	56	15	7.9	8.2
14	11	4	6.5	5	5.5	5.7	19	80	54	14	7.9	9.7
15	11	4	6.8	5	5.5	5.4	18	74	55	14	10	8.6
16	12	4	6.4	4.5	5.5	5.7	16	69	49	14	14	8.6
17	11	4.5	6.4	4.5	5	5.7	16	62	47	14	11	8.6
18	10	6	6.1	4	5	7.2	16	58	44	12	9.7	8.2
19	9.1	6	6.1	4	5	9.7	16	56	40	12	8.2	7.9
20	9.1	5.5	6	3.5	5.5	12	16	55	38	11	8.2	7.9
21	9.1	5	6	4	5.5	15	16	57	37	11	7.5	7.9
22	9.7	5	6.5	4	5.5	16	15	54	34	11	7.6	7.9
23	11	6	6.5	4.5	5.5	17	15	53	32	12	11	7.9
24	9.7	6	6.5	5	5.5	16	15	54	31	11	11	7.9
25	10	5	6.5	6	5	17	16	54	29	10	10	7.5
26	9.1	4.5	6	6	5	19	15	54	27	10	9.1	7.5
27	9.1	5	6	6	5	19	15	58	26	9.7	8.6	7.5
28	8.6	5.5	5.5	6	5	16	14	58	24	*10	8.2	7.5
29	9.1	6	5.5	6	*5.4	13	14	61	23	10	7.9	7.5
30	8.6	6	5.5	6.1	-------	12	16	73	23	11	7.5	7.5
31	9.7	-------	5.5	5.7	-------	11	-------	*94	-------	11	7.5	-------
Total	319.9	199.9	189.6	162.1	159.7	296.0	519.0	1,732	1,790	435.7	291.2	242.3
Mean	10.3	6.66	6.12	5.23	5.51	9.55	17.3	55.9	59.7	14.1	9.39	8.08
Ac-ft	635	396	376	322	317	587	1,030	3,440	3,550	864	578	481

Calendar year 1959: Max 128 Min 4.0 Mean 16.8 Ac-ft 12,140
Water year 1959-60: Max 119 Min 3.5 Mean 17.3 Ac-ft 12,580

Peak discharge (base, 100 cfs).--May 12 (9 p.m.) 135 cfs (2.72 ft); June 2 (7 p.m.) 133 cfs (2.66 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 5, 6, Nov. 12 to Dec. 12, Dec. 14, 20-29, Jan. 14-22, Feb. 14-27, Mar. 9-11. No gage-height record Dec. 30 to Jan. 9, Jan. 23-29, Feb. 28, Mar. 1-7; discharge estimated on basis of 2 discharge measurements and records for Racetrack Creek below Granite Creek, near Anaconda.

3241. Racetrack Creek below Granite Creek, near Anaconda, Mont.

Location.--Lat 46°16'40", long 112°55'00", in NW¼NE¼ sec.13, T.6 N., R.11 W., on right bank 30 ft upstream from bridge, 2 miles downstream from Granite Creek, 9½ miles upstream from mouth, and 10 miles north of Anaconda.

Drainage area.--39.5 sq mi.

Records available.--April 1914 to September 1917 (gage heights only, published as "near Anaconda"), July 1957 to September 1960. Records for July 1911 to November 1912 at site 3 miles upstream, published as "near Anaconda", not equivalent owing to inflow.

Gage.--Water-stage recorder. Altitude of gage is 5,420 ft (from topographic map). April 1914 to September 1917 at site a quarter of a mile downstream at different datum.

Extremes.--Maximum discharge during year, 349 cfs June 17 (gage height, 4.67 ft); minimum, 14 cfs Dec. 27.
1957-60: Maximum discharge, 452 cfs June 15, 1959 (gage height 5.35 ft); minimum, 9.3 cfs Jan. 19, 1958 (gage height, 2.05 ft).

Remarks.--Records good. No diversion above station. Some regulation by Racetrack and Fisher Lakes.

Revisions.--WSP 1316: Drainage area.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 1-30)

2.2	16	3.5	137
2.5	33	4.0	212
3.0	77	5.0	387

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	44	37	b20	25	b18	26	34	184	118	71	47
2	42	44	36	b20	25	b18	26	36	218	106	71	49
3	42	*42	36	b20	25	b18	28	39	272	100	66	45
4	*43	36	33	b22	*24	b20	31	*42	301	96	64	47
5	44	32	32	28	24	b20	39	41	288	91	64	48
6	46	42	36	30	24	*23	*47	39	269	88	69	47
7	52	39	35	29	25	23	48	44	270	88	68	46
8	46	38	29	28	24	23	51	47	265	92	63	46
9	46	38	32	28	24	23	57	46	*243	91	61	43
10	44	37	34	26	24	22	61	61	242	99	59	42
11	52	36	36	28	24	22	54	86	245	97	57	41
12	65	27	33	28	23	22	50	120	242	95	55	40
13	56	20	32	22	24	22	45	137	240	94	60	*39
14	52	b20	33	b21	23	22	44	115	250	96	62	39
15	63	b20	32	b21	23	22	40	104	257	90	65	36
16	67	b24	32	b20	23	22	39	104	265	90	70	35
17	61	34	*31	b20	23	22	39	92	317	86	65	34
18	58	*39	31	b20	20	22	38	88	243	85	58	32
19	57	40	30	b20	22	23	37	85	209	84	54	31
20	54	40	28	b20	23	25	37	82	199	86	52	31
21	52	42	30	b20	23	25	38	86	175	*87	52	31
22	51	39	27	b20	23	28	36	81	160	91	52	31
23	63	55	29	b22	20	28	36	79	151	90	61	31
24	56	51	30	b24	b19	29	35	78	147	89	61	31
25	65	44	29	26	b18	31	35	76	145	85	65	30
26	58	39	27	26	b18	34	34	76	140	84	64	29
27	55	36	20	26	b18	35	34	90	131	83	62	29
28	52	40	b20	25	b18	34	33	90	130	81	62	29
29	51	41	b20	26	b18	30	33	94	124	74	58	29
30	45	38	b20	25	------	29	33	115	120	68	54	29
31	46	------	b20	25	------	28	------	160	------	60	48	------
Total	1,626	1,117	930	736	647	763	1,184	2,467	6,442	2,766	1,893	1,117
Mean	52.5	37.2	30.0	23.7	22.3	24.6	39.5	79.6	215	89.2	61.1	37.2
Cfsm	1.33	0.942	0.759	0.600	0.565	0.623	1.00	2.02	5.44	2.26	1.55	0.942
In.	1.53	1.05	0.88	0.69	0.61	0.72	1.11	2.32	6.07	2.60	1.78	1.05
Ac-ft	3,230	2,220	1,840	1,460	1,280	1,510	2,350	4,890	12,780	5,490	3,750	2,220

Calendar year 1959: Max 396 Min 10 Mean 61.1 Cfsm 1.55 In. 20.98 Ac-ft 44,220
Water year 1959-60: Max 317 Min 18 Mean 59.3 Cfsm 1.50 In. 20.41 Ac-ft 43,020

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

3255. Flint Creek near Southern Cross, Mont.

Location.--Lat 46°14'00", long 113°17'40", in SE¼NW¼ sec.36, T.6 N., R.14 W., on left wing of weir half a mile downstream from powerplant, 2 miles downstream from Georgetown Lake, 3 miles northwest of Southern Cross, and 6 miles south of Philipsburg.

Drainage area.--52.6 sq mi.

Records available.--October 1940 to September 1960.

Gage.--Staff gage and Cippoletti weir; gage read once daily. Altitude of gage is 5,630 ft (from topographic map).

Average discharge.--20 years, 29.8 cfs (21,570 acre-ft per year).

Extremes.--Maximum discharge during year, 54 cfs Oct. 30, 31, July 8 (gage height, 1.18 ft); minimum daily, 9.1 cfs Nov. 17.
1940-60: Maximum discharge observed, 174 cfs June 13, 1942 (gage height, 1.86 ft); probably no flow for parts of Aug. 20, 1943, May 23, 1952, Oct. 6, 1954, when generator was shut down.

Remarks.--Records good. Flow regulated by Georgetown Lake (see p. 255). Flow may be augmented by transbasin diversion from Silver Lake to Georgetown Lake or reduced by pumping from Georgetown Lake to Silver Lake.

Cooperation.--Gage-height record furnished by The Montana Power Co. under general supervision of Geological Survey in connection with a Federal Power Commission project.

Revisions (water years).--WSP 1216: 1942(M). WSP 1246: Drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

0.3	6.5	0.8	26
.4	10	1.2	55
.6	18		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	53	40	14	27	26	28	28	30	31	28	26
2	32	53	41	14	27	26	28	28	30	41	27	26
3	32	*53	41	14	27	26	28	29	30	42	27	26
4	*32	53	40	13	*27	26	28	*30	30	42	27	26
5	32	53	40	14	27	26	28	31	30	42	27	26
6	32	53	34	14	27	*26	*28	31	30	48	27	26
7	32	53	25	14	27	26	28	31	31	53	27	26
8	32	49	23	13	27	26	28	31	30	54	27	20
9	32	44	23	14	26	26	28	31	*30	53	27	19
10	32	33	22	14	26	26	28	31	30	53	26	19
11	32	27	22	14	26	26	28	31	30	53	26	19
12	32	27	22	14	26	26	28	31	28	53	26	19
13	31	27	22	14	26	26	28	31	28	47	26	*19
14	31	27	22	14	26	26	28	31	32	29	26	19
15	31	28	22	14	26	26	28	30	31	29	26	19
16	31	16	*23	13	26	26	28	30	31	28	27	19
17	30	9.1	23	14	26	26	28	20	31	28	27	19
18	31	16	23	14	26	26	28	15	31	28	27	19
19	31	15	22	14	26	26	28	21	31	28	26	18
20	30	20	22	19	26	27	28	28	31	28	26	18
21	30	25	21	26	26	26	28	29	31	*28	26	19
22	30	25	19	26	26	27	28	30	31	28	26	19
23	30	33	19	26	26	17	28	30	30	29	27	19
24	30	40	19	26	26	20	28	30	30	28	26	19
25	30	40	20	26	26	28	28	30	30	28	26	19
26	28	41	20	27	26	28	28	30	30	28	26	19
27	28	41	20	27	26	28	28	30	30	27	26	22
28	29	40	17	27	26	28	28	30	30	27	26	26
29	34	41	14	27	26	28	28	31	30	27	26	26
30	47	40	14	27	-------	28	28	31	30	27	26	26
31	54	-------	14	27	-------	28	-------	30	-------	27	26	-------
Total	999	1,075.1	749	574	762	807	840	900	907	1,114	820	642
Mean	32.2	35.8	24.2	18.5	26.3	26.0	28.0	29.0	30.2	35.9	26.5	21.4
Ac-ft	1,980	2,130	1,490	1,140	1,510	1,600	1,670	1,790	1,800	2,210	1,630	1,270

Calendar year 1959: Max 54 Min 9.1 Mean 27.4 Ac-ft 19,860
Water year 1959-60: Max 54 Min 9.1 Mean 27.8 Ac-ft 20,220

* Discharge measurement made on this day.

3295. Flint Creek at Maxville, Mont.

Location.--Lat 46°28'00", long 113°14'30", in NW¼ sec.9, T.8 N., R.13 W., on right bank 0.4 mile west of Maxville and 1 mile upstream from Boulder Creek.

Drainage area.--208 sq mi.

Records available.--August 1941 to September 1960. April 1939 to September 1941 at site half a mile upstream (above Maxville siding), records not equivalent owing to diversions.

Gage.--Water-stage recorder. Datum of gage is 4,828.44 ft above mean sea level, datum of 1929.

Average discharge.--19 years, 99.3 cfs (71,890 acre-ft per year).

Extremes.--Maximum discharge during year, 495 cfs Mar. 23 (gage height, 4.66 ft); minimum daily, 30 cfs Jan. 15-21.
1941-60: Maximum discharge, 1,680 cfs Mar. 28, 1943 (gage height, 6.79 ft), from rating curve extended above 600 cfs; minimum daily, 18 cfs Jan. 2, 3, 4, 1958.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 8,200 acres above station. During irrigation season, flow is supplemented by water from East Fork Rock Creek which is diverted in sec.5, T.4 N., R.14 W., 500 ft below Rock Creek Dam, through a canal into Trout Creek, thence into Flint Creek. Some regulation by Georgetown Lake (see p. 255).

Revisions.--WSP 1216: Drainage area.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 13 to Aug. 9)

1.7	34	3.5	236
2.0	57	4.0	336
2.5	105	4.5	455
3.0	162		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95	116	100	b40	59	a35	101	97	139	67	122	77
2	95	119	99	b35	65	a35	96	100	136	83	127	79
3	95	128	98	b35	62	a45	100	119	190	76	122	77
4	*96	*122	96	36	*60	a55	103	*128	226	84	117	84
5	96	108	90	43	65	*58	108	133	198	87	107	85
6	99	112	94	54	64	62	*119	126	157	82	105	82
7	122	112	89	51	68	61	126	124	144	80	100	78
8	110	111	83	51	66	58	125	130	135	82	103	84
9	111	110	86	52	64	57	128	125	*120	82	105	84
10	107	106	87	b50	64	52	134	126	117	89	104	84
11	110	102	83	b45	64	55	125	141	104	92	103	89
12	118	66	78	b40	62	57	123	163	104	89	97	89
13	115	b60	77	b40	62	55	112	190	96	84	95	*89
14	110	b55	83	b35	60	57	108	154	83	84	96	88
15	117	b55	78	b30	62	55	103	134	87	85	90	84
16	134	b55	*76	b30	61	56	99	128	97	103	105	92
17	122	b70	75	b30	62	58	95	120	113	91	98	82
18	116	94	73	b30	b60	70	98	103	93	83	94	72
19	113	95	71	b30	b60	116	99	98	81	76	93	69
20	111	102	68	b30	62	198	95	89	78	*82	84	67
21	110	109	b65	b30	62	253	96	95	77	85	87	66
22	109	104	b65	b35	60	294	94	101	68	106	90	65
23	117	154	b60	b35	b45	357	95	99	67	110	112	65
24	113	158	b60	50	b40	275	95	105	51	99	95	65
25	117	134	b60	61	b35	270	96	97	45	103	103	63
26	113	111	b55	71	b35	211	98	93	44	110	90	63
27	109	107	b55	64	b35	184	103	100	47	108	93	61
28	107	105	b55	62	b35	145	101	102	47	108	92	61
29	111	106	b55	67	b35	116	95	100	43	108	86	59
30	110	104	b55	68	-------	116	94	100	47	106	85	61
31	113	-------	b50	62	-------	106	-------	112	-------	103	85	-------
Total	3,421	3,090	2,319	1,392	1,634	3,622	3,164	3,632	3,034	2,837	3,085	2,264
Mean	110	103	74.8	44.9	56.3	117	105	117	101	91.5	99.5	75.5
Ac-ft	6,790	6,130	4,600	2,760	3,240	7,180	6,280	7,200	6,020	5,630	6,120	4,490

Calendar year 1959: Max 281 Min 30 Mean 96.8 Ac-ft 70,110
Water year 1959-60: Max 357 Min 30 Mean 91.5 Ac-ft 66,440

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for nearby stations.
b Stage-discharge relation affected by ice.

3300. Boulder Creek at Maxville, Mont.

Location.--Lat 46°28'30", long 113°14'00", in SE¼ sec.4, T.8 N., R.13 W., on right bank an eighth of a mile upstream from mouth and three-quarters of a mile north of Maxville.

Drainage area.--71.3 sq mi.

Records available.--April 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 4,750 ft (from topographic map). Apr. 15, 1939, to July 7, 1941, wire-weight gage at site 75 ft upstream at different datum. July 8-20, 1941, staff gage at site 175 ft upstream at datum 1.03 ft higher.

Average discharge.--21 years, 46.6 cfs (33,740 acre-ft per year).

Extremes.--Maximum discharge during year, 325 cfs June 4 (gage height, 3.07 ft); maximum gage height, 4.03 ft Jan. 4 (backwater from ice); minimum discharge, 9.8 cfs Sept. 29 (gage height, 0.93 ft).
1939-60: Maximum discharge, 764 cfs June 13, 1953; maximum gage height, 4.24 ft June 3, 1948; minimum discharge, 4.2 cfs Sept. 12, 13, 1954 (gage height, 0.74 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 350 acres, all of which lies below station.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.9	8.0	2.3	129
1.0	11	2.8	245
1.4	31	3.0	305
1.9	77		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	50	33	b16	20	b15	19	29	178	50	22	16
2	31	50	32	b15	20	b15	18	30	200	47	22	16
3	31	50	32	b16	20	b15	19	35	272	45	19	16
4	*32	*44	30	b17	*20	b17	22	*36	278	42	18	16
5	33	b40	b28	b20	20	b20	29	37	228	44	16	15
6	37	47	30	b22	20	b20	*40	36	202	41	15	14
7	43	45	30	b21	20	b19	45	42	200	40	14	13
8	39	43	b26	a21	20	18	49	48	174	37	14	13
9	40	41	b26	a20	20	*18	55	47	*148	34	13	13
10	37	41	b27	a18	20	18	60	64	144	34	12	a13
11	42	40	b28	b20	20	18	52	96	146	33	11	a13
12	59	29	28	b20	20	17	47	152	138	30	11	a13
13	55	b25	28	a18	20	17	42	200	126	30	10	*13
14	53	b20	b27	b15	20	16	41	129	127	29	10	13
15	69	b20	27	b15	20	17	37	105	135	28	11	13
16	79	b20	*27	a15	20	16	34	99	129	29	15	13
17	68	b22	27	a15	20	16	32	85	138	27	14	13
18	62	b24	26	a14	b18	18	33	75	110	26	13	11
19	60	b26	26	a13	b19	18	33	69	98	24	11	11
20	58	b30	b24	a12	20	20	31	64	94	*20	11	11
21	54	b34	b22	a13	20	22	31	73	86	20	11	12
22	53	36	b24	a14	20	22	30	69	78	18	12	12
23	61	42	b26	a16	b18	21	29	65	74	18	13	12
24	59	45	b26	a18	b18	21	29	63	69	17	15	11
25	68	41	25	a19	b18	24	29	60	67	16	20	11
26	64	b35	25	a20	b15	26	28	56	64	16	20	11
27	59	b35	b24	a20	b15	27	29	77	61	17	20	10
28	55	b36	b24	a20	b15	26	29	76	57	17	19	10
29	53	35	b24	a20	b15	23	28	80	53	16	17	10
30	50	33	b22	20	-------	22	28	100	51	16	16	10
31	49	-------	b20	20	-------	20	-------	140	-------	16	16	-------
Total	1,583	1,079	824	543	551	602	1,028	2,337	3,925	877	461	378
Mean	51.1	36.0	26.6	17.5	19.0	19.4	34.3	75.4	131	28.3	14.9	12.6
Ac-ft	3,140	2,140	1,630	1,080	1,090	1,190	2,040	4,640	7,790	1,740	914	750

Calendar year 1959: Max 356 Min 8.6 Mean 45.3 Ac-ft 32,810
Water year 1959-60: Max 278 Min 10 Mean 38.8 Ac-ft 28,140

Peak discharge (base, 150 cfs).--May 13 (3 to 4 a.m.) 228 cfs (2.79 ft); June 4 (1 to 3 a.m.) 325 cfs (3.07 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations.
b Stage-discharge relation affected by ice.

3320. Middle Fork Rock Creek near Philipsburg, Mont.

Location.--Lat 46°11', long 113°30', in NE¼ sec.17, T.5 N., R.15 W., on right bank a quarter of a mile upstream from East Fork, 2½ miles upstream from West Fork, and 15 miles southwest of Philipsburg.

Drainage area.--123 sq mi.

Records available.--September 1937 to September 1960. Monthly discharge only January to March 1938, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 5,450 ft (from topographic map). Sept. 21, 1937, to May 10, 1942, wire-weight gage at site 600 ft upstream at different datum. May 11, 1942, to May 11, 1954, staff or wire-weight gages at site 400 ft downstream at different datum. May 12, 1954, to Sept. 30, 1955, at site 300 ft upstream at datum 5.74 ft higher.

Average discharge.--23 years, 120 cfs (86,880 acre-ft per year).

Extremes.--Maximum discharge during year, 836 cfs June 4 (gage height, 4.16 ft); minimum daily, 10 cfs Nov. 15, 16.

1937-60: Maximum discharge, 1,430 cfs June 13, 1953 (gage height, 3.92 ft, site and datum then in use); minimum observed, 4.5 cfs Dec. 9, 10, 23, 24, 1944 (gage height, 0.02 ft, site and datum then in use).

Remarks.--Records good except those for periods of ice effect, which are poor. A few small diversions for irrigation above station.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	23	3.5	470
2.0	54	4.0	740
2.5	135	4.5	1,060
3.0	265		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	79	60	15	35	15	52	86	416	194	74	46
2	55	78	63	15	35	15	50	86	495	187	79	46
3	55	*78	60	15	40	20	52	97	638	175	68	46
4	*57	76	54	20	*40	25	59	*108	758	165	64	48
5	58	50	35	25	40	30	72	108	674	160	60	50
6	60	73	59	25	40	*35	*85	110	595	156	62	48
7	68	74	59	20	40	35	101	121	595	153	59	47
8	64	70	42	20	40	35	110	135	560	146	57	46
9	70	70	48	20	40	35	123	137	*500	140	54	44
10	67	68	63	15	40	30	140	163	465	144	54	42
11	67	67	67	20	40	25	133	221	450	144	54	42
12	84	58	59	20	40	20	129	332	445	135	49	41
13	78	23	62	20	40	20	121	465	425	125	47	*42
14	73	15	45	15	40	20	121	392	440	127	46	44
15	79	10	60	15	40	20	111	360	450	123	47	43
16	86	10	*62	15	35	25	106	336	435	117	62	42
17	82	30	59	15	30	30	102	293	475	110	63	41
18	76	82	59	15	25	35	102	265	392	110	57	39
19	74	86	54	15	25	40	101	247	356	99	52	38
20	73	85	40	15	25	45	101	232	340	90	49	37
21	73	85	40	20	20	50	99	247	304	*85	47	38
22	76	79	40	25	20	60	97	227	282	80	49	38
23	94	73	40	25	15	70	94	218	259	82	63	38
24	85	73	40	30	15	80	92	210	247	78	60	38
25	94	70	35	35	15	90	90	204	247	73	64	37
26	91	50	30	35	15	106	85	200	238	70	59	37
27	86	45	30	40	15	80	85	229	227	68	55	36
28	84	50	25	40	15	72	86	229	215	67	55	36
29	84	55	25	40	15	62	82	238	202	67	52	36
30	80	68	25	40	------	60	84	276	197	64	49	36
31	79	------	20	35	------	55	------	348	------	66	47	------
Total	2,309	1,830	1,460	720	875	1,340	2,865	6,922	12,322	3,600	1,757	1,242
Mean	74.5	61.0	47.1	23.2	30.2	43.2	95.5	223	411	116	56.7	41.4
Cfsm	0.606	0.496	0.383	0.189	0.246	0.351	0.776	1.81	3.34	0.943	0.461	0.337
In.	0.70	0.55	0.44	0.22	0.26	0.41	0.87	2.09	3.73	1.09	0.53	0.38
Ac-ft	4,580	3,630	2,900	1,430	1,740	2,660	5,680	13,730	24,440	7,140	3,480	2,460

Calendar year 1959: Max 816 Min 10 Mean 109 Cfsm 0.886 In. 11.98 Ac-ft 78,600
Water year 1959-60: Max 758 Min 10 Mean 102 Cfsm 0.829 In. 11.27 Ac-ft 73,870

Peak discharge (base, 450 cfs).--May 13 (2:30 to 6 a.m.) 490 cfs (3.57 ft); June 4 (5 a.m.) 836 cfs (4.16 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 5, 14-17, 26-29, Dec. 5, 14, 15, Dec. 20 to Mar. 25 (no gage-height record Jan. 20 to Feb. 3, Mar. 1-5; discharge estimated on basis of 2 discharge measurements, weather records, and records for nearby stations).

3355. Nevada Creek above reservoir, near Finn, Mont.

Location.--Lat 46°46'30", long 112°45'20", near south line of sec.20, T.12 N., R.9 W., on right bank a quarter of a mile downstream from Gallagher Creek, 2 miles upstream from Buffalo Creek, and 3 miles west of Finn.

Drainage area.--116 sq mi.

Records available.--April 1939 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 4,660 ft (river-profile survey). Prior to Apr. 30, 1942, wire-weight gage at site seven-eighths of a mile downstream at different datum. Apr. 30, 1942, to July 26, 1953, water-stage recorder at site 1 mile downstream at different datum.

Average discharge.--21 years, 36.4 cfs (26,350 acre-ft per year).

Extremes.--Maximum discharge during year, 806 cfs Mar. 25 (gage height, 4.44 ft); maximum gage height, 4.76 ft Nov. 24 (backwater from ice); minimum discharge, 5.6 cfs Aug. 13, 14 (gage height, 1.14 ft).
1939-60: Maximum discharge, 1,800 cfs June 2, 1953 (gage height, 6.00 ft, site and datum then in use), from rating curve extended above 400 cfs on basis of inflow-outflow study of Nevada Creek Reservoir; maximum gage height, 7.40 ft May 29, 1953, site and datum then in use (backwater from diversion dam); minimum discharge, probably less than 2 cfs at times in 1944 and 1957.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 2,500 acres above station.

Rating table, water year 1959-60, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 28 to Apr. 11)

1.1	5.0	3.0	177
1.2	8.0	3.5	248
1.3	12	4.0	350
1.5	25	4.2	500
2.0	68	4.4	750
2.5	120		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	31	20	15	18	10	61	49	129	24	13	8.4
2	24	30	20	15	18	11	56	51	139	21	14	8.4
3	24	31	20	15	18	12	65	104	141	19	13	8.4
4	24	30	20	15	18	13	73	117	149	18	12	10
5	24	39	20	15	18	13	80	93	141	17	12	9.6
6	27	39	20	15	17	13	109	86	120	15	12	8.4
7	39	*29	19	16	17	14	118	88	99	14	13	8.4
8	30	29	18	17	17	14	119	99	*91	14	13	8.4
9	*35	28	18	17	16	14	127	104	82	14	12	8.4
10	35	27	17	17	16	13	138	108	73	16	12	8.0
11	39	22	17	17	16	12	*151	*143	70	14	10	8.4
12	47	20	18	17	15	12	120	200	66	15	7.7	8.4
13	37	15	18	17	15	12	101	285	55	15	7.1	8.8
14	32	12	20	17	15	12	90	271	52	15	5.9	8.8
15	37	12	*20	17	15	*12	79	198	60	16	*6.8	8.4
16	50	12	20	17	14	13	71	172	56	16	8.4	9.2
17	36	14	20	17	14	15	66	151	55	16	7.4	9.2
18	33	17	20	17	14	25	63	131	47	16	7.1	8.8
19	31	*19	20	17	14	30	66	122	41	15	6.8	8.8
20	31	22	20	17	14	*50	62	108	39	14	6.5	10
21	30	24	18	17	13	100	57	102	42	*13	6.5	10
22	29	25	18	17	13	*200	54	90	44	12	7.1	10
23	30	25	18	18	13	600	54	93	36	12	10	10
24	29	23	18	19	12	*685	52	*87	27	11	9.2	11
25	39	20	18	*19	12	410	53	78	25	10	16	11
26	31	17	17	21	11	384	55	71	24	9.6	10	10
27	30	15	17	21	10	315	54	73	24	9.6	9.6	10
28	30	18	16	21	10	157	53	72	21	10	9.2	10
29	32	20	15	21	9	101	51	75	19	9.6	8.4	10
30	28	20	15	21	-------	111	51	83	19	9.6	8.4	11
31	30	-------	15	19	-------	75	-------	98	-------	10	8.4	-------
Total	997	685	570	541	422	3,458	2,329	3,602	1,986	440.4	302.5	278.2
Mean	32.2	22.8	18.4	17.5	14.6	112	77.6	116	66.2	14.2	9.76	9.27
Ac-ft	1,980	1,360	1,130	1,070	837	6,860	4,620	7,140	3,940	874	600	552

Calendar year 1959: Max 536 Min 5 Mean 47.2 Ac-ft 34,150
Water year 1959-60: Max 685 Min 5.9 Mean 42.7 Ac-ft 30,960

Peak discharge (base, 160 cfs).--Mar. 25 (7 p.m.) 806 cfs (4.44 ft); May 13 (4 to 6 p.m.) 312 cfs (3.86 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 23 (no gage-height record Nov. 26 to Dec. 14, Jan. 12-24, Feb. 3 to Mar. 9; discharge estimated on basis of 2 discharge measurements and weather records).

3385. Blackfoot River near Ovando, Mont.

Location.--Lat 47°01'10", long 113°13'40", in SE¼NW¼ sec.34, T.15 N., R.13 W., on left bank a quarter of a mile upstream from Monture Creek and 5 miles west of Ovando.

Drainage area.--1,274 sq mi.

Records available.--September 1940 to September 1960. Monthly discharge only for September 1940, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 3,917.27 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--20 years, 871 cfs (630,600 acre-ft per year).

Extremes.--Maximum discharge during year, 4,300 cfs June 4 (gage height, 5.06 ft); minimum daily, 200 cfs Feb. 27-29.
1940-60: Maximum discharge, 14,600 cfs June 4, 1953 (gage height, 8.45 ft); minimum daily, 100 cfs Jan. 20, 1954.
Floodmarks indicate stage of 10 ft reached in recent years, prior to 1940.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 15,000 acres above station.

Revisions (water years).--WSP 1216: Drainage area. WSP 1246: 1941.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	305	3.5	1,340
2.5	445	4.0	2,060
3.0	800	5.0	4,160

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	581	930	746	370	410	220	719	930	3,080	1,160	494	440
2	567	920	719	360	395	230	678	950	*3,160	1,100	524	435
3	560	930	710	350	395	240	678	1,000	3,800	1,000	524	435
4	554	920	686	350	395	260	710	1,080	4,160	1,000	512	435
5	548	840	662	360	390	*290	800	1,100	3,800	970	494	440
6	560	800	678	360	395	300	1,000	1,110	3,400	930	484	440
7	616	*810	670	380	395	310	*1,140	1,130	3,200	880	484	425
8	609	791	638	380	395	320	1,230	1,200	3,020	840	478	*415
9	623	791	630	370	390	320	1,360	1,260	2,740	800	472	415
10	646	800	620	370	390	333	1,530	1,380	2,520	791	467	410
11	670	700	610	360	390	329	1,540	*1,770	2,440	782	450	415
12	755	580	602	360	385	333	1,540	2,660	2,420	746	440	410
13	773	520	595	350	380	329	1,490	3,730	2,360	727	435	400
14	755	500	581	340	375	325	1,420	3,580	2,360	702	435	400
15	755	480	*574	330	380	329	1,350	3,220	2,300	678	440	395
16	860	480	595	320	375	329	1,290	2,840	2,340	662	445	405
17	860	520	595	310	375	333	1,220	2,600	2,480	630	440	400
18	830	600	588	300	340	341	1,190	2,340	2,190	623	430	400
19	810	*680	581	290	300	365	1,190	2,170	1,950	602	430	395
20	800	654	560	280	290	462	1,190	1,980	1,840	*582	420	390
21	810	654	560	280	280	870	1,140	1,930	1,710	581	415	380
22	820	670	540	300	270	1,110	1,100	1,850	1,570	560	425	370
23	900	755	530	360	250	1,240	1,070	1,800	1,470	567	456	375
24	920	1,000	510	400	240	1,200	1,060	1,800	1,400	549	478	375
25	1,030	1,160	480	*440	220	1,120	1,060	1,740	1,380	537	506	385
26	1,090	1,030	460	489	210	1,030	1,030	1,700	1,350	519	512	375
27	1,060	900	440	462	200	1,000	1,010	1,760	1,300	512	500	360
28	1,020	830	420	430	200	930	980	1,820	1,260	507	489	355
29	1,010	782	410	415	200	850	950	1,880	1,190	491	478	350
30	980	773	400	410	-------	810	930	2,100	1,160	481	462	345
31	950	-------	380	410	-------	764	-------	2,540	-------	471	450	-------
Total	24,322	22,800	17,770	11,286	9,610	17,202	33,595	58,950	69,350	22,163	14,469	11,970
Mean	785	760	573	364	331	555	1,120	1,902	2,312	715	467	399
Cfsm	0.616	0.597	0.450	0.286	0.260	0.436	0.879	1.49	1.81	0.561	0.367	0.313
In.	0.71	0.67	0.52	0.33	0.28	0.50	0.98	1.72	2.02	0.65	0.42	0.35
Ac-ft	48,240	45,220	35,250	22,390	19,060	34,120	66,630	116,900	137,600	43,960	28,700	23,740

Calendar year 1959: Max 6,630 Min 200 Mean 1,192 Cfsm 0.936 In. 12.69 Ac-ft 862,700
Water year 1959-60: Max 4,160 Min 200 Mean 857 Cfsm 0.673 In. 9.15 Ac-ft 621,800

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 11-19, Dec. 10, 11, Dec. 21 to Jan. 25, Feb. 18 to Mar. 9.

3398. Blackfoot River near Potomac, Mont.

Location.--Lat 46°57'10", long 113°34'00", in NE¼SW¼ sec.24, T.14 N., R.16 W., on right bank an eighth of a mile upstream from Belmont Creek and 5 miles north of Potomac.

Drainage area.--2,046 sq mi.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 3,533.36 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Extremes.--Maximum discharge during year, 6,330 cfs June 4 (gage height, 6.21 ft); minimum daily, 400 cfs Feb. 26 to Mar. 2.
1956-60: Maximum discharge, 10,900 cfs June 15, 1959 (gage height, 8.54 ft); minimum daily, 300 cfs Jan. 4, 1958.
Flood in June 1953 reached a stage of about 12.5 ft, from floodmarks (discharge, about 17,000 cfs).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 18,000 acres above station.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 5-22, June 7-9)

2.6	470	6.0	5,790
3.0	850	7.0	7,650
4.0	2,300		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	938	1,600	1,320	600	716	400	1,530	1,900	4,440	2,010	756	612
2	927	1,550	1,280	600	716	400	1,500	1,980	*4,760	1,960	798	612
3	916	1,520	1,250	600	698	450	1,580	2,110	5,540	1,860	787	612
4	916	1,560	1,220	630	660	*490	1,840	2,200	6,170	1,760	776	622
5	905	1,420	1,130	650	688	510	2,060	2,280	5,900	1,660	756	631
6	916	1,350	1,080	670	698	530	2,490	2,350	5,560	1,560	745	622
7	1,010	*1,350	1,120	660	678	550	*2,910	2,410	5,390	1,460	736	602
8	*996	1,340	1,070	640	678	550	3,200	2,490	*5,180	1,400	736	*602
9	1,020	1,320	1,030	620	669	550	3,470	2,640	4,850	1,310	716	593
10	1,070	1,310	1,050	600	669	550	3,850	2,820	4,510	1,270	707	584
11	1,110	1,310	1,100	580	669	550	*4,060	*3,280	4,370	1,240	678	584
12	1,290	850	1,030	560	650	550	3,990	4,240	4,280	1,180	669	574
13	1,350	787	1,030	540	650	560	3,810	5,610	4,170	1,140	660	555
14	1,320	750	996	520	650	574	3,570	5,570	4,130	1,090	650	555
15	1,340	730	*984	500	660	564	3,380	4,960	4,040	1,070	650	555
16	1,530	720	1,010	500	660	546	3,180	4,370	4,030	1,030	660	546
17	1,600	750	1,020	500	650	564	2,980	3,970	4,240	996	650	546
18	1,560	900	996	500	600	564	2,840	3,560	3,940	984	650	538
19	1,520	*1,100	972	500	550	602	2,760	3,250	3,570	960	631	538
20	1,480	1,210	938	490	550	688	2,670	2,980	3,320	*949	602	530
21	1,480	1,220	840	480	550	972	2,570	2,860	3,110	916	593	521
22	1,480	1,280	776	500	530	1,350	2,480	2,740	2,910	883	593	512
23	1,630	1,360	750	550	510	1,580	2,400	2,640	2,670	872	640	504
24	1,690	1,660	750	600	500	1,320	2,360	2,650	2,510	850	650	512
25	1,820	1,930	750	700	480	1,280	2,320	2,620	2,430	829	688	521
26	1,960	1,760	750	*750	400	1,270	2,250	2,510	2,410	808	698	521
27	1,920	1,470	710	800	400	1,320	2,170	2,520	2,350	787	678	504
28	1,850	1,400	680	800	400	1,320	2,120	2,620	2,220	766	678	496
29	1,800	1,380	670	770	400	1,290	2,060	2,770	2,120	745	660	487
30	1,740	1,360	650	750	------	1,410	2,010	3,080	2,030	736	640	487
31	1,660	------	630	730	------	1,400	------	3,710	------	736	622	------
Total	42,744	38,247	29,582	18,890	17,329	25,324	80,410	95,690	117,150	35,827	21,153	16,678
Mean	1,379	1,275	954	609	598	817	2,680	3,087	3,905	1,156	682	556
Cfsm	0.674	0.623	0.466	0.298	0.292	0.399	1.31	1.51	1.91	0.565	0.333	0.272
In.	0.78	0.70	0.54	0.34	0.31	0.46	1.46	1.74	1.13	0.65	0.38	0.30
Ac-ft	84,780	75,860	58,680	37,470	34,370	50,230	159,500	189,800	232,400	71,060	41,960	33,080

Calendar year 1959: Max 10,700 Min 350 Mean 1,992 Cfsm 0.974 In. 13.23 Ac-ft 1,442,000
Water year 1959-60: Max 6,170 Min 400 Mean 1,473 Cfsm 0.720 In. 9.79 Ac-ft 1,069,000

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 14-19, Dec. 10, 11, Dec. 23 to Jan. 31, Feb. 18 to Mar. 13.

3400. Blackfoot River near Bonner, Mont.

Location.--Lat 46°53'50", long 113°45'20", near center sec.9, T.13 N., R.17 W., on right bank 5 miles northeast of Bonner, 5 miles downstream from Union Creek, and 7 miles upstream from mouth.

Drainage area.--2,290 sq mi.

Records available.--July to November 1898, March 1899 to September 1901, May 1903 to January 1905, March to October 1905, October 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1316. Published as "at Bonner" 1898-99 and as Big Blackfoot River near Bonner 1903-5.

Gage.--Water-stage recorder. Datum of gage is 3,344.76 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. July 7, 1898, to June 30, 1901, and May 15, 1903, to Oct. 31, 1905, chain gage at site 7 miles downstream at different datum. Oct. 4, 1939, to Sept. 30, 1955, staff gage at site 1.3 miles downstream at datum 21.82 ft lower.

Average discharge.--24 years (1899-1901, 1903-4, 1939-60), 1,609 cfs (1,165,000 acre-ft per year).

Extremes.--Maximum discharge during year, 6,880 cfs June 4 (gage height, 6.75 ft); maximum gage height recorded, 9.30 ft Nov. 16 (ice jam); minimum discharge, 386 cfs Feb. 26 (gage height, 2.01 ft).
1898-1901, 1903-5, 1939-60: Maximum discharge, 18,300 cfs June 4, 1953 (gage height, 11.65 ft, from graph based on gage readings, site and datum then in use); minimum daily determined, 200 cfs Jan. 4, 5, 1950.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 20,000 acres above station.

Revisions.--WSP 1216: Drainage area.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.9	420	3.0	1,120
2.0	460	4.0	2,230
2.3	600	6.0	5,480
2.5	720	7.0	7,580

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,080	1,740	1,680	850	790	488	*2,130	2,060	4,800	2,130	846	666
2	1,060	1,700	1,620	830	776	464	2,070	2,070	5,130	2,140	902	666
3	1,040	1,650	1,600	830	769	510	2,060	2,240	5,860	2,020	886	660
4	1,030	1,700	1,550	870	755	585	2,200	2,400	6,660	1,930	870	666
5	1,020	1,560	1,460	910	755	595	2,450	2,520	6,560	1,810	838	672
6	1,020	1,500	1,370	930	769	624	3,010	2,610	6,100	1,730	822	666
7	1,120	1,490	1,370	920	776	630	3,510	2,710	5,740	1,640	822	654
8	1,130	1,480	1,350	900	*776	636	3,840	2,830	5,440	1,580	830	648
9	1,160	1,450	1,270	860	762	630	4,160	2,950	5,060	1,510	798	642
10	1,230	1,440	1,220	800	755	*630	4,570	3,130	4,710	1,470	776	642
11	1,280	1,440	1,340	760	741	624	4,680	3,650	4,540	1,430	755	642
12	1,500	1,350	1,330	740	702	618	4,570	*4,710	4,470	1,380	727	*636
13	1,620	1,030	1,310	700	696	618	4,340	6,340	4,350	1,350	720	618
14	1,560	990	1,250	650	684	618	4,090	6,560	4,300	1,310	702	612
15	1,550	940	*1,260	630	690	612	3,830	6,000	4,280	1,260	702	612
16	1,730	900	1,280	620	684	624	3,550	5,380	4,260	1,230	714	612
17	1,800	900	1,270	620	660	624	3,310	4,970	4,470	1,170	708	612
18	1,750	1,000	1,250	*620	624	642	3,180	4,570	4,210	1,150	708	606
19	1,710	1,200	1,220	610	590	660	3,060	4,210	3,830	*1,120	690	600
20	1,660	1,300	1,170	600	620	741	2,950	3,890	3,550	1,080	660	590
21	1,660	1,400	1,090	600	642	1,060	2,860	3,730	3,360	1,050	654	590
22	1,660	1,500	1,070	620	630	1,560	2,710	3,550	3,130	1,010	648	580
23	1,770	1,650	1,050	660	585	2,000	2,620	3,430	2,890	1,010	690	575
24	1,850	2,000	1,090	730	590	2,180	2,550	3,390	2,680	982	708	580
25	1,960	2,100	1,110	800	600	2,200	2,500	3,270	2,610	950	755	580
26	2,150	1,950	1,070	840	452	2,200	2,430	3,130	2,580	926	755	580
27	2,110	1,800	974	886	460	2,310	2,330	3,130	2,500	894	741	570
28	2,050	1,750	926	862	*448	2,290	2,230	3,240	2,380	878	727	565
29	*1,980	1,740	902	830	468	2,150	2,150	3,250	2,260	862	708	565
30	1,900	1,740	890	806	------	2,240	2,090	3,460	2,150	846	690	*565
31	1,810	------	870	806	------	2,190	------	*3,940	------	838	678	------
Total	47,950	44,390	38,212	23,690	19,249	34,553	92,010	113,320	124,860	40,676	23,230	18,472
Mean	1,547	1,480	1,233	764	664	1,115	3,067	3,655	4,162	1,312	749	616
Cfsm	0.676	0.646	0.538	0.334	0.290	0.487	1.34	1.60	1.82	0.573	0.327	0.269
In.	0.78	0.72	0.62	0.38	0.31	0.56	1.49	1.84	2.03	0.66	0.38	0.30
Ac-ft	95,110	88,050	75,790	46,990	38,180	68,530	182,500	224,800	247,700	80,680	46,080	36,640

Calendar year 1959: Max 12,000 Min 400 Mean 2,395 Cfsm 1.05 In. 14.21 Ac-ft 1,733,000
Water year 1959-60: Max 6,660 Min 448 Mean 1,696 Cfsm 0.741 In. 10.07 Ac-ft 1,231,000

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 15-29, Dec. 6-9, Dec. 30 to Jan. 26, Feb. 19, 20.

3405. Clark Fork above Missoula, Mont.

Location.--Lat 46°52'40", long 113°55'40", in NW¼NW¼ sec.19, T.13 N., R.18 W., on right bank 3 miles downstream from Blackfoot River and 3 miles east of Missoula.

Drainage area.--5,999 sq mi.

Records available.--March 1929 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 3,230 ft (from topographic map). Prior to May 27, 1929, staff gage at same site and datum.

Average discharge.--31 years, 2,827 cfs (2,047,000 acre-ft per year).

Extremes.--Maximum discharge during year, 12,100 cfs May 14 (gage height, 7.86 ft); minimum recorded, 670 cfs Feb. 26 (gage height, 2.00 ft), but may have been less during other periods of ice effect.
1929-60: Maximum discharge, 31,500 cfs May 23, 1948 (gage height, 13.07 ft); minimum, 115 cfs Oct. 25, 1943 (gage height, 0.64 ft, powerplant shutdown); minimum daily, 340 cfs Sept. 27, 1937.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are poor. Diurnal fluctuation caused by powerplant at Bonner. Diversions for irrigation of about 120,000 acres above station.

Revisions (water years).--WSP 1042: 1936. WSP 1152: 1942. WSP 1246: 1929-30, 1935, drainage area. WSP 1316: 1932-33.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 23-30)

2.0	670	4.0	3,400
2.5	1,170	6.0	7,410
3.0	1,820	8.0	12,500

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,250	3,170	3,040	1,850	1,850	900	3,900	3,870	8,030	3,440	1,470	1,600
2	2,220	3,130	2,920	1,700	1,830	750	3,800	3,960	8,700	3,440	1,620	1,550
3	2,190	3,090	2,850	1,600	1,860	900	3,700	4,220	*9,800	3,270	1,650	1,550
4	2,160	3,170	2,790	1,700	1,860	1,000	3,940	4,600	11,300	3,110	1,640	1,550
5	2,140	2,970	2,630	1,750	1,790	1,150	4,360	4,900	11,600	3,370	1,590	1,600
6	2,180	2,790	2,480	1,850	1,810	1,400	5,060	5,020	10,800	2,690	1,540	1,650
7	2,320	2,820	2,570	1,900	1,850	1,700	5,980	5,100	9,980	2,380	1,540	1,600
8	2,460	2,840	2,570	1,850	*1,990	1,750	6,800	5,380	9,550	2,520	1,560	1,600
9	2,520	2,810	2,370	1,700	1,850	*1,720	7,400	5,600	8,680	2,440	1,540	1,600
10	2,610	2,770	2,190	1,600	1,830	1,670	7,800	5,740	8,100	2,380	1,480	1,550
11	2,660	2,770	2,300	1,500	*1,830	1,670	8,000	*6,540	7,640	2,310	1,450	1,550
12	3,020	2,610	2,460	1,600	1,720	1,600	7,500	8,240	7,570	2,140	1,340	1,500
13	3,260	1,700	2,420	1,500	1,670	1,640	*7,070	10,900	7,340	1,970	1,340	1,450
14	3,170	1,450	2,310	1,400	1,670	1,520	6,540	11,700	7,140	2,120	1,320	1,400
15	3,090	1,400	*2,260	1,200	1,630	1,640	6,160	10,600	7,180	2,040	1,290	1,400
16	3,330	1,500	2,360	1,250	1,650	1,600	5,860	9,520	7,250	1,990	1,340	1,400
17	3,510	1,800	2,310	1,300	1,630	1,640	5,440	8,920	7,460	1,900	*1,360	1,400
18	3,440	2,100	2,260	1,250	1,480	1,820	5,180	8,170	7,250	1,880	1,400	1,350
19	3,310	2,400	2,220	1,200	1,420	2,500	5,140	7,520	6,560	1,790	1,400	1,350
20	3,200	2,600	2,180	1,100	1,510	3,170	5,020	6,960	6,040	*1,780	1,350	1,350
21	3,200	2,850	1,960	1,000	1,630	3,690	4,900	6,720	*5,720	1,750	1,300	1,340
22	3,170	2,970	1,970	1,100	1,600	4,420	4,660	6,500	5,340	1,650	1,300	1,330
23	3,240	*3,330	1,780	1,300	1,480	5,280	4,570	6,200	4,980	1,680	1,350	*1,320
24	3,440	4,170	1,990	1,600	1,250	5,700	4,510	6,230	4,620	1,650	1,450	1,320
25	3,530	4,980	2,140	1,750	1,150	5,940	4,470	6,060	4,360	1,620	1,600	1,320
26	3,710	4,170	2,070	1,800	1,000	5,700	4,360	5,780	4,260	1,580	1,700	1,370
27	3,650	3,490	2,000	1,900	900	5,640	4,220	5,700	4,090	1,520	1,750	1,370
28	3,560	3,330	2,000	1,800	994	5,380	4,110	5,860	3,870	1,510	1,750	1,360
29	*3,470	3,200	2,000	1,890	1,070	4,760	4,020	5,900	3,710	1,500	1,700	1,230
30	3,360	3,170	1,950	1,920	-------	4,550	3,890	6,080	3,540	1,460	1,700	1,330
31	3,220	-------	1,900	1,900	-------	4,360	-------	6,700	-------	1,460	1,650	-------
Total	92,590	85,550	71,250	48,760	45,804	87,160	158,360	205,190	212,460	68,340	46,470	43,290
Mean	2,987	2,852	2,298	1,573	1,579	2,812	5,279	6,619	7,082	2,140	1,499	1,443
Ac-ft	183,600	169,700	141,300	96,710	90,850	172,900	314,100	407,000	421,400	131,600	92,170	85,860

Calendar year 1959: Max 18,200 Min 850 Mean 3,967 Ac-ft 2,872,000
Water year 1959-60: Max 11,700 Min 750 Mean 3,178 Ac-ft 2,307,000

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov.13-20, Dec. 27 to Jan. 27, Jan. 31, Feb. 1, 24-27, Mar. 1-7. No gage-height record Apr. 1-3, 8-12, Aug. 18 to Sept. 22; discharge estimated on basis of records for Clark Fork below Missoula.

3410. Rattlesnake Creek at Missoula, Mont.

Location.--Lat 46°52'20", long 113°59'00", in SW¼NE¼ sec.22, T.13 N., R.19 W., on upstream side of Vine Street Bridge in Missoula, half a mile upstream from mouth.

Drainage area.--79.7 sq mi.

Records available.--June to December 1899, January to November 1900 (gage heights and discharge measurements only), April 1958 to September 1960. Monthly discharge only for December 1899, published in WSP 1316.

Gage.--Wire-weight gage read once daily. Altitude of gage is 3,220 ft (from topographic map). June 1899 to November 1900 at or near present site at different datum.

Extremes.--Maximum discharge observed during year, 720 cfs June 4 (gage height, 9.05 ft); maximum gage height observed, 9.76 ft Nov. 17 (backwater from ice); minimum discharge observed, 3.8 cfs Sept. 16 (gage height, 6.82 ft).

1899, 1958-60: Maximum discharge observed, 2,050 cfs June 18, 1897 (gage height, 6.25 ft, site and datum then in use); minimum observed, 3.2 cfs Aug. 30, 1958 (gage height, 6.73 ft).

Maximum discharge known, 2,400 cfs June 6, 1948, by computation of flow over dam 4 miles upstream.

Remarks.--Records fair except those for periods of ice effect, which are poor. Many small diversions for irrigation and diversion for municipal water supply for Missoula above station.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 8-10, Apr. 19 to May 6)

6.7	3.0	7.6	83
6.8	4.0	7.9	153
6.9	6.0	8.5	380
7.0	10	9.0	680
7.1	17	9.5	1,100
7.3	37		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	69	101	73	20	20	5	139	60	528	120	8.2	9.6
2	69	94	69	20	*20	5	101	71	540	103	47	8.7
3	58	87	74	20	20	*5	101	87	645	92	30	9.2
4	66	85	71	20	20	5	139	108	720	92	25	9.2
5	80	85	64	20	20	10	153	106	645	92	25	10
6	78	*92	71	25	25	20	340	145	666	83	28	12
7	103	83	56	25	26	30	*355	192	666	83	23	9.2
8	*97	83	50	20	26	25	365	258	510	74	23	9.2
9	101	74	45	20	26	*15	365	255	*420	60	21	7.8
10	115	74	45	15	26	15	400	290	360	50	16	9.2
11	136	71	50	15	22	15	375	318	355	45	15	8.2
12	370	50	55	15	17	14	345	475	405	50	13	*8.2
13	294	40	52	15	20	14	298	645	380	37	14	6.9
14	326	35	47	12	17	14	258	610	405	28	16	5.2
15	276	35	46	12	17	15	206	*405	405	23	9.6	3.9
16	298	40	*47	10	16	14	182	405	405	23	9.6	3.8
17	272	50	45	10	17	10	150	355	405	21	6.0	6.9
18	210	60	40	10	17	15	136	272	350	14	8.7	6.9
19	199	65	42	10	17	17	113	272	310	*17	9.2	6.4
20	156	68	42	8	17	22	101	202	269	22	8.2	6.0
21	131	69	36	8	16	25	99	220	244	17	8.7	5.0
22	131	64	35	10	14	50	111	192	166	6.0	9.6	6.4
23	133	68	35	10	13	74	97	175	159	12	11	6.0
24	196	85	37	10	10	83	97	169	136	11	15	5.0
25	248	128	37	15	10	113	61	169	147	6.9	14	4.8
26	196	115	35	15	7	166	78	166	153	8.2	12	4.8
27	136	106	30	20	5	182	68	220	128	9.6	14	5.2
28	111	96	25	25	5	202	60	252	153	8.2	16	5.6
29	123	92	20	30	5	169	*89	280	145	8.7	14	5.4
30	123	85	20	25	-------	153	64	405	139	9.6	16	5.4
31	101	-------	20	20	-------	139	-------	430	-------	9.6	14	-------
Total	5,002	2,280	1,414	510	491	1,641	5,426	8,209	10,959	1,241.8	499.8	210.1
Mean	161	76.0	45.6	16.5	16.9	52.9	181	265	365	40.1	16.1	7.00
Ac-ft	9,920	4,520	2,800	1,010	974	3,250	10,760	16,280	21,740	2,460	991	417

Calendar year 1959: Max 1,200 Min 8 Mean 134 Ac-ft 97,210
Water year 1959-60: Max 720 Min 3.8 Mean 104 Ac-ft 75,120

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-19, Dec. 8-10, Dec. 27 to Feb. 6, Feb. 23 to Mar. 11.

3425. West Fork Bitterroot River near Conner, Mont.

Location.--Lat 45°44', long 114°17', in NE¼NW¼ sec.26, T.1 S., R.22 W., on right bank half a mile downstream from Painted Rocks Lake (formerly West Fork Bitterroot River Reservoir), 6 miles upstream from Nez Perce Creek, and 16 miles southwest of Conner.

Drainage area.--317 sq mi.

Records available.--April 1941 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 4,560 ft (by barometer).

Average discharge.--19 years, 294 cfs (212,800 acre-ft per year).

Extremes.--Maximum discharge during year, 2,280 cfs May 13 (gage height, 4.80 ft); minimum daily, 24 cfs Jan. 18-24.
1941-60: Maximum discharge, 4,060 cfs May 9, 1947 (gage height, 6.18 ft); minimum, 0.2 cfs Nov. 25, 1942; minimum daily, 0.6 cfs May 3-7, 1954.

Remarks.--Records good. Flow regulated by Painted Rocks Lake (formerly West Fork Bitterroot River Reservoir, see p. 255). Diversions for irrigation of about 200 acres above station.

Revisions.--WSP 1246: Drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 9 to Jan. 8, June 28 to July 28)

1.1	58	3.0	790
1.3	93	4.0	1,560
1.6	165	5.0	2,570
2.0	295		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*86	88	205	288	68	*75	80	445	*1,300	323	138	171
2	86	86	*208	288	68	75	80	500	1,520	303	138	171
3	86	86	205	288	70	75	80	540	1,820	281	116	174
4	86	86	205	284	70	75	80	595	2,040	267	108	174
5	86	86	205	284	70	75	82	642	2,010	257	101	174
6	86	86	205	*281	72	75	84	686	1,840	*244	101	174
7	86	131	201	278	72	75	84	746	1,770	237	154	*174
8	86	205	205	278	72	73	86	838	1,640	230	171	118
9	86	205	266	281	72	73	86	838	1,460	217	168	79
10	86	205	319	278	72	73	88	938	1,320	217	171	80
11	86	205	319	278	72	73	88	1,350	1,230	205	171	80
12	86	*205	319	278	72	73	89	1,900	1,180	189	171	80
13	86	205	319	278	72	73	89	*2,230	1,100	183	171	80
14	86	205	276	278	72	73	91	1,950	1,060	183	171	80
15	888	205	288	281	72	73	208	1,600	1,070	177	171	80
16	88	205	292	281	72	73	445	1,370	987	168	186	80
17	88	205	292	195	72	73	440	1,190	945	160	205	82
18	88	205	292	24	72	73	420	1,050	844	152	205	82
19	88	205	292	24	72	73	407	938	774	143	205	82
20	88	205	292	24	72	73	389	862	713	141	205	82
21	88	205	292	24	72	73	380	850	664	128	205	82
22	88	205	292	24	72	73	366	779	600	124	208	82
23	89	205	292	24	72	73	358	740	550	119	208	82
24	89	205	288	24	72	73	348	724	520	112	183	84
25	89	205	288	38	73	75	327	686	490	110	171	84
26	89	205	288	66	73	75	*319	652	455	106	171	84
27	89	205	288	66	73	77	319	713	425	106	171	84
28	88	205	288	*68	73	77	362	724	394	110	174	*84
29	88	205	284	68	73	*77	384	774	362	106	174	84
30	88	205	284	68	-------	79	402	862	344	99	171	84
31	88	-------	284	68	-------	79	-------	1,040	-------	116	171	-------
Total	2,705	5,364	8,373	5,307	2,069	2,305	7,061	29,752	31,427	5,513	5,234	3,131
Mean	87.3	179	270	171	71.7	74.4	235	960	1,048	178	169	104
Ac-ft	5,370	10,640	16,610	10,530	4,120	4,570	14,010	59,010	62,330	10,930	10,380	6,210

Calendar year 1959: Max 2,200 Min 65 Mean 333 Ac-ft 241,200
Water year 1959-60: Max 2,230 Min 24 Mean 296 Ac-ft 214,700

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 17 to Dec. 1, Jan. 17-25; discharge estimated on basis of recorded range in stage and records for Painted Rocks Lake.

3434. East Fork Bitterroot River near Conner, Mont.

Location.--Lat 45°53'00", long 114°03'50", in NE¼ sec.34, T.2 N., R.20 W., on right bank 10 ft below private bridge, 4½ miles southeast of Conner, and 5 miles upstream from confluence with West Fork.

Drainage area.--381 sq mi.

Records available.--April 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 4,191.81 ft above mean sea level, datum of 1929, Pacific Northwest supplementary adjustment of 1947.

Extremes.--Maximum discharge during year, 1,730 cfs June 4 (gage height, 5.64 ft); minimum daily, 45 cfs Mar. 1.
1956-60: Maximum discharge, 3,000 cfs May 25, 1956 (gage height, 6.44 ft); minimum daily, 30 cfs Jan. 4, 1959.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Some diversion for irrigation above station.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 28 to Aug. 13)

2.8	84	4.5	815
3.0	124	5.0	1,220
3.5	280	5.5	1,700
4.0	500		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*136	177	126	90	100	45	163	288	*1,070	338	142	102
2	129	167	*120	90	100	55	149	304	1,210	312	157	97
3	126	167	120	90	100	80	152	360	1,470	292	126	96
4	126	171	113	95	95	100	177	410	1,630	280	122	105
5	126	113	86	95	95	192	208	460	1,540	269	117	105
6	134	160	85	*100	95	196	269	464	1,440	*257	117	100
7	166	174	85	100	110	183	324	496	1,430	242	111	*98
8	146	149	85	100	100	180	360	535	1,310	228	*109	97
9	149	149	90	100	95	180	396	525	1,190	228	102	95
10	146	152	95	100	90	186	432	592	1,100	228	97	95
11	152	*144	105	100	90	183	392	815	1,080	211	93	93
12	208	146	120	95	85	166	365	1,150	1,040	199	89	89
13	192	95	144	95	85	174	329	*1,420	986	192	86	95
14	167	85	120	90	80	171	320	1,220	978	189	88	109
15	177	75	142	85	80	155	292	1,060	1,010	183	89	102
16	202	70	134	80	75	139	272	994	938	171	97	97
17	177	75	122	80	65	113	253	898	970	166	102	95
18	167	85	113	80	65	97	261	787	830	157	100	93
19	163	95	109	75	65	98	257	710	745	144	93	89
20	163	120	97	70	70	113	246	668	689	146	88	89
21	163	150	100	70	70	136	253	689	623	144	86	91
22	166	155	105	75	65	171	246	623	556	139	93	93
23	218	171	110	75	60	208	246	604	510	139	122	93
24	196	202	115	80	60	218	242	580	482	132	120	96
25	205	183	120	80	60	235	232	556	473	126	144	98
26	196	142	120	85	55	253	*235	535	446	122	122	96
27	186	111	115	*90	55	265	242	630	406	117	115	93
28	180	115	115	95	50	250	265	623	370	120	115	*91
29	183	163	100	100	*50	*205	253	642	356	115	113	89
30	163	142	95	100	------	196	265	731	347	117	106	89
31	166	------	90	100	------	180	------	914	------	126	102	------
Total	5,174	4,103	3,396	2,760	2,265	5,123	8,096	21,283	27,225	5,829	3,363	2,870
Mean	167	137	110	89.0	78.1	165	270	687	908	188	108	95.7
Cfsm	0.438	0.360	0.289	0.234	0.205	0.433	0.709	1.80	2.38	0.493	0.283	0.251
In.	0.50	0.40	0.33	0.27	0.22	0.50	0.79	2.08	2.66	0.57	0.33	0.28
Ac-ft	10,260	8,140	6,740	5,470	4,490	10,160	16,060	42,210	54,000	11,560	6,670	5,690

Calendar year 1959: Max 2,050 Min 30 Mean 291 Cfsm 0.764 In. 10.35 Ac-ft 210,400
Water year 1959-60: Max 1,630 Min 45 Mean 250 Cfsm 0.656 In. 8.93 Ac-ft 181,400

Peak discharge (base, 700 cfs).--May 13 (6:30 a.m.) 1,470 cfs (5.32 ft); June 4 (5 a.m.) 1,730 cfs (5.64 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 14-21, 28, Dec. 2, 3, 6-12, Dec. 21 to Mar. 4 (no gage-height record Jan. 21-26; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations). No gage-height record Sept. 3-6, 24-27; discharge estimated on basis of recorded range in stage and records for nearby stations.

3440. Bitterroot River near Darby, Mont.

Location.--Lat 45°58'20", long 114°08'20", in E½ sec.36, T.3 N., R.21 W., on left bank 25 ft downstream from bridge on U. S. Highway 93, a quarter of a mile downstream from Chaffin Creek, and 4 miles southeast of Darby.

Drainage area.--1,049 sq mi.

Records available.--April 1937 to September 1960. Monthly discharge only for April 1937, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 3,943.14 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Aug. 2, 1939, wire-weight gage at highway bridge 25 ft upstream at same datum.

Average discharge.--23 years, 905 cfs (655,200 acre-ft per year).

Extremes.--Maximum discharge during year, 6,780 cfs June 4 (gage height, 6.22 ft); minimum daily determined, 160 cfs Mar. 2.
1937-60: Maximum discharge, 11,500 cfs May 9, 1947 (gage height, 8.18 ft); minimum observed, about 71 cfs Feb. 9, 1939; minimum gage height, 0.96 ft Dec. 11, 1957.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Some regulation by Painted Rocks Lake (formerly West Fork Bitterroot River Reservoir), see page 255. Diversions for irrigation of about 5,000 acres above station. Ditch bypassing station irrigates about 500 acres below.

Revisions.--WSP 1246: Drainage area.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	195	3.0	1,340
1.5	270	4.0	2,640
2.0	525	6.0	6,300
2.5	880	7.0	8,560

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	405	598	598	430	242	a165	618	1,260	4,170	1,450	464	a400
2	395	579	*573	420	246	a160	579	1,340	4,680	1,350	498	a400
3	395	567	573	430	246	a180	573	1,490	5,800	1,180	432	a400
4	415	579	531	450	238	a220	657	1,630	6,300	1,120	400	a420
5	432	454	450	490	238	250	880	1,840	5,710	1,100	370	a400
6	459	508	450	*531	242	266	1,290	1,910	5,190	1,040	365	a350
7	525	525	450	514	292	274	1,620	2,090	5,120	*1,020	365	*370
8	481	592	470	514	282	262	1,640	2,360	4,600	978	415	350
9	508	592	481	498	258	234	1,730	2,370	4,120	936	390	274
10	498	592	598	470	254	230	1,770	2,720	3,830	904	385	258
11	604	*560	650	460	242	223	1,520	3,760	3,940	856	380	250
12	1,190	490	657	440	234	226	1,320	5,290	3,830	784	365	234
13	912	440	644	415	242	226	1,180	*6,320	3,660	752	350	238
14	736	430	567	410	226	226	1,100	5,100	3,610	744	350	274
15	848	430	611	410	238	216	1,070	4,170	3,990	706	355	254
16	1,050	440	604	410	230	216	1,260	3,700	3,780	685	375	242
17	808	490	592	a310	216	234	1,210	3,270	3,870	644	405	238
18	713	530	579	a230	195	266	1,200	2,900	3,060	579	395	238
19	664	549	555	a225	210	315	1,170	2,600	2,800	549	385	238
20	630	549	498	a225	230	380	1,110	2,360	2,660	537	380	230
21	618	579	485	a225	234	464	1,100	2,360	2,220	525	375	230
22	706	567	485	a225	226	555	1,070	2,150	1,940	508	390	230
23	1,890	848	490	a225	210	685	1,050	2,050	1,820	481	442	230
24	1,250	1,110	500	a225	190	736	1,020	1,970	1,880	464	432	238
25	1,280	1,010	510	a230	180	832	978	1,860	1,900	442	a450	246
26	1,030	864	510	258	175	960	*960	1,770	1,740	415	a430	238
27	864	752	460	*262	170	996	960	2,000	1,560	405	a420	230
28	768	720	455	254	*170	944	1,090	2,070	1,480	405	a415	226
29	713	713	450	258	170	816	1,100	2,180	1,450	390	a410	223
30	637	657	450	258	------	768	1,140	2,560	1,480	375	a405	*220
31	604	------	440	250	------	*685	------	*3,430	------	405	a400	------
Total	23,028	18,314	16,366	10,952	6,506	13,210	33,965	82,880	102,190	22,729	12,393	8,369
Mean	743	610	528	353	224	426	1,132	2,674	3,406	733	400	279
Ac-ft	45,680	36,330	32,460	21,720	12,900	26,200	67,370	164,400	202,700	45,080	24,580	16,600

Calendar year 1959: Max 6,610 Min 200 Mean 1,055 Ac-ft 764,000
Water year 1959-60: Max 6,320 Min 160 Mean 959 Ac-ft 696,000

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 2 discharge measurements, weather records, and records for upstream stations.
Note.--Stage-discharge relation affected by ice Nov. 11-18, Dec. 5-8, Dec. 21 to Jan. 5, Jan. 10-16, Feb. 18-20, 23-29, Mar. 5.

3465. Skalkaho Creek near Hamilton, Mont.

Location.--Lat 46°09'50", long 113°56'20", in SW¼NW¼ sec.26, T.5 N., R.19 W., on right bank 2 miles downstream from Daly Creek and 12 miles southeast of Hamilton.

Drainage area.--87.8 sq mi.

Records available.--December 1948 to September 1953, August 1957 to September 1960. April 1920 to September 1924 at site 3 miles downstream; records not equivalent owing to inflow.

Gage.--Water-stage recorder. Altitude of gage is 4,510 ft (from topographic map).

Average discharge.--7 years (1949-53, 1957-60), 94.1 cfs (68,130 acre-ft per year).

Extremes.--Maximum discharge during year, 600 cfs June 3 (gage height, 4.05 ft); maximum gage height, 5.18 ft Feb. 29 (backwater from ice); minimum discharge, 13 cfs Feb. 23 (gage height, 1.46 ft).

1948-53, 1957-60: Maximum discharge, 812 cfs June 21, 1950 (gage height, 4.40 ft); maximum gage height recorded, that of Feb. 29, 1960; minimum discharge recorded, 10 cfs Apr. 2, 1953 (gage height, 1.26 ft, backwater from ice).

Flood of June 15, 1922, reached a discharge of 1,110 cfs at gaging station site 3 miles downstream; flood in May 1948 reached a discharge of 1,130 cfs, by slope-area measurement of peak flow at a point 5 miles dwonstream.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. During irrigation season, flow is supplemented by releases from Kent Lake and Dam Creek Lake (combined capacity, 200 acre-ft).

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 22-31, May 14, 15)

1.7	20	2.8	146
2.0	39	3.2	255
2.4	83	4.0	600

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	49	42	b35	26	b20	37	65	366	166	83	45
2	43	49	41	b40	26	b20	37	70	433	157	79	45
3	43	51	*41	b40	26	a20	39	78	514	148	71	45
4	*43	47	39	b45	26	a20	44	84	523	144	68	52
5	44	b45	b40	b45	26	a20	58	88	478	138	66	48
6	46	b45	b40	a45	26	a20	75	92	*474	135	65	44
7	50	b45	b40	a45	27	a25	87	102	469	131	63	*44
8	44	45	39	a40	26	a30	95	107	451	*124	60	43
9	47	44	b40	a40	26	a25	109	112	428	122	59	42
10	44	44	b40	a35	26	a20	112	144	424	118	58	41
11	53	*44	b40	a35	26	a20	102	222	424	113	57	40
12	69	35	b40	a30	26	a20	93	342	415	109	55	40
13	58	b30	41	a30	26	a20	88	366	415	107	54	40
14	54	b25	40	a25	25	a20	87	*298	420	103	54	46
15	63	b25	39	a25	26	a20	82	255	428	100	53	40
16	65	b20	36	a25	25	a20	78	248	420	96	57	40
17	57	b20	35	a25	24	a20	74	210	424	93	56	38
18	54	b25	35	a20	b25	a25	74	193	379	91	53	37
19	53	b30	34	a20	b25	a25	75	176	358	90	50	37
20	53	b35	34	a20	25	a30	74	173	330	92	50	37
21	52	b40	b30	a20	25	a30	71	176	283	91	49	37
22	52	44	b30	a25	24	33	70	157	262	90	54	37
23	62	48	b30	a30	b25	35	68	153	242	86	58	37
24	55	48	b25	b30	b25	37	66	150	225	83	58	38
25	63	46	b25	32	b20	40	*65	148	222	82	60	38
26	56	43	b25	32	b20	44	64	150	208	78	56	37
27	54	b40	b25	32	b20	48	64	168	196	78	54	36
28	52	b40	b30	*30	b20	49	64	170	183	75	51	*35
29	52	b40	b30	29	b20	*44	62	190	176	71	49	34
30	48	43	b35	27	------	44	63	229	166	69	48	33
31	49	------	*b35	27	------	40	------	314	------	70	46	------
Total	1,621	1,185	1,096	979	713	884	2,177	5,430	10,736	3,250	1,794	1,206
Mean	52.3	39.5	35.4	31.6	24.6	28.5	72.6	175	358	105	57.9	40.2
Cfsm	0.596	0.450	0.403	0.360	0.280	0.325	0.827	1.99	4.08	1.20	0.659	0.458
In.	0.69	0.50	0.46	0.41	0.30	0.37	0.92	2.30	4.55	1.38	0.76	0.51
Ac-ft	3,220	2,350	2,170	1,940	1,410	1,750	4,320	10,770	21,290	6,450	3,560	2,390

Calendar year 1959: Max 655 Min 17 Mean 91.2 Cfsm 1.04 In. 14.09 Ac-ft 66,020
Water year 1959-60: Max 523 Min 20 Mean 84.9 Cfsm 0.967 In. 13.15 Ac-ft 61,620

Peak discharge (base, 400 cfs).--May 12 (7 to 10 p.m.) 433 cfs (3.72 ft); June 3 (9 p.m.) 600 cfs (4.05 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for nearby stations.
b Stage-discharge relation affected by ice.

3475. Blodgett Creek near Corvallis, Mont.

Location.--Lat 46°16'10", long 114°14'10", in NW¼NW¼ sec. 21, T.6 N., R.21 W., on right bank 4½ miles upstream from mouth and 7 miles southwest of Corvallis.

Drainage area.--26.4 sq mi.

Records available.--December 1946 to September 1960. Monthly discharge only for December 1946, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 4,050 ft (from topographic map).

Average discharge.--13 years (1947-60), 72.2 cfs (52,270 acre-ft per year).

Extremes.--Maximum discharge during year, 672 cfs June 17 (gage height, 5.73 ft); minimum, 3.3 cfs Sept. 21-23 (gage height, 2.12 ft).
1946-60: Maximum discharge, 836 cfs May 16, 1949 (gage height, 6.42 ft); minimum, 1.2 cfs Nov. 9, 10, 23, 25, 1952; minimum gage height, 1.93 ft Nov. 9, 10, 1952.

Remarks.--Records good except those for periods of ice effect, which are poor. Some regulation for irrigation at low flow by Blodgett Lake (capacity, 160 acre-ft).

Revisions.--WSP 1216: Drainage area.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.1	2.8	3.5	142
2.2	5.4	4.0	246
2.4	13	5.0	490
2.7	31	5.5	615
3.0	61		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	67	*42	13	8.5	*7	49	55	388	146	15	6.4
2	39	62	40	13	8.1	6.5	46	62	428	128	17	6.4
3	38	59	38	12	8.1	7	46	65	565	108	15	6.4
4	54	57	36	12	8.1	7.5	56	75	525	104	14	6.8
5	*51	51	34	13	8.1	8	93	86	380	*100	13	9.6
6	54	49	34	14	8.1	9	152	90	333	95	13	7.4
7	60	46	32	14	10	9.6	172	117	*340	98	12	6.4
8	50	43	28	14	10	9.2	174	138	269	92	11	6.1
9	61	41	31	13	10	8.8	194	128	244	82	11	5.7
10	56	39	30	10	9.6	8.5	186	182	269	76	10	5.4
11	124	*37	28	9	9.6	8.5	146	318	290	69	9.6	4.9
12	274	34	26	8.5	9.6	8.5	120	415	280	61	9.2	4.6
13	164	32	25	8	9.6	7.8	100	422	271	57	8.8	4.6
14	128	30	24	8	9.2	7.4	92	*246	278	54	8.1	5.1
15	202	30	24	8	8.8	7.4	82	194	398	50	8.1	4.9
16	184	28	24	7.5	8.1	7.4	75	180	392	47	7.8	4.9
17	126	26	23	7.5	8.1	7.4	68	158	450	42	*8.1	4.9
18	106	26	22	7	8.5	7.8	64	133	226	37	8.1	4.4
19	93	26	22	7	8.8	9.6	64	117	224	34	7.4	4.1
20	87	26	18	7	8.5	13	61	108	220	32	7.1	3.6
21	82	26	18	7.5	8.5	16	61	119	150	30	6.8	3.6
22	107	28	17	7.5	8.5	23	55	103	129	28	6.8	3.3
23	215	54	17	8	8.1	30	53	98	135	25	8.5	3.3
24	150	80	18	8.5	8	36	51	93	170	23	8.8	3.6
25	237	80	19	9.2	7.5	49	49	88	196	20	11	4.1
26	152	64	16	*8.8	7.5	74	48	92	166	18	9.6	4.9
27	120	56	12	8.8	7	95	*48	137	148	17	9.2	*4.4
28	103	54	13	8.5	7	88	50	135	146	16	12	4.1
29	92	49	14	8.8	7	*72	47	150	142	16	9.6	3.8
30	80	45	*14	8.8	------	65	50	213	148	14	7.8	3.6
31	72	------	14	8.1	------	55	------	355	------	14	7.1	------
Total	3,401	1,345	753	298.0	246.5	768.9	2,552	4,872	8,300	1,733	310.5	151.3
Mean	110	44.8	24.3	9.61	8.50	24.8	85.1	157	277	55.9	10.0	5.04
Cfsm	4.17	1.70	0.920	0.364	0.322	0.939	3.22	5.95	10.5	2.12	0.379	0.191
In.	4.79	1.89	1.06	0.42	0.35	1.08	3.60	6.86	11.69	2.44	0.44	0.21
Ac-ft	6,750	2,670	1,490	591	489	1,530	5,060	9,660	16,460	3,440	616	300

Calendar year 1959: Max 620 Min 7.1 Mean 83.9 Cfsm 3.18 In. 43.15 Ac-ft 60,770
Water year 1959-60: Max 565 Min 3.3 Mean 67.6 Cfsm 2.56 In. 34.83 Ac-ft 49,060

Peak discharge (base, 450 cfs).--May 13 (2:30 a.m.) 545 cfs (5.22 ft); June 4 (1 to 2 a.m.) 665 cfs (5.70 ft); June 17 (3 a.m.) 672 cfs (5.73 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 12-21, Dec. 21-24, Dec. 28 to Jan. 5, Jan. 10-24, Feb. 24 to Mar. 6.

3482. Bitterroot River near Corvallis, Mont.

Location.--Lat 46°18'40", long 114°08'40", on center of south line of sec.31, T.7 N., R.20 W., on right abutment of old bridge, 20 ft downstream from present highway bridge, 1¼ miles downstream from Blodgett Creek, and 1½ miles west of Corvallis.

Drainage area.--1,711 sq mi.

Records available.--July 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 3,420 ft (from topographic map). Prior to Nov. 12, 1959, wire-weight gage at same site and datum.

Extremes.--1959: Maximum discharge during period July to September, 1,060 cfs Sept. 27 (gage height, 3.30 ft); minimum daily determined, 270 cfs Aug. 14, 15.
1959-60: Maximum discharge during water year, 12,800 cfs June 4 (gage height, 6.90 ft); minimum, 186 cfs Sept. 23 (gage height, 2.23 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Some regulation by Painted Rocks and Como Lakes (see p. 255) and numerous small reservoirs on headwaters of tributary streams. Diversions for irrigation of about 60,000 acres above station. Records of water temperatures for the period July 1959 to September 1960 are given in WSP 1744.

Discharge, in cubic feet per second, 1959

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	-	a460	409	9	-	a300	554	17	-	a290	673	25	-	371	760
2	-	a460	*389	10	-	a300	465	18	-	a300	617	26	-	359	964
3	-	a450	359	11	-	a300	423	19	-	*302	617	27	-	353	1,060
4	-	a410	341	12	-	a290	395	20	-	324	720	28	-	365	1,000
5	-	a400	341	13	-	a280	359	21	-	371	810	29	-	359	885
6	-	a370	692	14	-	a270	383	22	-	377	790	30	-	359	820
7	-	a330	830	15	-	a270	481	23	-	383	780	31	*458	371	-
8	-	a310	563	16	-	a280	617	24	-	383	711				
Total													-	10,747	18,808
Mean													-	347	627
Runoff in acre-feet													-	21,320	37,310

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for station near Florence.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	770	1,030	1,110	639	412	250	1,270	1,840	*6,900	2,570	284	284
2	770	966	1,040	600	*412	*250	1,180	1,990	7,730	2,400	361	280
3	*780	896	*992	550	400	250	1,130	2,140	10,500	2,010	356	272
4	790	992	953	650	383	250	1,240	2,350	11,800	1,880	315	296
5	929	764	830	750	378	270	1,530	2,670	10,600	*1,730	280	335
6	988	797	830	797	378	320	2,210	2,800	9,360	1,520	257	*330
7	1,140	830	852	742	431	330	2,880	3,040	9,190	1,460	284	310
8	1,060	841	808	742	450	320	3,040	3,480	8,380	1,360	260	300
9	1,130	830	693	720	416	310	3,270	3,550	7,440	1,270	260	280
10	1,180	852	863	666	405	300	3,330	4,070	7,060	1,180	257	233
11	1,190	819	953	742	394	310	2,940	5,550	7,140	1,080	245	221
12	3,930	*819	1,000	742	383	325	2,540	7,560	7,140	966	230	212
13	2,420	603	979	700	372	330	2,180	*9,800	6,730	874	218	203
14	2,880	576	896	650	366	335	1,990	8,290	7,100	841	206	221
15	3,240	600	907	550	361	335	1,860	*6,530	7,900	775	209	224
16	2,350	650	907	550	361	315	1,900	5,700	8,160	753	233	215
17	1,960	750	896	600	350	361	1,900	5,000	9,360	684	300	206
18	1,650	850	863	600	315	464	1,840	4,270	7,060	621	320	203
19	1,530	1,000	841	500	325	549	1,820	3,800	5,890	549	236	200
20	1,440	1,210	720	450	372	612	1,760	3,420	6,080	505	212	194
21	1,420	1,350	711	400	361	675	1,800	3,390	4,590	450	209	192
22	1,420	1,270	720	380	345	852	1,730	3,130	3,740	438	209	192
23	4,270	1,600	693	340	315	1,070	1,710	2,910	3,360	470	254	186
24	2,940	1,920	786	380	292	1,210	1,730	2,880	3,360	470	268	196
25	3,300	1,820	800	420	290	1,340	1,670	2,750	3,640	378	288	215
26	2,700	1,500	808	480	270	1,530	1,620	2,620	3,270	350	292	218
27	2,030	1,350	576	520	260	1,730	*1,580	3,070	2,830	315	300	239
28	1,760	1,340	612	585	250	1,690	1,670	3,330	2,670	296	315	206
29	1,640	1,280	639	576	250	1,520	1,710	3,550	2,540	280	320	*200
30	1,500	1,180	*639	470	-------	*1,460	1,730	4,030	2,520	264	300	200
31	1,280	-------	720	431	-------	1,380	-------	5,480	-------	254	292	-------
Total	56,387	31,285	25,637	17,922	10,299	21,243	58,760	124,990	194,040	28,993	8,370	7,063
Mean	1,819	1,043	827	578	355	685	1,959	4,032	6,468	935	270	235
Ac-ft	111,800	62,050	50,850	35,550	20,430	42,130	116,500	247,900	384,900	57,510	16,600	14,010

Calendar year 1959: Max - Min - Mean - Ac-ft -
Water year 1959-60: Max 11,800 Min 186 Mean 1,598 Ac-ft 1,160,000

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 15-19, Jan. 2-5, 13-27, Feb. 25 to Mar. 10.

3485. Willow Creek near Corvallis, Mont.

Location.--Lat 46°17'40", long 113°59'40", in SW¼NE¼ sec.8, T.6 N., R.19 W., on right bank 800 ft downstream from Butterfly ranger station, half a mile downstream from Horn ditch, and 6 miles southeast of Corvallis.

Drainage area.--22.4 sq mi.

Records available.--April 1920 to May 1924 (no winter records), September 1957 to September 1960.

Gage.--Wire-weight gage read once daily. Crest-stage gage since July 20, 1959. Altitude of gage is 4,130 ft (from topographic map). Apr. 20, 1920, to May 3, 1924, staff gage at site 200 ft downstream at different datum.

Extremes.--Maximum discharge during year, 99 cfs June 3 (gage height, 2.60 ft, from graph based on gage readings); minimum observed, 2.7 cfs Dec. 23.
1920-24, 1957-60: Maximum discharge, 130 cfs June 15, 1922 (gage height, 2.20 ft, site and datum then in use); minimum observed, 2.5 cfs Mar. 1, 1958.

Remarks.--Records good except those for periods of ice effect, which are poor. One small diversion for irrigation above station. Natural flow is supplemented by releases from Gleason Lake (capacity, 160 acre-ft) during irrigation season.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	2.5	2.0	35
1.4	4.9	2.3	61
1.6	12	2.6	92
1.8	21		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.0	7.5	7.5	4.5	5.5	*4.5	5.5	11	48	30	13	8.7
2	9.0	7.5	6.8	4	5.5	4	6.2	12	71	27	12	7.9
3	*8.3	7.5	*5.5	4	5.5	4	6.2	5.2	85	27	12	7.9
4	7.5	7.5	7.5	4	5.5	4	6.2	12	74	25	12	7.9
5	9.0	7.5	4.3	4.5	5.5	4.5	8.3	12	74	25	12	7.9
6	9.0	7.5	6.2	5.5	5.5	4.5	6.5	11	74	*24	13	7.9
7	9.0	6.8	4.3	5.5	5.5	5	5.2	12	*73	22	12	7.9
8	9.0	6.2	4	4.5	5.5	5	6.5	15	74	22	12	7.9
9	9.0	*6.5	4	4.5	5.5	5	6.5	13	74	20	12	7.9
10	7.5	6.2	4.5	4	4.9	4.5	9.4	14	73	21	12	7.9
11	9.0	6.8	5	4	4.9	4.3	12	31	73	20	12	7.9
12	11	6.8	5.5	4.5	4.9	4.3	10	40	65	18	11	*7.2
13	9.4	6	6.2	4.5	6.2	4.3	10	37	65	18	11	6.5
14	10	5	9.0	4	4.9	4.3	7.2	*31	66	17	11	6.5
15	9.4	5	4.9	3.5	4.9	4.3	7.9	28	68	15	10	7.2
16	9.4	5	4.9	3.5	4.9	3.8	9.4	29	68	15	9.4	6.5
17	8.7	5	5.8	3.5	5.5	4.3	9.4	30	66	17	9.4	6.5
18	8.7	6	5.2	3.5	4.9	4.3	8.7	16	56	15	9.4	6.5
19	8.7	8.5	5.2	3	4.9	6.2	10	27	54	11	9.4	6.5
20	8.7	11	5.2	3	4.9	8.3	11	24	52	14	9.4	6.5
21	7.9	9.0	5.2	3.5	4.9	8.3	8.3	34	50	14	9.4	6.2
22	7.9	6.8	5.2	4	4.9	8.3	6.8	31	46	16	9.4	6.2
23	7.9	3.3	2.7	4	4.9	8.3	9.8	27	46	16	10	5.5
24	7.9	5.5	4.6	4.5	4.9	8.3	8.3	27	46	14	10	5.5
25	7.9	4.9	5.2	5	4.5	8.3	8.3	27	46	14	9.4	5.5
26	8.7	4.9	5.2	5	4	9.8	7.5	28	38	14	10	5.5
27	9.4	4.3	5.5	5.5	4	8.3	*9.4	28	38	13	10	5.5
28	7.9	6.8	5.5	*5.5	4	8.3	8.3	31	34	14	10	*5.5
29	7.9	7.5	5.5	5.5	4.5	6.8	8.3	33	32	13	10	5.5
30	7.9	6.2	*5.5	6.2	-------	*6.8	11	34	30	13	9.4	6.2
31	6.8	-------	5	5.5	-------	5.5	-------	46	-------	13	9.4	-------
Total	267.4	195.0	166.6	136.2	145.9	180.4	248.1	756.2	1,759	557	371.0	204.7
Mean	8.63	6.50	5.37	4.39	5.03	5.82	8.27	24.4	58.6	18.0	10.7	6.82
Ac-ft	530	387	330	270	289	358	492	1,500	3,490	1,100	657	406

Calendar year 1959: Max 84 Min 2.7 Mean 13.1 Ac-ft 9,500
Water year 1959-60: Max 85 Min 2.7 Mean 13.5 Ac-ft 9,810

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 13-19, Dec. 8-11, Dec. 27 to Jan. 27, Feb. 25 to Mar. 10.

3505. Kootenai Creek near Stevensville, Mont.

Location.--Lat 46°32'30", long 114°10'00", in SW¼NW¼ sec.18, T.9 N., R.20 W., on left bank 3 miles upstream from mouth and 4 miles northwest of Stevensville.

Drainage area.--28.9 sq mi.

Records available.--December 1948 to September 1953, August 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 3,780 ft (from topographic map).

Average discharge.--7 years (1949-53, 1957-60), 79.8 cfs (57,770 acre-ft per year).

Extremes.--Maximum discharge during year, 998 cfs June 16 (gage height, 5.30 ft); minimum daily, 7 cfs Jan. 19, 20.
1948-53, 1957-60: Maximum discharge, 1,300 cfs June 17, 1950 (gage height, 5.85 ft), from rating curve extended above 500 cfs; minimum daily, 2.0 cfs Nov. 30, 1952.
Flood of May-June 1948 reached a discharge of 1,250 cfs, by slope-area measurement of peak flow at a point a quarter of a mile downstream.

Remarks.--Records good except those for periods of ice effect, which are poor.

Revisions.--WSP 1216: Drainage area.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 17-20)

1.6	8.5	2.3	41	3.5	270
1.7	12	2.6	69	4.0	435
2.0	24	3.0	138	5.0	845

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	70	*51	17	10	10	*55	64	438	209	36	14
2	47	68	49	16	10	*10	53	73	614	181	47	14
3	48	65	47	16	10	10	54	87	658	164	36	15
4	56	59	45	17	10	11	70	100	634	166	31	19
5	*60	54	42	17	10	12	121	*106	460	164	28	27
6	66	51	42	17	10	12	181	109	424	161	25	20
7	72	47	38	16	12	12	186	128	421	171	23	17
8	57	43	36	15	12	12	186	140	*316	159	21	15
9	70	42	35	15	11	11	196	130	326	145	20	14
10	64	*40	33	15	11	10	176	199	365	134	19	13
11	174	38	32	14	11	10	145	376	372	132	19	13
12	326	36	31	13	11	10	123	518	339	125	19	12
13	147	34	30	12	11	10	109	438	365	121	17	12
14	119	32	28	11	11	10	100	*237	332	121	16	14
15	220	29	30	10	12	10	88	186	502	115	15	13
16	159	26	30	10	12	10	77	176	606	109	14	13
17	115	26	28	9	12	11	69	152	421	95	14	13
18	104	26	27	8	13	11	65	138	220	84	13	12
19	96	27	26	7	12	13	62	123	243	*76	14	11
20	90	28	26	7	11	16	61	119	223	76	14	10
21	82	30	25	8	11	22	58	128	152	67	13	9.7
22	150	32	24	8	11	33	55	119	132	60	13	9.4
23	224	76	23	9	11	46	54	111	156	54	*14	9.1
24	161	130	22	10	10	55	52	104	220	43	14	9.4
25	376	128	20	11	10	79	49	98	264	37	15	11
26	147	92	19	11	10	90	47	104	209	36	15	11
27	117	78	19	11	9	96	47	152	189	36	15	11
28	106	67	18	11	9	92	50	147	196	37	17	11
29	96	58	18	*12	9	79	50	164	204	35	17	*10
30	85	55	17	11	------	70	54	243	223	33	16	9.7
31	77	------	17	11	------	59	------	506	------	33	15	------
Total	3,759	1,587	928	375	312	942	2,693	5,475	10,224	3,179	605	392.3
Mean	121	52.9	29.9	12.1	10.8	30.4	89.8	177	341	103	19.5	13.1
Cfsm	4.19	1.83	1.03	0.419	0.374	1.05	3.11	6.12	11.8	3.56	0.675	0.453
In.	4.84	2.04	1.19	0.48	0.40	1.21	3.47	7.05	13.16	4.09	0.78	0.50
Ac-ft	7,460	3,150	1,840	744	619	1,870	5,340	10,860	20,280	6,310	1,200	778

Calendar year 1959: Max 809 Min 8 Mean 102 Cfsm 3.53 In. 48.01 Ac-ft 73,990
Water year 1959-60: Max 658 Min 7 Mean 83.3 Cfsm 2.88 In. 39.21 Ac-ft 60,450

Peak discharge (base, 500 cfs).--Oct. 25 (5:30 a.m.) 737 cfs (4.80 ft); May 12 (10 p.m.) 886 cfs (5.04 ft); June 3 (8:30 p.m.) 922 cfs (5.13 ft); June 16 (7:30 p.m.) 998 cfs (5.30 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 13-21, Dec. 9-11, Dec. 20 to Jan. 5, Jan. 10-24, Feb. 23 to Mar. 5.

3510. Burnt Fork Creek near Stevensville, Mont.

Location.--Lat 46°27'50", long 113°56'40", in NW¼SW¼ sec.11, T.8 N., R.19 W., or right bank 150 ft upstream from county road bridge and 8 miles southeast of Stevensville.

Drainage area.--74.0 sq mi.

Records available.--May to November 1920, April 1922 to September 1924 (no winter records), April to June 1938, October 1938 to September 1960. Monthly discharge only for some periods, published in WSP 1316. Records for December 1922, published in WSP 572 and 916, have been found to be unreliable and should not be used.

Gage.--Staff gage read once daily except Sundays and holidays. Crest-stage gage, since July 20, 1959. Altitude of gage is 4,270 ft (from topographic map). May 8, 1920, to Aug. 23, 1924, staff gage at site 150 ft downstream at different datum. April 1938 to Mar. 18, 1953, staff gage and Mar. 19, 1953, to Mar. 15, 1955, wire-weight gage, at site 150 ft downstream at datum 2.00 ft lower.

Average discharge.--22 years (1938-60), 48.9 cfs (35,400 acre-ft per year).

Extremes.--Maximum discharge during year, 317 cfs June 4 or 5; maximum gage height observed, 5.10 ft Jan. 15, 16 (backwater from ice); minimum daily discharge, 6 cfs Jan. 20.

1920, 1922-24, 1938-60: Maximum discharge observed, 641 cfs May 28, 1938 (gage height, 2.92 ft, site and datum then in use); maximum gage height observed, that of Jan. 15, 16, 1960 (backwater from ice); minimum daily discharge, 2 cfs Mar. 11, 1948.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Figures of daily discharge do not include diversion by Sunset Highland ditch which diverts half a mile above station for irrigation of about 2,000 acres below. During irrigation season natural flow of stream is augmented by release from Burnt Fork Lake (capacity, 510 acre-ft).

Revisions.--See Records available.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 1-16)

1.4	14	2.5	129
1.5	17	3.0	243
1.8	37	3.5	377
2.2	77		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	a26	29	a13	21	b12	26	a42	188	80	47	21
2	22	26	32	b12	21	*b14	24	46	206	80	49	21
3	22	26	*28	a13	21	b15	a24	48	261	a75	43	21
4	a22	26	28	b16	20	b16	26	53	290	a70	42	a21
5	*23	b26	b27	b22	20	b17	35	60	a270	67	41	a20
6	23	26	a26	*b25	20	a19	48	62	253	66	41	20
7	26	25	b25	b24	a20	22	51	66	256	*64	a40	19
8	26	a24	b25	b22	20	22	50	a64	*230	60	39	19
9	24	24	b24	b16	20	22	56	63	206	58	39	18
10	22	*24	b24	a12	20	20	a53	72	191	a55	36	18
11	a30	a24	b24	b12	20	20	50	110	206	53	35	a18
12	40	b24	b24	b12	20	20	49	153	a190	51	33	*18
13	35	b22	a24	b12	20	a19	46	191	184	53	33	17
14	31	b18	b26	b10	a20	19	46	*143	184	53	a32	18
15	33	a15	31	b9	20	19	44	a130	193	51	31	18
16	40	b14	25	b9	20	19	41	118	186	50	33	18
17	35	b11	25	a9	20	19	a39	103	191	a47	29	17
18	a33	b12	25	b8	b20	18	38	89	168	45	28	a17
19	31	b18	25	b7	b20	19	40	78	a150	45	26	17
20	31	b25	a23	b6	20	a19	38	78	143	42	25	17
21	30	b29	b21	b7	a20	20	38	86	125	42	a25	16
22	30	a33	b20	b9	a20	22	36	a80	118	40	26	17
23	30	35	b20	b11	b18	24	35	76	110	39	27	16
24	28	33	b22	a12	b17	24	a35	73	110	a36	26	17
25	a28	33	a24	b13	b16	27	*35	77	106	34	27	a17
26	28	a32	b24	b14	b14	31	34	75	a106	33	24	16
27	28	31	a22	b15	b13	a33	33	80	106	32	24	16
28	28	b27	b20	b15	a12	36	36	90	90	32	a22	16
29	28	a27	b18	*b15	b12	33	36	a100	88	31	21	*16
30	26	29	b16	b16	-------	*30	38	a120	82	31	21	16
31	26	-------	b15	a19	-------	27	-------	145	-------	a35	21	-------
Total	881	745	742	415	545	677	1,180	2,771	5,187	1,550	986	536
Mean	28.4	24.8	23.9	13.4	18.8	21.8	39.3	89.4	173	50.0	31.8	17.9
Ac-ft	1,750	1,480	1,470	823	1,080	1,340	2,340	5,500	10,290	3,070	1,960	1,060
(†)	430	140	0	0	0	0	0	760	1,900	1,230	550	450

Calendar year 1959: Max 310 Min 7 Mean 45.1 Ac-ft 32,680
Water year 1959-60: Max 290 Min 6 Mean 44.3 Ac-ft 32,160

* Discharge measurement made on this day.
† Diversions, in acre-feet, by Sunset Canal; total for water year, 5,460 acre-ft.
a No gage-height record; discharge interpolated or estimated on basis of records for nearby stations.
b Stage-discharge relation affected by ice.

3512. Bitterroot River near Florence, Mont.

Location.--Lat 46°38'00", long 114°03'00" on south line of SE¼ sec.12, T.10 N., R.20 W., on downstream side of bridge on State Secondary Highway 269, 1.3 miles east of Florence.

Drainage area.--2,354 sq mi.

Records available.--September 1957 to September 1960.

Gage.--Wire-weight gage read once daily. Altitude of gage is 3,200 ft (from topographic map).

Extremes.--Maximum discharge observed during year, 14,700 cfs June 4 (gage height, 10.10 ft); minimum observed, 438 cfs Sept. 17 (gage height, 2.44 ft).
1957-60: Maximum discharge observed, 16,700 cfs May 26, 1958 (gage height, 9.93 ft); minimum observed, that of Sept. 17, 1960.

Remarks.--Records good except those for periods Nov. 24 to June 5 and Jure 8 to July 4, which are poor. Some regulation by Painted Rocks and Como Lakes (see p. 255) and numerous small reservoirs on headwaters of tributary streams. Diversions for irrigation of about 105,000 acres above station.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,810	2,420	1,910	1,090	1,240	c550	1,860	2,220	*8,800	3,490	574	748
2	1,750	2,240	1,860	1,200	834	c550	1,600	2,330	8,710	3,400	594	674
3	1,700	2,200	1,790	714	*810	*c540	1,480	2,320	11,700	3,060	682	698
4	1,720	2,030	*1,730	930	763	c580	1,450	2,520	14,700	2,770	674	714
5	1,850	*2,000	1,630	898	728	588	1,720	2,760	13,600	2,660	615	748
6	1,870	1,980	1,430	1,020	721	721	2,760	3,030	12,500	2,490	601	784
7	*2,040	1,980	1,530	*1,070	794	818	4,270	3,110	11,000	*2,330	601	730
8	2,020	1,930	1,530	1,110	914	890	5,140	3,680	*10,400	2,260	594	*722
9	1,940	1,910	1,300	1,100	*794	975	5,250	3,890	9,130	2,070	601	690
10	2,150	1,910	1,190	1,080	*749	858	5,560	3,890	8,400	1,940	574	643
11	2,060	1,850	1,250	930	770	735	5,270	5,340	8,380	1,780	562	629
12	3,770	1,950	1,570	1,160	749	728	4,270	*9,190	8,540	1,650	550	580
13	4,720	1,790	1,540	1,210	714	802	3,540	12,100	8,380	1,370	520	550
14	3,660	1,600	1,440	850	707	794	2,950	12,800	8,290	1,350	514	532
15	3,330	1,580	1,460	735	665	802	2,680	*8,630	8,400	1,300	520	538
16	4,520	1,610	1,400	b750	714	763	2,420	6,940	11,000	1,240	544	520
17	3,840	1,410	1,360	b800	707	802	2,620	5,840	11,400	1,140	556	438
18	3,510	1,600	1,310	b800	686	1,320	2,460	4,680	9,840	*1,150	580	550
19	3,120	1,770	1,320	b700	637	1,430	2,450	4,050	7,490	990	601	544
20	2,940	1,770	1,280	b650	672	1,420	2,290	3,360	7,360	840	532	520
21	2,820	1,970	1,140	581	721	1,380	2,250	2,980	6,080	775	514	514
22	2,660	2,020	1,100	595	693	1,440	2,130	2,900	4,680	714	520	492
23	3,540	1,980	1,090	644	686	1,740	2,080	2,650	4,110	690	562	514
24	4,680	2,710	1,080	700	658	1,980	2,160	2,680	4,030	714	629	520
25	4,780	3,140	1,260	826	c650	2,060	2,310	2,460	4,500	698	650	550
26	4,840	2,960	1,150	802	616	2,310	2,180	2,240	4,480	615	690	526
27	3,870	1,710	1,080	834	c600	2,700	2,080	2,280	3,960	594	714	538
28	3,410	2,220	906	866	c580	*2,810	*2,090	2,680	3,560	562	748	538
29	3,200	2,220	1,060	1,020	c560	2,600	2,180	2,760	3,560	562	757	520
30	2,940	2,120	939	1,450	-------	2,160	2,110	3,300	3,360	550	748	514
31	2,710	-------	1,040	1,450	-------	2,080	-------	4,350	-------	556	714	-------
Total	93,770	60,580	41,675	28,565	21,132	39,906	83,610	133,960	240,340	46,310	18,835	17,778
Mean	3,025	2,019	1,344	921	729	1,287	2,787	4,321	8,011	1,494	608	593
Ac-ft	186,000	120,200	82,660	56,660	41,910	79,150	165,800	265,700	476,700	91,850	37,360	35,260

Calendar year 1959 : Max 15,900 Min 488 Mean 2,721 Ac-ft 1,970,000
Water year 1959-60 : Max 14,700 Min 438 Mean 2,258 Ac-ft 1,639,000

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
c backwater from bulldozer operation on control.

3514. Eightmile Creek near Florence, Mont.

Location.--Lat 46°39'10", long 113°57'30", in SW¼SW¼ sec.2, T.10 N., R.19 W., on right bank 0.6 mile upstream from Granite Creek, 5 miles upstream from mouth, and 6 miles east of Florence.

Drainage area.--20.6 sq mi.

Records available.--September 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 3,800 ft (from topographic map).

Extremes.--Maximum discharge during year, 30 cfs Apr. 10; maximum gage height, 2.09 ft May 13; minimum daily discharge, 1.5 cfs Jan. 20.
1957-60: Maximum discharge, 62 cfs May 12 or 13, 1958 (gage height, 2.72 ft, from high-water mark on outside staff gage); minimum daily, 1.5 cfs Jan. 2, 1958, Jan. 20, 1960.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No known diversion or regulation above station.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 12-22)

1.0	2.1	1.6	16
1.1	3.0	2.0	30
1.3	6.6		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	3.5	b4.0	2.6	a3.5	a2.0	7.1	8.9	19	a7.2	a5.3	3.3
2	3.5	3.5	b3.9	2.6	a3.5	a2.0	6.6	9.8	22	a7.0	a5.6	3.3
3	3.3	3.5	3.8	2.9	*3.3	b2.3	6.9	12	25	a6.8	a5.4	3.5
4	3.3	b3.0	*3.3	2.8	3.3	b2.5	8.4	12	28	a6.5	a5.2	4.1
5	3.3	*b2.5	b3.0	*2.6	3.3	b2.9	13	13	27	a6.3	a5.0	3.8
6	3.6	b3.0	b3.0	2.5	3.3	b3.1	19	13	24	a6.1	a4.8	3.5
7	*4.6	3.3	b3.0	2.5	3.3	b3.4	23	15	23	*6.0	a4.7	3.5
8	4.1	3.2	b2.8	2.5	3.3	b3.5	25	16	21	6.2	a4.6	*3.2
9	4.4	3.2	b2.6	2.4	3.3	b3.4	27	16	*19	6.0	a4.6	3.0
10	4.3	3.2	b2.7	b2.3	3.3	b3.3	29	16	18	5.8	a4.5	2.9
11	4.8	3.2	3.2	b2.2	3.3	b3.1	27	20	17	5.6	a4.5	2.9
12	6.4	b2.5	2.9	b2.1	3.3	b3.0	25	26	16	5.6	a4.4	2.7
13	5.4	b2.0	b2.8	b2.0	3.3	b3.0	22	29	14	5.6	a4.3	2.6
14	4.6	b2.0	b3.0	a2.0	3.3	b3.0	19	*25	14	5.6	a4.3	3.0
15	5.0	b2.0	3.2	a2.0	3.3	b3.0	18	22	15	a5.9	a4.3	3.0
16	5.6	b2.0	3.3	a2.0	3.3	b3.0	15	20	14	a5.6	a4.2	2.9
17	4.8	b2.5	3.0	a2.0	3.3	b3.0	13	17	12	a5.2	4.1	2.9
18	4.4	b3.0	2.9	a2.0	3.1	2.9	a12	16	12	4.8	4.0	2.7
19	4.3	b3.5	b2.6	a1.8	b3.1	3.5	all	14	11	5.0	3.8	2.5
20	4.3	4.1	b2.5	a1.5	b3.3	4.4	all	13	all	4.8	3.6	2.6
21	4.3	4.0	b2.5	a1.7	3.3	5.4	a10	13	a10	4.8	3.8	2.8
22	4.0	3.6	b2.4	a2.0	3.3	6.0	a9.6	11	a9.7	4.8	4.1	2.8
23	3.8	4.6	b2.2	a2.0	b3.0	6.9	a9.4	12	a9.4	4.4	4.8	2.8
24	3.8	4.4	b2.5	a2.5	b2.7	8.2	a9.0	a12	a9.2	4.4	4.4	2.9
25	3.8	4.6	3.0	a2.5	b2.6	9.8	*8.7	a12	a9.1	4.4	5.0	2.9
26	3.6	b3.5	b2.7	a3.0	b2.4	12	8.4	12	a9.0	a4.2	3.6	2.8
27	3.6	b3.5	b2.5	a3.0	b2.1	12	8.4	13	a8.8	a4.0	3.6	3.0
28	3.6	b3.6	b2.5	a3.5	b2.0	*12	8.4	13	a8.3	a3.7	3.5	2.9
29	3.8	3.8	b2.5	a4.0	b2.0	10	7.9	13	a8.0	a3.5	3.2	3.0
30	3.6	4.0	b2.5	a3.5	-------	9.8	8.2	14	a7.6	a3.4	3.2	3.0
31	3.5	-------	2.6	a3.5	-------	7.9	-------	18	-------	a4.0	3.2	-------
Total	128.9	98.3	89.4	76.5	89.4	160.3	426.0	476.7	451.1	163.2	133.6	90.8
Mean	4.16	3.28	2.88	2.47	3.08	5.17	14.2	15.4	15.0	5.26	4.31	3.03
Ac-ft	256	195	177	152	177	318	845	946	895	324	265	180

Calendar year 1959: Max 31 Min 2.0 Mean 6.42 Ac-ft 4,640
Water year 1959-60: Max 29 Min 1.5 Mean 6.51 Ac-ft 4,730

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 3 discharge measurements, weather records, and records for nearby stations.
b Stage-discharge relation affected by ice.

3520. Lolo Creek above Sleeman Creek, near Lolo, Mont.

Location.--Lat 46°45', long 114°09', in NW¼ sec.5, T.11 N., R.20 W., on left bank 3 miles west of Lolo and 4 miles upstream from mouth.

Drainage area.--250 sq mi.

Records available.--November 1950 to September 1960 (discontinued). Prior to October 1954, published as "near Lolo." April 1911 to November 1914 at site 3½ miles upstream, published as "near Lolo"; records not equivalent owing to diversions and tributary inflow.

Gage.--Water-stage recorder. Altitude of gage is 3,290 ft (from topographic map).

Average discharge.--9 years (1951-60), 215 cfs (155,700 acre-ft per year).

Extremes.--Maximum discharge during year, 1,340 cfs May 13 (gage height, 4.65 ft); maximum gage height, 4.96 ft Jan. 17 (backwater from ice); minimum discharge, 18 cfs Sept. 26-28, 30.
1950-60: Maximum discharge, 2,430 cfs May 24, 1956 (gage height, 6.24 ft); minimum, 6.3 cfs Nov. 9, 1952 (gage height, 1.01 ft).

Remarks.--Records good except those for periods of ice effect, which are poor. Numerous small diversions mainly for irrigation of hay meadows above station.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 7 to July 31)

1.3	15	2.5	236
1.5	34	3.0	400
1.8	81	3.5	620
2.2	164	4.5	1,240

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	118	175	146	55	55	25	263	331	759	275	49	43
2	112	175	131	55	55	30	244	368	831	239	68	43
3	108	179	146	55	*60	*40	247	424	1,000	218	61	40
4	108	203	*131	60	60	50	292	472	1,030	205	58	43
5	106	*155	106	60	60	55	376	*534	915	193	55	57
6	110	177	105	60	65	60	512	552	849	182	46	49
7	120	164	100	60	65	65	590	595	831	175	43	46
8	*114	155	95	55	65	70	615	664	699	166	40	43
9	153	153	90	50	70	80	653	626	*620	155	39	46
10	160	151	85	40	*75	85	648	705	605	142	35	44
11	186	146	85	35	75	85	566	909	610	135	33	44
12	342	110	85	35	74	90	512	1,110	575	129	30	*39
13	260	53	90	30	72	90	460	1,230	548	120	29	38
14	215	50	94	30	68	90	428	982	548	118	29	42
15	247	40	124	30	72	95	388	*837	570	108	27	39
16	283	40	133	25	72	95	353	759	580	102	26	37
17	228	50	120	25	58	95	324	658	595	92	26	34
18	203	60	112	25	55	95	318	575	460	*81	26	31
19	193	80	96	20	55	100	318	525	424	67	24	24
20	184	100	63	20	60	102	314	507	400	65	23	22
21	188	130	60	20	55	120	321	520	349	63	23	20
22	188	173	60	20	45	149	298	460	314	61	25	20
23	223	184	55	20	40	196	302	428	292	60	30	20
24	208	260	55	20	35	236	295	412	289	58	34	21
25	275	272	55	25	30	278	283	396	302	57	44	22
26	236	223	50	25	30	311	275	384	286	53	43	19
27	205	203	50	30	25	353	283	494	266	50	50	18
28	196	195	50	35	25	*360	298	460	258	49	53	18
29	198	185	50	40	25	318	305	460	244	43	47	19
30	186	175	50	45	-------	328	305	520	250	39	44	19
31	177	-------	50	50	-------	292	-------	681	-------	39	42	-------
Total	5,830	4,416	2,722	1,155	1,601	4,438	11,386	18,578	16,299	3,539	1,202	1,000
Mean	188	147	87.8	37.3	55.2	143	380	599	543	114	38.8	33.3
Ac-ft	11,560	8,760	5,400	2,290	3,180	8,800	22,580	36,850	32,330	7,020	2,380	1,980

Calendar year 1959: Max 1,380 Min 40 Mean 274 Ac-ft 198,300
Water year 1959-60: Max 1,230 Min 18 Mean 197 Ac-ft 143,100

Peak discharge (base, 1,000 cfs).--May 13 (4:30 a.m.) 1,340 cfs (4.65 ft); June 4 (3:30 a.m.) 1,120 cfs (4.42 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 14-21, 28, 29, Dec. 6-13, Dec. 21 to Mar. 19 (no gage-height record Jan. 29 to Feb. 2, Mar. 12-19; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations).

3530. Clark Fork below Missoula, Mont.

Location.--Lat 46°52'10", long 114°07'30", in NE¼SE¼ sec.21, T.13 N., R.20 W., on right bank 2 miles downstream from Bitterroot River and 5 miles west of Missoula.

Drainage area.--9,003 sq mi.

Records available.--October 1929 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 3,090 ft (from topographic map).

Average discharge.--31 years, 5,186 cfs (3,755,000 acre-ft per year).

Extremes.--Maximum discharge during year, 27,100 cfs June 5 (gage height, 8.14 ft); minimum recorded, 1,340 cfs Feb. 27 (gage height, 0.51 ft), but may have been less during period of ice effect Mar. 1-5.
1929-60: Maximum discharge, 52,800 cfs May 23, 1948 (gage height, 12.08 ft); minimum, 388 cfs Jan. 18, 1933; minimum gage height, 0.30 ft about Jan. 16, 1954.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are poor. Some diurnal fluctuation at low flow caused by powerplant at Bonner. Diversions for irrigation of about 235,000 acres above station. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1042: 1931. WSP 1246: Drainage area. WSP 1316: 1932(M), 1935(M), 1946(M).

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.5	1,330	4.0	8,440
1.0	1,830	6.0	16,100
2.0	3,480	8.0	26,400
3.0	5,610	10.0	39,000

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,560	6,120	5,420	a3,100	3,050	b1,600	6,600	6,600	16,800	7,310	2,190	2,360
2	4,430	5,860	5,210	a2,900	2,920	b1,400	6,120	6,820	18,600	7,190	2,360	2,300
3	4,340	5,710	5,050	a2,700	2,990	b1,600	5,910	7,250	*21,500	6,760	2,480	2,300
4	4,320	5,680	a4,900	a2,800	2,960	b1,750	6,020	7,900	25,400	6,290	2,500	2,330
5	4,360	5,440	a4,500	a3,000	2,870	b2,000	6,650	8,500	26,800	6,310	2,390	2,430
6	4,540	5,140	a4,400	a3,250	2,850	2,390	8,080	9,020	24,700	5,610	2,300	2,460
7	4,780	5,120	a4,450	3,400	2,960	2,730	10,200	9,320	22,300	5,120	2,280	2,360
8	4,980	5,090	a4,500	3,310	3,120	2,780	11,400	10,200	21,300	5,070	2,280	2,350
9	5,020	5,020	a4,200	3,120	*3,030	*2,800	12,300	10,800	19,000	4,910	2,270	2,350
10	5,260	4,980	a4,050	a2,900	2,960	2,720	13,200	11,200	17,400	4,690	2,200	2,310
11	5,350	4,960	a4,000	a2,600	2,960	2,630	13,300	*13,300	16,700	4,560	2,140	2,240
12	7,490	4,870	a4,300	a2,700	2,820	2,530	12,500	17,400	16,800	4,300	2,060	2,190
13	8,920	3,670	a4,250	a2,600	2,750	2,530	*11,500	22,600	16,400	3,840	1,930	2,120
14	7,840	3,120	a4,150	a2,500	2,730	2,530	10,600	24,600	16,400	3,860	1,930	2,040
15	7,370	b2,500	*4,100	a2,050	2,700	2,550	9,830	21,400	16,600	3,800	1,880	2,060
16	8,410	b2,600	4,180	a2,150	2,700	2,580	9,250	18,400	18,400	3,650	1,950	2,070
17	8,380	2,700	4,140	a2,200	2,660	2,630	8,730	16,800	19,200	3,460	*1,970	2,030
18	7,660	3,330	4,040	a2,150	2,500	3,010	8,350	15,000	18,700	3,290	2,040	2,000
19	7,160	4,200	3,960	*2,020	2,380	3,920	8,230	13,600	15,200	3,160	2,060	1,970
20	6,820	4,690	3,840	1,830	2,440	4,580	8,020	12,300	13,900	*2,900	1,970	1,960
21	6,620	5,140	3,540	1,780	2,630	5,090	7,900	11,500	*12,800	2,770	1,910	1,930
22	6,510	5,230	a3,500	1,900	2,600	5,890	7,540	11,200	11,100	2,610	1,900	1,910
23	7,370	5,490	a3,300	2,280	2,460	6,850	7,400	10,500	9,900	2,580	1,970	*1,930
24	8,790	*6,930	a3,500	2,530	2,300	7,540	7,340	10,400	9,320	2,580	2,140	1,930
25	8,700	9,290	3,690	3,010	2,200	8,140	7,280	10,000	9,180	2,530	2,410	1,950
26	9,050	7,600	3,690	3,120	1,940	8,200	7,100	9,490	9,150	2,410	2,460	1,960
27	8,140	6,510	3,230	3,230	1,600	8,540	6,900	9,450	8,600	2,310	2,530	1,950
28	7,540	5,860	a3,200	3,050	1,660	8,570	6,740	10,100	8,020	2,250	2,550	1,930
29	*7,160	5,760	a3,200	3,140	1,720	7,900	6,710	10,200	7,630	2,190	2,550	1,860
30	6,820	5,680	a3,150	3,250	-------	7,400	6,540	10,800	7,340	2,130	2,500	1,860
31	6,430	-------	a3,150	3,180	-------	7,080	-------	12,800	-------	2,130	2,380	-------
Total	205,120	153,290	124,790	83,750	75,460	132,460	258,240	379,450	475,140	122,570	68,480	63,440
Mean	6,617	5,110	4,025	2,702	2,602	4,273	8,608	12,240	15,840	3,954	2,209	2,115
Ac-ft	406,800	304,000	247,500	166,100	149,700	262,700	512,200	752,600	942,400	243,100	135,800	125,800

Calendar year 1959: Max 34,700 Min 1,500 Mean 7,221 Ac-ft 5,228,000
Water year 1959-60: Max 26,800 Min 1,400 Mean 5,853 Ac-ft 4,249,000

Peak discharge (base, 12,000 cfs).--Apr. 11 (2 to 5 a.m.) 13,500 cfs (5.37 ft); May 14 (6 and 9 a.m) 25,200 cfs (7.79 ft); June 5 (10 a.m.) 27,100 cfs (8.14 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for other Clark Fork stations.
b Stage-discharge relation affected by ice.

3533. Clark Fork near Alberton, Mont.

Location.--Lat 46°59'40", long 114°26'20", near southeast corner sec.1, T.14 N., R.23 W., on right bank a quarter of a mile upstream from Petty Creek and 1¾ miles east of Alberton.
Drainage area.--9,272 sq mi.
Records available.--May 1959 to September 1960.
Gage.--Water-stage recorder with pressure recording bubbler system. Altitude of gage is 2,944 ft (river-profile survey).
Extremes.--1959: Maximum discharge observed during period May to September, 34,900 cfs June 16 (gage height, 14.90 ft); minimum, 2,270 cfs Aug. 19 (gage height, 4.77 ft).
1959-60: Maximum discharge during water year, 27,600 cfs June 5 (gage height, 13.16 ft); minimum recorded, 1,560 cfs Mar. 1 (gage height, 4.30 ft).
Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Some diurnal fluctuation at low flow caused by powerplant at Bonner. Diversions for irrigation of about 243,000 acres above station.

Discharge, in cubic feet per second, 1959

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	-	14,900	14,500	3,480	3,090	16	-	34,500	7,060	2,600	4,020
2	-	16,400	13,500	3,480	3,150	17	-	30,900	6,520	2,770	4,300
3	-	19,400	13,000	3,460	*3,210	18	-	29,600	6,150	*2,520	4,230
4	-	23,400	12,000	3,330	3,190	19	-	27,700	5,890	2,360	4,210
5	-	25,800	11,500	*3,250	3,270	20	-	27,200	5,560	2,560	4,180
6	-	29,100	10,800	3,170	3,420	21	-	28,100	5,250	2,710	4,230
7	-	33,600	10,200	3,050	4,020	22	-	28,000	4,950	3,010	4,330
8	-	34,300	9,780	2,890	4,230	23	-	25,200	4,750	3,070	4,400
9	-	31,900	9,380	2,890	3,980	24	-	22,500	4,500	3,090	4,280
10	-	30,300	8,830	2,870	3,840	25	-	20,200	4,300	3,050	4,260
11	-	27,300	8,570	2,750	3,730	26	-	18,700	4,160	2,990	4,520
12	-	24,200	8,180	2,690	3,600	27	-	19,300	4,070	2,990	4,880
13	-	25,800	7,970	2,630	3,500	28	-	17,400	3,930	2,850	5,120
14	-	30,800	7,790	2,630	3,520	29	17,000	17,100	3,750	2,850	5,150
15	-	34,000	7,400	2,750	3,750	30	15,800	15,700	3,670	2,970	*5,050
						31	15,000	-	3,580	3,010	-
Total							-	763,300	231,490	90,720	120,660
Mean							-	25,440	7,467	2,926	4,022
Runoff in acre-feet							-	‡1,514	459,200	179,900	239,300

* Discharge measurement made on this day.
‡ Expressed in thousands
Note.--No gage-height record July 1-7; discharge estimated on basis of records for other Clark Fork stations.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,880	6,470	6,050	3,500	3,400	1,850	7,190	7,350	16,100	7,950	a2,400	2,540
2	4,720	6,210	5,790	3,400	3,290	1,700	6,780	7,560	18,700	7,840	a2,600	2,580
3	4,620	6,020	5,580	2,970	3,290	1,800	6,440	7,970	*21,100	7,560	a2,700	2,500
4	4,520	6,000	5,480	a3,150	3,250	1,900	6,490	8,550	25,200	7,060	a2,700	2,560
5	4,500	5,890	5,280	a3,300	3,190	2,200	7,010	9,250	*27,200	7,010	a2,700	2,610
6	4,600	5,530	4,850	a3,550	3,150	2,550	8,310	9,830	25,700	6,440	a2,600	2,650
7	4,800	5,400	4,800	a3,650	3,190	2,800	10,300	10,200	23,000	5,920	a2,600	2,650
8	5,020	5,400	4,900	a3,550	3,350	2,850	11,700	10,800	21,900	5,530	a2,500	2,630
9	5,100	5,300	4,580	a3,400	3,400	2,850	12,400	11,400	19,600	5,450	a2,500	2,600
10	5,250	5,250	4,330	a3,150	*3,250	*2,850	13,400	11,600	17,700	5,120	a2,500	2,600
11	5,400	5,220	4,230	a3,000	3,250	2,800	13,500	*13,100	16,800	a4,800	a2,400	2,540
12	6,540	5,250	4,820	a3,100	3,190	2,700	12,800	17,000	16,800	a4,500	a2,300	2,520
13	8,750	a4,400	4,800	a2,950	3,110	2,700	12,000	22,400	16,600	a4,200	a2,200	2,460
14	7,970	a3,500	4,620	a2,800	3,050	2,700	*11,200	25,800	16,200	a4,100	a2,150	a2,300
15	7,320	a2,900	4,500	a2,450	3,030	2,750	10,600	23,000	16,500	a4,000	a2,100	a2,300
16	7,820	a3,000	*4,550	a2,500	3,010	2,800	9,940	19,500	18,000	a3,700	a2,200	a2,300
17	8,230	a3,200	4,580	a2,550	2,990	2,830	9,430	17,500	19,000	a3,600	*2,260	a2,300
18	7,610	a3,700	4,480	a2,500	2,930	3,050	9,010	15,800	19,500	a3,500	2,270	a2,200
19	7,090	a4,500	4,380	a2,450	2,730	3,780	8,830	14,300	16,000	a3,300	2,320	a2,150
20	6,830	a4,900	4,280	a2,300	2,730	4,520	8,600	13,100	*14,300	*3,030	2,300	a2,100
21	6,570	a5,300	4,040	2,150	2,890	5,180	8,470	12,300	13,400	a3,000	2,220	a2,100
22	6,440	a5,500	3,730	2,300	2,930	6,000	8,210	11,900	11,900	a2,900	2,140	*2,060
23	6,670	a6,000	3,630	2,700	2,870	6,830	8,050	11,300	10,800	a2,800	2,180	*2,100
24	8,470	*7,140	3,630	3,100	2,650	7,790	8,080	11,200	10,100	a2,750	2,290	2,060
25	8,390	8,650	3,980	3,350	2,560	8,260	7,970	10,800	9,830	a2,700	2,500	2,060
26	8,960	8,390	4,090	3,400	2,500	8,780	7,870	10,400	9,830	a2,650	2,710	2,060
27	8,360	7,270	3,820	3,500	2,000	8,810	7,610	10,100	9,430	a2,550	2,710	2,060
28	*7,770	6,540	3,710	3,350	1,880	9,090	7,510	10,600	8,780	a2,500	2,710	2,060
29	7,400	6,340	3,580	3,400	1,970	8,520	7,480	10,800	8,360	a2,400	2,730	2,060
30	7,090	6,310	3,560	3,500	-------	8,000	7,350	11,200	8,050	a2,300	*2,730	1,960
31	6,750	-------	3,520	3,600	-------	7,710	-------	12,700	-------	a2,300	2,670	-------
Total	204,440	165,480	138,170	94,570	85,030	138,950	274,530	399,310	486,380	133,460	75,890	69,670
Mean	6,595	5,516	4,457	3,051	2,952	4,482	9,151	12,880	16,210	4,305	2,448	2,322
Ac-ft	405,500	328,200	274,100	187,600	168,700	275,600	544,500	792,000	964,700	264,700	150,500	138,200

Calendar year 1959: Max - Min - Mean - Ac-ft -
Water year 1959-60: Max 27,200 Min 1,700 Mean 6,191 Ac-ft 4,494,000

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for other Clark Fork stations.
Note.--Stage-discharge relation affected by ice Jan. 21 to Feb. 1, Mar, 1-16.

3540. St. Regis River near St. Regis, Mont.

Location.--Lat 47°17'50", long 115°07'20", in NE¼ sec.26, T.18 N., R.28 W., on left bank at county road bridge, 500 ft upstream from Little Joe Creek, 1¼ miles west of St. Regis, and 1½ miles upstream from mouth.

Drainage area.--303 sq mi.

Records available.--September 1910 to September 1917 (no winter records in most years), September 1958 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 2,645.00 ft above mean sea level, datum of 1929. September 1910 to September 1917, staff gage at site 2 miles upstream at different datum.

Extremes.--Maximum discharge during year, 3,610 cfs May 12 (gage height, 5.33 ft); minimum, 98 cfs Sept. 21-23, 27, 30.

1910-17, 1958-60: Maximum discharge observed, 7,740 cfs May 28, 1917 (gage height, 8.65 ft, site and datum then in use); minimum observed, 85 cfs Aug. 30 to Sept. 2, 1915 (gage height, 1.75 ft, site and datum then in use).

Flood of about Dec. 20, 1933, reached a stage of about 14.5 ft, from information by local residents (discharge unknown). Flood of May 19, 1954, reached a discharge of about 11,000 cfs (gage height, 9.4 ft), from rating curve extended above 5,100 cfs.

Remarks.--Records good except those for periods of ice effect, which are poor. Minor diversions for irrigation of hay meadows above station.

Revisions (water years).--WSP 1246: 1912, drainage area. WSP 1316: 1911.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Nov. 19 to Dec. 11, Sept. 21-23)

2.0	92	3.5	950
2.2	137	4.0	1,500
2.5	248	5.0	3,040
3.0	540	5.5	3,920

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	205	322	562	b180	173	b140	1,040	1,020	1,820	570	244	134
2	191	317	519	b180	180	b140	923	1,140	*1,980	526	350	127
3	183	368	505	b190	180	b145	923	1,260	2,250	491	231	127
4	176	512	477	b195	176	b150	1,130	1,350	2,160	464	209	147
5	173	422	434	b195	176	166	1,530	1,490	1,900	446	198	159
6	173	398	410	205	176	169	2,120	1,570	1,720	422	191	143
7	183	386	410	205	235	166	2,450	1,700	1,650	404	187	130
8	180	362	380	205	248	166	2,550	1,920	1,450	386	180	127
9	362	356	339	201	*231	166	2,990	1,880	1,300	362	176	122
10	328	344	350	180	218	*163	2,940	*1,960	1,270	339	173	120
11	368	339	362	b170	209	159	2,390	2,550	1,290	328	166	117
12	663	339	356	b165	205	159	1,990	3,180	1,240	312	156	114
13	555	235	344	159	201	159	1,710	3,120	1,220	300	156	112
14	458	b220	328	150	201	163	*1,610	2,440	1,170	290	156	110
15	440	b230	356	b160	205	163	1,440	2,020	1,250	281	156	108
16	422	b200	*428	b160	198	159	1,290	1,810	1,330	267	*156	104
17	392	b220	374	b155	194	163	1,180	1,640	1,260	257	156	104
18	368	b250	350	153	169	166	1,150	1,490	1,050	244	153	104
19	339	290	334	153	166	183	1,120	1,350	950	*239	143	102
20	328	295	322	*156	198	209	1,130	1,320	*905	226	143	100
21	368	374	312	b160	194	257	1,170	1,320	834	218	140	98
22	386	368	295	b170	191	322	1,100	1,240	775	214	137	*100
23	440	533	290	b190	156	440	1,090	1,180	735	214	150	100
24	422	783	286	194	b150	592	1,060	1,150	727	205	163	104
25	452	*1,110	286	187	b140	775	1,010	1,120	735	201	166	102
26	416	995	276	173	b130	986	968	1,110	695	194	176	100
27	404	834	198	173	b135	1,090	932	1,210	663	191	180	98
28	*392	735	b190	169	b140	1,240	932	1,300	623	183	163	102
29	380	679	b185	194	b140	1,180	923	1,320	600	180	147	100
30	350	615	b190	198	------	1,320	941	1,410	585	180	143	100
31	339	------	b185	194	------	1,210	------	1,650	------	180	137	------
Total	10,836	13,431	10,633	5,519	5,315	12,666	43,732	50,220	36,137	9,314	5,382	3,415
Mean	350	448	343	178	183	409	1,458	1,620	1,205	300	174	114
Cfsm	1.16	1.48	1.13	0.587	0.604	1.35	4.81	5.35	3.98	0.990	0.574	0.376
In.	1.33	1.65	1.31	0.68	0.65	1.55	5.37	6.16	4.44	1.14	0.66	0.42
Ac-ft	21,490	26,640	21,090	10,950	10,540	25,120	86,740	99,610	71,680	18,470	10,680	6,770

Calendar year 1959: Max 3,830 Min 143 Mean 730 Cfsm 2.41 In. 32.73 Ac-ft 528,700
Water year 1959-60: Max 3,180 Min 98 Mean 564 Cfsm 1.86 In. 25.36 Ac-ft 409,800

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

3545. Clark Fork at St. Regis, Mont.

Location.--Lat 47°18'05", long 115°05'15", in center of SW¼ sec.19, T.18 N., R.27 W., on left bank at St. Regis, half a mile downstream from St. Regis River.

Drainage area.--10,709 sq mi.

Records available.--October 1910 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 2,600 ft (by barometer). Prior to Nov. 29, 1933, staff gage at same site and datum.

Average discharge.--50 years, 7,396 cfs (5,354,000 acre-ft per year).

Extremes.--Maximum discharge during year, 33,600 cfs June 5 (gage height, 14.28 ft); minimum, 1,450 cfs Mar. 3 (gage height, 4.10 ft).
1910-60: Maximum discharge observed, 68,900 cfs May 24, 1948 (gage height, 19.96 ft); minimum, 1,000 cfs Dec. 17, 1940 (gage height, 3.36 ft), but may have been less during period of ice effect Feb. 19-22, 1929.

Remarks.--Records excellent except those for periods of ice effect, which are poor. Some diurnal fluctuation at low flow caused by powerplant at Bonner. Diversions for irrigation of about 244,000 acres above station.

Revisions (water years).--WSP 1246: Drainage area. WSP 1316: 1916-17, 1920, 1929-31(M), 1933(M).

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 23 to Dec. 4)

4.4	1,740	10.0	14,900
5.0	2,550	12.0	22,600
6.0	4,310	15.0	37,400
8.0	8,800		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,650	8,120	7,780	4,160	3,900	2,490	9,550	9,140	19,800	9,580	3,170	3,160
2	5,500	7,780	7,440	3,750	3,850	2,180	8,980	9,450	*23,900	9,400	3,480	3,160
3	5,370	7,680	7,130	3,800	3,800	1,810	8,600	10,000	26,900	9,110	3,370	3,100
4	5,270	7,850	6,900	3,530	3,850	1,960	8,750	10,700	31,300	8,550	3,430	3,120
5	5,230	7,610	6,640	3,620	3,800	2,330	9,530	11,800	33,400	8,180	3,410	3,230
6	5,330	7,270	6,190	3,890	3,800	3,000	11,200	12,600	32,400	8,100	3,280	3,260
7	5,480	6,990	5,930	4,250	3,710	3,520	13,800	13,400	29,400	7,320	3,250	3,250
8	5,710	6,920	5,990	4,350	3,840	3,570	16,000	14,500	27,400	6,830	3,260	3,160
9	6,240	6,830	5,650	4,200	*3,930	3,530	17,600	15,200	25,200	6,710	3,230	3,120
10	6,350	6,760	5,160	3,880	3,790	*3,480	18,600	*15,900	22,800	6,370	3,250	3,120
11	6,600	6,690	5,180	3,660	3,730	3,350	18,400	18,100	21,800	6,170	3,160	3,070
12	7,950	6,830	5,520	3,500	3,700	3,260	17,600	22,600	21,500	5,910	3,050	3,000
13	10,300	5,990	5,670	3,590	3,590	3,170	16,200	28,200	21,200	5,500	2,930	2,940
14	10,300	4,880	5,540	3,390	3,500	3,170	*15,000	31,400	20,700	5,180	2,830	2,860
15	9,450	3,850	5,420	2,830	3,480	3,160	13,800	29,600	21,100	5,120	2,780	2,780
16	9,400	3,500	*5,480	2,720	3,440	3,190	12,800	25,700	22,300	4,980	*2,720	2,760
17	10,000	3,650	5,500	2,700	3,390	3,190	12,100	22,900	23,500	4,820	2,730	2,750
18	9,630	4,250	5,390	2,800	3,300	3,280	11,500	20,800	23,800	4,560	2,760	2,730
19	9,010	5,250	5,270	2,800	3,120	3,800	11,100	18,800	20,600	*4,400	2,800	2,680
20	8,620	6,080	5,140	2,700	3,080	4,780	11,000	17,200	*18,100	4,200	2,800	2,660
21	8,380	6,640	5,000	2,650	3,160	5,600	10,800	16,100	16,900	3,970	2,700	2,640
22	8,220	7,060	4,660	2,600	3,300	6,350	10,500	15,300	15,100	3,800	2,640	*2,620
23	8,280	7,300	4,440	2,900	3,170	7,440	10,300	14,600	13,400	3,610	2,670	2,610
24	9,610	8,280	4,330	3,300	3,080	8,700	10,100	14,100	12,400	3,550	2,760	2,660
25	10,200	*10,700	4,540	3,600	2,980	9,660	9,890	13,700	12,000	3,520	2,940	2,640
26	10,600	11,100	4,800	3,700	2,700	10,500	9,710	13,100	11,800	3,440	3,210	2,640
27	10,400	9,980	4,560	3,800	2,580	10,800	9,450	13,100	11,500	3,350	3,300	2,660
28	9,710	8,830	4,080	4,000	2,260	11,400	9,290	13,500	10,700	3,250	3,370	2,620
29	*9,200	8,300	3,840	3,800	2,370	11,200	9,140	13,900	10,200	3,160	3,350	2,600
30	8,830	8,120	3,730	3,900	-------	10,700	9,110	14,400	9,790	3,080	3,340	2,540
31	8,480	-------	3,970	4,000	-------	10,200	-------	16,300	-------	3,030	3,280	-------
Total	249,300	211,090	166,870	108,370	98,200	164,770	360,400	516,090	610,890	168,750	95,250	86,140
Mean	8,042	7,036	5,383	3,496	3,386	5,315	12,010	16,650	20,360	5,444	3,073	2,871
Ac-ft	494,500	418,700	331,000	214,900	194,800	326,800	714,800	‡1,024	‡1,212	334,700	188,900	170,900

Calendar year 1959: Max 42,600 Min 2,400 Mean 9,901 Ac-ft 7,168,000
Water year 1959-60: Max 33,400 Min 1,810 Mean 7,749 Ac-ft 5,626,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
Note.--Stage-discharge relation affected by ice Nov. 15-18, Jan. 19 to Feb. 5.

3550. Flathead River at Flathead, British Columbia

(International gaging station)

Location.--Lat 49°00', long 114°29', on left bank at highway bridge, 0.2 mile north of international boundary, 0.2 mile northwest of Flathead, British Columbia, and 7 miles northwest of Trail Creek, Mont.

Drainage area.- 450 sq mi, approximately.

Records available.--March 1929 to September 1960 (no winter records prior to 1952). Prior to October 1934, published as "near Trail Creek, Mont."

Gage.--Water-stage recorder. Altitude of gage is 3,980 ft (from topographic map). Prior to Sept. 1, 1949, staff gage at same site and datum.

Average discharge.--9 years (1951-60), 1,001 cfs (724,700 acre-ft per year).

Extremes.--Maximum discharge during year, 9,610 cfs June 3 (gage height, 5.96 ft); minimum daily, 136 cfs Mar. 3.
1929-60: Maximum discharge, 14,600 cfs May 23, 1948 (gage height, 9.1 ft, from floodmark), from rating curve extended above 8,000 cfs; minimum observed, 65 cfs Apr. 9, 1929, but may have been less during periods of no winter record.

Remarks.--Records excellent except those for periods of ice effect, which are fair. No regulation or diversion above station.

Cooperation.--This station is maintained by Canada under agreement with the United States.

Revisions (water years).--WSP 1092: 1933 (maximum gage height only).

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 3				June 4 to Sept. 30			
0.7	218	2.5	1,660	0.6	195	2.5	1,660
1.0	355	3.0	2,420	.8	265	3.0	2,420
1.5	650	4.0	4,470	1.0	370	4.0	4,470
2.0	1,100	6.0	9,720	1.5	700	6.0	9,720
				2.0	1,120		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	636	964	500	223	222	167	594	1,000	5,760	2,100	518	320
2	608	910	472	200	213	153	552	1,330	6,900	1,960	679	300
3	573	928	444	218	217	136	601	1,420	9,080	1,750	630	285
4	552	802	416	229	214	144	766	1,400	8,570	1,640	*616	295
5	531	739	376	240	209	160	1,200	1,380	5,350	1,550	609	348
6	531	748	382	254	216	170	1,660	1,530	4,520	1,460	581	448
7	*524	714	381	247	211	178	1,740	1,990	*4,920	1,410	525	400
8	524	690	350	229	208	184	1,820	2,980	4,330	1,350	490	359
9	580	666	*297	216	206	187	2,350	2,730	4,020	1,290	466	332
10	552	643	298	219	205	188	2,980	3,020	3,950	1,200	448	310
11	517	601	340	227	201	188	2,560	4,700	4,150	1,120	430	295
12	538	472	313	233	194	187	2,150	6,950	4,150	1,050	412	280
13	594	410	289	220	193	185	1,800	8,240	4,330	1,020	394	270
14	714	392	280	194	193	184	1,640	5,560	4,380	1,020	388	261
15	1,580	376	328	176	192	189	1,420	3,870	4,240	962	382	257
16	1,700	357	390	197	193	186	1,270	3,260	4,090	911	370	253
17	1,390	372	372	182	192	183	1,150	2,850	4,240	871	359	249
18	1,180	430	344	168	*181	184	1,110	2,500	3,330	831	348	241
19	1,060	500	330	153	166	187	1,060	*2,280	2,900	791	337	233
20	973	580	315	149	183	190	1,020	2,130	2,720	760	332	229
21	937	608	296	148	209	200	973	2,500	2,490	730	320	229
22	*928	580	284	157	172	212	919	2,350	2,160	693	315	229
23	928	594	286	190	179	232	883	2,130	1,980	*658	315	229
24	928	594	300	212	167	265	820	1,960	2,150	630	310	229
25	1,920	766	314	238	154	325	784	1,800	2,540	609	310	229
26	1,960	739	307	243	146	435	722	1,790	2,420	581	315	225
27	1,620	698	262	242	149	601	*714	2,440	2,220	560	315	222
28	1,400	636	230	241	155	811	698	2,660	2,200	546	310	219
29	1,240	572	212	243	162	829	698	2,830	2,180	525	310	216
30	1,100	560	217	241	------	784	802	3,540	2,150	511	337	213
31	1,020	------	232	236	------	682	------	5,130	------	504	354	------
Total	29,838	18,641	10,157	6,565	5,502	8,906	37,456	90,250	118,420	31,593	12,825	8,205
Mean	963	621	328	212	190	287	1,250	2,910	3,950	1,020	414	274
Cfsm	2.14	1.38	0.73	0.47	0.42	0.64	2.78	6.47	8.78	2.27	0.92	0.61
In.	2.47	1.54	0.84	0.54	0.45	0.74	3.10	7.46	9.80	2.62	1.06	0.68
Ac-ft	59,180	36,970	20,150	13,020	10,910	17,660	74,290	179,000	234,900	62,660	25,440	16,270

Calendar year 1959: Max 9,100 Min 83 Mean 1,260 Cfsm 2.80 In. 38.02 Ac-ft 913,000
Water year 1959-60: Max 9,080 Min 136 Mean 1,030 Cfsm 2.29 In. 31.30 Ac-ft 750,400

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 14-20, Nov. 29 to Mar. 23.

3555. Flathead River near Columbia Falls, Mont.

Location.--Lat 48°28'20", long 114°05'20", in NE¼NE¼ sec.12, T.31 N., R.20 W., on right bank 1 mile upstream from Middle Fork and 8 miles northeast of Columbia Falls.

Drainage area.--1,553 sq mi.

Records available.--September 1910 to September 1917 (no winter records in some years), April 1929 to February 1935 (incomplete), June 1935 to September 1960. Monthly discharge only for some periods, published in WSP 1316. Published as North Fork Flathead River near Columbia Falls 1910-17.

Gage.--Water-stage recorder. Datum of gage is 3,109.70 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation). September 1910 to September 1917, staff gage at site 1,000 ft downstream at different datum.

Average discharge.--29 years (1910-12, 1913-15, 1935-60), 2,915 cfs (2,110,000 acre-ft per year).

Extremes.--Maximum discharge during year, 20,700 cfs June 4 (gage height, 10.08 ft); minimum, 402 cfs Mar. 3 (gage height, 1.38 ft).
1910-17, 1929-60: Maximum discharge, 31,500 cfs May 21, 1954 (gage height, 12.25 ft); minimum, 198 cfs Jan. 8, 1953 (gage height, 0.86 ft).

Remarks.--Records good except those for period of ice effect, which are poor. A few small diversions from tributaries for irrigation of hay meadows above station. No regulation.

Revisions (water years).--WSP 1216: Drainage area. WSP 1246: 1911, 1912(M), 1915-17(M), 1929(M), 1938-39(M), 1946(M).

Rating table, water year 1959-60, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.6	500	3.0	1,590	7.0	9,100
2.0	730	4.0	2,810	9.0	15,800
2.5	1,100	5.0	4,500	11.0	25,300

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,640	3,430	2,150	1,110	980	646	*3,600	3,040	13,600	7,930	*2,180	1,210
2	2,490	3,190	2,130	1,000	932	572	3,290	3,620	14,400	7,700	2,510	1,160
3	2,360	3,190	2,040	1,050	964	518	3,240	4,290	18,600	7,100	2,550	1,130
4	2,270	2,960	1,930	1,080	948	599	3,880	4,440	20,500	6,650	2,530	1,140
5	2,210	2,590	1,770	1,140	932	646	5,010	4,500	17,600	6,380	2,550	1,240
6	2,220	2,600	1,670	1,270	925	700	6,580	4,560	*14,400	6,070	2,480	1,350
7	2,180	2,540	*1,770	1,240	956	718	6,980	5,090	14,600	5,830	2,330	1,430
8	2,120	2,410	1,680	1,080	925	*730	6,940	6,670	13,800	5,700	2,170	1,390
9	2,360	*2,330	1,390	1,070	910	736	7,730	7,200	12,400	5,540	2,050	1,330
10	2,310	2,250	1,450	1,130	902	730	9,180	7,340	11,900	5,230	1,940	1,280
11	2,170	2,180	1,700	1,170	*872	736	8,630	9,420	12,200	4,890	1,850	1,240
12	2,160	1,950	1,670	1,170	851	730	7,630	14,400	12,500	4,580	1,770	1,190
13	2,230	1,380	1,540	*1,000	844	712	6,770	18,300	12,700	4,390	1,700	1,140
14	2,360	b1,350	1,400	872	837	700	6,250	16,000	13,300	4,330	1,640	1,100
15	3,200	b1,300	1,610	865	837	730	5,760	12,000	13,300	4,200	1,630	1,080
16	*4,890	b1,200	1,970	988	823	724	5,110	9,950	13,300	4,060	1,580	1,070
17	4,580	1,270	1,930	902	809	718	4,630	8,970	14,100	3,880	1,510	1,040
18	4,130	1,550	1,850	823	788	743	4,330	8,030	12,000	3,700	1,450	1,010
19	3,810	1,920	1,810	730	688	769	4,150	7,460	10,000	3,530	1,400	980
20	3,580	2,180	1,710	700	706	816	4,000	6,940	*9,440	3,400	1,360	940
21	3,520	2,250	1,590	682	844	858	3,970	7,420	8,810	3,290	1,330	925
22	3,450	2,150	1,520	782	788	925	3,680	7,390	7,830	3,130	1,300	918
23	3,550	2,230	1,430	880	706	1,060	3,480	6,820	7,150	2,980	1,290	910
24	3,450	2,370	1,430	1,000	743	1,240	3,270	6,420	7,130	2,810	1,280	902
25	4,560	2,780	1,570	1,060	646	1,590	3,080	6,030	8,140	2,680	1,270	902
26	5,030	2,810	1,510	1,050	533	2,110	2,880	*5,810	8,580	2,540	1,280	*895
27	5,540	2,540	1,260	1,050	533	2,710	2,770	6,450	8,060	2,410	1,300	880
28	4,990	2,350	1,130	1,040	555	3,600	2,700	7,420	7,830	2,330	1,250	865
29	4,500	2,340	1,050	1,050	628	4,040	*2,660	7,490	7,850	2,250	1,220	851
30	4,080	2,300	1,030	1,060	------	4,460	2,730	8,160	7,880	2,190	1,230	837
31	3,720	------	1,170	1,040	------	4,130	------	10,400	------	2,160	*1,240	------
Total	102,660	67,890	49,860	31,084	23,405	40,696	144,910	242,030	353,900	133,860	53,170	32,335
Mean	3,312	2,263	1,608	1,003	807	1,313	4,830	7,807	11,800	4,318	1,715	1,078
Cfsm	2.13	1.46	1.04	0.646	0.520	0.845	3.11	5.03	7.60	2.78	1.10	0.694
In.	2.46	1.63	1.19	0.74	0.56	0.97	3.47	5.80	8.47	3.21	1.27	0.77
Ac-ft	203,600	134,700	98,900	61,650	46,420	80,720	287,400	480,100	702,000	265,500	105,500	64,140

Calendar year 1959: Max 25,000 Min 347 Mean 4,108 Cfsm 2.65 In. 35.92 Ac-ft 2,974,000
Water year 1959-60: Max 20,500 Min 518 Mean 3,486 Cfsm 2.24 In. 30.54 Ac-ft 2,531,000

Peak discharge (base, 11,000 cfs).--May 13 (9 a.m.) 18,800 cfs (9.67 ft); June 4 (8 to 9 a.m.) 20,700 cfs (10.08 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

3557. Middle Fork Flathead River near Essex, Mont.

Location.--Lat 48°10'20", long 113°32'40", near center of sec.19, T.28 N., R.15 W., on right bank a quarter of a mile downstream from Spruce Park cabin, 1 mile downstream from Charlie Creek, and 7½ miles southeast of Essex.

Drainage area.--408 sq mi.

Records available.--April 1957 to September 1960 (no winter records after 1958).

Gage.--Water-stage recorder with pressure recording bubbler system. Altitude of gage is 4,070 ft (from topographic map).

Extremes.--Maximum discharge during year, 7,690 cfs June 4 (gage height, 10.48 ft); minimum not determined, probably occurred during period of no gage-height record.
1957-60: Maximum discharge, 10,500 cfs June 6, 1959 (gage height, 11.32 ft); minimum daily determined, 85 cfs Jan. 1, 1958.

Remarks.--Records good except those for periods of no gage-height record, which are fair.

Revisions (water years).--WSP 1636: 1957(M).

Rating table, Apr. 1 to Sept. 30, 1960 (gage height, in feet, and discharge, in cubic feet per second)

3.0	147	6.0	1,840
3.5	279	8.0	3,860
4.0	470	10.0	6,560
4.5	730	10.5	7,620
5.0	1,060		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	430						750	697	5,310	2,030	383	247
2	400						690	855	5,300	1,900	438	239
3	390						720	948	7,090	1,650	408	236
4	385						860	1,010	6,560	1,550	417	236
5	390						1,300	1,030	4,780	1,450	391	236
6	400						*2,300	1,070	4,240	1,350	356	230
7	410						2,170	1,300	4,590	1,300	342	225
8	400						2,090	1,680	*4,040	1,200	338	222
9	490						2,250	1,810	3,650	1,150	328	219
10	490						2,410	2,350	3,610	1,050	310	217
11	470						2,080	3,820	3,740	980	304	208
12	570						1,820	5,260	3,700	940	294	206
13	720						1,600	5,950	3,860	900	291	203
14	850						1,420	4,340	3,800	900	285	200
15	1,500						1,270	3,230	3,670	840	282	198
16	1,750						1,130	2,660	4,100	780	279	203
17	1,400						1,020	2,320	4,230	720	273	200
18	1,150						976	2,030	3,110	670	264	195
19	1,000						927	1,810	2,690	650	*256	188
20	920						881	1,700	2,620	620	253	182
21	900						855	1,810	2,250	580	244	*180
22	890						796	1,730	1,930	550	244	182
23	1,100						754	*1,640	*1,790	510	262	180
24	1,100						714	1,540	1,770	490	285	180
25	1,480						675	1,490	2,400	470	285	182
26	1,500						*653	1,530	2,450	450	285	180
27	*1,300						631	2,190	2,200	430	285	175
28	1,200						626	2,590	2,150	*412	279	172
29	1,100						595	2,710	2,050	404	264	172
30	950				------		626	3,230	2,020	391	256	170
31	860	------			------		------	4,720	------	375	253	------
Total	26,895	-	-	-	-	-	35,589	71,050	105,700	27,692	9,434	6,063
Mean	868	-	-	-	-	-	1,186	2,292	3,523	893	304	202
Cfsm	2.13	-	-	-	-	-	2.91	5.62	8.63	2.19	0.745	0.495
In.	2.45	-	-	-	-	-	3.24	6.48	9.63	2.52	0.86	0.55
Ac-ft	53,350	-	-	-	-	-	70,590	140,900	209,700	54,930	18,710	12,030

Calendar year	: Max	Min	Mean	Cfsm	In.	Ac-ft
Water year	: Max	Min	Mean	Cfsm	In.	Ac-ft

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 1-26, 28-31, Apr. 1-5, June 25 to July 27; discharge estimated on basis of record for station at Essex.

3570. Middle Fork Flathead River at Essex, Mont.

Location.--Lat 48°16'30", long 113°36'10", in NE¼SW¼ sec.14, T.29 N., R.16 W., on right bank 0.6 mile upstream from Ole Creek, 0.7 mile southeast of Essex, and 4 miles downstream from Bear Creek.

Drainage area.--510 sq mi.

Records available.--October 1939 to September 1953, June 1956 to September 1960. Monthly discharge only for October 1939, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 3,730 ft (from river-profile map).

Average discharge.--18 years, 1,064 cfs (770,300 acre-ft per year).

Extremes.--Maximum discharge during year, 10,100 cfs June 3 (gage height, 9.54 ft); minimum daily, 100 cfs Mar. 3.
1939-53, 1956-60: Maximum discharge, 14,500 cfs May 22, 1948 (gage height, 10.95 ft, from partly estimated gage-height record); minimum daily, 30 cfs Jan. 22, 1940.
Flood in May 1954 reached a stage of 12.7 ft (discharge, 18,000 cfs, from rating curve extended above 12,000 cfs). Flood of May 21 or 22, 1956, reached a stage of 11.7 ft, from floodmark (discharge, 15,400 cfs, from rating curve extended above 12,000 cfs).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor.

Revisions (water years).--WSP 1216: Drainage area. WSP 1246: 1940, 1941(M).

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 3-20)

2.0	180	6.0	3,420
2.5	323	7.0	4,950
3.0	525	8.0	6,910
4.0	1,180	9.0	9,080
5.0	2,140	10.0	11,400

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	530	999	908	b380	380	b150	1,070	950	*7,100	2,420	453	277
2	502	936	866	b360	360	b120	950	1,190	6,950	2,240	520	274
3	489	943	845	b350	370	b100	971	1,320	9,590	1,940	471	268
4	484	810	784	b350	360	b130	1,200	1,390	9,040	1,820	480	271
5	489	752	709	360	350	b150	1,840	*1,420	6,100	1,710	453	290
6	502	745	685	370	350	200	3,150	1,480	5,110	1,590	419	274
7	520	727	691	350	350	220	3,040	1,790	*5,700	1,550	399	264
8	502	703	652	300	350	230	2,880	2,380	4,900	1,490	391	258
9	619	685	535	270	330	220	3,050	2,510	4,380	1,380	376	252
10	614	680	663	250	320	210	3,200	3,050	4,280	1,270	362	246
11	586	658	652	300	320	200	2,830	4,860	4,490	1,180	351	243
12	727	550	619	300	320	190	*2,490	6,990	4,490	1,110	337	237
13	929	b350	580	250	310	160	2,190	8,440	4,700	1,080	330	234
14	1,020	b340	540	*b180	300	150	1,980	5,800	4,670	1,080	320	231
15	1,760	b330	619	210	290	180	1,750	4,120	4,480	999	313	228
16	2,200	b300	752	250	280	180	1,560	3,430	5,060	929	313	228
17	1,740	b400	*691	200	270	160	1,410	3,020	5,260	859	306	228
18	1,440	b500	663	170	*258	*b190	1,340	2,650	3,760	797	*300	225
19	1,260	b550	636	150	230	210	1,290	2,370	3,240	764	290	220
20	1,150	b600	586	150	268	250	1,230	2,240	3,210	721	280	215
21	1,130	b670	512	180	264	330	1,180	2,380	2,800	685	280	*215
22	1,080	641	b480	250	255	*411	1,100	2,270	*2,380	652	277	215
23	1,360	824	b450	300	*246	500	1,040	*2,180	2,210	608	297	218
24	1,390	1,270	b500	400	277	700	978	2,030	2,270	575	323	218
25	1,830	2,030	555	400	b200	1,000	915	1,950	2,920	550	320	220
26	*1,860	1,690	545	350	b180	1,400	873	1,980	2,960	525	326	215
27	1,660	*1,360	489	350	b160	1,590	831	2,760	2,610	507	326	210
28	1,480	1,170	b400	420	b150	1,620	810	3,250	2,520	*489	326	207
29	1,320	1,130	b370	400	b150	1,440	771	3,360	2,460	476	306	205
30	1,170	1,020	b350	450	------	1,360	804	3,920	2,400	458	293	202
31	1,060	------	b400	410	------	*1,230	------	5,940	------	444	284	------
Total	33,443	24,363	18,727	9,410	8,248	15,201	48,703	93,420	132,060	32,898	10,822	7,088
Mean	1,079	812	604	304	284	490	1,623	3,014	4,402	1,061	349	236
Cfsm	2.12	1.59	1.18	0.596	0.557	0.961	3.18	5.91	8.63	2.08	0.684	0.463
In.	2.44	1.78	1.37	0.69	0.60	1.11	3.55	6.81	9.63	2.40	0.79	0.52
Ac-ft	66,330	48,320	37,140	18,660	16,360	30,150	96,600	185,300	261,900	65,250	21,470	14,080

Calendar year 1959: Max 11,800 Min 264 Mean 1,623 Cfsm 3.18 In. 43.22 Ac-ft 1,175,000
Water year 1959-60: Max 9,590 Min 100 Mean 1,187 Cfsm 2.33 In. 31.69 Ac-ft 861,500

Peak discharge (base, 4,400 cfs).--May 13 (5 a.m.) 9,300 cfs (9.10 ft); June 3 (3 a.m.) 10,100 cfs (9.54 ft); June 17 (1:30 a.m.) 6,140 cfs (7.73 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Jan. 5-13, 15-31, Feb. 1-17, 19, Mar. 6-17, 19-21, 23-26 (stage-discharge relation probably affected by ice most of periods); discharge estimated on basis of 4 discharge measurements, weather records, and records for station near West Glacier.

3585. Middle Fork Flathead River near West Glacier, Mont.

Location.--Lat 48°29'50", long 114°00'30", in SW¼NE¼ sec.34, T.32 N., R.19 W., on left bank three-quarters of a mile downstream from McDonald Creek, 1¼ miles west of West Glacier (formerly Belton), and 3½ miles upstream from mouth.

Drainage area.--1,128 sq mi.

Records available.--October 1939 to September 1960. Prior to October 1947, published as "near Belton."

Gage.--Water-stage recorder. Altitude of gage is 3,130 ft (from river-profile map). Prior to Nov. 22, 1950, staff gage at same site and datum.

Average discharge.--21 years, 2,881 cfs (2,086,000 acre-ft per year).

Extremes.--Maximum discharge during year, 21,500 cfs June 4 (gage height, 9.10 ft); minimum, 370 cfs Mar. 3 (gage height, 0.94 ft).
1939-60: Maximum discharge, 34,500 cfs May 20, 1954 (gage height, 13.01 ft); minimum, less than 173 cfs Nov. 27, 1952 (stage below intake pipe).

Remarks.--Records good.

Revisions.--WSP 1216: Drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 1-5, Apr. 23-30)

1.0	400	4.0	4,850
1.5	760	6.0	10,600
2.0	1,260	8.0	17,500
3.0	2,690	9.0	21,200

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,980	2,900	2,340	970	696	*474	3,220	2,390	14,600	7,660	1,880	880
2	1,850	2,690	2,200	950	688	448	2,900	2,780	14,400	7,430	2,200	880
3	1,750	2,640	2,150	930	696	418	2,820	3,120	19,600	6,620	2,080	880
4	1,700	2,440	*2,020	930	672	448	3,220	*3,240	20,600	6,320	2,050	900
5	1,690	2,200	1,880	940	672	481	4,320	3,410	15,400	6,130	1,940	1,050
6	1,700	2,130	1,750	1,000	680	509	6,840	3,450	*12,900	5,820	1,810	1,070
7	1,700	2,050	1,740	990	720	537	7,010	3,920	14,000	5,740	1,680	990
8	1,660	1,960	1,680	890	712	544	6,780	5,150	12,800	5,740	1,590	930
9	1,880	1,880	1,480	880	688	544	7,120	5,610	11,700	5,480	1,490	890
10	1,890	1,820	1,430	823	688	530	7,610	6,100	11,300	5,050	1,410	850
11	1,780	1,770	1,570	880	*680	523	7,160	9,300	11,700	4,660	1,360	832
12	1,840	1,570	1,530	910	664	502	6,370	13,600	11,700	4,470	1,350	805
13	2,150	1,220	1,450	841	656	495	5,710	17,500	12,200	4,510	1,320	796
14	2,460	1,220	1,370	*656	648	502	5,320	13,900	12,800	4,440	1,280	787
15	3,980	1,220	1,510	696	648	502	4,830	10,500	12,300	4,300	1,220	778
16	*5,380	1,150	1,820	769	640	509	4,370	8,690	13,800	4,070	1,150	769
17	4,540	1,260	1,800	704	632	509	4,030	7,720	15,200	3,850	1,100	760
18	3,920	1,390	1,710	616	600	523	3,810	6,950	11,500	3,640	1,070	736
19	3,470	1,590	1,650	551	558	544	3,660	6,350	9,610	3,430	1,040	712
20	3,220	1,610	1,590	530	593	593	3,510	5,900	*9,320	3,320	1,030	680
21	3,180	1,710	1,440	530	616	672	3,410	6,000	8,410	3,200	1,020	672
22	3,040	1,680	1,360	624	579	805	3,200	5,840	7,260	3,000	970	664
23	3,410	2,050	1,290	728	544	1,120	3,060	5,510	6,640	2,770	950	648
24	3,570	3,040	1,320	769	558	1,510	2,880	5,200	6,750	2,560	980	656
25	4,980	4,660	1,370	752	516	2,070	2,690	4,850	8,350	2,370	950	680
26	5,220	4,050	1,340	696	488	3,000	2,550	*4,730	8,750	2,230	990	*704
27	4,660	3,430	1,270	688	467	3,700	2,410	5,920	7,780	2,100	980	664
28	4,190	2,960	1,150	769	467	3,960	2,340	7,200	7,720	2,040	960	648
29	3,810	2,750	1,020	720	495	3,790	*2,260	7,350	7,720	*2,010	920	624
30	3,410	2,530	910	814	-------	*3,830	2,280	8,260	7,640	1,960	920	608
31	3,120	-------	1,010	744	-------	3,600	-------	12,100	-------	1,890	*890	-------
Total	93,130	65,570	48,150	24,290	17,961	38,192	127,670	212,540	344,450	128,830	40,590	23,543
Mean	3,004	2,186	1,553	784	619	1,232	4,256	6,856	11,480	4,156	1,309	785
Cfsm	2.66	1.94	1.38	0.695	0.549	1.09	3.77	6.08	10.2	3.68	1.16	0.696
In.	3.07	2.16	1.59	0.80	0.59	1.26	4.21	7.01	11.36	4.25	1.34	0.78
Ac-ft	184,700	130,100	95,500	48,180	35,630	75,750	253,200	421,600	683,200	255,500	80,510	46,700

Calendar year 1959: Max 24,700 Min 650 Mean 4,041 Cfsm 3.58 In. 48.63 Ac-ft 2,925,000
Water year 1959-60: Max 20,600 Min 418 Mean 3,183 Cfsm 2.82 In. 38.42 Ac-ft 2,311,000

Peak discharge (base, 8,700 cfs).--May 13 (12 m.) 18,600 cfs (8.30 ft); June 4 (9 a.m.) 21,500 cfs (9.10 ft); June 17 (5 a.m.) 16,300 cfs (7.67 ft); June 26 (6 a.m.) 9,160 cfs (5.54 ft).

* Discharge measurement made on this day.

3590. South Fork Flathead River at Spotted Bear ranger station, near Hungry Horse, Mont.

Location.--Lat 47°55'20", long 113°31'25", in SE¼SW¼ sec.17, T.25 N., R.15 W., on left bank 600 ft south of Spotted Bear ranger station, 1,000 ft upstream from Spotted Bear River, and 40 miles southeast of Hungry Horse.
Drainage area.--958 sq mi.
Records available.--August 1948 to September 1957, August 1959 to September 1960.
Gage.--Water-stage recorder. Altitude of gage is 3,670 ft (from river-profile map).
Average discharge.--10 years, 1,954 cfs (1,415,000 acre-ft per year).
Extremes.--1959: Maximum discharge during period August to September, 1,430 cfs Sept. 27 (gage height, 2.63 ft); minimum, 592 cfs Sept. 5 (gage height, 1.44 ft).
1959-60: Maximum discharge during water year, 16,200 cfs June 4 (gage height, 10.65 ft); minimum daily, 250 cfs Mar. 3.
1948-57, 1959-60: Maximum discharge, 21,200 cfs June 2, 1956; maximum gage height, 12.75 ft May 20, 1954; minimum discharge, less than 121 cfs Dec. 26, 1952 (stage below intake pipes).
Flood in May to June 1948 reached a stage of 14.00 ft about May 22 (discharge, 22,000 cfs, by slope-area measurement of peak flow).
Remarks.--Records excellent except those for periods of ice effect, no gage-height record, and those for period May 3-31, which are poor.
Revisions.--WSP 1216: Drainage area.

Discharge, in cubic feet per second, 1959

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	-	691	7	-	1,010	13	-	777	19	-	960	25	*730	934
2	-	664	8	-	1,050	14	-	747	20	-	928	26	696	1,350
3	-	630	9	-	1,090	15	-	879	21	-	891	27	686	1,410
4	-	603	10	-	*1,010	16	-	1,020	22	-	873	28	724	1,360
5	-	620	11	-	915	17	-	1,030	23	-	855	29	702	*1,250
6	-	843	12	-	837	18	-	994	24	-	825	30	664	1,170
												31	652	-
Total													-	28,216
Mean													-	941
Cubic feet per second per square mile													-	0.982
Runoff in inches													-	1.10
Runoff in acre-feet													-	55,970

* Discharge measurement made on this day.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,070	1,920	1,390	b530	488	*b315	1,640	1,520	9,190	4,680	893	492
2	1,010	1,760	1,300	b520	*b440	b280	1,470	*1,730	*9,760	4,580	932	*470
3	960	1,740	1,270	b500	b440	b250	1,420	1,990	13,900	3,980	942	462
4	941	1,720	1,190	b490	426	280	1,700	2,230	*15,000	3,660	915	466
5	928	1,490	1,090	b500	444	320	2,430	2,360	11,800	3,350	866	492
6	960	1,420	1,010	b520	444	350	3,740	2,500	10,000	3,180	816	502
7	1,050	1,400	1,100	b530	444	360	3,980	2,840	9,980	3,130	788	484
8	1,050	1,330	1,010	b530	418	370	4,190	3,340	8,660	3,080	783	470
9	1,200	1,280	825	b530	439	360	4,680	3,470	7,660	2,920	740	454
10	1,240	1,250	879	b520	439	350	5,410	4,140	7,580	2,690	700	438
11	1,220	1,240	1,000	b500	426	*350	4,780	6,740	7,900	2,490	665	422
12	1,760	1,120	954	b500	406	330	4,150	9,540	7,880	2,340	641	410
13	2,190	879	891	b480	406	320	3,610	12,200	*8,450	2,220	623	398
14	2,130	b820	819	430	398	320	3,250	8,950	8,510	2,140	605	394
15	3,430	b780	879	*b470	398	325	2,920	6,570	8,180	2,040	592	390
16	4,190	b740	948	b470	394	325	2,600	5,430	9,080	1,910	578	386
17	3,390	b750	885	b480	382	330	2,360	4,750	10,500	1,780	564	378
18	2,860	b800	848	460	b350	340	2,250	4,150	7,200	1,680	551	370
19	2,500	b850	825	440	b320	350	2,150	3,720	6,080	1,580	533	366
20	2,300	b920	759	b400	b360	370	2,060	3,420	5,970	1,500	515	350
21	2,220	b1,000	658	b400	b380	450	2,000	3,450	5,140	1,430	506	342
22	2,110	1,100	674	b400	b350	550	1,870	3,280	4,300	1,360	497	338
23	*2,840	1,420	674	b410	b320	850	1,780	3,110	3,750	1,280	556	346
24	2,920	1,920	741	b430	b340	1,250	1,670	2,960	3,800	1,210	569	354
25	4,200	2,370	777	460	b300	1,600	1,580	*2,830	4,780	1,130	596	350
26	4,260	2,200	724	500	b280	1,950	1,580	*2,780	5,360	1,070	600	342
27	3,600	1,860	598	520	b280	2,120	1,430	3,290	4,680	*1,010	592	*334
28	3,090	1,670	b530	530	b300	2,220	1,400	3,620	*4,460	970	574	326
29	2,690	1,670	*b500	530	b300	*2,090	1,380	3,910	4,470	948	544	322
30	2,340	1,530	b490	b540	------	2,030	1,400	4,680	4,490	926	515	318
31	2,090	------	b500	516	------	1,870	------	6,900	------	904	502	------
Total	68,739	40,949	26,739	15,036	11,112	23,575	76,790	132,400	228,510	67,168	20,295	11,966
Mean	2,217	1,365	863	485	383	760	2,560	4,271	7,617	2,167	655	399
Cfsm	2.31	1.42	0.901	0.506	0.400	0.793	2.67	4.46	7.95	2.26	0.684	0.416
In.	2.67	1.59	1.04	0.58	0.43	0.92	2.98	5.14	8.87	2.61	0.79	0.46
Ac-ft	136,300	81,220	53,040	29,820	22,040	46,760	152,300	262,600	453,200	133,200	40,250	23,730

Calendar year 1959: Max - Min - Mean - Cfsm - In. - Ac-ft -
Water year 1959-60: Max 15,000 Min 250 Mean 1,976 Cfsm 2.06 In. 28.08 Ac-ft 1,434,000

Peak discharge (base, 7,500 cfs).--May 13 (9 a.m.) 12,900 cfs (9.05 ft); June 4 (6 a.m.) 16,200 cfs (10.65 ft); June 17 (4:30 a.m.) 11,500 cfs (8.71 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Jan. 18, 19, 25-29, Mar. 4-26 (stage-discharge relation probably affected by ice most of periods); discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations.

3610. Sullivan Creek near Hungry Horse, Mont.

Location.--Lat 48°01'45", long 113°42'10", in W½ sec.12, T.26 N., R.17 W., on left bank a quarter of a mile downstream from Quintonkon Creek, 1 mile upstream from Hungry Horse Reservoir flow line, and 30 miles southeast of Hungry Horse.
Drainage area.--71.3 sq mi.
Records available.--September 1948 to September 1956, August 1959 to September 1960.
Gage.--Water-stage recorder. Altitude of gage is 3,740 ft (from topographic map).
Average discharge.--9 years, 220 cfs (159,300 acre-ft per year).
Extremes.--1959: Maximum daily discharge during period August to September, 380 cfs Sept. 27; minimum, 51 cfs Aug. 30, 31 (gage height, 1.27 ft).
1959-60: Maximum discharge during water year, 1,870 cfs June 3 (gage height, 4.49 ft); minimum daily, 25 cfs Feb. 27 to Mar. 4.
1948-56, 1959-60: Maximum discharge, 2,750 cfs May 19, 1954 (gage height, 5.29 ft); minimum daily, 10 cfs Nov. 26, 1952.
Flood in May to June 1948 reached a discharge of 2,280 cfs about May 22, by slope-area measurement of peak flow at a point 1,300 ft upstream.
Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor.
Revisions.--WSP 1216: Drainage area.

Discharge, in cubic feet per second, 1959

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	-	88	7	-	93	13	-	65	19	-	a90	25	*56	a150
2	-	64	8	-	98	14	-	64	20	-	a86	26	55	a350
3	-	58	9	-	a100	15	-	97	21	-	a83	27	58	a380
4	-	56	10	-	*80	16	-	95	22	-	a80	28	66	a320
5	-	68	11	-	74	17	-	a93	23	-	a78	29	56	*291
6	-	95	12	-	69	18	-	a91	24	-	a76	30	52	255
												31	70	-

Total	-	3,687
Mean	-	123
Cubic feet per second per square mile	-	1.73
Runoff in inches	-	1.92
Runoff in acre-feet	-	7,310

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	224	255	199	70	55	25	311	299	1,100	568	90	51
2	202	238	187	65	54	*25	267	*360	*1,310	500	137	*50
3	190	267	187	65	*54	25	279	400	1,690	440	98	47
4	181	248	172	65	54	25	370	445	*1,510	405	120	53
5	178	230	157	70	53	30	552	475	1,190	370	95	57
6	184	220	155	75	52	35	742	490	1,110	340	88	50
7	193	211	147	80	60	40	718	590	1,150	323	84	47
8	190	202	134	75	57	40	700	730	987	303	80	46
9	311	196	110	70	57	35	742	694	912	275	75	43
10	283	190	115	70	56	35	766	790	932	252	72	42
11	299	187	122	75	54	*40	656	1,100	952	227	69	40
12	612	155	116	75	53	40	557	1,480	1,020	211	65	39
13	618	144	111	80	53	35	475	1,470	*1,020	202	63	38
14	557	120	109	80	52	40	435	980	959	187	61	37
15	832	110	160	*77	52	45	375	760	1,330	175	61	35
16	736	100	172	75	52	45	335	661	1,430	160	60	35
17	584	110	155	70	49	44	307	596	1,200	147	58	34
18	470	120	147	65	45	45	299	515	856	139	56	32
19	395	*135	139	60	40	49	291	480	766	129	54	32
20	390	160	129	50	45	62	283	470	724	122	52	31
21	470	170	100	55	45	86	271	520	662	113	51	29
22	480	163	80	60	40	129	252	480	579	107	52	29
23	*520	267	75	65	35	205	238	440	530	102	66	41
24	510	440	80	65	40	227	224	400	574	97	64	35
25	606	574	90	60	35	299	211	*380	706	95	60	37
26	535	425	90	55	30	415	199	410	667	90	62	32
27	465	335	85	55	25	445	196	650	590	*88	69	*30
28	415	283	*77	60	25	460	202	700	*568	84	64	29
29	355	248	70	63	25	420	208	800	568	81	58	29
30	315	220	60	60	------	*460	241	900	557	78	57	29
31	283	------	70	56	------	385	------	1,000	------	78	54	------
Total	12,583	6,723	3,800	2,066	1,347	4,291	11,702	20,465	28,149	6,488	2,195	1,159
Mean	406	224	123	66.6	46.4	138	390	660	938	209	70.8	38.6
Cfsm	5.69	3.14	1.73	0.934	0.651	1.94	5.47	9.26	13.2	2.93	0.993	0.541
In.	6.56	3.51	1.98	1.08	0.70	2.24	6.10	10.67	14.68	3.38	1.14	0.60
Ac-ft	24,960	13,330	7,540	4,100	2,670	8,510	23,210	40,590	55,830	12,870	4,350	2,300

Calendar year 1959:	Max	-	Min	-	Mean	-	Cfsm	-	In.	-	Ac-ft	-
Water year 1959-60:	Max	1,690	Min	25	Mean	276	Cfsm	3.87	In.	52.64	Ac-ft	200,300

Peak discharge (base, 700 cfs).--Oct. 15 (10 a.m.) 938 cfs (3.49 ft); Apr. 10 (1 to 4 a.m.) 796 cfs (3.21 ft); May 12 (12 p.m.) 1,860 cfs (4.47 ft); June 3 (8 p.m.) 1,870 cfs (4.49 ft); June 16 (4 p.m.) 1,690 cfs (4.37 ft); June 25 (8 p.m.) 778 cfs (3.35 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 14-21, Dec. 9, 10, 21-31, Jan. 1-11, 14-28, Feb. 18 to Mar. 14.

3620. Hungry Horse Reservoir near Hungry Horse, Mont.

Location.--Lat 48°20'30", long 114°00'50", in NE¼NE¼NW¼ sec.27, T.30 N., R.19 W., in block 14 of Hungry Horse Dam, 3 miles southeast of Hungry Horse.

Drainage area.--1,654 sq mi.

Records available.--September 1951 to September 1960.

Gage.--Water-stage recorder equipped with remote indicator in powerhouse. Datum of gage is at mean sea level (levels by Bureau of Reclamation). During construction and prior to May 1, 1953, various types of nonrecording gages were used.

Extremes.--Maximum contents observed during year, 3,455,000 acre-ft Oct. 16 (elevation, 3,561.12 ft); minimum observed, 2,506,000 acre-ft May 1 (elevation, 3,517.22 ft).
1951-60: Maximum contents observed, 3,461,000 acre-ft July 3, 4, 1955, Aug. 6, 1956; maximum elevation observed, 3,561.40 ft July 3, 4, 1955; minimum contents observed since normal low operating level reached in May 1952, 607,700 acre-ft Jan. 13, 1953 (elevation, 3,362.50 ft).

Remarks.--Reservoir formed by concrete dam; construction of dam began in 1948, completed in 1952. Storage began Sept. 21, 1951. Capacity, 3,428,000 acre-ft between elevations 3,560 (controlled spillway elevation) and 3,196 ft. Dead storage, 40,140 acre-ft. Normal operating low level, 3,336 ft for on-site power generation (contents, 445,900 acre-ft, exclusive of dead storage). Water is used for power production, flood control, and irrigation. Figures given herein represent usable contents above elevation 3,196 ft.

Cooperation.--Daily elevations furnished by Bureau of Reclamation.

Capacity table, water year 1959-60 (elevation, in feet, and contents, in acre-feet)

3,500	2,186,000
3,520	2,560,000
3,540	2,974,000
3,565	3,548,000

Elevation, in feet, at 12 p.m., water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60.96	60.93	60.59	58.03	52.78	39.42	33.03	17.22	37.83	60.50	60.54	60.48
2	60.96	60.91	60.59	58.04	51.33	39.42	32.30	17.29	39.14	60.49	60.44	60.47
3	60.96	61.02	60.66	58.06	50.88	39.42	31.55	17.47	41.18	60.39	60.49	60.45
4	60.97	60.95	60.66	58.10	50.90	39.50	30.89	17.56	43.35	60.36	60.47	60.46
5	60.95	60.88	60.66	58.10	50.96	39.55	30.38	17.93	45.00	60.34	60.43	60.47
6	60.97	60.87	60.64	58.00	50.97	39.58	30.17	18.27	46.39	60.39	60.41	60.45
7	61.00	60.92	60.64	57.95	49.75	39.58	29.96	18.72	47.90	60.45	60.38	60.46
8	61.00	60.96	60.60	57.93	48.33	39.10	29.70	19.33	49.26	60.49	60.37	60.46
9	60.96	60.97	60.55	57.97	47.74	38.21	29.60	19.95	50.45	60.49	60.40	60.48
10	60.94	60.88	60.56	57.96	47.70	37.30	29.56	20.83	51.61	60.44	60.41	60.47
11	61.00	60.75	60.60	57.98	47.65	36.40	29.34	22.12	52.80	60.40	60.41	60.47
12	61.10	60.64	60.64	58.02	47.63	35.50	29.06	23.88	54.05	60.48	60.42	60.47
13	61.02	60.64	60.64	57.88	47.62	34.57	28.67	25.91	55.25	60.50	60.41	60.47
14	60.96	60.76	60.64	57.83	46.33	34.10	28.21	27.11	56.11	60.51	60.41	60.47
15	61.01	60.92	60.72	56.88	44.78	33.65	27.65	27.91	57.08	60.47	60.44	60.47
16	61.12	60.98	60.69	55.75	44.20	33.18	27.21	28.53	57.95	60.44	60.48	60.47
17	60.93	61.00	60.64	55.00	44.17	32.95	26.80	29.06	58.63	60.45	60.47	60.48
18	60.96	61.03	60.64	54.98	44.18	32.99	26.20	29.45	58.82	60.50	60.42	60.49
19	60.96	60.88	60.64	54.98	44.15	33.06	25.53	29.89	58.80	60.48	60.44	60.48
20	60.99	60.85	60.64	54.97	44.18	33.12	24.81	30.31	58.95	60.45	60.44	60.46
21	60.93	60.80	60.50	54.97	44.21	33.22	24.14	30.76	59.07	60.48	60.41	60.43
22	60.95	60.70	59.88	54.99	44.19	33.33	23.40	31.14	59.07	60.49	60.43	60.46
23	61.00	60.65	59.28	55.03	44.18	33.38	22.60	31.50	59.02	60.50	60.48	60.46
24	60.92	60.75	58.66	54.99	44.19	33.34	21.80	31.80	59.08	60.47	60.46	60.47
25	61.08	60.98	58.07	54.58	44.21	33.42	20.98	32.12	59.34	60.44	60.47	60.47
26	61.06	60.92	57.98	53.98	43.61	33.55	20.14	32.56	59.66	60.50	60.45	60.45
27	60.80	60.75	57.96	53.83	41.99	33.80	19.30	33.15	59.88	60.48	60.48	60.47
28	60.86	60.68	57.97	53.75	40.35	34.00	18.40	33.77	60.04	60.48	60.49	60.47
29	60.89	60.77	57.95	53.80	39.47	34.00	17.55	34.45	60.22	60.48	60.49	60.47
30	60.90	60.71	57.95	53.80	-------	34.00	17.26	35.26	60.45	60.48	60.49	60.47
31	61.00	-------	58.00	53.70	-------	33.76	-------	36.50	-------	60.50	60.48	-------
(†)	3,452	3,445	3,381	3,281	2,962	2,841	2,507	2,899	3,439	3,440	3,440	3,439
(‡)	+1,000	-7,000	-64,000	-100,000	-319,000	-121,000	-334,000	+392,000	+540,000	+1,000	0	-1,000

Calendar year 1959..... ‡ +126,000
Water year 1959-60..... ‡ -12,000

† Contents, in thousands of acre-feet, at end of month.
‡ Change in contents, in acre-feet.
Note.--Add 3,500 ft to obtain elevation above mean sea level.

3625. South Fork Flathead River near Columbia Falls, Mont.

Location.--Lat 48°21'30", long 114°02'15", in SW¼SE¼SW¼ sec.16, T.30 N., R.19 W., on right bank 1½ miles downstream from Hungry Horse Dam, 3½ miles upstream from mouth, and 7 miles east of Columbia Falls.

Drainage area.--1,663 sq mi.

Records available.--September 1910 to January 1911 (discharge measurements only), February 1911 to September 1913 (no winter records), October 1913 to August 1916 (scattered daily discharge only), April 1923 to November 1924 (no winter records), July to October 1925, May to November 1927, May 1928 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 3,040.0 ft above mean sea level (levels by Bureau of Reclamation). September 1910 to September 1916 chain gage and Apr. 23, 1923, to Sept. 30, 1928, water-stage recorder, at site 3 miles downstream at different datum. Oct. 1, 1928, to Sept. 30, 1952, water-stage recorder at site 1½ miles downstream at different datums.

Average discharge.--32 years (1928-60), 3,456 cfs (2,502,000 acre-ft per year), adjusted for storage.

Extremes.--Maximum discharge during year, 21,200 cfs Feb. 26 (gage height, 14.74 ft); minimum daily, 151 cfs Mar. 18.

1910-16, 1923-60: Maximum discharge observed, 46,200 cfs June 19, 1916 (gage height, 16.6 ft, site and datum then in use), from rating curve extended above 20,000 cfs; minimum observed, 7.3 cfs Sept. 24, 1951 (gage height, 0.52 ft, dam closure), site and datum then in use; minimum daily, 7.3 cfs Sept. 24, 1951.

Remarks.--Records excellent. Flow regulated since Sept. 21, 1951, by Hungry Horse Reservoir (see preceding page).

Revisions (water years).--WSP 1216: Drainage area. WSP 1316: 1923-24(M), 1926-27(M), 1932(M), 1935-36(M). WSP 1636: 1958 (adjusted runoff).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used above 5,600 cfs)

2.5	146	7.0	4,020
3.0	287	9.0	7,420
3.5	480	11.0	12,000
4.0	755	13.0	17,100
5.0	1,570	14.0	19,800

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,060	4,770	4,460	632	*11,800	1,040	11,600	3,820	3,750	7,990	1,580	832
2	2,220	3,470	2,550	955	18,100	676	11,600	3,850	5,320	9,530	3,530	1,010
3	1,910	3,300	2,470	936	6,040	669	11,600	3,350	4,800	8,600	1,060	1,010
4	1,920	4,820	2,490	868	856	170	11,600	4,170	3,160	7,180	1,840	800
5	1,920	3,930	2,480	1,430	677	574	11,600	2,360	3,070	6,710	1,980	926
6	1,940	2,820	2,480	2,980	805	648	11,600	*2,450	2,990	5,740	1,530	999
7	2,190	2,220	2,470	1,800	15,000	*574	11,600	2,360	1,890	5,210	1,710	820
8	2,840	2,230	*2,470	1,100	17,200	6,300	11,700	2,400	1,030	5,500	1,530	351
9	4,270	2,530	2,450	904	7,570	10,400	11,800	1,660	1,030	5,500	340	448
10	2,840	3,860	1,850	953	1,840	10,400	11,800	820	1,030	5,500	1,190	868
11	2,440	4,600	1,840	881	1,620	10,400	11,800	1,600	1,040	4,970	1,190	786
12	3,140	2,700	1,870	907	1,010	10,400	11,700	2,230	1,020	2,870	1,040	766
13	6,220	1,360	1,860	*2,930	1,130	10,400	11,700	4,250	1,980	4,280	1,040	592
14	5,550	495	1,870	997	15,300	6,030	*11,800	4,350	6,020	4,230	823	500
15	5,880	668	1,900	*11,900	18,100	5,790	11,800	4,360	5,870	4,280	826	526
16	8,000	719	2,430	14,100	7,310	5,820	9,950	4,460	8,290	3,960	190	538
17	8,870	2,030	2,470	10,100	1,340	3,170	9,820	4,340	11,500	2,880	1,030	555
18	4,920	3,420	2,470	951	745	*151	10,900	4,350	11,600	2,750	1,380	561
19	4,740	4,850	1,990	875	987	168	11,700	3,240	11,600	2,810	626	601
20	4,760	4,720	1,970	766	826	168	11,700	2,970	10,200	3,240	749	660
21	5,680	4,700	2,970	890	824	163	11,700	2,980	*8,790	2,260	737	514
22	*4,740	4,620	9,150	587	907	*163	11,700	3,060	8,820	2,200	606	204
23	5,650	4,590	8,680	960	834	1,580	11,700	2,990	8,240	2,150	761	*904
24	7,490	4,640	9,040	2,150	565	3,020	11,700	2,990	7,290	2,130	926	621
25	4,710	5,330	8,720	6,470	570	3,020	11,700	2,670	7,080	2,130	931	538
26	8,590	6,920	2,230	9,000	7,040	3,000	11,700	1,540	7,040	1,020	1,520	689
27	8,500	6,800	1,380	2,890	19,100	2,990	11,700	*1,760	7,020	*2,020	1,010	475
28	6,230	4,650	1,180	2,100	19,200	3,860	11,700	1,880	7,000	1,660	912	480
29	4,700	2,640	1,090	364	10,500	5,840	11,600	1,890	6,950	1,540	978	483
30	3,850	4,450	949	989	-------	6,050	6,160	1,890	7,040	1,470	943	522
31	2,940	-------	826	2,080	-------	7,460	-------	1,910	-------	1,420	*910	-------
Total	141,710	108,852	93,055	85,445	187,796	121,094	340,730	88,950	172,460	123,730	35,418	19,579
Mean	4,571	3,628	3,002	2,756	6,476	3,906	11,360	2,869	5,749	3,991	1,143	653
Ac-ft	281,100	215,900	184,600	169,500	372,500	240,200	675,800	176,400	342,100	245,400	70,250	38,830
(†)	+1,000	-7,000	-64,000	-100,000	-319,000	-121,000	-334,000	-692,000	+540,000	+1,000	0	-1,000

Adjusted for change in contents in Hungry Horse Reservoir

Mean	4,588	3,511	1,961	1,130	930	1,939	5,744	9,244	14,820	4,007	1,143	636
Cfsm	2.76	2.11	1.18	0.679	0.559	1.17	3.45	5.56	8.91	2.41	0.687	0.382
In.	3.18	2.36	1.36	0.78	0.60	1.34	3.85	6.41	9.95	2.78	0.79	0.43
Ac-ft	282,100	208,900	120,600	69,500	53,500	119,200	341,800	568,400	882,100	246,400	70,250	37,830

Observed

Calendar year 1959: Max 22,300 Min 495 Mean 5,457 Ac-ft 3,951,000
Water year 1959-60: Max 19,200 Min 151 Mean 4,150 Ac-ft 3,013,000

Adjusted

Calendar year 1959: Mean 5,631 Cfsm 3.39 In. 45.97 Ac-ft 4,077,000
Water year 1959-60: Mean 4,133 Cfsm 2.49 In. 33.83 Ac-ft 3,001,000

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Hungry Horse Reservoir, furnished by Bureau of Reclamation.

3630. Flathead River at Columbia Falls, Mont.

Location.--Lat 48°21'50", long 114°11'10", in NW¼SE¼ sec.17, T.30 N., R.20 W., on right bank 200 ft downstream from county bridge at Columbia Falls and 5 miles downstream from South Fork.

Drainage area.--4,464 sq mi.

Records available.--May 1922 to September 1923 (fragmentary), June 1928 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 2,978.00 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Nov. 12, 1928, wire-weight gage on bridge 200 ft upstream at datum 0.19 ft higher.

Average discharge.--32 years (1928-60), 9,530 cfs (6,899,000 acre-ft per year), adjusted for change in contents in Hungry Horse Reservoir since Oct. 1, 1951.

Extremes.--Maximum discharge during year, 46,400 cfs June 4 (gage height, 12.79 ft); minimum, 1,280 cfs Feb. 26 (gage height, 0.52 ft).

1922-23, 1928-60: Maximum discharge, 102,000 cfs May 23, 1948 (gage height, 19.08 ft); minimum, 798 cfs Dec. 8, 1929 (gage height, -0.08 ft).

Maximum stage known, 22.7 ft in June 1894, from floodmarks (discharge, 135,000 cfs, from rating curve extended above 85,000 cfs by logarithmic plotting).

Remarks.--Records excellent except those for periods of no gage-height record, which are fair. South Fork Flathead River, which contributes about one-third of flow, completely regulated by Hungry Horse Dam since Sept. 21, 1951 (see p. 232).

Revisions (water years).--WSP 1092: 1923. WSP 1216: Drainage area. WSP 1636: 1958 (adjusted runoff).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 13 to Nov. 2, Feb. 9, Feb. 14 to Mar. 17, Mar. 23 to Apr. 21, June 7-21, 23, 26, June 28 to Aug. 10, Aug. 30 to Sept. 30)

0.7	1,350	6.0	12,200
1.0	1,630	8.0	20,000
2.0	2,900	10.0	29,800
4.0	6,700	13.0	48,300

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,020	11,500	9,120	3,010	11,900	2,520	19,300	9,570	31,700	23,400	5,750	3,090
2	6,950	9,920	7,160	3,040	19,300	2,070	18,600	10,500	33,700	24,800	9,070	3,160
3	6,490	9,090	*6,890	3,000	9,260	1,870	18,400	11,100	41,900	22,500	6,180	3,150
4	6,260	10,700	6,680	3,140	2,950	1,410	19,300	12,100	44,200	20,400	6,380	2,950
5	6,170	9,150	6,400	3,560	2,520	1,910	21,400	10,800	37,100	19,300	6,630	3,260
6	6,200	7,890	6,140	5,360	2,490	2,050	25,500	*10,800	30,800	17,600	6,000	3,510
7	6,320	7,210	6,210	4,430	15,600	*1,980	26,900	11,500	*30,300	16,700	6,030	3,320
8	6,960	6,930	6,120	3,600	19,200	*6,800	26,700	14,400	28,100	16,800	5,310	2,830
9	8,440	6,940	5,560	3,100	11,200	12,600	27,800	15,300	25,500	16,500	4,280	2,780
10	7,540	8,050	4,910	3,070	3,970	12,600	30,000	14,900	24,400	15,800	4,670	3,110
11	6,550	8,610	5,270	3,050	3,650	12,500	29,200	20,000	25,100	14,600	4,600	2,980
12	7,350	6,810	5,290	3,230	2,930	12,500	27,500	29,800	25,300	11,900	4,350	2,860
13	10,600	4,560	5,110	4,880	2,990	12,500	25,800	39,600	26,500	13,000	4,240	2,650
14	10,800	3,300	4,850	2,860	16,200	8,340	*24,800	35,700	31,600	12,900	3,910	2,550
15	12,400	3,780	5,150	12,100	20,200	7,790	23,700	28,000	31,400	12,700	3,840	2,510
16	18,400	3,330	6,250	16,300	11,100	7,790	20,600	24,100	34,400	12,000	3,050	2,490
17	18,400	4,700	6,470	12,700	3,370	5,590	19,300	21,900	40,700	10,700	3,800	2,460
18	13,700	6,340	6,250	2,940	2,740	1,760	19,700	20,000	35,700	9,920	4,080	2,410
19	12,400	8,370	5,790	2,320	2,610	1,840	20,300	17,800	31,700	9,940	3,200	2,440
20	11,900	8,690	5,540	2,150	2,400	1,920	19,900	16,300	29,200	9,940	3,280	2,400
21	12,700	8,820	5,640	2,100	2,480	2,010	19,800	16,700	*26,400	8,810	3,230	2,250
22	*11,600	8,710	12,100	2,180	2,660	2,170	19,100	16,700	24,200	8,340	3,010	*1,920
23	12,600	8,820	11,600	2,360	2,450	3,860	18,700	15,900	22,300	8,020	3,140	2,530
24	14,600	9,770	12,000	3,810	2,180	6,290	18,300	15,000	21,000	7,650	3,330	2,280
25	14,100	12,100	12,200	7,580	2,070	7,190	17,900	14,100	23,100	7,250	3,290	2,210
26	20,200	14,200	5,940	11,000	6,830	8,540	17,500	12,500	24,600	6,210	3,960	2,360
27	19,200	13,100	4,480	*5,480	20,500	10,000	17,300	*13,900	23,000	*6,500	3,450	2,100
28	16,100	10,400	3,500	4,040	20,700	11,900	17,000	16,700	22,500	6,130	3,260	2,090
29	13,600	8,120	3,560	2,600	13,700	14,200	16,800	17,000	22,500	6,000	*3,260	2,040
30	11,800	9,200	3,080	2,820	-------	14,900	11,900	18,600	22,600	5,620	3,220	2,060
31	10,100	-------	3,130	3,900	-------	15,700	-------	23,600	-------	5,560	3,220	-------
Total	347,450	249,110	198,390	145,710	240,150	215,100	639,000	554,870	871,500	387,490	135,020	78,750
Mean	11,210	8,304	6,400	4,700	8,281	6,939	21,300	17,900	29,050	12,500	4,355	2,625
Ac-ft	689,200	494,100	393,500	289,000	476,300	426,600	‡1,267	‡1,101	‡1,729	768,600	267,800	156,200
(†)	+1,000	-7,000	-64,000	-100,000	-319,000	-121,000	-334,000	+392,000	+540,000	+1,000	0	-1,000

Adjusted for change in contents in Hungry Horse Reservoir

Mean	11,230	8,186	5,359	3,074	2,735	4,970	15,680	24,280	38,130	12,520	4,355	2,608
Cfsm	2.52	1.83	1.20	0.689	0.613	1.11	3.51	5.44	8.54	2.80	0.976	0.584
In.	2.90	2.05	1.38	0.79	0.66	1.28	3.92	6.27	9.53	3.23	1.12	0.65
Ac-ft	690,200	487,100	329,500	189,000	157,300	305,600	933,000	‡1,493	‡2,269	769,600	267,800	155,200

Observed

Calendar year 1959: Max 56,600 Min 2,620 Mean 13,970 Ac-ft 10,110,000
Water year 1959-60: Max 44,200 Min 1,410 Mean 11,100 Ac-ft 8,058,000

Adjusted

Calendar year 1959: Mean 14,150 Cfsm 3.17 In. 43.03 Ac-ft 10,240,000
Water year 1959-60: Mean 11,080 Cfsm 2.48 In. 33.78 Ac-ft 8,046,000

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Hungry Horse Reservoir, furnished by Bureau of Reclamation.
‡ Expressed in thousands.
Note.--No gage-height record Aug. 11-29: discharge estimated on basis of upstream Flathead River stations.

3700. Swan River near Bigfork, Mont.

Location.--Lat 48°01'30", long 113°58'40", in SE¼SW¼ sec.11, T.26 N., R.19 W., on left bank at outlet of Swan Lake, 1,000 ft downstream from Johnson Creek and 5 miles southeast of Bigfork.

Drainage area.--671 sq mi.

Records available.--October 1910 to May 1911 (gage heights only), April 1922 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 3,062.6 ft above mean sea level (river-profile survey). Oct. 10, 1910, to May 22, 1911, staff gage at site 10 miles upstream at different datum, Apr. 28, 1922, to Oct. 14, 1930, staff gage at site 800 ft upstream at datum 1.9 ft higher.

Average discharge.--38 years (1922-60), 1,123 cfs (813,000 acre-ft per year).

Extremes.--Maximum discharge during year, 5,500 cfs June 6 (gage height, 5.75 ft); minimum, 458 cfs Mar. 3 (gage height, 2.35 ft).
1922-60: Maximum discharge, 8,400 cfs May 24, 1948 (gage height, 7.12 ft, from graph based on gage readings); minimum observed, 193 cfs Jan. 26-29, 1930 (gage height, 0.04 ft, site and datum then in use).

Remarks.--Records excellent. Diversions for irrigation of about 360 acres above station.

Revisions (water years).--WSP 1216: Drainage area. WSP 1246: 1923-24(M), 1930. WSP 1316: 1923.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

2.3	425	4.0	2,290
2.5	560	5.0	4,040
3.0	1,020	6.0	6,010

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,260	1,730	*1,610	703	649	490	2,350	1,290	2,460	*2,920	1,060	712
2	1,210	1,610	1,480	685	640	484	2,260	1,260	2,910	3,010	1,130	703
3	1,160	1,580	1,420	676	640	470	2,170	1,310	3,500	3,070	1,130	694
4	1,110	1,600	1,360	685	632	484	2,170	1,400	4,320	2,960	1,160	694
5	1,060	*1,580	1,300	685	624	490	2,260	1,480	5,140	2,840	1,150	685
6	1,030	1,500	1,200	712	624	504	2,440	1,590	*5,400	2,720	1,100	*694
7	1,080	1,440	1,130	721	624	518	2,680	1,650	5,260	2,580	1,080	694
8	1,140	1,400	1,140	721	632	525	2,890	1,730	5,040	2,500	1,040	685
9	1,200	1,340	1,050	730	632	525	3,070	1,850	4,760	2,440	1,000	676
10	1,280	1,290	990	712	640	525	3,250	1,940	4,460	2,380	970	658
11	1,320	1,280	990	685	632	532	3,370	2,080	4,250	2,290	930	649
12	1,420	1,240	1,020	694	632	518	3,350	2,440	4,170	2,200	910	640
13	1,630	1,140	1,010	712	624	518	3,190	*3,030	*4,150	2,110	870	632
14	1,800	1,010	1,010	667	624	518	2,960	3,760	4,230	2,010	830	624
15	1,900	990	980	632	616	518	2,750	3,890	4,400	1,940	802	616
16	2,080	940	990	640	608	518	2,540	3,620	4,700	1,890	784	600
17	2,290	900	1,000	640	*616	511	2,380	3,320	5,100	1,820	775	600
18	2,290	950	1,000	632	600	511	2,180	3,070	5,340	1,760	766	592
19	2,160	1,020	990	608	576	511	2,070	2,870	5,000	1,700	757	576
20	2,040	1,120	970	584	560	525	2,030	2,630	4,460	1,610	721	560
21	1,970	1,280	920	553	584	539	1,970	2,490	4,140	1,550	703	553
22	1,890	1,410	890	553	584	568	1,960	2,340	3,790	1,500	694	546
23	1,850	1,460	850	568	568	608	1,870	2,200	3,430	1,460	694	546
24	1,820	1,600	830	600	560	658	1,760	2,100	3,070	1,400	721	553
25	1,850	1,800	840	632	560	757	1,660	2,030	2,820	1,340	721	553
26	2,030	1,990	870	667	525	920	1,590	1,930	2,840	*1,280	739	553
27	2,160	2,030	850	685	504	1,150	1,500	1,900	2,920	1,220	739	553
28	2,170	1,920	784	685	484	1,460	*1,430	1,940	2,910	1,170	748	539
29	2,100	1,800	757	676	484	*1,770	1,380	2,000	2,860	1,140	739	539
30	1,990	1,700	730	676	------	2,070	1,320	2,060	2,890	1,100	739	552
31	1,860	------	703	667	------	2,320	------	2,140	------	1,040	730	------
Total	52,150	42,650	31,664	20,486	17,278	23,015	68,800	69,340	120,720	60,950	26,932	18,451
Mean	1,682	1,422	1,021	661	596	742	2,293	2,237	4,024	1,966	889	615
Cfsm	2.51	2.12	1.52	0.985	0.888	1.11	3.42	3.33	6.00	2.93	1.30	0.917
In.	2.89	2.36	1.75	1.14	0.96	1.28	3.81	3.84	6.69	3.38	1.49	1.02
Ac-ft	103,400	84,600	62,800	40,630	34,270	45,650	136,500	137,500	239,400	120,900	53,420	36,600

Calendar year 1959: Max 7,380 Min 539 Mean 1,901 Cfsm 2.83 In. 38.47 Ac-ft 1,377,000
Water year 1959-60: Max 5,400 Min 470 Mean 1,509 Cfsm 2.25 In. 30.61 Ac-ft 1,096,000

* Discharge measurement made on this day.

3710. Flathead Lake at Somers, Mont.

Location.--Lat 48°04'30", long 114°13'30", in SE¼NE¼ sec.26, T.27 N., R.21 W., at steamboat dock at Somers.

Drainage area.--7,086 sq mi.

Records available.--April to August 1900, daily lake elevations only, at site near Holt, 6 miles east of Somers (datum unknown). August 1908 to November 1909 (fragmentary), January 1910 to September 1960. Month-end contents only for some periods, published in WSP 1316. Published as "at Polson" prior to April 1923.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (Somers datum). July 1 to Dec. 12, 1923, staff gage at same site and datum.

Extremes.--Maximum contents during year, 1,820,000 acre-ft Sept. 4 (elevation, 2,893.23 ft); minimum, 829,300 acre-ft Mar. 27 (elevation, 2,885.16 ft).
1908-60: Maximum contents, 2,208,000 acre-ft June 19, 1933 (elevation, 2,896.26 ft); minimum, 347,000 acre-ft Dec. 5, 1936 (elevation, 2,881.07 ft).
Revisions.--The minimum elevation for the water year 1959 has been revised to 2,884.02 ft, superseding figure published in WSP 1636.

Remarks.--Since April 1938, lake elevation has been subject to regulation by Kerr Dam, 4 miles below lake outlet. During normal operation, lake level is generally held between elevations 2,883 and 2,893 ft. Figures given herein represent usable contents above 2,878 ft (elevation of natural outlet).

Capacity table, water year 1959-60 (elevation, in feet, and contents, in acre-feet)

2,885	810,100	2,891	1,541,000
2,887	1,051,000	2,893	1,791,000
2,889	1,294,000	2,894	1,917,000

Elevations, in feet, at 12 p.m., water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	92.95	92.86	92.40	90.90	89.26	88.18	85.59	87.42	89.38	93.04	92.95	92.86
2	92.95	92.88	92.41	90.80	89.44	88.05	85.72	87.59	89.60	93.05	92.95	92.88
3	92.95	92.89	92.39	90.75	89.48	87.88	85.80	87.43	89.90	93.04	93.00	92.88
4	92.99	92.93	92.35	90.60	89.38	87.69	85.95	87.52	90.31	92.94	93.05	93.03
5	92.96	92.88	92.28	90.55	89.28	87.58	86.08	87.63	90.70	92.91	93.04	92.96
6	92.92	92.85	92.23	90.52	89.19	87.47	86.25	87.75	91.03	92.93	92.97	92.93
7	92.87	92.80	92.20	90.47	89.28	87.36	86.50	87.89	91.28	92.98	93.00	92.88
8	92.95	92.77	92.12	90.45	89.40	87.27	86.74	88.07	91.60	93.01	92.92	92.86
9	92.97	92.77	92.04	90.40	89.52	87.33	86.95	88.24	91.90	93.04	92.85	92.83
10	92.99	92.82	91.95	90.30	89.45	87.34	87.20	88.41	92.18	93.06	92.84	92.80
11	93.01	92.81	91.90	90.17	89.35	87.32	87.41	88.65	92.38	92.98	92.78	92.78
12	92.96	92.76	91.82	90.10	89.26	87.21	87.82	89.10	92.49	92.88	92.77	92.77
13	92.97	92.71	91.78	90.01	89.16	87.12	87.80	89.56	92.63	92.90	92.71	92.73
14	92.98	92.66	91.71	89.92	89.21	86.98	87.84	89.79	92.83	92.90	92.65	92.69
15	92.99	92.61	91.65	89.83	89.35	86.80	87.96	89.82	92.93	92.92	92.66	92.60
16	93.00	92.48	91.56	89.94	89.44	86.62	88.01	89.82	92.98	92.93	92.67	92.57
17	92.99	92.38	91.53	90.05	89.34	86.45	88.07	89.75	93.01	92.95	92.67	92.61
18	92.96	92.39	91.49	89.95	89.24	86.25	87.99	89.70	92.96	92.96	92.67	92.63
19	92.94	92.48	91.43	89.81	89.13	86.07	87.99	89.62	92.94	92.96	92.67	92.58
20	93.02	92.52	91.34	89.63	89.02	85.90	87.99	89.57	93.12	92.98	92.65	92.55
21	93.06	92.55	91.21	89.49	88.90	85.75	88.00	89.49	93.08	92.96	92.66	92.53
22	93.04	92.52	91.13	89.33	88.79	85.63	88.08	89.38	92.95	92.91	92.68	92.53
23	93.00	92.48	91.11	89.23	88.65	85.47	88.04	89.32	92.98	92.93	92.68	92.54
24	93.02	92.50	91.13	89.18	88.43	85.34	87.89	89.27	93.02	92.93	92.66	92.51
25	92.98	92.50	91.20	89.12	88.28	85.25	87.82	89.13	93.01	92.91	92.70	92.50
26	93.01	92.51	91.16	89.20	88.12	85.21	87.77	89.00	93.03	92.89	92.76	92.50
27	93.01	92.51	91.11	89.25	88.18	85.17	87.71	88.98	93.03	92.86	92.81	92.50
28	92.95	92.49	91.07	89.24	88.29	85.20	87.67	89.05	93.01	92.81	92.82	92.47
29	92.86	92.45	91.05	89.23	88.30	85.31	87.62	89.12	93.02	92.75	92.85	92.44
30	92.82	92.40	91.01	89.21	-------	85.40	87.55	89.13	93.03	92.72	92.85	92.42
31	92.85	-------	90.95	89.24	-------	85.48	-------	89.18	-------	92.70	92.85	-------
(†)	1,772	1,715	1,535	1,324	1,209	867.8	1,118	1,316	1,795	1,753	1,772	1,718
(‡)	-10,000	-57,000	-180,000	-211,000	-115,000	-341,200	+250,200	+198,000	+479,000	-42,000	+19,000	-54,000

Calendar year 1959..... ‡ +57,000
Water year 1959-60..... ‡ -64,000

† Contents, in thousands of acre-feet, at end of month, above 2,878 ft.
‡ Change in contents, in acre-feet.
Note.--Add 2,800 ft to obtain elevation above mean sea level.

3720. Flathead River near Polson, Mont.

Location.--Lat 47°40'50", long 114°15'10", in NW¼SE¼ sec.11, T.22 N., R.21 W., on left bank half a mile downstream from Kerr Dam, 4 miles west of Polson, and 5 miles downstream from Flathead Lake.

Drainage area.--7,096 sq mi.

Records available.--July 1907 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,693.70 ft above mean sea level (levels by The Montana Power Co.). Prior to Oct. 1, 1941, staff and chain gages or water-stage recorder at several sites near highway bridge at old site of Michell's ferry 6 miles downstream from present site, all at datum 2,629.20 ft above mean sea level (river-profile survey).

Average discharge.--53 years, 11,600 cfs (8,398,000 acre-ft per year), adjusted since Oct. 1, 1952, for change in contents in Hungry Horse Reservoir and Flathead Lake.

Extremes.--Maximum discharge during year, 55,000 cfs June 18 (gage height, 16.13 ft); minimum daily, 2,150 cfs Aug. 26.
1907-60: Maximum discharge, 82,800 cfs May 29, 1928 (gage height, 17.2 ft, site and datum then in use); minimum, probably less than 5 cfs Apr. 13, 1938; minimum daily, 32 cfs Apr. 12, 1938.

Remarks.--Records excellent. Diversions above station for irrigation of about 10,000 acres. Flathead project pumps can divert up to 12,000 acre-ft per month when required for irrigation of lands downstream from station. Flow regulated by Flathead Lake (Kerr Dam) since April 1938 (see p. 236) and Hungry Horse Reservoir since September 1951 (see p. 232).

Revisions (water years).--WSP 652: 1926. WSP 752: 1932. WSP 1182: 1948. WSP 1216: Drainage area. WSP 1246: 1928(M). WSP 1636: 1958 (adjusted runoff).

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,570	12,300	11,300	9,650	7,200	13,200	14,200	22,400	27,300	29,300	5,300	2,710
2	8,660	11,500	10,500	10,200	11,500	13,600	14,800	16,400	24,700	30,100	5,200	3,520
3	8,500	10,300	10,700	9,480	10,900	14,700	14,400	10,300	25,300	30,000	7,440	3,240
4	4,980	13,200	11,000	12,000	10,500	14,000	15,500	10,200	25,500	31,500	6,740	3,580
5	6,830	13,800	11,100	9,290	12,100	12,300	16,000	9,460	25,000	27,400	7,120	3,400
6	13,100	12,600	10,300	8,150	8,830	9,490	17,000	7,270	21,900	22,000	10,400	*4,040
7	12,200	13,000	11,800	7,440	7,280	11,700	17,700	7,530	20,400	21,400	6,200	5,450
8	7,400	10,800	12,400	7,540	12,000	10,400	18,700	6,280	18,400	18,900	10,400	6,020
9	7,240	8,830	12,900	7,820	10,800	10,500	20,000	8,220	15,300	19,000	9,980	5,450
10	6,760	5,790	12,900	10,300	11,500	11,100	20,800	8,060	15,400	18,700	8,820	5,510
11	9,900	10,100	11,600	12,400	11,100	13,300	22,100	8,180	20,800	23,600	10,500	5,380
12	13,800	13,600	10,600	11,900	11,200	20,300	22,700	7,800	26,700	21,600	5,560	5,160
13	11,500	10,800	10,100	11,000	9,810	21,200	*23,700	15,400	*25,700	18,800	7,700	6,600
14	13,600	6,910	11,600	11,600	8,980	21,100	24,000	27,800	27,600	16,200	9,000	5,870
15	*13,000	10,200	10,500	12,900	11,700	20,500	24,800	35,900	33,300	15,000	4,950	5,960
16	18,800	13,300	10,800	13,100	10,600	19,600	25,500	*37,400	40,100	14,800	3,630	6,150
17	22,700	12,500	*10,500	9,820	10,400	19,300	25,200	32,800	46,600	13,400	3,680	3,660
18	20,900	8,450	*10,800	12,200	10,700	18,200	25,500	32,600	51,300	12,400	3,790	2,600
19	17,000	5,340	11,800	13,000	11,600	17,000	25,200	32,600	43,100	12,700	4,070	3,720
20	12,300	*9,940	13,600	14,000	10,400	15,900	25,600	30,600	30,500	12,500	3,460	3,360
21	12,500	12,300	15,200	13,700	9,760	15,600	25,600	28,700	37,500	12,300	3,250	3,440
22	14,700	14,000	17,200	13,800	12,200	14,500	26,200	28,400	40,100	13,100	3,200	3,420
23	16,500	14,000	15,900	9,820	13,500	13,600	25,900	28,600	28,500	9,520	2,500	3,840
24	17,200	13,400	12,400	8,190	14,000	13,100	25,200	27,600	27,300	8,320	4,390	3,160
25	17,400	13,100	10,500	11,900	*14,100	*12,700	25,400	27,300	28,300	8,460	2,400	2,510
26	20,300	15,200	11,000	8,000	14,800	12,600	25,000	26,800	30,400	*9,600	2,150	2,540
27	23,200	16,600	9,460	5,660	14,600	12,500	24,800	21,500	30,400	10,200	2,230	3,500
28	23,500	15,800	6,050	*5,670	14,700	12,300	24,500	15,900	29,100	10,400	2,660	3,540
29	23,100	15,400	6,480	5,450	14,100	12,600	24,000	18,500	28,800	10,800	2,810	5,080
30	17,300	13,900	7,120	4,100	-------	13,000	23,300	22,500	29,000	9,200	2,670	5,000
31	10,900	-------	6,890	3,260	-------	12,800	-------	25,500	-------	9,140	3,220	-------
Total	433,340	356,960	345,000	303,340	330,860	452,690	663,300	638,500	874,300	520,340	163,420	127,410
Mean	13,980	11,900	11,130	9,785	11,410	14,600	22,110	20,600	29,140	16,790	5,336	4,247
Ac-ft	859,500	708,000	684,300	601,700	656,300	897,900	‡1,316	‡1,266	‡1,734	‡1,032	323,100	252,700
(†)	-9,000	-64,000	-244,000	-311,000	-434,000	-462,200	-83,800	+590,000	‡+1,019	-41,000	+19,000	-55,000

Adjusted for change in contents in Hungry Horse Reservoir and Flathead Lake

Mean	13,830	10,820	7,161	4,728	3,865	7,086	20,710	30,180	46,270	16,120	5,645	3,322
Cfsm	1.95	1.52	1.01	0.666	0.545	0.999	2.92	4.25	6.52	2.27	0.796	0.468
In.	2.25	1.70	1.16	0.77	0.59	1.15	3.26	4.90	7.27	2.62	0.92	0.52
Ac-ft	850,500	644,000	440,300	290,700	222,300	435,700	‡1,232	‡1,856	‡2,753	991,000	347,100	197,700

Observed

Calendar year 1959: Max 52,400 Min 2,540 Mean 17,440 Ac-ft 12,630,000
Water year 1959-60: Max 51,300 Min 2,150 Mean 14,240 Ac-ft 10,340,000

Adjusted

Calendar year 1959: Mean 17,700 Cfsm 2.49 In. 33.85 Ac-ft 12,810,000
Water year 1959-60: Mean 14,130 Cfsm 1.99 In. 27.11 Ac-ft 10,260,000

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Hungry Horse Reservoir (furnished by Bureau of Reclamation) and Flathead Lake (furnished by The Montana Power Co.).
‡ Expressed in thousands.

3890. Clark Fork near Plains, Mont.

Location.--Lat 47°25'50", long 114°51'20", in SW¼ sec.1, T.19 N., R.26 W., on right bank 2 miles southeast of Plains and 6 miles downstream from Flathead River.

Drainage area.--19,958 sq mi.

Records available.--October 1910 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 2,449.34 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Nov. 28, 1911, wire-weight gage at site 50 ft upstream at same datum.

Average discharge.--50 years, 19,570 cfs (14,170,000 acre-ft per year).

Extremes.--Maximum discharge during year, 76,100 cfs June 19 (gage height, 13.22 ft); minimum, 5,310 cfs Sept. 28 (gage height, 3.32 ft).
1910-60: Maximum discharge, 134,000 cfs June 5, 1948 (gage height, 19.17 ft); minimum, 3,200 cfs Feb. 8, 1936, Dec. 10, 1940; minimum gage height, 2.70 ft (from partly estimated gage-height record) Sept. 2, 1958.

Remarks.--Records good except those for periods of ice effect, which are poor. Flow partly regulated by Flathead Lake (see p. 236) and by Hungry Horse Reservoir (see p. 232). Diversions for irrigation of about 335,000 acres above station.

Revisions (water years).--WSP 1246: Drainage area.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Oct. 1 to Nov. 25, Dec. 4 to Feb. 16, Mar. 12 to Apr. 15, Aug. 20 to Sept. 19)

3.5	5,760	11.0	53,300
5.0	12,100	15.0	95,700
8.0	28,500		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15,500	20,800	21,000	12,700	8,980	b17,000	24,000	32,600	45,800	38,200	12,500	*7,420
2	*14,000	22,200	19,300	b14,500	12,500	b15,700	24,500	32,200	51,700	38,000	10,200	7,040
3	15,300	20,600	18,600	b15,000	16,200	b15,800	24,400	24,700	51,700	38,200	9,650	7,340
4	15,000	20,200	18,600	b14,500	15,900	b17,000	24,400	22,300	58,300	38,800	11,100	7,550
5	11,800	22,800	18,600	b16,500	16,000	b16,500	25,500	23,200	60,200	38,100	11,000	7,510
6	13,600	22,300	18,200	15,300	16,300	15,600	28,000	23,200	*59,600	32,800	11,500	7,720
7	20,300	21,000	17,800	14,100	14,100	13,600	31,600	22,400	53,100	28,800	13,900	8,010
8	17,400	21,300	18,800	13,500	13,100	15,900	35,300	23,500	50,000	27,100	*10,300	9,520
9	15,100	18,800	19,200	13,500	16,800	14,800	38,000	23,000	45,100	24,600	14,000	9,860
10	15,200	16,800	19,400	14,100	15,700	14,900	40,600	25,400	40,000	24,800	13,300	9,730
11	15,000	14,300	19,100	b15,000	16,000	15,500	41,800	26,800	38,400	24,800	12,800	9,610
12	19,600	19,400	18,200	b16,500	15,700	18,800	42,200	31,400	44,400	29,600	13,700	9,560
13	25,400	19,200	17,700	b16,200	15,700	23,800	41,200	37,300	50,200	25,000	9,650	8,930
14	22,900	16,600	17,300	b15,700	14,600	24,100	40,900	52,400	47,000	23,100	11,400	10,200
15	24,900	b13,000	18,400	b15,500	13,600	24,600	39,800	64,800	51,000	20,300	12,100	9,940
16	24,300	b15,500	17,600	b16,000	15,900	23,800	39,400	65,300	57,100	19,600	8,850	9,520
17	31,200	b18,000	17,900	b16,000	14,700	23,000	39,200	*61,400	67,300	19,000	7,460	9,940
18	34,300	b18,000	17,700	b14,500	14,300	23,700	*38,300	54,900	72,500	*17,600	7,340	7,340
19	31,200	14,800	17,900	b15,500	14,800	22,800	38,200	52,900	73,500	17,000	7,420	6,560
20	25,700	12,600	19,000	b16,000	15,200	22,600	37,700	50,500	56,700	16,900	7,670	6,720
21	22,500	17,800	20,100	b16,200	14,300	22,300	37,500	47,000	49,500	16,300	7,170	7,250
22	22,800	21,500	*21,800	b16,500	13,800	22,500	37,500	45,200	54,100	16,200	6,800	6,520
23	25,100	22,200	22,700	b17,000	16,200	*22,300	37,600	43,800	52,100	16,500	6,840	6,880
24	27,700	23,000	21,600	b15,000	17,200	22,900	36,800	43,300	*38,800	13,200	6,360	6,920
25	30,200	24,000	17,400	13,600	*17,400	24,000	36,000	42,000	40,900	12,200	7,420	6,840
26	29,400	25,000	17,000	*17,000	b17,000	24,300	35,500	41,200	39,600	12,500	6,960	6,160
27	34,200	26,500	17,300	13,900	b17,500	24,600	35,000	40,200	43,100	13,200	6,720	5,800
28	*36,100	25,500	15,400	11,600	b17,000	25,200	34,600	33,000	39,500	13,800	6,280	*6,320
29	34,600	24,300	11,900	11,500	b17,200	25,300	34,000	30,600	39,200	13,800	6,920	6,560
30	34,700	*23,600	11,700	11,400	-------	24,800	33,600	35,100	38,000	14,000	7,210	8,050
31	25,000	-------	12,800	10,000	-------	24,800	-------	39,700	-------	12,800	6,800	-------
Total	730,000	601,600	560,000	454,300	443,680	642,500	‡1,053.1	‡1,191.3	‡1,508.4	697,200	291,320	237,320
Mean	23,550	20,050	18,060	14,650	15,300	20,730	35,100	38,430	50,280	22,490	9,397	7,911
Ac-ft	‡1,448	‡1,193	‡1,111	901,100	880,000	‡1,274	‡2,089	‡2,363	‡2,992	‡1,383	577,800	470,700

Calendar year 1959: Max 92,400 Min 6,400 Mean 28,390 Ac-ft 20,550,000
Water year 1959-60: Max 73,500 Min 5,800 Mean 22,980 Ac-ft 16,680,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
b Stage-discharge relation affected by ice.

3895. Thompson River near Thompson Falls, Mont.

Location.--Lat 47°35'35", long 115°13'40", in NE¼ sec.7, T.21 N., R.28 W., on right bank 1 mile upstream from mouth and 6 miles east of Thompson Falls.

Drainage area.--642 sq mi.

Records available.--March to September 1911, October 1911 to September 1916 (occasional gage heights, discharges, and discharge measurements), April 1956 to September 1960. Records for January and February 1911, published in WSP 916, have been found to be in error and should not be used.

Gage.--Water-stage recorder. Altitude of gage is 2,410 ft (from topographic map). October 1911 to September 1916 staff gage at site a quarter of a mile upstream at different datum.

Extremes.--Maximum discharge during year, 2,670 cfs May 13 (gage height, 5.32 ft); minimum, 137 cfs Feb. 26 (gage height, 1.57 ft).
1956-60: Maximum discharge, 4,960 cfs May 21, 1956 (gage height, 7.77 ft); minimum, 89 cfs Jan. 1, 1958; minimum gage height, 1.29 ft Jan. 17, 1957.
Flood in May to June 1948 reached a discharge of 6,190 cfs, by slope-area measurement at site a quarter of a mile downstream.

Remarks.--Records good except those for periods of ice effect, which are poor.

Cooperation.--Water-stage-recorder graph furnished by Washington Water Power Co.

Revisions (water years).--WSP 1246: 1911. See also Records available.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 4 to May 4)

1.7	152	4.0	1,470
2.0	238	5.0	2,320
2.5	445	6.0	3,240
3.0	735		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	283	311	*418	210	232	b160	842	780	1,440	591	343	*249
2	275	307	409	b180	242	b165	768	814	1,550	567	418	245
3	271	323	409	b210	235	175	754	905	1,800	544	364	242
4	264	343	391	b235	229	192	828	1,020	1,840	522	335	252
5	260	315	347	249	229	192	982	1,180	1,720	511	331	256
6	264	315	343	256	229	195	1,250	1,320	*1,560	489	323	249
7	271	311	373	249	252	198	1,430	1,410	1,500	484	335	242
8	275	303	335	245	245	198	1,530	1,500	1,360	467	327	235
9	343	303	299	245	242	198	1,740	1,480	1,220	456	*315	235
10	364	299	323	204	245	198	1,880	1,490	1,140	445	311	232
11	368	303	351	245	238	201	1,730	1,800	1,120	436	303	229
12	456	283	339	252	232	198	1,530	2,290	1,100	422	295	226
13	462	181	327	204	235	198	1,350	2,600	1,070	418	295	226
14	418	226	315	192	229	204	1,270	2,320	1,060	418	291	222
15	422	242	323	232	232	210	1,190	1,920	1,060	404	287	222
16	427	192	347	238	229	207	1,100	1,660	*1,120	396	283	222
17	404	242	327	207	219	213	1,020	1,480	1,140	382	283	219
18	382	268	319	b185	204	219	*996	*1,370	996	*373	279	219
19	360	279	311	b180	201	232	961	1,240	912	364	271	216
20	347	303	303	b175	226	260	940	1,160	856	360	268	213
21	343	347	*291	b200	232	295	954	1,120	807	351	264	210
22	343	360	287	b210	222	*355	912	1,070	761	347	264	210
23	335	440	287	226	207	436	905	1,020	711	339	271	213
24	335	561	283	226	*216	533	905	1,030	687	335	271	213
25	343	735	291	*219	201	651	884	1,030	681	335	275	213
26	343	663	283	226	160	814	849	989	669	323	275	210
27	339	544	222	226	b155	898	828	1,030	651	319	271	207
28	339	494	245	226	b160	989	814	1,070	627	311	268	207
29	*339	494	222	232	b165	975	787	1,100	609	307	268	*204
30	327	456	260	238	------	996	774	1,160	597	307	260	201
31	319	------	260	238	------	933	------	1,290	------	311	252	------
Total	10,621	10,743	9,840	6,860	6,343	11,888	32,703	41,648	32,364	12,634	9,196	6,739
Mean	343	358	317	221	219	383	1,090	1,343	1,079	408	297	225
Cfsm	0.534	0.558	0.494	0.344	0.341	0.597	1.70	2.09	1.68	0.636	0.463	0.350
In.	0.62	0.62	0.57	0.40	0.37	0.69	1.89	2.41	1.87	0.73	0.53	0.39
Ac-ft	21,070	21,310	19,520	13,610	12,580	23,580	64,870	82,610	64,190	25,060	18.240	13,370

Calendar year 1959: Max 2,930 Min 181 Mean 676 Cfsm 1.05 In. 14.27 Ac-ft 489,200
Water year 1959-60: Max 2,600 Min 155 Mean 523 Cfsm 0.815 In. 11.09 Ac-ft 380,000

Peak discharge (base, 2,000 cfs).--May 13 (9:30 a.m.) 2,670 cfs (5.32 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

3907. Prospect Creek at Thompson Falls, Mont.

Location.--Lat 47°35'15", long 115°21'20", in lot 12, SE¼SE¼SE¼ sec.7, T.21 N., R.29 W., on right bank 500 ft downstream from Dry Creek, half a mile upstream from mouth, and half a mile south of Thompson Falls.

Drainage area.--182 sq mi.

Records available.--April 1956 to September 1960. February 1911 to September 1916 (fragmentary) at site 500 ft upstream, records not equivalent owing to inflow.

Gage.--Water-stage recorder. Altitude of gage is 2,400 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,490 cfs May 13 (gage height, 5.59 ft); minimum, 64 cfs Sept. 27-30.
1956-60: Maximum discharge, 2,860 cfs May 21, 1956 (gage height, 7.60 ft); minimum, 36 cfs Jan. 1, 1958 (gage height, 0.69 ft).
Flood in May to June 1948 reached a discharge of 2,800 cfs, from contracted-opening measurement of peak flow at site above Dry Creek 500 ft upstream.

Remarks.--Records good.

Cooperation.--Water-stage-recorder graph furnished by Washington Water Power Co.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

1.0	59	4.0	690
1.5	112	5.0	1,160
2.0	177	6.0	1,760 .
3.0	380		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*77	165	*523	140	98	96	620	398	868	251	124	*75
2	76	159	298	132	98	92	535	442	935	239	122	75
3	75	174	279	134	98	92	496	1,120	228	110	74	74
4	75	223	261	132	97	97	517	529	1,110	217	106	77
5	75	210	241	131	97	94	655	568	975	208	104	76
6	75	205	228	130	97	96	855	606	*864	198	101	75
7	76	196	219	128	105	96	990	676	828	190	100	74
8	76	187	207	128	107	94	1,050	788	729	182	97	73
9	90	179	196	125	107	92	1,190	788	655	174	*96	73
10	98	172	188	122	106	91	1,200	824	613	166	93	72
11	125	168	185	122	106	90	1,000	1,110	606	162	93	71
12	245	166	182	123	104	89	832	1,390	592	154	91	72
13	295	147	172	117	105	88	721	1,430	574	149	91	71
14	267	140	165	112	104	88	690	1,130	560	146	90	71
15	265	140	180	116	107	88	624	891	578	140	90	70
16	253	132	205	117	106	86	560	778	*638	137	89	69
17	232	132	196	115	105	87	514	711	685	134	89	69
18	215	134	193	108	104	89	499	*655	557	128	86	67
19	196	134	188	104	102	92	*478	596	487	*126	85	67
20	185	141	185	100	102	98	478	568	451	124	84	67
21	185	171	*182	104	104	108	487	560	418	123	82	67
22	188	195	177	106	104	*132	475	535	372	122	82	67
23	200	313	174	106	102	165	481	514	340	119	84	67
24	208	538	172	106	*101	263	457	496	323	117	85	66
25	217	757	174	*104	100	463	436	472	315	116	84	66
26	208	733	166	102	97	613	418	457	304	114	82	66
27	202	588	158	101	96	694	400	514	289	112	82	65
28	198	478	154	101	94	774	390	585	279	107	80	64
29	*191	408	148	101	97	741	375	599	267	106	79	*64
30	180	360	146	100	------	801	375	655	257	106	78	64
31	172	------	144	99	------	725	------	745	------	106	77	------
Total	5,220	7,845	6,086	3,562	2,950	7,314	18,798	21,506	17,577	4,701	2,836	2,094
Mean	168	262	196	115	102	236	627	694	586	152	91.5	69.8
Cfsm	0.923	1.44	1.08	0.632	0.560	1.30	3.45	3.81	3.22	0.835	0.503	0.384
In.	1.07	1.60	1.24	0.73	0.60	1.49	3.84	4.39	3.59	0.96	0.58	0.43
Ac-ft	10,350	15,560	12,070	7,070	5,850	14,510	37,290	42,660	34,860	9,320	5,630	4,150

Calendar year 1959: Max 1,790 Min 74 Mean 350 Cfsm 1.92 In. 26.03 Ac-ft 253,100
Water year 1959-60: Max 1,430 Min 64 Mean 275 Cfsm 1.51 In. 20.52 Ac-ft 199,300

Peak discharge (base, 1,000 cfs).--Apr. 10 (1 to 2:30 a.m.) 1,270 cfs (5.21 ft); May 13 (7 a.m.) 1,490 cfs (5.59 ft); June 4 (5 a.m.) 1,170 cfs (5.03 ft).

* Discharge measurement made on this day.

3920. Clark Fork at Whitehorse Rapids, near Cabinet, Idaho

Location.--Lat 48°05'25", long 116°03'50", in NE¼SW¼ sec.27, T.55 N., R.3 E., on left bank at Cabinet, 0.4 mile downstream from Cabinet Gorge Dam, 1.7 miles downstream from Blue Creek, and 6.5 miles southeast of Clark Fork. Measuring cableway 0.4 mile downstream. Discharge computed at Whitehorse Rapids, 2.7 miles downstream.

Drainage area.--22,067 sq mi, based on revised area of 22,006 sq mi for site near Heron.

Records available.--September 1928 to September 1960. Prior to October 1952, published as Clark Fork near Heron, Mont.

Gage.--Water-stage recorder. Datum of gage is 2,000.00 ft above mean sea level, datum of 1929, supplementary adjustment of 1947, levels by Washington Water Power Co. Prior to Oct. 30, 1928, staff gage and Oct. 30, 1928, to Apr. 8, 1952, water-stage recorder, at site near Heron, 4 miles upstream at datum 88.00 ft higher prior to Jan. 2, 1931, and 78.00 ft higher thereafter. Apr. 9 to Sept. 30, 1952, staff gage just upstream from present site at approximately same datum.

Average discharge.--32 years, 21,420 cfs (15,510,000 acre-ft per year).

Extremes.--Maximum discharge during year, 87,800 cfs June 19 (gage height, 83.60 ft); minimum, 872 cfs Sept. 26 (gage height, 63.92 ft); minimum daily, 3,190 cfs Sept. 25.

1928-60: Maximum discharge, 153,000 cfs May 29 to June 1, 1948; maximum gage height, 50.97 ft May 31, 1948, site and datum then in use; minimum discharge observed, 270 cfs Aug. 12, 1952 (discharge measurement), at present site during filling of Cabinet Gorge reservoir; minimum daily discharge since reservoir filled, 969 cfs Sept. 1, 1957.

Maximum discharge known, 195,000 cfs June 1894 (elevation of floodmark at site about 4 miles upstream and an eighth of a mile below "near Heron" site, 2,137.1 ft).

Remarks.--Records excellent. Flow regulated by Hungry Horse Reservoir (see p. 232) and Flathead Lake (see p. 236). Extreme diurnal fluctuation caused by powerplant at Cabinet Gorge Dam. Diversions above station for irrigation of about 354,000 acres. Discharge measurements indicate approximately 1,000 cfs ground-water inflow between Cabinet Gorge Dam and Whitehorse Rapids, with approximately 600 cfs of this inflow occurring in the 2.3 mile reach from the measuring cableway to Whithorse Rapids. Records given herein represent flow at Whitehorse Rapids, computed by adding 600 cfs to observed flows at the measuring cableway, and are considered comparable to records at former site near Heron, except for minor surface inflow from additional drainage area. To determine flow at Cabinet Dam, 1,000 cfs should be deducted from discharges published herein.

Cooperation.--Gage-height record and one discharge measurement furnished by Washington Water Power Co.

Revisions (water years).--WSP 1182: 1936.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

65.0	1,820	68.0	7,900	75.0	37,000
66.0	3,240	69.0	11,000	79.0	57,900
67.0	5,260	71.0	18,600	83.0	83,600

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24,800	18,000	28,100	10,300	15,400	17,500	23,500	44,300	51,700	43,400	16,300	11,700
2	18,100	15,800	21,900	14,400	12,800	19,000	28,400	37,000	58,600	41,200	12,600	11,300
3	5,260	14,700	22,500	13,600	9,020	20,600	30,000	35,800	65,500	42,600	14,300	6,880
4	10,500	21,500	19,000	17,100	14,200	21,400	29,700	26,000	63,500	42,300	20,400	5,910
5	18,800	24,700	18,900	18,500	16,800	14,700	31,400	28,200	70,200	42,500	13,700	4,280
6	23,000	27,700	20,300	14,800	18,100	8,800	37,500	29,800	68,000	41,000	8,940	9,070
7	21,500	24,700	23,900	16,000	16,200	*17,000	39,700	32,300	64,100	31,900	12,800	12,700
8	18,800	19,800	*21,200	15,700	17,200	16,200	45,000	34,300	57,800	34,500	12,000	12,000
9	15,900	24,000	18,800	13,700	14,200	19,200	48,400	33,700	54,200	26,300	13,200	10,800
10	12,300	16,400	19,900	12,000	17,500	18,000	51,000	32,300	49,400	31,300	16,600	9,780
11	11,700	21,900	21,800	19,300	17,400	14,200	50,600	40,400	45,800	25,700	18,500	9,000
12	17,100	21,500	20,400	17,500	16,600	16,100	52,000	44,600	50,000	30,200	16,400	15,300
13	29,400	24,300	20,200	16,200	16,800	25,200	49,800	48,900	*54,500	31,500	9,640	13,100
14	27,500	16,500	19,300	18,400	16,900	26,200	48,800	59,600	54,200	27,200	7,640	12,900
15	26,300	10,700	18,200	18,000	16,300	24,700	47,800	70,300	55,000	31,000	13,400	11,300
16	24,300	18,800	20,200	12,700	15,600	25,600	47,100	71,700	61,100	23,300	13,400	12,100
17	33,800	13,600	20,300	7,920	16,200	25,500	44,800	71,000	68,400	18,300	9,440	6,920
18	37,700	19,300	26,800	20,600	17,800	25,800	*43,800	57,800	76,400	21,200	8,990	3,820
19	31,600	19,000	24,900	21,000	16,200	24,900	43,700	59,200	77,800	18,200	11,700	11,400
20	32,300	17,600	10,500	20,100	15,600	24,000	41,200	56,800	64,900	19,000	6,180	10,500
21	28,500	10,900	27,600	*16,700	17,300	23,300	44,200	54,600	54,000	21,400	5,560	11,100
22	13,500	26,600	27,200	16,000	18,000	24,300	40,500	50,000	55,800	21,900	8,110	14,900
23	24,700	27,600	11,900	15,000	12,300	23,900	43,300	49,400	58,600	19,300	7,300	14,900
24	32,800	22,400	24,800	8,000	18,400	28,800	41,600	51,200	45,200	14,300	10,400	15,500
25	29,400	26,100	19,600	14,100	20,500	28,600	40,500	*49,100	42,100	*15,700	6,270	3,190
26	29,100	28,100	19,100	13,800	21,600	36,400	41,000	45,500	45,300	15,500	8,100	*6,560
27	*34,500	29,500	20,200	17,200	15,800	36,300	40,700	45,400	45,100	13,500	5,980	5,100
28	40,700	31,200	23,200	16,900	16,800	36,800	39,200	45,000	52,900	14,700	6,900	10,100
29	42,200	29,000	19,400	15,400	21,100	33,700	40,200	37,900	39,600	14,900	*7,220	10,300
30	40,400	30,100	13,600	10,100	-------	34,300	42,300	40,900	39,600	12,100	7,840	11,600
31	39,300	-------	12,000	9,620	-------	30,900	-------	45,400	-------	13,400	5,440	-------
Total	795,760	652,000	635,700	470,640	478,620	741,900	‡1,245.7	‡1,428.4	‡1,689.3	799,300	335,250	304,010
Mean	25,670	21,730	20,510	15,180	16,500	23,930	41,520	46,080	56,310	25,780	10,810	10,130
Ac-ft	‡1,578	‡1,293	‡1,261	933,500	949,300	‡1,472	‡2,471	‡2,833	‡3,351	‡1,585	665,000	603,000

Calendar year 1959: Max 95,200 Min 1,020 Mean 30,920 Ac-ft 22,380,000
Water year 1959-60: Max 77,800 Min 3,190 Mean 26,170 Ac-ft 18,990,000

* Discharge measurement made on this day.
‡ Expressed in thousands.

3923. Pack River near Colburn, Idaho

Location.--Lat 48°25'10", long 116°30'10", in SW¼ sec.32, T.59 N., R.1 W., on left bank 50 ft downstream from bridge on U. S. Highway 95, 2.2 miles northeast of Colburn, and 10 miles north of Sandpoint.

Drainage area.--124 sq mi.

Records available.--September 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,130 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,380 cfs May 12 (gage height, 11.04 ft); minimum, 26 cfs Sept. 29 (gage height, 1.20 ft).
1958-60: Maximum discharge, that of May 12, 1960; minimum, 18 cfs Sept. 12, 13, 1958 (gage height, 0.93 ft).

Remarks.--Records good except those for periods of ice effect, which are fair. No regulation or diversion above station.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	21	2.5	168
1.2	29	3.0	240
1.4	47	5.0	590
1.7	76	8.0	1,400
2.0	108	11.0	2,370

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	165	218	214	b160	204	b94	610	512	1,510	491	55	43
2	150	207	207	b150	192	b88	520	648	1,780	491	53	39
3	143	292	204	b155	159	*b90	552	682	2,200	391	52	35
4	136	365	191	b170	135	b94	680	658	2,020	381	64	58
5	129	279	181	b180	131	b100	940	713	1,510	352	64	154
6	127	256	b180	b210	127	b120	1,110	775	1,420	333	54	92
7	133	236	174	201	173	131	1,120	1,070	1,430	317	51	72
8	143	222	165	192	160	127	1,140	1,310	1,110	293	46	60
9	304	210	*162	182	149	116	1,350	1,090	1,100	252	43	52
10	231	198	160	182	143	b106	1,270	1,270	1,060	225	41	47
11	216	188	164	192	136	99	1,040	1,840	1,230	202	38	42
12	287	b155	169	172	135	97	942	1,930	*1,200	184	36	40
13	296	b140	155	b158	132	b94	872	1,890	1,220	*178	34	37
14	336	b150	151	b145	132	94	872	1,420	1,150	173	34	35
15	422	b160	513	b150	136	97	760	1,130	1,140	159	33	34
16	330	b170	632	b140	130	94	*663	1,030	1,090	145	33	34
17	278	b190	419	b130	126	95	608	728	960	135	33	34
18	256	b210	360	b120	b117	102	592	852	696	124	32	32
19	230	b240	327	b110	b120	117	560	790	682	117	30	29
20	232	279	303	b105	b125	136	568	1,090	660	110	28	32
21	287	335	285	b100	126	168	552	1,190	546	101	27	29
22	330	280	268	b105	120	206	495	932	464	94	27	27
23	367	365	256	*b115	111	256	457	810	504	86	28	31
24	365	383	256	b130	121	301	435	760	639	80	34	41
25	554	410	264	b150	b105	386	405	742	682	73	37	34
26	384	315	240	b180	b86	542	384	*802	542	69	54	32
27	322	279	228	188	b88	687	378	1,120	540	67	79	31
28	295	260	b210	181	b90	795	384	962	570	64	64	29
29	267	238	b200	231	b92	805	393	960	564	61	*55	28
30	*248	230	b185	284	------	872	433	1,130	546	58	54	27
31	231	------	b175	228	------	670	------	1,480	------	57	49	------
Total	8,194	7,460	7,598	5,096	3,801	7,779	21,085	32,316	30,765	5,863	1,362	1,310
Mean	264	249	245	164	131	251	703	1,042	1,026	189	43.9	43.7
Cfsm	2.13	2.01	1.98	1.32	1.06	2.02	5.67	8.40	8.27	1.52	0.354	0.352
In.	2.46	2.24	2.28	1.53	1.14	2.33	6.32	9.69	9.23	1.76	0.41	0.39
Ac-ft	16,250	14,800	15,070	10,110	7,540	15,430	41,820	64,100	61,020	11,630	2,700	2,600

Calendar year 1959: Max 1,770 Min 37 Mean 390 Cfsm 3.15 In. 42.72 Ac-ft 282,600
Water year 1959-60: Max 2,200 Min 27 Mean 362 Cfsm 2.92 In. 39.78 Ac-ft 263,100

Peak discharge (base, 1,450 cfs).--May 8 (3 a.m.) 1,480 cfs (8.27 ft); May 12 (4:30 a.m.) 2,380 cfs (11.04 ft); June 4 (3:30 a.m.) 2,350 cfs (10.94 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

3925. Pend Oreille Lake at Hope, Idaho

Location.--Lat 48°15', long 116°18', in lot 2, sec.35, T.57 N., R.1 E., at floating dock near Northern Pacific Railway station at Hope.

Drainage area.--22,900 sq mi, approximately.

Records available.--March 1914 to September 1960. Published as "at Sandpoint" 1914-22. Records published for both sites September 1921 to September 1922.

Gage.--Water-stage recorder. Datum of gage is 2,000.00 ft above mean sea level, datum of 1929, supplementary adjustment of 1947; gage readings have been reduced to elevations above mean sea level. Prior to Oct. 1, 1921, staff gage at Sandpoint at datum 42.18 ft higher. Oct. 1, 1921, to Sept. 30, 1929, staff gage at present site at datum 45.47 ft higher than present datum. Oct. 1, 1929, to Sept. 30, 1950, water-stage recorder at present site at datum 0.20 ft lower than present datum.

Extremes.--Maximum elevation during year, 2,062.61 ft Sept. 30 (contents, 1,572,000 acre-ft); minimum, 2,055.83 ft Mar. 22 (contents, 946,200 acre-ft).
1914-60: Maximum elevation, 2,071.62 ft, present datum, June 9, 1948 (contents, 2,462,000 acre-ft); minimum, 2,046.27 ft, present datum, Feb. 17, 1936 (contents, 117,700 acre-ft).
Maximum elevation known, 2,075.88 ft, present datum, June 1894 (contents, 2,905,000 acre-ft).

Remarks.--Regulation at Albeni Falls Dam beginning June 4, 1952. Contents shown is that above elevation 2,044.8 ft but does not include storage in Pend Oreille River above Albeni Falls Dam.

Revisions (water years).--WSP 1122: 1946.

Capacity table, water year 1959-60 (elevation, in feet, and contents, in acre-feet)

2,054.00	782,500	2,060.00	1,327,000
2,056.00	961,500	2,062.00	1,514,000
2,058.00	1,143,000	2,064.00	1,704,000

Gage height, in feet, at 12 p.m., water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62.47	60.55	56.70	56.71	56.62	56.52	57.13	56.91	56.91	62.31	62.48	62.51
2	62.39	60.19	56.66	56.72	56.64	56.48	56.98	56.60	57.17	62.29	62.39	62.51
3	62.21	59.90	56.62	56.69	56.57	56.52	56.91	56.34	57.55	62.32	62.37	62.50
4	62.13	59.68	56.57	56.66	56.59	56.74	56.83	56.64	57.80	62.38	62.45	62.55
5	62.16	59.50	56.55	56.69	56.61	56.78	56.75	56.61	58.16	62.41	62.45	62.45
6	62.20	59.44	56.60	56.68	56.70	56.62	56.80	56.33	58.44	62.39	62.47	62.48
7	62.14	59.34	56.65	56.66	56.64	56.68	56.86	56.50	58.61	62.28	62.53	62.57
8	62.12	59.11	56.64	56.71	56.68	56.63	56.88	56.61	58.62	62.35	62.48	62.57
9	61.98	59.05	56.61	56.71	56.66	56.61	56.91	56.62	58.63	62.30	62.41	62.51
10	61.74	58.84	56.60	56.74	56.60	56.56	56.99	56.50	58.64	62.37	62.43	62.48
11	61.56	58.71	56.62	56.79	56.63	56.35	57.04	56.43	58.66	62.32	62.51	62.40
12	61.43	58.60	56.65	56.79	56.60	56.18	57.24	56.47	58.79	62.34	62.54	62.45
13	61.53	58.56	56.62	56.71	56.62	56.23	57.54	56.59	59.05	62.40	62.53	62.47
14	61.59	58.39	56.67	56.67	56.66	56.24	57.82	56.86	59.36	62.40	62.47	62.46
15	61.57	58.09	56.71	56.69	56.60	56.22	57.78	57.28	59.61	62.43	62.42	62.42
16	61.44	57.93	56.74	56.60	56.58	56.14	57.60	57.71	60.03	62.37	62.44	62.45
17	61.44	57.73	56.74	56.39	56.54	56.10	57.37	58.09	60.59	62.26	62.30	62.44
18	61.52	57.68	56.80	56.42	56.57	56.07	57.19	58.10	61.19	62.23	62.27	62.36
19	61.41	57.61	56.82	56.52	56.58	56.03	57.16	58.15	61.68	62.22	62.34	62.40
20	61.40	57.66	56.63	56.53	56.61	55.98	57.28	58.20	61.93	62.31	62.27	62.34
21	61.29	57.50	56.67	56.52	56.65	55.90	57.50	58.20	62.01	62.42	62.20	62.32
22	60.88	57.57	56.75	56.55	56.68	55.87	57.60	58.05	62.27	62.51	62.15	62.42
23	60.69	57.62	56.45	56.60	56.60	55.92	57.78	57.91	62.44	62.48	62.18	62.50
24	60.68	57.45	56.46	56.51	56.59	56.04	57.90	57.83	62.30	62.40	62.24	62.60
25	60.58	57.22	56.36	56.50	56.56	56.13	57.91	57.73	62.24	62.36	62.25	62.53
26	60.46	56.99	56.26	56.45	56.62	56.37	57.88	57.56	62.29	62.35	62.30	62.50
27	60.45	56.80	56.25	56.48	56.56	56.61	57.91	57.42	62.34	62.30	62.33	62.47
28	60.60	56.70	56.40	56.64	56.60	56.80	57.76	57.29	62.49	62.32	62.39	62.53
29	60.75	56.60	56.52	56.67	56.54	56.88	57.42	57.00	62.37	62.37	62.45	62.57
30	60.83	56.62	56.57	56.51	-------	57.03	57.13	56.82	62.27	62.40	62.46	62.61
31	60.88	-------	56.62	56.55	-------	57.05	-------	56.81	-------	62.42	62.43	-------
(†)	††1,409	††1,017	††1,017	††1,011	††1,010	††1,056	††1,064	††1,035	††1,539	††1,554	††1,555	††1,572
(‡)	-147,000	-392,000	0	-6,000	-1,000	+46,000	+8,000	-29,000	+504,000	+15,000	+1,000	+17,000

Calendar year 1959..... ‡ -325,000
Water year 1959-60..... ‡ +16,000

† Contents, in acre-feet, at end of month.
‡ Change in contents, in acre-feet.
†† Expressed in thousands.
Note.--Add 2,000 ft to obtain elevation above mean sea level.

3930. Priest Lake at outlet, near Coolin, Idaho

Location.--Lat 48°29'30", long 116°53'00", in SE¼ sec.5, T.59 N., R.4 W., half a mile east of outlet and 1¾ miles northwest of Coolin.

Drainage area.--572 sq mi.

Records available.--June 1911 to September 1913 (fragmentary gage-height records at Coolin, published as part of records for Priest River at outlet of Priest Lake, at Coolin), April 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,434.64 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. June 18, 1911, to Sept. 30, 1913, staff gages at Coolin at different datums. Apr. 21, 1928, to Oct. 18, 1939, staff gage at site 400 ft north of lake outlet at present datum.

Extremes.--Maximum gage height during year, 4.42 ft June 7 (contents, 153,100 acre-ft); minimum, 0.09 ft Mar. 3 (contents, 50,420 acre-ft).
1928-60: Maximum gage height, 6.46 ft May 29, 30, 1948 (contents, 202,200 acre-ft); minimum, -0.19 ft Feb. 7, 21, 22, 1957 (contents, 43,840 acre-ft).

Remarks.--Flow from Priest Lake is regulated to hold lake at heights desirable for recreation interests during summer months and storage is released for power use downstream during winter months. Storage began Aug. 9, 1950. Prior to Aug. 9, 1950, some regulation resulted from logging operations in the outlet channel. Figures given herein represent contents above gage height of about -2 ft. Capacity table is based on area measured from Priest Lake quadrangle (scale 1:250,000) and reconnaissance survey of marginal areas and is only approximate.

Capacity table, water year 1959-60 (gage height, in feet, and contents, in acre-feet)

0	48,310	3.0	119,300
1.0	71,880	4.0	143,100
2.0	95,530	5.0	167,000

Gage height, in feet, at 12 p.m., water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.85	1.05	0.73	0.64	0.39	0.15	1.15	2.10	3.94	3.06	3.02	3.12
2	1.76	1.03	.71	.62	.39	.14	1.20	2.15	4.05	3.06	3.05	3.12
3	1.70	1.09	.70	.58	.30	.10	1.24	2.20	4.23	3.06	3.10	3.11
4	1.62	1.04	.68	.57	.38	.10	1.31	2.25	4.34	3.04	3.13	3.17
5	1.56	1.02	.65	.58	.39	.14	1.44	2.31	4.38	3.01	3.14	3.22
6	1.51	1.00	.63	.58	.42	.16	1.56	2.39	4.39	2.98	3.14	3.20
7	1.43	.96	.61	.57	.40	.18	1.71	2.57	4.40	2.96	3.14	3.19
8	1.43	.92	.59	.55	.40	.20	1.90	2.74	4.34	2.96	3.12	3.17
9	1.42	.89	.57	.53	.39	.20	2.09	2.83	4.28	3.00	3.10	3.15
10	1.38	.86	.57	.52	.38	.20	2.26	2.99	4.21	3.04	3.09	3.14
11	1.39	.86	.59	.51	.36	.19	2.42	3.24	4.17	3.06	3.06	3.13
12	1.36	.79	.60	.48	.36	.18	2.52	3.45	4.14	3.09	3.05	3.12
13	1.32	.75	.58	.47	.36	.17	2.58	3.87	4.11	3.10	3.04	3.10
14	1.30	.72	.61	.45	.38	.18	2.63	4.04	4.08	3.10	3.02	3.08
15	1.28	.69	.65	.44	.37	.18	2.64	4.08	4.06	3.10	3.00	3.07
16	1.27	.64	.70	.43	.35	.16	2.63	4.11	4.03	3.10	3.01	3.05
17	1.23	.69	.72	.42	.33	.15	2.65	4.12	3.97	3.10	3.00	3.03
18	1.20	.72	.73	.41	.32	.14	2.61	4.08	3.87	3.09	3.00	3.01
19	1.17	.72	.74	.38	.31	.14	2.59	4.02	3.72	3.08	2.99	2.99
20	1.13	.85	.75	.34	.32	.14	2.59	4.12	3.66	3.06	2.98	2.97
21	1.12	.86	.74	.31	.31	.14	2.55	4.20	3.54	3.04	2.98	2.95
22	1.13	.92	.73	.30	.30	.15	2.51	4.20	3.42	3.01	2.98	2.94
23	1.12	.90	.72	.32	.28	.17	2.44	4.14	3.31	3.00	2.97	2.95
24	1.13	.89	.76	.34	.28	.20	2.37	4.02	3.21	2.99	3.00	2.94
25	1.17	.87	.78	.38	.26	.25	2.32	3.95	3.15	3.01	3.02	2.94
26	1.16	.86	.77	.40	.23	.35	2.25	3.93	3.07	3.02	3.07	2.94
27	1.15	.84	.74	.39	.21	.48	2.20	3.93	3.01	3.01	3.08	2.94
28	1.14	.81	.71	.40	.18	.63	2.11	3.90	3.02	3.03	3.09	2.94
29	1.13	.77	.68	.44	.17	.86	2.11	3.86	3.03	3.04	3.09	2.95
30	1.11	.75	.68	.42	-------	1.03	2.09	3.85	3.05	3.04	3.10	2.86
31	1.07	-------	.66	.41	-------	1.10	-------	3.88	-------	3.05	3.11	-------
(†)	73,530	65,980	63,860	57,960	52,300	74,240	97,660	140,230	120,460	120,460	121,890	115,940
(‡)	-20,580	-7,550	-2,120	-5,900	-5,660	+21,940	+23,420	+42,570	-19,770	0	+1,430	-5,950

Calendar year 1959..... ‡ +9,440
Water year 1959-60..... ‡ +21,830

† Contents, in acre-feet, at end of month.
‡ Change in contents, in acre-feet.

3940. Priest River near Coolin, Idaho

Location.--Lat 48°26'50", long 116°53'50", in SE¼ sec.19, T.59 N., R.4 W., on left bank 190 ft downstream from Dickensheet Bridge, 2½ miles downstream from Binarch Creek, 3 miles southwest of Coolin, and 5 miles downstream from outlet of Priest Lake.

Drainage area.--611 sq mi.

Records available.--October 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,338.24 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--12 years, 1,361 cfs (985,300 acre-ft per year).

Extremes.--Maximum discharge during year, 5,390 cfs June 7 (gage height, 6.66 ft); minimum, 172 cfs Sept. 30 (gage height, 2.08 ft).
1948-60: Maximum discharge, 8,130 cfs May 27, 1956 (gage height, 8.15 ft); minimum observed, 26 cfs Sept. 25, 1958 (gage height, 1.16 ft), but may have been less Sept. 11, 1953, Sept. 24, 1958, when stage was below intake.

Remarks.--Records excellent except those for periods of doubtful or no gage-height record, which are good. No diversion above station. Flow partly regulated by Priest Lake (see preceding page).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

2.0	150	4.0	1,460
2.5	319	5.0	2,710
3.0	575	6.0	4,240
3.5	940	7.0	6,000

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,790	1,220	950	850	674	500	1,440	2,440	4,660	1,930	319	235
2	1,690	1,180	920	834	674	480	1,480	2,490	4,770	1,940	319	235
3	1,620	1,200	900	818	674	490	1,530	2,560	4,920	1,940	323	287
4	1,560	1,220	880	802	661	500	1,610	2,610	5,150	1,930	354	354
5	1,490	1,180	860	794	661	470	1,740	2,680	5,280	1,900	363	445
6	1,440	1,150	840	802	661	*515	1,880	2,770	5,330	1,760	363	515
7	1,380	1,100	*820	794	674	521	2,040	2,930	5,370	1,520	415	504
8	1,350	1,080	810	778	674	533	2,210	3,180	5,320	1,070	445	498
9	1,370	1,060	794	770	668	539	2,400	3,310	5,210	800	430	488
10	1,340	1,050	786	763	654	539	2,630	3,460	5,100	680	420	482
11	1,340	1,030	802	749	648	539	2,810	3,720	5,010	690	415	471
12	1,440	980	810	721	642	533	2,950	4,090	4,970	*687	372	460
13	1,490	920	802	721	642	527	*3,060	4,500	4,920	694	386	450
14	1,450	930	794	707	642	521	3,170	4,770	*4,900	700	295	440
15	1,440	910	834	694	648	521	3,200	4,870	4,870	707	246	435
16	1,430	860	877	687	642	515	3,180	4,900	4,820	707	242	425
17	1,390	870	904	668	630	510	3,150	4,900	4,770	707	242	420
18	1,360	900	922	654	620	504	3,170	4,850	4,660	700	235	405
19	1,330	920	931	648	610	504	3,110	4,800	4,500	687	235	401
20	1,310	980	931	630	610	504	3,110	4,850	4,360	680	235	391
21	1,270	1,070	931	617	620	504	3,060	4,970	4,220	668	211	382
22	1,270	1,080	922	611	610	510	3,000	5,010	4,050	587	196	377
23	1,270	1,100	913	*605	600	527	2,910	4,940	3,880	533	189	311
24	1,270	1,110	931	623	593	551	2,820	*4,890	3,760	425	196	264
25	1,300	1,130	958	635	587	593	2,750	4,780	3,630	315	199	260
26	1,310	1,100	949	661	569	680	2,670	4,720	3,540	315	208	215
27	1,310	1,050	931	654	530	778	2,580	4,720	3,080	315	218	177
28	1,310	1,010	913	654	510	904	2,530	4,700	2,160	311	222	174
29	*1,300	1,000	895	687	520	1,070	2,490	4,650	1,910	315	228	174
30	1,270	980	886	694	-------	1,270	2,460	4,660	1,920	315	232	1,050
31	1,250	-------	886	687	-------	1,370	-------	4,660	-------	319	*232	-------
Total	43,140	31,370	27,282	22,012	18,148	19,022	77,140	127,320	131,040	26,847	8,985	11,725
Mean	1,392	1,046	880	710	628	614	2,571	4,107	4,368	866	290	391
Ac-ft	85,570	62,220	54,110	43,660	36,000	37,730	153,000	252,500	259,900	53,250	17,820	23,260

Calendar year 1959: Max 5,570 Min 172 Mean 1,465 Ac-ft 1,061,000
Water year 1959-60: Max 5,370 Min 174 Mean 1,486 Ac-ft 1,079,000

* Discharge measurement made on this day.
Note.--Doubtful or no gage-height record Nov. 7 to Dec. 7, Feb. 17-23, Feb. 27 to Mar. 5, July 8-11; discharge estimated on basis of recorded range in stage, weather records , 1 discharge measurement, and records for station near Priest River and Priest Lake near Coolin.

3950. Priest River near Priest River, Idaho

Location.--Lat 48°13', long 116°55', in NE¼SE¼ sec.11, T.56 N., R.5 W., on right bank 500 ft downstream from Saddler Creek, a quarter of a mile downstream from Lower West Branch, 2½ miles north of Priest River, and 3½ miles upstream from mouth.

Drainage area.--902 sq mi.

Records available.--June 1903 to April 1905, November 1910 to April 1911, May to December 1923, February 1929 to September 1960. Prior to October 1930, published as "at Priest River."

Gage.--Water-stage recorder. Altitude of gage is 2,090 ft (from river-profile map). Prior to May 15, 1929, and Sept. 18, 1929, to Apr. 28, 1930, staff gages at site 3 miles downstream at altitude about 40 ft lower. June 4 to Sept. 17, 1929, and Apr. 29 to Sept. 11, 1930, staff gages at or near present site at present datum.

Average discharge.--32 years (1903-4, 1929-60), 1,645 cfs (1,191,000 acre-ft per year).

Extremes.--Maximum discharge during year, 6,840 cfs May 21 (gage height, 6.84 ft); minimum, 320 cfs Sept. 30 (gage height, 0.84 ft).
1903-5, 1910-11, 1923, 1929-60: Maximum discharge, 10,500 cfs May 29, 30, 1948; maximum gage height, 8.97 ft May 29, 1948; minimum discharge, 165 cfs Sept. 26, 1958 (gage height, 0.46 ft).

Remarks.--Records excellent except those for periods of ice effect, which are good. No diversion above station. Some regulation on tributary and, since Aug. 9, 1950, by low buttress and stoplog dam on Priest River three-quarters of a mile downstream from lake outlet.

Revisions (water years).--WSP 572: 1903-5.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	280	3.0	1,910
1.0	375	4.0	3,000
1.5	680	5.0	4,260
2.0	1,040	7.0	7,120

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,920	1,410	1,290	b1,140	b1,000	b830	3,470	3,220	5,720	2,310	520	392
2	1,830	1,390	1,250	b1,100	1,000	b800	3,160	3,290	5,850	2,320	514	386
3	1,760	1,460	1,240	b1,050	995	834	3,040	3,400	6,070	2,300	514	386
4	1,690	1,580	1,200	b1,070	972	848	3,200	3,420	6,320	2,260	556	532
5	1,630	1,450	1,160	b1,090	965	*820	3,490	3,480	6,440	2,220	576	622
6	1,580	1,410	1,140	b1,080	965	792	3,860	3,540	6,460	2,140	556	701
7	1,540	1,360	1,120	1,070	1,160	785	4,100	3,870	6,430	1,920	556	701
8	1,520	1,330	1,090	1,060	1,160	799	4,140	4,180	6,340	1,610	628	680
9	1,610	1,300	1,060	1,030	1,140	813	4,360	4,270	6,190	1,060	622	667
10	1,540	1,280	*1,050	b1,000	1,060	799	4,520	4,420	6,040	920	608	654
11	1,550	1,260	1,080	1,020	1,030	785	4,520	4,720	5,940	920	596	641
12	1,580	1,220	1,140	1,000	1,010	771	*4,550	5,220	5,850	928	582	628
13	1,700	1,120	1,120	972	1,010	764	4,590	5,710	*5,750	935	526	622
14	1,650	1,130	1,080	b960	1,010	757	4,870	6,020	5,740	935	502	608
15	1,620	1,120	1,580	b950	1,070	764	4,790	6,080	5,740	942	436	596
16	1,590	b1,060	1,690	935	1,020	757	4,580	6,120	5,630	935	408	589
17	1,560	b1,060	1,500	920	995	757	4,390	6,140	5,510	928	408	582
18	1,520	1,100	1,430	b830	958	771	4,490	6,020	5,390	928	402	570
19	1,480	1,120	1,390	b850	950	827	4,440	5,910	5,190	912	397	563
20	1,480	1,240	1,360	b850	935	958	4,510	6,240	5,040	890	386	556
21	1,470	1,680	1,330	b900	950	1,030	4,480	6,740	4,900	876	380	544
22	1,490	1,610	1,310	*b930	928	1,140	4,250	6,600	4,660	855	360	532
23	1,500	1,770	1,280	b940	883	1,290	4,060	6,420	4,430	750	355	538
24	1,490	1,810	1,290	928	898	1,470	3,900	6,220	4,270	729	360	442
25	1,500	1,930	1,350	950	862	1,710	3,730	6,010	4,120	550	370	419
26	1,500	1,640	1,280	995	b830	2,090	3,580	*5,880	4,010	*514	402	408
27	1,500	1,500	1,250	1,000	b820	2,520	3,460	5,950	3,830	514	424	350
28	1,510	1,410	1,210	972	b830	2,980	3,360	5,860	2,890	508	408	325
29	*1,490	1,370	1,200	1,020	b840	3,660	3,260	5,750	2,320	502	397	325
30	1,470	1,320	1,200	1,080	-------	4,360	3,220	5,670	2,320	502	*397	320
31	1,440	-------	1,170	1,060	-------	3,950	-------	5,670	-------	508	397	-------
Total	48,710	41,440	38,840	30,752	28,246	42,231	120,370	162,040	155,390	35,121	14,543	15,879
Mean	1,571	1,381	1,253	992	974	1,362	4,012	5,227	5,180	1,133	469	529
Ac-ft	96,610	82,200	77,040	61,000	56,030	83,760	238,800	321,400	308,200	69,660	28,850	31,500

Calendar year 1959: Max 6,900 Min 355 Mean 1,980 Ac-ft 1,434,000
Water year 1959-60: Max 6,740 Min 320 Mean 2,004 Ac-ft 1,455,000

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

3955. Pend Oreille River at Newport, Wash.

Location.--Lat 48°11'00", long 117°02'00", in SE¼SW¼ sec.24, T.56 N., R.6 W., on left bank at Newport, 0.2 mile upstream from bridge on U. S. Highway 2, a quarter of a mile east of Idaho-Washington State line, and 1.6 miles downstream from Albeni Falls Dam.

Drainage area.--24,200 sq mi, approximately.

Records available.--June 1903 to September 1941, October 1952 to September 1960. Prior to October 1921, published as Clark Fork at Newport, Wash., October 1921 to September 1937, as Clark Fork at Priest River, Idaho, and October 1937 to September 1941, as Pend Oreille River at Priest River, Idaho.

Gage.--Water-stage recorder. Datum of gage is 2,000.00 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Sept. 22, 1928, staff or wire-weight gages at Priest River, Newport, or Metaline Falls at various datums (see description, WSP 532, p. 92). Sept. 22, 1928, to Sept. 30, 1935, water-stage recorder at Priest River at datum 2,040.14 ft above mean sea level and Oct. 1, 1935, to Sept. 30, 1941, at datum 2,000 ft above mean sea level, datum of 1929. Since December 1952, auxiliary water-stage recorder 2.74 miles downstream from base gage.

Average discharge.--46 years (1903-41, 1952-60), 25,370 cfs (18,370,000 acre-ft per year).

Extremes.--Maximum discharge during year, 71,000 cfs June 7; maximum gage height, 42.49 ft June 7; minimum discharge, 3,070 cfs Aug. 28; minimum gage height, 29.12 ft Aug. 29.
1903-41, 1952-60: Maximum discharge, 136,000 cfs June 15, 1913, June 21, 1933; minimum, 2,200 cfs Dec. 12, 1919.
Maximum stage known, about 64.0 ft in June 1894, present site and datum, from water-surface profiles (discharge, about 200,000 cfs).

Remarks.--Records excellent. Flow regulated at Albeni Falls Dam and affected by storage in Pend Oreille Lake (see p. 243), Flathead Lake (see p. 236), Hungry Horse Reservoir (see p. 232), and several smaller reservoirs (see p. 255). Diversions above station for irrigation of about 337,600 acres (1946 determination). Records of chemical analyses for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 532: 1903-11.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27,100	37,600	28,000	10,100	14,800	20,800	31,300	60,900	59,600	46,700	14,600	8,750
2	25,200	36,000	28,100	13,400	15,100	20,400	42,000	59,400	60,500	46,700	15,700	10,700
3	17,800	34,700	26,500	17,100	14,800	19,200	41,400	55,500	62,500	44,800	16,800	9,210
4	17,300	35,000	24,500	19,100	17,100	16,300	42,500	43,400	64,900	43,700	16,500	8,800
5	20,200	35,500	22,400	19,200	19,100	*16,400	44,200	31,300	67,100	45,400	14,300	8,400
6	24,000	33,300	20,800	18,200	18,900	17,500	44,600	31,400	68,300	45,100	10,600	8,180
7	26,500	32,000	*21,700	17,900	21,100	18,700	48,600	34,300	70,000	41,400	10,400	9,420
8	24,700	32,000	22,700	16,300	20,100	21,100	56,500	38,100	67,900	33,500	14,900	11,900
9	27,100	30,800	23,100	14,400	20,100	21,200	59,300	43,400	66,500	30,300	16,200	13,400
10	25,600	28,700	22,100	14,800	22,100	22,700	59,700	48,100	59,900	28,100	16,800	13,000
11	26,400	29,000	24,200	18,000	21,200	26,000	59,300	56,200	56,400	29,400	15,800	12,900
12	26,500	30,200	24,100	18,900	20,100	24,500	*53,600	56,700	54,200	28,700	14,900	13,200
13	26,700	26,600	23,200	20,200	19,800	24,300	45,300	58,000	54,100	29,300	10,600	13,400
14	27,700	26,100	22,100	21,000	18,300	26,900	49,400	58,700	*53,100	29,000	10,000	13,400
15	31,000	26,000	23,600	19,400	19,600	28,500	60,500	62,100	53,500	28,900	14,200	13,500
16	33,500	27,200	25,300	18,000	20,600	29,200	64,900	63,900	53,300	27,400	14,800	11,900
17	36,600	26,900	26,000	17,700	20,300	28,400	63,800	66,600	52,900	25,300	14,100	7,960
18	37,000	26,100	26,500	17,700	19,700	28,500	61,800	68,400	57,000	23,900	10,600	7,800
19	37,700	25,100	28,000	18,700	19,200	28,700	54,800	68,500	63,300	20,300	9,430	10,800
20	37,300	24,800	24,500	19,700	17,900	28,400	46,000	69,300	63,900	16,700	9,070	12,100
21	37,300	26,500	25,600	20,000	17,900	28,700	43,200	68,700	59,500	15,600	9,010	11,400
22	37,300	28,900	28,400	*17,600	18,000	28,800	43,300	68,300	50,900	18,100	10,100	11,100
23	37,100	32,700	28,400	16,600	19,300	26,200	43,000	68,000	58,200	19,900	8,220	12,400
24	37,500	39,600	28,500	17,800	19,700	27,500	43,100	*66,900	60,700	17,800	7,770	10,100
25	37,200	42,400	28,000	19,800	21,200	29,400	46,500	65,400	52,800	17,700	6,900	7,250
26	38,000	43,800	27,000	19,900	21,600	33,300	47,700	64,900	49,700	*17,800	6,870	7,250
27	37,900	42,100	23,600	18,600	20,400	36,700	45,700	64,200	49,200	15,700	4,710	7,250
28	*37,400	40,000	18,600	14,100	20,200	41,600	51,200	63,200	51,200	15,000	4,180	7,170
29	37,500	37,900	16,000	15,100	20,400	45,500	61,800	62,100	52,900	13,900	4,500	8,080
30	38,100	30,900	15,400	15,200	-------	44,300	62,600	59,900	49,200	11,000	6,700	9,650
31	40,100	-------	12,100	15,500	-------	42,600	-------	58,800	-------	12,600	*6,970	-------
Total	971,300	968,400	739,000	540,000	558,600	852,300	‡1,517.6	‡1,784.6	‡1,743.2	839,700	346,230	310,370
Mean	31,330	32,280	23,840	17,420	19,260	27,490	50,590	57,570	58,110	27,090	11,170	10,350
Ac-ft	‡1,927	‡1,921	‡1,466	‡1,071	‡1,108	‡1,691	‡3,010	‡3,540	‡3,458	‡1,666	686,700	615,600

Calendar year 1959: Max 100,000 Min 5,150 Mean 35,850 Ac-ft 25,960,000
Water year 1959-60: Max 70,000 Min 4,180 Mean 30,520 Ac-ft 22,160,000

* Discharge measurement made on this day.
‡ Expressed in thousands.

3960. Calispell Creek near Dalkena, Wash.

Location.--Lat 48°14'40", long 117°20'30", in SW¼ sec.26, T.32 N., R.43 E., on left bank 2 miles upstream from Calispell Lake, 4.8 miles west of Dalkena, and 9 miles upstream from mouth.

Drainage area.--67.8 sq mi.

Records available.--August 1950 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,070 ft (from topographic map).

Average discharge.--10 years, 76.5 cfs (55,380 acre-ft per year).

Extremes.--Maximum discharge during year, 918 cfs Mar. 30 (gage height, 7.33 ft); minimum, 4.0 cfs Sept. 19, 25, 26.
1950-60: Maximum discharge, 1,070 cfs Feb. 25, 1958; maximum gage height, that of Mar. 30, 1960; minimum discharge, 3.5 cfs Sept. 1, Oct. 19, 1957.

Remarks.--Records good except those below 20 cfs, which are fair, and those for periods of ice effect or no gage-height record, which are poor. No diversion above station. Regulation at low flow by Power Lake (capacity, 1,000 acre-ft) since September 1956.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 25, 26, 30, 31, Apr. 6-10)

Oct. 1 to Mar. 26				Mar. 27 to Sept. 30			
3.1	3.4	3.7	80	3.18	4.0	4.5	168
3.2	8.0	4.0	127	3.3	8.9	5.0	268
3.3	16.5	4.5	212	3.4	15	6.0	520
3.4	31	5.0	340	3.7	50	7.0	850
				4.0	90		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	5.4	41	29	40	34	406	158	190	53	12.5	16
2	17.5	11	24	15.5	50	b34	344	184	*175	2[illegible]	13	16
3	8.0	19	15.5	b16	55	b34	334	207	166	29	13	13
4	8.0	19	14.5	29	60	34	*344	213	151	36	16	11
5	22	16.5	14.5	33	60	23	396	213	143	5[illegible]	18	7.4
6	28	14.5	14.5	33	40	17.5	464	203	137	53	14.5	19
7	28	6.4	14.5	31	30	33	474	266	121	*46	13	36
8	38	6.4	14.5	31	50	36	459	293	112	39	*16	34
9	41	11.5	14.5	14.5	*61	38	454	*275	101	24	17	29
10	14.5	23	14.5	10	54	38	428	253	100	24	17	13
11	8.6	13.5	15.5	13.5	51	38	373	255	94	34	17	11
12	26	14.5	16.5	16.5	43	24	339	268	86	44	16	12.5
13	36	13.5	17.5	19	28	19	322	273	89	43	13	15
14	36	8.0	26	19	31	29	334	240	86	40	11	15
15	*34	7.4	50	19	48	38	286	207	86	32	13	15
16	31	15.5	*66	b13	50	38	244	201	83	15	17	14.5
17	9.3	16.5	66	b10	46	38	225	209	76	16	17	10.5
18	6.9	16.5	59	b20	45	38	255	186	67	29	17	9.9
19	22	17.5	40	25	36	14.5	238	166	67	38	15	11
20	34	17.5	34	25	26	11	264	270	73	37	11.5	15
21	34	11.5	50	25	26	38	273	400	75	37	11.5	15
22	36	16.5	48	25	28	50	236	373	70	30	15	15
23	36	54	45	15	b40	56	223	339	67	13.5	16	13.5
24	17.5	*67	43	8.0	45	85	217	301	58	13.5	16	4.3
25	11.5	72	19	30	43	191	201	277	40	16	16	4.0
26	22	50	13.5	40	*b40	290	184	264	45	17	15	10.5
27	36	45	b18	45	b20	406	173	293	49	18	12.5	14.5
28	29	41	38	50	b25	*438	165	257	49	18	11.5	14.5
29	33	36	34	50	36	*487	156	242	49	17	15	14.5
30	11.5	40	36	30	-------	744	154	225	50	13	16	14.5
31	5.9	-------	36	25	-------	514	-------	213	-------	12.5	16	-------
Total	743.2	706.1	953.0	765.0	1,207	3,908.0	8,965	7,724	2,755	917.5	458.0	444.1
Mean	24.0	23.5	30.7	24.7	41.6	126	299	249	91.8	29.6	14.8	14.8
Ac-ft	1,470	1,400	1,890	1,520	2,390	7,750	17,780	15,320	5,460	1,820	908	881

Calendar year 1959: Max 340 Min 5.4 Mean 74.3 Ac-ft 53,780
Water year 1959-60: Max 744 Min 4.0 Mean 80.7 Ac-ft 58,590

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Jan. 19 to Feb. 8; discharge estimated on basis of recorded range in stage, weather records, and knowledge of powerplant operation.

3965. Pend Oreille River below Box Canyon, near Ione, Wash.

Location.--Lat 48°46'50", long 117°24'40", in SE¼NE¼ sec.19, T.38 N., R.43 E., on left bank 1,000 ft downstream from Box Canyon Dam and 4 miles north of Ione.

Drainage area.--25,000 sq mi, approximately.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 29, 1954, staff gage at site 300 ft upstream at same datum. Mar. 29 to Aug. 25, 1954, staff gage at present site and datum.

Extremes.--Maximum discharge during year, 69,200 cfs May 22 (elevation, 2,000.20 ft); minimum, 4,100 cfs July 29 (elevation, 1,981.00 ft).
1952-60: Maximum discharge, 125,700 cfs June 6, 1956 (elevation, 2,011.74 ft); minimum, 3,190 cfs Aug. 17, 18, 20, 1958 (elevation, 1,980.5 ft, from hourly tail-water readings at Box Canyon Dam).
Flood in June 1948 reached elevation of 2,018.0 ft, from floodmarks (discharge, 167,000 cfs).

Remarks.--Records excellent except those for period of no gage-height record, which are good. In 1946 there were diversions for irrigation of about 340,000 acres, and there probably has not been any appreciable change since that time. Flow regulated at Box Canyon and Albeni Falls Dams and affected by storage in Pend Oreille Lake (see p. 243), Flathead Lake (see p. 236), Hungry Horse Reservoir (see p. 232), and by smaller reservoirs in Pend Oreille River basin in Montana (see p. 255).

Rating table, water year 1959-60 (elevation, in feet, and discharge, in cubic feet per second)

1,981.0	4,100	1,990.0	30,000
1,983.0	8,500	1,995.0	47,200
1,985.0	14,000	2,000.0	68,200
1,987.0	20,200	2,005.0	93,000

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26,400	39,000	29,000	12,000	15,400	20,800	45,200	60,300	61,100	46,800	13,800	*7,390
2	24,500	38,200	*28,600	12,200	15,300	20,500	42,800	60,200	61,000	45,000	15,700	6,760
3	21,900	35,800	28,700	16,500	15,200	*19,300	44,200	58,900	61,500	44,900	17,300	10,100
4	23,100	*34,900	27,000	18,300	15,500	17,900	46,000	54,900	62,300	44,500	18,600	10,900
5	23,300	36,300	25,200	19,600	18,400	17,700	46,100	37,300	63,800	44,800	16,700	10,700
6	22,800	34,500	25,400	19,600	19,500	18,100	46,200	31,100	65,900	47,600	12,100	8,800
7	24,500	32,500	22,900	19,500	20,400	18,700	48,000	35,100	67,400	48,900	10,800	9,800
8	23,600	32,600	21,400	18,600	21,600	19,900	51,800	39,300	67,200	40,600	11,900	11,800
9	23,300	32,600	22,500	15,600	20,800	23,900	57,100	45,300	64,900	34,500	15,200	13,900
10	24,100	31,200	24,200	15,500	21,700	18,600	60,100	44,800	63,600	32,500	16,200	13,900
11	25,000	29,300	26,400	15,700	22,300	25,900	60,400	48,900	59,200	29,700	17,000	13,000
12	26,000	29,400	25,600	17,700	21,600	28,400	59,200	54,700	56,100	30,700	14,600	13,500
13	27,000	28,700	24,900	*19,200	21,000	26,600	53,500	56,700	56,000	30,700	12,700	14,300
14	28,200	28,000	24,100	21,000	20,700	24,900	49,300	58,000	55,800	27,200	10,400	13,900
15	29,300	27,100	23,700	21,300	19,900	26,800	52,900	59,300	54,900	31,000	13,600	13,700
16	29,600	27,900	25,200	19,600	20,900	27,700	58,400	61,900	54,200	27,000	15,900	11,600
17	32,400	27,900	26,400	19,200	20,600	28,900	61,800	64,400	53,600	26,800	13,800	9,060
18	35,000	28,000	27,200	19,100	20,400	27,800	62,300	66,200	53,300	27,300	11,100	8,300
19	36,600	28,000	28,300	18,500	19,500	29,300	*61,400	66,600	57,000	27,000	9,960	11,100
20	38,000	25,800	27,600	18,900	18,600	29,300	56,700	68,200	60,100	22,200	8,800	12,200
21	36,700	27,000	27,000	20,500	19,800	28,200	49,400	68,900	61,200	16,500	9,220	11,400
22	37,000	27,700	27,400	19,900	17,700	28,200	46,100	68,900	54,700	14,200	10,500	10,600
23	37,300	30,600	28,500	17,300	19,000	26,500	45,500	68,800	50,700	18,600	8,750	11,700
24	37,300	35,400	28,500	16,500	20,700	29,700	45,400	68,000	54,100	18,300	7,570	9,910
25	37,100	41,700	29,100	16,500	21,400	27,900	*45,400	*67,700	55,100	17,500	7,620	7,860
26	37,500	41,800	29,200	17,700	22,100	32,400	47,700	67,000	52,800	*16,400	6,500	7,620
27	39,800	42,100	26,600	18,300	21,900	36,600	48,100	66,100	49,700	17,600	5,680	7,660
28	39,200	41,800	a22,500	17,900	20,400	39,400	43,500	65,200	*49,900	16,500	5,300	7,760
29	37,700	38,800	a17,000	16,100	20,600	45,100	52,200	64,300	50,700	12,300	4,850	8,400
30	37,800	34,400	a15,000	15,800	-------	49,700	58,600	63,200	50,500	10,300	*5,930	9,270
31	39,000	-------	13,900	15,600	-------	52,100	-------	61,800	-------	10,400	6,820	-------
Total	961,000	989,000	779,000	549,700	572,900	866,800	‡3,545.3	‡1,802	‡1,728.3	876,300	354,900	316,890
Mean	31,000	32,970	25,130	17,730	19,760	27,960	51,510	58,130	57,610	28,270	11,450	10,560
Ac-ft	‡1,906	‡1,962	‡1,545	‡1,090	‡1,136	‡1,719	‡3,065	‡3,574	‡3,428	‡1,738	703,900	628,500

Calendar year 1959: Max 98,900 Min 7,160 Mean 36,270 Ac-ft 26,260,000
Water year 1959-60: Max 68,900 Min 4,850 Mean 30,990 Ac-ft 22,500,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
a No gage-height record; discharge estimated on basis of partial record reconstructed from Box Canyon Dam spillway records.

3969. Sullivan Creek above Outlet Creek, near Metaline Falls, Wash.

Location.--Lat 48°50'45", long 117°17'10", in SW¼SE¼ sec.30, T.39 N., R.44 E., on right bank 30 ft downstream from road bridge, 1,000 ft upstream from Outlet Creek, and 4 miles southeast of Metaline Falls.

Drainage area.--70.2 sq mi.

Records available.--January 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,540.09 ft above mean sea level (Pend Oreille County Public Utility District levels).

Extremes.--Maximum discharge during year, 958 cfs June 3 (gage height, 12.67 ft); minimum, 21 cfs about Feb. 27 (gage height, 9.94 ft).
1959-60: Maximum discharge, 1,040 cfs June 6, 1959 (gage height, 12.67 ft); minimum, 18 cfs Jan. 20-23, 1959 (gage height, 10.00 ft).

Remarks.--Records good except those for periods of no gage-height record, which are poor. No regulation or diversion above station.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 20 to June 1)

10.1	24	11.0	182
10.2	30	11.5	350
10.4	53	12.0	575
10.7	108	12.5	880

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	81	102	*65	58	50	*39	145	168	507	244	58	*39
2	77	100	65	63	50	35	140	191	641	231	58	38
3	75	112	65	58	50	33	142	218	845	215	56	37
4	72	100	63	65	49	35	155	222	866	203	65	56
5	68	*96	63	70	49	37	*191	238	784	188	56	62
6	70	94	62	72	49	35	234	254	752	177	53	45
7	68	90	60	70	50	35	263	346	*691	166	50	41
8	70	88	53	68	49	35	298	399	619	158	50	39
9	96	86	62	67	48	35	346	394	570	145	49	37
10	77	83	62	63	48	35	358	466	560	138	46	37
11	75	79	62	65	46	34	331	680	592	130	46	36
12	81	60	60	*56	46	33	305	*852	597	123	44	35
13	81	50	56	62	46	31	283	*817	586	117	44	34
14	90	45	56	60	45	31	266	641	565	110	43	33
15	108	45	110	60	45	32	250	530	570	104	43	33
16	106	50	140	53	44	33	231	476	535	100	43	32
17	104	55	108	41	41	35	222	435	489	96	43	32
18	102	65	102	45	36	37	*212	390	430	92	41	32
19	100	70	98	46	44	40	203	366	394	86	40	31
20	104	75	96	48	43	35	197	399	386	83	39	31
21	104	80	92	50	43	35	188	404	350	79	38	30
22	117	75	90	55	38	40	177	366	323	75	40	30
23	115	75	88	55	34	50	168	*335	312	74	40	33
24	112	80	88	56	45	60	163	316	312	72	43	32
25	128	80	88	55	40	70	155	305	312	*70	46	31
26	121	70	74	55	35	90	150	323	290	68	48	30
27	119	65	68	55	30	150	145	350	*280	67	46	29
28	119	65	65	50	30	170	145	346	273	65	43	29
29	112	65	63	60	35	170	148	346	263	62	46	29
30	108	65	81	58	------	160	152	370	257	62	44	29
31	106	------	75	52	------	155	------	440	------	60	40	------
Total	2,966	2,265	2,380	1,791	1,258	1,845	6,363	12,383	14,951	3,660	1,441	1,062
Mean	95.7	75.5	76.8	57.8	43.4	59.5	212	399	498	118	46.5	35.4
Cfsm	1.36	1.08	1.09	0.823	0.618	0.848	3.02	5.68	7.09	1.68	0.662	0.504
In.	1.57	1.20	1.26	0.95	0.67	0.98	3.37	6.56	7.92	1.94	0.76	0.56
Ac-ft	5,880	4,490	4,720	3,550	2,500	3,660	12,620	24,560	29,650	7,260	2,860	2,110

Calendar year 1959: Max 996 Min 18 Mean 139 Cfsm 1.98 In. 26.78 Ac-ft 100,300
Water year 1959-60: Max 866 Min 29 Mean 143 Cfsm 2.04 In. 27.74 Ac-ft 103,900

Peak discharge (base, 600 cfs).--May 12 (8 p.m.) 901 cfs (12.53 ft); June 3 (10 p.m.) 958 cfs (12.67 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 13-30, Jan. 20-23, Feb. 25-29, Mar. 2-30; discharge estimated on basis of recorded range in stage, weather records, and records for station at Metaline Falls.

3970. Sullivan Lake near Metaline Falls, Wash.

Location.--Lat 48°50'20", long 117°17'10", in NE¼ sec.31, T.39 N., R.44 E., 300 ft southeast of dam at outlet, 4 miles southeast of Metaline Falls.

Drainage area.--51.8 sq mi.

Records available.--May 1912 to September 1923, January 1959 to September 1960 (fragmentary).

Gage.--Staff gages. Datum of gage is at mean sea level (Pend Oreille County Public Utility District levels of 1957). Prior to May 9, 1913, staff gage and May 9, 1913, to Sept. 30, 1923, float gage on dam at outlet of lake at different datum.

Extremes.--Maximum elevation observed during year, 2,589.15 ft July 8; minimum observed, 2,564.85 ft Feb. 29, Mar. 4-10.
1959-60: Maximum elevation observed, that of July 8, 1960; minimum observed, that of Feb. 29, Mar. 4-10, 1960.

Remarks.--Reservoir is formed by concrete dam at lake outlet. Some small diversions for domestic use.

Cooperation.--Gage-height record furnished by Public Utility District No. 1 of Pend Oreille County.

Elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	88.75	71.14	65.79	64.88	65.95	73.60	84.60	88.75	88.50	87.94
2	-	-	88.58	-	65.75	64.88	66.10	73.80	84.65	88.90	88.45	-
3	-	-	88.28	-	65.71	64.88	66.30	74.00	84.90	89.00	88.45	-
4	-	88.50	87.78	-	65.68	64.85	66.50	74.30	85.15	89.05	-	-
5	-	88.52	87.08	69.69	65.65	64.85	66.70	74.60	85.26	89.10	-	88.00
6	-	-	86.40	69.39	65.61	64.85	67.05	74.95	85.32	89.10	-	-
7	86.95	-	85.78	69.09	65.61	64.85	67.40	75.40	85.40	89.12	-	-
8	-	-	85.05	68.79	65.60	64.85	67.80	76.00	85.25	89.15	88.40	-
9	-	-	84.30	68.52	65.57	64.85	68.20	76.60	85.15	89.12	-	-
10	-	-	83.38	68.24	65.53	64.85	68.70	77.10	85.10	89.12	-	-
11	-	88.50	82.25	68.02	65.50	-	69.10	77.80	85.10	89.05	-	-
12	-	-	81.55	67.75	65.47	-	69.50	78.80	85.55	89.02	-	87.95
13	-	-	80.95	67.55	65.45	64.95	69.90	79.80	86.00	89.00	-	-
14	87.20	-	80.15	67.35	65.45	64.95	70.30	80.70	86.40	88.98	-	-
15	-	-	79.35	67.15	65.41	64.95	70.50	81.20	86.90	88.95	88.15	-
16	-	-	78.85	67.00	65.41	64.95	70.80	81.70	-	88.95	-	-
17	-	-	78.20	66.85	65.39	64.93	71.00	82.30	-	88.88	-	-
18	-	88.60	77.57	66.68	65.33	64.93	71.20	82.80	88.10	88.85	-	-
19	-	-	76.97	66.55	65.31	64.93	71.40	83.00	88.20	88.82	-	87.82
20	-	-	76.42	66.45	65.27	64.93	71.60	83.15	88.30	88.80	-	-
21	87.60	-	75.92	66.30	65.26	64.93	71.80	83.75	88.40	88.78	-	-
22	-	-	75.42	66.25	65.25	64.93	72.00	84.30	88.45	88.75	88.05	-
23	-	-	74.92	66.15	65.21	64.97	72.20	84.20	88.45	88.70	-	-
24	-	-	74.48	66.10	65.19	65.00	72.30	84.30	88.50	88.65	-	-
25	-	88.80	74.03	66.05	65.15	65.05	72.50	84.45	88.55	88.62	-	-
26	-	-	73.58	66.03	65.05	65.13	72.60	84.40	88.55	88.60	-	87.65
27	-	-	73.08	66.00	64.98	65.33	72.60	84.50	88.50	88.58	-	-
28	88.10	-	72.68	65.97	64.93	65.50	72.70	84.50	88.50	88.55	-	-
29	-	-	72.23	65.90	64.85	65.65	72.90	84.40	88.60	88.55	87.98	-
30	-	-	71.83	65.88	-------	65.80	73.20	84.40	88.65	88.52	-	-
31	-	-------	71.43	65.84	-------	65.90	-------	84.45	-------	88.50	-	-------

Note.--Add 2,500 ft to obtain elevation above mean sea level.

3971. Outlet Creek near Metaline Falls, Wash.

Location.--Lat 48°50'45", long 117°17'15", in SW¼SE¼ sec.30, T.39 N., R.44 E., on right bank 600 ft upstream from mouth, half a mile below Sullivan Lake Dam, and 4 miles east of Metaline Falls.

Drainage area.--52.3 sq mi.

Records available.--January 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,550 ft above mean sea level (Pend Oreille County Public Utility District levels).

Extremes.--Maximum discharge during year, 616 cfs Dec. 9 (gage height, 11.49 ft); minimum, 5.1 cfs Apr. 3 (gage height, 8.86 ft).
1959-60: Maximum discharge, that of Dec. 9, 1959; minimum, 4.4 cfs May 11, 1959 (gage height, 8.85 ft); minimum daily, 4.7 cfs May 8-15, 1959.

Remarks.--Records good. Flow regulated by Sullivan Lake (see p. 251). No diversion.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

8.8	3.4	9.3	28	10.5	260
8.9	5.5	9.5	47	11.0	420
9.0	8.7	9.7	75	11.5	630
9.1	13.5	10.0	130		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18.5	21	*102	248	59	*28	40	7.4	364	55	29	*24
2	18.5	21	198	239	57	29	5.5	7.4	424	62	27	24
3	18.5	22	*293	230	57	28	5.1	7.7	416	69	27	24
4	18.5	23	*399	222	55	28	5.3	7.7	420	74	27	24
5	18.5	*24	452	215	54	28	5.5	7.7	420	75	27	24
6	19	24	444	208	52	28	5.5	8.1	413	78	26	24
7	19	25	432	200	51	28	5.8	8.4	428	78	26	24
8	19	26	478	190	51	28	5.8	8.4	428	81	26	24
9	19	27	562	185	50	28	5.8	8.7	378	80	26	24
10	19	28	576	175	50	28	6.1	9.2	341	80	26	24
11	19	28	554	165	50	28	6.1	9.6	189	74	26	24
12	19	28	536	*158	51	27	6.1	11	62	64	26	24
13	19	26	512	150	48	27	6.1	11.5	56	64	26	24
14	19	25	492	142	47	26	6.5	11.5	29	63	26	24
15	19	24	472	135	45	26	6.1	12	30	60	26	24
16	19	24	456	126	44	25	6.1	13	31	56	26	24
17	19	24	432	120	44	24	6.1	13.5	31	52	25	24
18	19	25	406	111	43	24	*6.1	80	95	50	25	24
19	19	26	382	104	42	24	6.1	208	148	48	25	24
20	20	29	357	96	41	24	6.1	210	158	45	25	24
21	20	34	341	88	41	24	6.5	212	162	42	25	24
22	20	35	335	81	40	24	6.5	212	162	40	24	24
23	20	36	326	77	39	26	6.5	210	165	36	24	24
24	20	36	317	74	36	28	6.5	205	168	35	24	23
25	21	36	308	72	36	30	6.5	256	170	*33	24	23
26	21	36	302	70	33	35	6.8	*357	170	32	24	23
27	21	35	290	77	31	42	6.8	360	*170	31	24	23
28	21	34	284	74	30	52	6.8	360	124	31	24	23
29	21	34	275	69	*29	60	7.1	360	107	30	24	23
30	21	34	269	68	-------	68	7.4	342	90	29	24	23
31	21	-------	257	63	-------	75	-------	314	-------	29	24	-------
Total	605.5	850	11,839	4,232	1,306	1,000	219.2	3,848.8	6,349	1,676	788	713
Mean	19.5	28.3	382	137	45.0	32.3	7.31	124	212	54.1	25.4	23.8
Ac-ft	1,200	1,690	23,480	8,390	2,590	1,980	435	7,630	12,590	3,320	1,560	1,410

Calendar year 1959: Max 576 Min 4.7 Mean 108 Ac-ft 78,020
Water year 1959-60: Max 576 Min 5.1 Mean 91.3 Ac-ft 66,280

* Discherge measurement made on this day.

3980. Sullivan Creek at Metaline Falls, Wash.

Location.--Lat 48°51'40", long 117°21'50", in SW¼SW¼ sec.22, T.39 N., R.43 E., on right bank 100 ft downstream from State highway bridge, half a mile upstream from mouth, and half a mile east of Metaline Falls.

Drainage area.--142 sq mi.

Records available.--October 1953 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,050 ft (from topographic map). Prior to Aug. 24, 1956, staff gage at site 120 ft upstream at datum 3.70 ft higher.

Average discharge.--7 years, 240 cfs (173,800 acre-ft per year).

Extremes.--Maximum discharge during year, 1,960 cfs June 3 (gage height, 6.11 ft); minimum, 71 cfs Sept. 30.
1953-60: Maximum discharge observed, 3,550 cfs June 12, 1955 (gage height, 3.90 ft, site and datum then in use); minimum, 7.3 cfs Jan. 1, 1958 (result of freezeup); minimum daily, 27 cfs Jan. 1, 1958.

Remarks.--Records good except those for periods of ice effect, which are fair. Some regulation by storage in Sullivan Lake. Small diversions above station for municipal and mine water supply.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Jan. 26 to Mar. 24, May 14 to June 11)

1.4	69	3.0	400
1.7	100	4.0	755
2.0	147	5.0	1,190
2.5	259	6.0	1,690

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	112	137	*169	332	114	*85	264	239	973	364	103	82
2	109	133	282	326	114	b83	193	269	1,180	352	102	81
3	106	145	376	318	112	b80	202	309	1,610	334	100	80
4	102	140	470	315	108	b83	226	318	1,580	320	109	95
5	99	132	537	312	108	87	*282	337	1,360	307	102	115
6	100	*130	530	304	108	84	329	358	1,300	298	99	93
7	102	127	520	296	112	83	355	424	*1,260	290	96	86
8	100	126	540	282	108	84	388	488	1,220	280	94	83
9	127	124	624	275	106	83	436	484	1,120	267	92	81
10	110	121	655	259	104	82	445	534	1,030	254	90	80
11	109	120	628	249	102	81	430	755	891	242	89	79
12	114	108	604	226	102	80	403	*947	731	224	87	78
13	112	79	579	214	100	78	370	*968	735	214	87	77
14	116	b75	562	*204	99	78	352	787	687	204	86	77
15	133	b75	576	193	99	79	334	691	695	193	84	76
16	133	b80	600	182	98	79	318	632	651	182	85	76
17	133	95	534	161	99	80	307	576	614	171	87	75
18	132	109	506	156	96	90	293	558	604	165	84	75
19	128	115	474	151	98	98	280	667	614	158	83	74
20	133	126	454	145	99	86	275	703	614	151	80	74
21	137	135	439	144	98	87	259	723	582	142	80	74
22	142	126	424	144	93	98	*246	683	554	137	82	74
23	145	127	412	140	87	112	234	655	544	132	81	76
24	142	135	400	137	94	126	224	*639	551	127	84	75
25	154	135	391	135	89	154	212	628	562	122	90	74
26	151	122	376	133	b87	214	202	751	540	120	92	74
27	151	115	358	127	b84	275	200	767	516	*116	93	74
28	151	116	355	122	b80	307	204	743	470	112	85	73
29	147	115	349	130	b82	312	209	839	433	110	88	73
30	142	114	349	128	------	318	222	815	421	106	87	73
31	138	------	343	120	------	307	------	843	------	104	*83	------
Total	3,910	3,537	14,416	6,360	2,880	3,973	8,694	19,130	24,642	6,298	2,784	2,377
Mean	126	118	465	205	99.3	128	290	617	821	203	89.8	79.2
Ac-ft	7,760	7,020	28,590	12,610	5,710	7,880	17,240	37,940	48,880	12,490	5,520	4,710

Calendar year 1959: Max 1,400 Min 44 Mean 267 Ac-ft 193,000
Water year 1959-60: Max 1,610 Min 73 Mean 270 Ac-ft 196,400

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

3985. Pend Oreille River below Z Canyon, near Metaline Falls, Wash.

(International gaging station)

Location.--Lat 48°58'50", long 117°20'40", in lot 2, sec.11, T.40 N., R.43 E., on right bank three-quarters of a mile downstream from Z Canyon, 1¼ miles south of international boundary, 5 miles downstream from Slate Creek, and 10 miles downstream from town of Metaline Falls.

Drainage area.--25,200 sq mi, approximately.

Records available.--November 1908 to September 1910 (gage heights only), October 1912 to September 1960. Prior to October 1928, published as Clark Fork at Metaline Falls and October 1928 to September 1937 as Clark Fork below Z Canyon, near Metaline Falls.

Gage.--Water-stage recorder. Datum of gage is 1,721.18 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Corps of Engineers). Prior to Dec. 19, 1928, staff gages at Metaline Falls 10 miles upstream at datum approximately 262.2 ft higher.

Average discharge.--48 years (1912-60), 26,830 cfs (19,420,000 acre-ft per year).

Extremes.--Maximum discharge during year, 72,000 cfs May 21 (gage height, 32.01 ft); minimum observed, 4,860 cfs Aug. 31 (gage height, 9.17 ft); minimum daily, 5,900 cfs Aug.29. 1912-60: Maximum discharge, 171,300 cfs June 13, 1948 (gage height, 60.25 ft); minimum, 2,500 cfs Dec. 12, 1919 (gage height, -2.4 ft, site and datum then in use). Maximum stage known, 69.0 ft in June 1894, from floodmarks.

Remarks.--Records excellent except those for period July 10 to Aug. 18, which are good, and those for period of no gage-height record, which are fair. In 1946 there were diversions for irrigation of about 340,000 acres, and there probably has not been any appreciable change since that time. Flow regulated at Albeni Falls and Box Canyon Dams and affected by storage in Pend Oreille Lake (see p. 243), Flathead Lake (see p. 236), Hungry Horse Reservoir (see p. 232), and several smaller reservoirs in Pend Oreille River basin in Montana (see following page).

Cooperation.--This station is maintained by the United States under agreement with Canada.

Revisions (water years).--WSP 442: 1913.

Corrections.--The figure of daily discharge for July 2, 1919, published erroneously in WSP 512, has been corrected to 47,700 cfs.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

9.0	4,670	20.0	35,400
10.0	5,970	25.0	50,600
12.0	10,000	30.0	65,900
15.0	19,500	35.0	81,200

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26,500	39,800	29,700	14,200	17,700	22,500	47,900	62,500	64,300	49,200	14,900	8,100
2	25,900	39,000	29,200	14,000	17,700	20,900	43,700	62,600	64,200	46,000	16,900	7,300
3	22,900	*36,600	29,600	18,000	17,700	21,400	45,400	61,800	64,700	46,200	18,600	11,200
4	23,500	35,400	28,600	19,500	17,700	20,700	47,200	*58,700	65,500	45,800	21,100	12,200
5	24,300	36,600	27,000	21,100	19,800	19,800	47,400	45,200	66,900	45,800	20,200	11,000
6	23,700	35,700	26,900	21,100	21,200	20,200	47,700	33,000	68,900	48,500	15,700	9,500
7	24,900	33,000	25,100	21,100	21,700	20,600	49,000	35,700	70,300	48,800	13,500	10,600
8	24,800	33,000	22,900	20,500	23,200	21,500	52,800	40,400	70,300	43,300	13,600	12,900
9	24,100	33,100	24,200	18,300	22,300	24,800	58,800	47,100	67,900	36,200	17,200	14,300
10	24,800	32,100	25,300	17,600	23,100	22,000	62,200	48,900	66,500	33,300	18,600	15,000
11	25,600	29,900	27,600	17,700	23,900	26,300	62,500	49,900	62,600	31,300	19,400	13,600
12	26,400	29,900	27,000	19,100	23,300	29,000	61,800	57,200	59,100	31,100	18,500	14,100
13	27,600	29,500	26,300	20,400	22,800	27,600	56,100	59,600	58,600	31,900	15,700	14,900
14	28,600	29,000	25,600	22,200	22,600	25,800	50,800	61,000	58,500	28,900	12,800	14,900
15	29,800	28,000	25,300	22,500	21,800	27,500	54,000	62,000	57,700	32,200	15,000	14,500
16	29,900	28,700	26,300	21,400	22,600	28,500	60,000	64,600	57,000	28,300	18,500	13,100
17	32,000	28,700	27,300	20,900	22,500	29,600	63,400	67,000	56,000	27,900	17,700	9,560
18	35,000	28,700	28,300	20,800	22,500	28,600	63,900	68,900	55,700	28,300	14,500	8,660
19	36,700	28,700	29,100	19,900	21,500	29,600	63,700	69,500	58,900	28,400	12,200	10,600
20	36,700	26,900	28,600	19,800	21,100	29,700	59,800	70,900	62,500	24,600	11,200	12,800
21	37,100	27,800	28,100	20,600	21,700	28,800	*52,100	71,800	67,900	20,600	11,800	12,500
22	37,500	28,300	28,100	20,000	20,000	29,000	48,000	71,600	58,300	16,300	12,500	10,900
23	37,500	30,500	29,400	19,100	21,000	28,200	47,000	71,300	52,600	20,700	10,100	12,400
24	37,700	35,200	29,400	18,600	22,300	29,900	46,600	71,100	56,100	21,200	9,300	11,300
25	37,600	41,900	30,200	18,400	23,000	29,400	46,800	70,400	57,700	19,900	9,100	8,440
26	37,700	42,300	30,200	19,200	23,600	32,800	49,000	69,900	55,200	19,100	7,600	8,030
27	39,800	42,600	28,400	20,000	24,000	37,000	49,900	69,200	51,800	19,600	6,900	8,060
28	39,800	42,400	26,300	20,000	22,600	39,700	45,800	68,200	51,600	19,400	6,300	8,100
29	38,000	39,600	22,700	18,500	22,300	45,800	51,800	67,400	*52,500	17,000	5,900	8,460
30	38,100	36,100	17,600	17,900	-------	50,800	60,700	66,500	52,500	12,300	6,900	9,650
31	39,600	-------	17,200	18,100	-------	53,500	-------	65,100	-------	12,600	*8,000	-------
Total	976,100	‡1,008.8	827,500	600,500	627,200	901,500	‡1,595.8	‡1,889	‡1,812.3	935,100	422,200	336,660
Mean	31,490	33,630	26,690	19,370	21,630	29,080	53,190	60,940	60,410	30,160	13,620	11,220
Ac-ft	‡1,936	‡2,001	‡1,641	‡1,191	‡1,244	‡1,788	‡3,165	‡3,747	‡3,595	‡1,855	837,400	667,800

Calendar year 1959: Max 101,900 Min 8,720 Mean 37,630 Ac-ft 27,250,000
Water year 1959-60: Max 71,800 Min 5,900 Mean 32,600 Ac-ft 23,670,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
Note.--No gage-height record Aug. 19 to Sept. 8; discharge estimated on basis of 1 discharge measurement and records for station below Box Canyon.

Smaller Reservoirs in Pend Oreille River basin in Montana

3250. Georgetown Lake on Flint Creek, 2 miles west of Southern Cross. Storage began about 1905 for pumpage into Warm Springs Creek for use of reduction works of Anaconda Copper Mining Co., Anaconda, or for release through Flint Creek for power development. Usable capacity, 31,000 acre-ft. Records furnished by The Montana Power Co.

3325. East Fork Rock Creek Reservoir on East Fork Rock Creek, 14 miles southwest of Philipsburg. Storage began in 1936 for irrigation in Flint Creek Valley; usable capacity, 16,000 acre-ft. Records furnished by Montana Water Conservation Board. The only figures of contents available during the water year 1960 are as follows: Mar. 22, 10,300 acre-ft; Apr. 14, 10,650 acre-ft; Apr. 28, 10,800 acre-ft.

3365. Nevada Creek Reservoir on Nevada Creek, 7 miles west of Finn. Storage began in 1939 for irrigation; usable capacity, 12,600 acre-ft. Records furnished by Montana Water Conservation Board.

3420. Painted Rocks Lake (formerly published as West Fork Bitterroot River Reservoir), on West Fork Bitterroot River, 7 miles upstream from Nez Perce Creek, 16½ miles southwest of Conner, and 23 miles south of Darby. Storage began in 1940 for irrigation; usable capacity, 31,700 acre-ft. Records furnished by Montana Water Conservation Board.

3445. Como Lake on Rock Creek, 4 miles northwest of Darby. Storage began in 1909 for irrigation; usable capacity, 34,800 acre-ft. Records furnished by Bitterroot Irrigation District.

Camas Reservoirs comprise a group of four reservoirs in Little Bitterroot River basin, which are operated for irrigation. Records furnished by Bureau of Indian Affairs.

3725. Little Bitterroot Lake on Little Bitterroot River, 2 miles southwest of Marion. Storage began in 1918; usable capacity, 26,400 acre-ft (revised).

3735. Hubbart Reservoir on Little Bitterroot River, 9 miles northwest of Nirrada. Storage began in 1924; usable capacity, 12,120 acre-ft (revised).

3750. Upper Dry Fork Reservoir on Dry Fork Creek, 4 miles northwest of Lonepine. Storage began in 1940; usable capacity, 2,810 acre-ft (revised).

3755. Dry Fork Reservoir on Dry Fork Creek, 1 mile west of Lonepine. Storage began in 1921; usable capacity, 3,860 acre-ft (revised).

Mission Valley Reservoirs comprise a group of eight reservoirs in an area east of and tributary to Flathead River between Flathead Lake and Jocko River, which are operated for irrigation. Records furnished by Bureau of Indian Affairs.

3704. Twin Reservoir, fed entirely by canals, 4 miles southeast of Polson. Storage began in 1932; usable capacity, 899 acre-ft (revised).

3759. Pablo Reservoir, fed entirely by canals, 3 miles south of Polson and 2 miles northwest of Pablo. Storage began in 1914, usable capacity, 27,100 acre-ft (revised).

3767. Lower Crow Reservoir on Crow Creek, 5 miles northwest of Charlo and 6 miles west of Ronan. Storage began in 1933, usable capacity, 10,350 acre-ft.

3772. Mission Reservoir on Mission Creek, 4 miles east of St. Ignatius. Storage began in 1935; usable capacity, 7,250 acre-ft.

3773. Tabor Reservoir on Dry Creek, 8 miles southeast of St. Ignatius. Storage began in 1919; usable capacity, 23,300 acre-ft (revised).

3782. McDonald Reservoir on Post Creek, 9 miles east of Charlo. Storage began in 1919; usable capacity, 8,220 acre-ft.

3797. Kicking Horse Reservoir, fed entirely by canals, 4½ miles east of Charlo and 5 miles south of Ronan. Storage began in 1930; usable capacity, 8,350 acre-ft.

3800. Ninepipe Reservoir, fed entirely by canals, 2 miles northeast of Charlo. Storage began in 1911; usable capacity, 14,870 acre-ft.

3805. Lower Jocko Lake on Middle Fork Jocko River, 15 miles east of Arlee. Storage began in 1937; usable capacity, 6,380 acre-ft (revised). Records furnished by Bureau of Indian Affairs.

3900. Thompson Falls Reservoir on Clark Fork, at Thompson Falls. Storage began in 1915 for power development; usable capacity, 15,000 acre-ft. Records furnished by The Montana Power Co.

3913. Noxon Reservoir on Clark Fork, 4 miles southeast of Noxon. Storage began in 1959 for power development; usable capacity, 334,600 acre-ft (revised). Records furnished by Washington Water Power Co.

Revisions.--Revised figures of month-end contents, in acre-feet, for April to September 1959, superseding those published in WSP 1636, are given herewith:

1959		1959-Con.	
Apr. 30	177,300	July 31	321,100
May 31	222,100	Aug. 31	332,200
June 30	291,300	Sept. 30	319,700

Smaller Reservoirs in Pend Oreille River basin in Montana--Continued

Other reservoirs of small capacity, principally on tributaries of Bitterroot River, are operated for irrigation.

Month-end contents, in acre-feet, water year October 1959 to September 1960

Date	Georgetown Lake	Nevada Creek Reservoir	Painted Rocks Lake	Como Lake	Camas Reservoirs	Mission Valley Reservoirs	Lower Jocko Lake	Thompson Falls Reservoir	Noxon Reservoir
Sept.30.....	28,690	a7,840	b24,810	1,500	27,780	43,510	1,400	11,130	319,700
Oct. 31.....	29,170	6,000	-	5,310	28,360	57,820	3,420	12,160	307,500
Nov. 30.....	28,810	6,000	c29,280	11,440	32,840	56,210	-	13,670	326,900
Dec. 31.....	28,390	6,000	-	14,150	34,090	54,050	-	10,150	314,000
Jan. 31.....	28,630	6,000	-	16,150	34,420	50,800	-	9,560	326,800
Feb. 29.....	28,210	7,290	-	17,790	34,960	49,600	-	14,970	322,900
Mar. 31.....	28,750	12,260	a13,720	20,080	37,260	52,980	1,440	13,960	313,400
Apr. 30.....	24,330	11,160	a32,820	31,350	39,860	59,010	3,090	2,630	320,100
May 31.....	25,800	12,640	b31,840	31,860	36,640	63,260	4,300	3,210	327,500
June 30.....	29,170	10,480	a32,250	37,050	34,140	86,150	5,620	2,630	330,600
July 31.....	28,990	a10,480	a31,970	25,410	28,080	54,640	1,710	14,390	330,000
Aug. 31.....	28,360	7,290	a26,890	5,000	22,820	34,520	0	11,900	331,700
Sept.30.....	27,770	a7,290	a24,830	0	20,990	13,850	0	14,250	275,200

a Interpolated on basis of readings made weekly or less frequently.
b Figure of contents for first day of following month.
c Dec. 2, 1959.

3995. Columbia River at international boundary

(International gaging station)

Location.--Lat 49°00'03", long 117°37'40", in SE¼ sec.4, T.40 N., R.41 E., on left bank at international boundary, half a mile downstream from Pend Oreille River.

Drainage area.--59,700 sq mi, approximately.

Records available.--October 1937 to September 1960. Prior to March 1938 monthly discharge only, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (Bureau of Reclamation 1937 datum). Prior to Apr. 27, 1939, staff gage at same site and datum. Since May 31, 1942, auxiliary water-stage recorder 2.2 miles downstream from base gage. Jan. 1 to May 30, 1942, auxiliary staff gage at same site.

Average discharge.--23 years, 98,270 cfs (71,140,000 acre-ft per year).

Extremes.--Maximum discharge during year, 281,800 cfs June 20; maximum elevation, 1,320.02 ft July 6; minimum daily discharge, 36,100 cfs Mar. 5; minimum elevation, 1,292.38 ft Mar. 5.

1937-60: Maximum discharge, 550,100 cfs June 12, 1948 (elevation, 1,338.13 ft); minimum, 18,000 cfs Feb. 7, 1954 (elevation, 1,289.38 ft).

Flood in June 1894 reached a stage of 1,346 ft, from information by Bureau of Reclamation (discharge, 680,000 cfs).

Flow of about 12,900 cfs occurred Jan. 30 or 31, 1937, based on information from other gaging stations (elevation, 1,287.9 ft), from rating curve extended below 1,291.6 ft); may have been as low sometime in January 1930.

Remarks.--Records excellent except those for periods of faulty or no auxiliary gage-height record, which are fair. Many diversions above station for irrigation. It was estimated that 346,700 acres was under irrigation in the United States in 1946. Water is diverted for irrigation of an additional 25,000 acres in Canada. Flow is affected by internationally controlled storage in Kootenay Lake as well as by natural and controlled regulation in other lakes and reservoirs in Kootenay and Pend Oreille River basins. Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Revisions (water years).--WSP 932: 1937(m), 1938(M), 1939(m).

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	111,600	103,500	68,000	40,200	39,000	41,000	91,900	121,600	184,100	*267,800	150,800	64,900
2	106,700	101,900	67,000	39,400	39,000	40,400	90,000	122,300	188,100	268,000	153,500	64,200
3	100,900	97,300	65,400	41,700	40,900	39,600	91,000	122,200	198,000	272,900	152,400	61,300
4	99,700	95,400	64,000	43,100	41,600	38,000	95,000	121,100	211,600	274,600	155,000	62,500
5	97,500	96,300	60,300	44,100	41,500	36,100	99,000	108,100	222,000	272,900	152,400	62,300
6	92,000	97,300	61,100	43,400	44,300	36,500	101,300	*97,200	234,700	273,800	145,800	61,300
7	88,000	92,600	62,200	43,400	44,800	37,300	104,600	104,400	244,600	274,400	142,200	68,400
8	87,900	91,200	56,500	42,400	45,900	40,300	111,300	113,600	248,600	270,700	141,100	70,500
9	90,000	89,200	56,400	39,500	45,600	45,800	120,700	119,100	249,000	260,400	141,200	72,200
10	89,300	84,500	56,000	37,600	46,500	43,800	126,700	127,700	249,700	256,400	139,100	72,900
11	90,300	78,000	60,100	40,500	47,900	48,000	128,900	134,000	249,600	251,300	136,600	70,500
12	89,800	77,500	62,500	46,200	46,500	52,200	130,300	150,300	248,600	244,900	133,700	68,900
13	85,900	*77,500	63,900	45,900	45,800	50,100	126,600	159,000	253,200	241,600	125,700	68,600
14	90,200	75,800	61,900	*48,100	45,600	46,900	123,200	163,400	259,000	233,900	121,600	64,800
15	92,000	74,600	57,300	48,800	44,700	49,000	126,400	171,700	264,200	234,200	122,100	62,300
16	92,200	71,700	61,800	74,200	46,300	49,200	132,000	180,700	269,800	227,900	121,800	66,600
17	94,000	66,400	63,400	46,200	45,100	49,800	135,600	188,200	274,900	226,200	118,300	62,200
18	96,700	66,400	65,100	45,400	45,300	48,200	136,500	193,300	276,500	226,300	111,400	60,400
19	97,900	65,200	68,300	42,400	42,900	49,400	135,300	194,600	277,800	225,000	107,100	60,200
20	101,400	62,500	67,200	38,700	42,000	49,200	130,700	196,900	279,000	219,100	102,600	61,100
21	101,700	63,400	65,300	40,300	43,100	48,400	123,800	199,600	276,200	211,600	100,800	62,000
22	101,000	62,800	60,200	40,500	39,500	51,600	118,300	197,600	266,300	204,200	99,600	61,900
23	97,700	68,000	59,800	37,900	39,000	58,900	116,200	196,200	255,600	204,600	95,400	66,600
24	98,700	79,900	58,900	36,200	42,200	60,700	114,800	194,700	257,000	202,000	88,500	66,500
25	99,400	92,900	59,300	37,200	43,500	62,200	112,700	191,500	259,700	197,300	85,000	64,400
26	101,100	90,500	61,800	42,700	44,500	68,200	114,100	189,300	257,400	188,700	82,000	64,200
27	106,200	92,100	63,100	43,500	43,900	74,900	*113,100	189,800	257,500	181,500	75,800	64,400
28	*108,800	91,800	54,000	43,900	41,000	79,000	107,400	186,700	258,200	172,800	73,900	63,200
29	108,100	83,600	50,000	43,800	40,400	86,100	111,300	184,400	261,500	163,300	71,700	60,700
30	104,200	77,400	45,000	49,100	-------	94,100	119,500	183,400	266,300	153,000	68,200	60,700
31	104,100	-------	44,000	44,600	-------	97,400	-------	183,400	-------	151,100	65,800	-------
Total	‡3,025	‡2,467.2	‡1,869.8	‡1,323.9	‡1,259.3	‡1,672.3	‡3,488.2	‡4,986	‡7,498.7	‡7,052.4	‡5,581.1	‡1,940.7
Mean	97,580	82,240	60,320	42,710	43,420	53,950	116,300	160,800	250,000	227,500	115,500	64,690
Ac-ft	‡6,000	‡4,894	‡3,709	‡2,626	‡2,498	‡3,317	‡6,919	‡9,890	‡14,870	‡13,990	‡7,173	‡3,849

Calendar year 1959: Max 395,200 Min 35,100 Mean 124,300 Ac-ft 90,010,000
Water year 1959-60: Max 279,000 Min 36,100 Mean 109,700 Ac-ft 79,660,000

* Discharge measurement made on this day.

‡ Expressed in thousands.

Note.--Faulty auxiliary gage-height record Dec. 28 to Mar. 11; no auxiliary gage-height record Apr. 2-4; discharge estimated on basis of base gage-height record and records for Pend Oreille River below Z Canyon, near Metaline Falls, Wash., and Columbia River at Birchbank, British Columbia.

4015. Kettle River near Ferry, Wash.

(International gaging station)

Location.--Lat 48°58'40", long 118°46'10", in lot 7, sec.10, T.40 N., R.32 E., on right bank 1¼ miles south of international boundary and Ferry and 3 miles upstream from Toroda Creek.

Drainage area.--2,220 sq mi, approximately.

Records available.--August 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,836.8 ft above mean sea level, international joint adjustment of 1947. Prior to Nov. 23, 1928, staff gage at present site and datum.

Average discharge.--32 years, 1,494 cfs (1,082,000 acre-ft per year).

Extremes.--Maximum discharge during year, 11,200 cfs May 13 (gage height, 17.23 ft); minimum, 134 cfs Aug. 22 (gage height, 9.47 ft).
1928-60: Maximum discharge, 21,200 cfs May 29, 1948 (gage height, 21.15 ft); minimum, 14 cfs (discharge measurement) Jan. 23, 1930, but may have been less during period of ice effect Jan. 18-23, 1930.

Remarks.--Records good except those for periods of ice effect, which are fair. Several small diversions above station for irrigation. No regulation.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

9.5	142	12.0	1,860
9.7	200	13.0	3,100
10.0	306	15.0	6,400
10.5	560	18.0	13,000
11.0	905		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,330	1,480	530	279	306	170	1,550	2,450	6,780	2,930	344	276
2	1,240	1,430	500	310	310	170	1,510	2,710	7,030	2,780	353	279
3	1,200	1,400	480	327	310	160	1,540	3,110	8,610	2,590	366	298
4	1,200	1,530	460	357	310	180	1,890	3,620	10,300	2,270	371	306
5	1,130	1,350	440	366	310	226	2,580	3,970	9,070	2,100	353	344
6	1,060	1,240	420	*376	314	229	3,100	4,100	*8,230	1,900	353	335
7	994	1,280	410	*380	314	236	3,350	4,590	8,330	1,780	357	340
8	953	1,210	*400	362	310	239	3,640	5,340	6,970	1,610	319	323
9	913	1,190	390	353	306	239	4,160	5,100	6,000	1,470	298	291
10	905	*1,120	380	353	*306	229	4,560	*5,100	5,690	1,330	268	264
11	989	1,070	445	344	302	243	4,270	6,480	6,200	1,210	257	254
12	882	994	554	344	302	236	3,960	8,920	6,720	1,110	239	236
13	945	600	560	340	298	243	3,540	10,900	6,590	*977	226	226
14	1,080	500	560	327	287	246	3,250	8,830	6,440	913	216	219
15	1,430	400	566	327	291	*257	2,980	7,030	*6,060	852	206	203
16	1,800	300	560	300	287	243	2,750	6,160	5,840	785	203	194
17	1,550	300	506	280	264	246	2,580	5,900	6,360	734	200	188
18	1,410	350	494	260	243	268	2,450	*5,300	4,960	678	194	188
19	1,310	572	506	240	257	291	2,330	4,820	4,270	633	*182	185
20	1,250	770	506	230	261	314	2,260	4,810	4,040	590	173	182
21	1,240	890	500	230	272	344	2,230	5,690	3,680	548	170	176
22	1,290	898	467	240	261	389	2,150	5,420	3,510	506	164	176
23	1,370	890	440	250	246	440	2,080	5,010	3,490	472	164	185
24	1,540	890	430	260	268	518	2,010	4,840	3,680	445	167	191
25	1,830	921	456	279	268	672	1,980	4,860	3,840	425	182	200
26	2,290	838	389	295	200	905	2,010	4,940	3,460	399	203	213
27	2,090	713	302	287	170	1,210	1,980	6,000	3,280	385	210	226
28	1,890	620	239	287	160	1,450	*2,020	5,920	3,200	366	264	222
29	1,760	584	210	295	160	1,630	2,080	5,530	2,970	357	279	203
30	1,630	560	226	302	-------	1,700	2,210	5,700	2,960	353	272	191
31	1,520	-------	261	306	-------	1,650	-------	6,220	-------	344	272	-------
Total	41,930	26,890	13,587	9,486	7,893	15,573	79,000	169,370	168,560	33,842	7,825	7,114
Mean	1,353	896	438	306	272	502	2,633	5,464	5,619	1,092	252	237
Ac-ft	83,170	53,340	26,950	18,820	15,660	30,890	156,700	335,900	334,300	67,120	15,520	14,110

Calendar year 1959: Max 12,100 Min 100 Mean 2,130 Ac-ft 1,542,000
Water year 1959-60: Max 10,900 Min 160 Mean 1,588 Ac-ft 1,152,000

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 13-18, Nov. 30 to Dec. 10, Jan. 16-24, Feb. 26 to Mar. 4 (no gage-height record Jan. 19-24).

4045. Kettle River near Laurier, Wash.

(International gaging station)

Location.--Lat 48°59'10", long 118°13'00", in NW¼ sec.11, T.40 N., R.36 E., on right bank 500 ft downstream from Deep Creek, 1½ miles southeast of Laurier, and 12 miles upstream from Boulder Creek.

Drainage area.--3,800 sq mi, approximately.

Records available.--September 1929 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,425.5 ft above mean sea level, international joint adjustment of 1947. Prior to Jan. 3, 1930, staff gage at same site and datum.

Average discharge.--31 years, 2,889 cfs (2,092,000 acre-ft per year).

Extremes.--Maximum discharge during year, 18,900 cfs May 13 (gage height, 12.51 ft); minimum, 319 cfs Sept. 22 (gage height, 2.81 ft).

1929-60: Maximum discharge, 35,000 cfs May 29, 1948 (gage height, 17.25 ft); minimum, 88 cfs Dec. 1, 1936 (gage height, 2.20 ft), but was probably less during winter of 1929-30.

Maximum stage known, about 22 ft in May or June 1894, from information by local residents.

Remarks.--Records excellent except those for periods of ice effect, which are fair. North Fork regulated by reservoir at Grand Forks, British Columbia. Numerous diversions for irrigation of about 720 acres in the United States (for 1946 from United States reports), and 2,090 acres in Canada from the Canada Year Book for 1940. Some diversion for domestic use.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Revisions (water years).--WSP 737: 1930-31. WSP 862: 1937. WSP 882: 1938.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.8	315	6.0	3,310
3.0	400	8.0	6,930
3.5	690	10.0	11,600
4.0	1,060	13.0	20,400
5.0	2,010		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,290	2,680	1,060	550	670	370	4,220	5,020	12,100	5,490	739	456
2	2,180	2,590	1,030	600	670	370	3,990	5,630	12,500	5,380	732	456
3	2,050	2,540	1,010	650	680	360	3,980	6,340	15,200	5,020	725	450
4	2,030	2,590	990	700	680	360	4,690	7,010	18,100	4,590	760	494
5	1,970	2,570	980	*750	680	450	6,220	7,560	17,000	4,220	753	505
6	1,860	2,370	980	780	680	500	7,350	7,890	*14,800	3,840	732	565
7	1,780	2,330	960	*800	690	541	7,580	8,720	14,800	3,600	711	571
8	1,710	2,270	*940	800	700	553	8,000	10,300	13,000	3,300	704	565
9	1,660	2,200	910	800	710	553	8,780	*10,100	11,000	3,010	656	541
10	1,620	*2,120	900	780	*718	535	9,600	9,700	10,600	2,730	607	500
11	1,590	2,010	964	760	690	523	9,110	11,600	11,000	2,500	565	461
12	1,560	1,930	1,060	750	677	535	8,490	15,500	12,000	2,310	529	440
13	1,580	1,500	1,080	740	670	529	7,780	*18,400	11,900	*2,140	505	415
14	1,720	1,300	1,060	720	658	553	7,200	16,600	11,800	1,930	466	400
15	1,990	1,100	1,140	700	638	*565	6,720	13,200	*11,300	1,810	456	382
16	2,700	900	1,180	650	638	577	6,220	11,600	10,800	1,690	445	364
17	2,740	700	1,120	600	619	571	5,800	*11,100	11,300	1,560	435	355
18	2,510	900	1,060	550	613	571	5,570	10,300	9,720	1,460	*420	347
19	2,360	1,170	1,080	500	571	613	5,270	9,360	8,220	1,350	400	343
20	2,270	1,360	1,080	500	583	664	5,160	9,150	7,760	1,260	391	327
21	2,210	1,610	1,070	520	601	760	5,130	10,400	7,120	1,180	368	323
22	2,230	1,690	1,030	540	607	940	4,930	10,500	6,580	1,100	364	323
23	2,360	1,700	1,000	560	583	1,240	4,750	9,650	6,500	1,010	355	327
24	2,640	1,720	980	580	577	1,530	4,620	9,150	6,950	956	351	331
25	2,970	1,720	980	600	550	1,970	4,520	9,020	7,080	924	355	343
26	3,690	1,650	900	620	450	3,010	4,490	8,950	6,780	893	364	355
27	3,820	1,300	800	620	400	4,030	4,380	10,500	6,280	851	410	360
28	3,500	1,200	600	640	350	4,490	*4,330	11,300	6,080	816	420	364
29	3,240	1,150	550	660	350	4,660	4,420	10,500	5,870	781	445	360
30	3,020	1,100	500	660	-------	4,770	4,610	10,300	5,720	753	461	355
31	2,810	-------	500	660	-------	4,570	-------	11,200	-------	739	456	-------
Total	72,660	51,970	29,494	20,340	17,703	42,263	177,910	316,550	309,860	69,193	16,082	12,378
Mean	2,344	1,732	951	656	610	1,363	5,930	10,210	10,330	2,232	519	413
Ac-ft	144,100	103,100	58,500	40,340	35,110	83,830	352,900	627,900	614,600	137,200	31,900	24,550

Calendar year 1959: Max 21,000 Min 180 Mean 3,889 Ac-ft 2,816,000
Water year 1959-60: Max 18,400 Min 323 Mean 3,105 Ac-ft 2,254,000

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-18, Nov. 27 to Dec. 10, Dec. 26 to Feb. 9, Feb. 25 to Mar. 6 (no gaga-height record Jan. 18-25, Feb. 29 to Mar. 6; discharge estimated on basis of weather records and records for station near Ferry).

4060. Deer Lake near Loon Lake, Wash.

Location.--Lat 48°06'25", long 117°36'10", on line between secs.11 and 14, T.30 N., R.41 E., an eighth of a mile upstream from outlet and about 3 miles northeast of town of Loon Lake.

Drainage area.--17.8 sq mi.

Records available.--November 1952 to September 1960 (fragmentary).

Gage.--Staff gage read occasionally. Altitude of gage is 2,480 ft (from topographic map). Prior to Oct. 1, 1953, staff gage at same site at datum 4.00 ft higher.

Extremes.--Maximum gage height observed during year, 7.82 ft June 2-5; minimum observed, 4.70 ft Jan. 29.
1952-60: Maximum gage height observed, 9.30 ft Apr. 25, 26, 1956; minimum observed, 3.05 ft Jan. 8, 1958.

Remarks.--Intermediate stages of lake controlled for recreational purposes by flashboards. No diversion.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.24	4.98		-			6.96	7.52	7.80	7.24	-	-
2	5.24	4.98		-			7.04	7.52	7.82	7.20	-	-
3	5.20	4.96		4.96			7.08	7.52	7.82	7.14	-	-
4	5.18	4.96		4.96			7.12	7.52	7.82	7.12	-	-
5	5.18	4.94		4.96			7.16	7.50	7.82	7.08	6.11	-
6	5.16	4.94		4.96			7.20	7.50	7.80	7.06	6.10	-
7	5.16	4.94		4.97			7.24	7.52	7.76	7.00	-	-
8	5.16	4.92		4.97			7.26	7.54	7.76	6.94	6.05	-
9	5.18	4.92		4.97			7.28	7.55	7.74	6.90	6.02	-
10	5.18	4.92		4.97			7.30	7.52	7.70	6.88	6.00	-
11	5.18	4.90		4.97			7.30	7.52	7.66	6.88	6.00	-
12	5.16	4.90		4.97			7.32	7.52	7.64	6.84	5.98	-
13	5.16	-		4.97			7.32	7.50	7.64	6.80	5.98	-
14	5.14	-		4.97			7.34	7.50	7.60	-	5.92	-
15	5.12	-	4.90	4.96			7.36	7.48	7.54	-	5.86	-
16	5.11	4.78		4.96			7.36	7.48	7.52	-	5.80	-
17	5.10	-		-			7.36	7.46	7.52	-	5.76	-
18	5.10	-		-			7.38	7.46	7.48	-	5.74	-
19	5.09	-		-			7.38	7.46	7.42	-	5.72	-
20	5.08	-		-			7.40	7.50	7.40	-	5.70	-
21	5.08	-		-			7.42	7.58	7.40	-	-	-
22	5.08	-		-			7.44	7.60	7.38	-	-	-
23	5.06	-		-			7.44	7.62	7.36	-	-	-
24	5.06	-		-			7.48	7.70	7.34	-	-	-
25	5.04	-		-	5.80		7.50	7.74	7.32	-	-	-
26	5.04	-		-			7.51	7.74	7.30	-	-	5.04
27	5.02	-		-			7.52	7.76	7.28	-	-	5.04
28	5.02	-		-		6.29	7.54	7.80	7.28	-	-	5.02
29	5.02	-		4.70			7.54	7.80	7.26	-	-	5.02
30	5.00	-		-			7.52	7.80	7.24	-	-	5.00
31	5.00			-				7.80		-	-	

4065. Loon Lake near Loon Lake, Wash.

Location.--Lat 48°01'45", long 117°36'15", in NW¼ sec.11, T.29 N., R.41 E., at south end of Loon Lake, 2.7 miles southeast of town of Loon Lake.

Drainage area.--33.4 sq mi.

Records available.--April 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929, unadjusted; 0.94 ft above mean sea level, datum of 1929, supplementary adjustmert of 1947. Prior to Sept. 29, 1951, at site 0.2 mile north at present datum.

Extremes.--Maximum elevation during year, 2,381.39 ft June 4; minimum, 2,380.20 ft Sept. 30.
1950-60: Maximum elevation, 2,382.71 ft May 3, 1950, but may have been higher sometime in 1951 water year while water-stage recorder was not operating; minimum recorded, 2,379.74 ft Oct. 18, 1958.

Remarks.--Elevation controlled by dam at lake outlet. Elevations given herein are based on datum of 1929, unadjusted. Some small diversions for irrigation.

Revisions (water years).--WSP 1216: 1950.

Mean elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80.31	80.31	80.45		-	-	80.53	80.97	81.38	81.12	80.64	80.38
2	80.30	80.31	80.44		80.85	-	80.54	80.97	81.38	81.11	80.61	80.38
3	80.29	80.31	80.44		80.82	-	80.54	80.98	81.38	81.10	80.66	80.38
4	80.29	80.32	80.44		-	-	80.55	81.01	81.37	81.09	80.75	80.43
5	80.29	80.31	80.44		80.77	-	80.56	81.02	81.36	81.08	80.74	80.44
6	80.29	80.30	80.43		80.76	-	80.56	81.03	81.36	81.07	80.73	80.43
7	80.29	80.29	80.43		80.84	-	80.56	81.08	81.35	81.06	80.71	80.42
8	80.31	80.29	80.43		80.84	-	80.57	81.05	81.35	81.04	80.68	80.41
9	80.33	80.28	80.42		80.82	-	80.58	81.09	81.34	81.03	80.67	80.40
10	80.32	80.28	80.43		80.78	-	80.59	81.09	81.34	81.00	80.65	80.39
11	80.34	80.28	80.45		80.74	-	80.60	81.10	81.33	80.98	80.63	80.38
12	80.34	80.27	80.49		80.71	-	80.61	81.10	81.32	80.97	80.61	80.38
13	80.34	80.25	80.50		-	-	80.63	81.11	81.32	80.95	80.59	80.37
14	80.34	80.24	80.50		-	-	80.67	81.11	81.31	80.95	80.57	80.36
15	80.34	80.24	80.55		-	-	80.70	81.11	81.31	80.94	80.55	80.35
16	80.33	80.22	80.57		-	-	80.71	81.13	81.30	80.92	80.54	80.35
17	80.33	80.22	80.57		-	-	80.72	81.14	81.28	80.90	80.52	80.34
18	80.32	80.26	80.58		-	-	80.74	81.14	81.27	80.89	80.51	80.32
19	80.32	80.29	80.58		-	-	80.77	81.14	81.25	80.88	80.49	80.31
20	80.33	80.31	80.58		-	-	80.81	81.21	81.24	80.86	80.47	80.29
21	80.33	80.41	80.58		-	-	80.83	81.26	81.23	80.85	80.45	80.28
22	80.35	80.44	80.58		-	-	80.84	81.27	81.23	80.82	80.43	80.27
23	80.35	80.45	80.58		-	80.32	80.87	81.28	81.22	80.79	80.42	80.27
24	80.35	80.45	80.62		-	80.33	80.90	81.28	81.21	80.77	80.43	80.26
25	80.35	80.46	80.67		-	80.33	80.92	81.30	81.19	80.75	80.43	80.26
26	80.35	80.45	80.67		-	80.33	80.94	81.33	81.18	80.73	80.44	80.25
27	80.34	80.45	-		-	80.35	80.94	81.37	81.17	80.71	80.44	80.23
28	80.34	80.45	-		-	80.37	80.95	81.38	81.16	80.70	80.42	80.22
29	80.33	80.45	-		-	80.42	80.95	81.38	81.15	80.69	80.41	80.21
30	80.33	80.45	-		-------	80.49	80.96	81.38	81.14	80.67	80.40	80.20
31	80.32	-------	-		-------	80.51	-------	81.38	-------	80.66	80.39	-------

Note.--Add 2,300 ft to obtain elevation above mean sea level.

4075. Sheep Creek at Springdale, Wash.

Location.--Lat 48°03'30", long 117°45'05", in SW¼NW¼ sec.34, T.30 N., R.40 E., on right bank 45 ft upstream from railroad trestle on State Highway 3, half a mile west of Springdale, and 4 miles upstream from mouth.

Drainage area.--46.4 sq mi.

Records available.--January 1953 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,980 ft (from topographic map). Prior to Sept. 30, 1958, at site 500 ft upstream at different datum.

Average discharge.--7 years, 13.7 cfs (9,920 acre-ft per year).

Extremes.--Maximum discharge during year, 71 cfs Feb. 7 (gage height, 1.74 ft); maximum gage height, 2.85 ft Nov. 21 (backwater from ice); minimum discharge, 8.7 cfs Oct. 29. 1953-60: Maximum discharge, 78 cfs Feb. 26, 1958 (gage height, 2.20 ft, site and datum then in use); maximum gage height recorded, 5.22 ft Jan. 30 to Feb. 7, 1956 (backwater from ice), site and datum then in use; minimum discharge, 1.6 cfs Jan. 21, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Some small diversions for domestic use. Flow partly regulated by dam at outlet of Loon Lake.

Revisions.--WSP 1636: Drainage area.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 21		Nov. 22 to Sept. 30			
1.03	8.7	0.9	7.7	1.3	27
1.1	11.5	1.0	10.5	1.6	55
1.2	16	1.1	14		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	9.1	12.5	12	27	25	*29	12.5	12	10	10.5	11
2	10	9.4	12	11	33	25	27	12.5	*11.5	10	10	11
3	10	9.8	12	11	32	25	26	13	*11.5	10	10.5	11
4	10	9.8	12	11.5	31	25	26	12.5	11.5	10	10.5	11.5
5	*10	9.4	11.5	11.5	32	25	*25	12.5	11.5	10	10.5	11.5
6	10	9.4	11.5	12	34	22	25	12.5	11.5	10	10.5	11.5
7	10.5	9.4	11.5	12	53	19	17	14	11	10	10.5	11.5
8	10.5	9.1	11.5	11.5	42	22	13.5	14	11	9.8	*10.5	11.5
9	11	9.1	11.5	11.5	40	22	13.5	*12.5	11.5	9.8	10.5	11.5
10	10	9.1	11.5	11.5	39	19.5	13	12	11.5	9.8	10.5	11.5
11	10	9.1	12	11.5	37	16	13	12	11.5	*9.8	10.5	11.5
12	9.8	9.8	12	11.5	36	15.5	13	11.5	11	9.8	10	11.5
13	9.8	9.5	12	11.5	36	13.5	13	11.5	*11	9.8	10.5	11.5
14	9.4	9.5	12	11.5	36	*11	13.5	11.5	11	9.8	10.5	11
15	9.4	9.5	*14.5	11.5	37	11.5	13.5	11.5	11.5	9.8	10.5	11
16	*9.4	10	13.5	11	35	13.5	13.5	11.5	11	9.8	11	11
17	9.4	*11	12.5	10.5	33	19	13	11.5	10.5	9.8	11	11
18	9.4	11	12	10	32	21	13.5	11.5	10.5	9.8	11	11
19	9.4	11	12.5	9.5	31	25	13.5	11.5	10.5	9.8	11	11
20	9.8	11	12	9.5	30	25	14	14	10.5	9.8	11	11
21	9.4	13	12	9.5	29	*17.5	14	14	10.5	9.8	11	11
22	9.4	15	12	10	27	15.5	13.5	13.5	10.5	9.8	11	10.5
23	9.4	14.5	12	10	27	15.5	13.5	13	10.5	9.8	11	10.5
24	9.1	14.5	14	10	26	14	14	12.5	10.5	9.8	11	10.5
25	9.1	14	16.5	10	*26	14	13.5	13	11	9.8	11	10.5
26	9.1	13.5	13	*10	25	14	13.5	12.5	10.5	9.8	11	*10.5
27	9.1	13	12.5	10.5	24	15	13	13	10.5	9.8	11	10.5
28	9.1	12.5	12	10.5	24	*18	13	12.5	10.5	9.8	11	10.5
29	8.7	12.5	12	12.5	24	22	13	12.5	10	10.5	10.5	10.5
30	9.1	12.5	12	13	-------	*29	12.5	12	10	10	10.5	10.5
31	9.1	-------	12	13.5	-------	26	-------	12	-------	10.5	10.5	-------
Total	298.4	330.0	382.5	343.0	938	601.0	482.0	386.5	328.0	303.8	331.0	330.5
Mean	9.63	11.0	12.3	11.1	32.3	19.4	16.1	12.5	10.9	9.90	10.7	11.0
Ac-ft	592	655	759	680	1,860	1,190	956	767	651	609	657	656

Calendar year 1959: Max 38 Min 8.7 Mean 14.5 Ac-ft 10,510
Water year 1959-60: Max 53 Min 8.7 Mean 13.8 Ac-ft 10,030

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-22, 27, 28, Dec. 28 to Jan. 5, Jan. 16-26, Feb. 26 to Mar. 6 (no gage-height record Jan. 19-26). No gage-height record Jan. 6-8, June 18-23, Sept. 10-25; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations.

4075.2. Deer Creek near Valley, Wash.

Location.--Lat 48°07'25", long 117°48'05", in SE¼SE¼ sec.6, T.30 N., R.40 E., on left bank at downstream side of county road bridge, 2 miles upstream from confluence with Sheep Creek and 5 miles southwest of Valley.

Drainage area.--36.0 sq mi.

Records available.--July 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,060 ft (from topographic map).

Extremes.--Maximum discharge during year, 425 cfs Mar. 29 (gage height, 2.33 ft); maximum gage height, 3.24 ft Feb. 29 (backwater from ice); minimum discharge, 5.6 cfs Sept. 29, 30.

1959-60: Maximum discharge, that of Mar. 29, 1960; maximum gage height, that of Feb. 29, 1960; minimum discharge, 5.6 cfs Aug. 18, 1959, Sept. 29, 30, 1960.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No regulation. Small diversions above station for irrigation.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	5.3	1.6	55
.9	7.1	1.8	98
1.0	9.8	2.0	180
1.2	18.5	2.2	310
1.4	32		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.3	8.3	10	6.0	10.5	6.5	112	55	36	11	7.1	6.7
2	7.1	8.3	10	6.0	14.5	6.5	98	60	33	11	7.6	6.5
3	7.1	9.2	9.8	6.0	14.5	6.0	88	73	*31	11	7.8	6.1
4	7.3	9.2	9.4	6.5	13	8.0	83	68	29	10.5	8.6	8.6
5	*7.3	8.6	9.4	7.0	13	11	*86	64	27	11	8.8	9.4
6	7.3	8.6	9.2	8.0	13	11	86	59	27	10.5	8.0	7.3
7	7.8	8.3	*9.2	8.5	34	11	83	78	24	10	7.3	6.7
8	9.4	8.0	9.2	*9.0	23	10.5	76	66	24	8.3	*7.1	6.7
9	10.5	8.3	8.8	9.0	*18.5	10.5	73	*62	22	8.0	7.1	6.5
10	8.8	8.0	9.2	8.5	16	10	68	57	22	8.0	6.9	6.5
11	11	8.3	10	8.0	14.5	9.5	62	52	21	*9.2	6.7	6.3
12	9.8	8.3	11	8.0	13.5	9.5	57	47	20	9.4	6.7	6.3
13	8.8	7.0	10	8.0	13	10	55	45	*19	9.2	6.7	6.1
14	8.6	6.0	9.8	8.0	13	*11	59	39	19.5	9.2	6.5	5.9
15	8.3	6.0	21	8.0	15	15.5	57	36	19.5	8.8	6.5	5.9
16	8.0	6.5	17.5	7.5	14	15.5	48	37	19	8.8	6.9	5.9
17	8.3	*7.0	14	7.0	13.5	16	41	*35	18	8.6	6.7	5.9
18	8.3	8.0	12.5	6.5	13	22	42	32	17	8.8	6.5	5.8
19	8.3	8.3	11.5	6.0	13	28	44	30	16.5	7.6	6.5	5.8
20	9.2	10	10.5	6.0	13	35	57	49	16.5	7.1	6.5	5.8
21	10	17.5	11	6.0	13	*47	60	51	16	7.1	6.3	5.8
22	9.8	15	10.5	6.5	13	66	49	44	15.5	6.9	6.9	5.9
23	9.4	14.5	10.5	6.5	13	71	57	40	14.5	6.7	6.9	6.1
24	9.2	17	12.5	7.0	13	73	57	39	13.5	6.7	7.3	5.9
25	8.8	16	18	7.5	*12.5	83	69	44	13	6.7	7.6	5.8
26	8.6	12.5	13	8.0	10	98	71	44	13	6.9	7.6	*5.8
27	8.6	10	11	*8.5	7.0	108	68	57	13	6.9	7.3	5.8
28	8.6	10	8.0	10	7.0	*130	66	51	12	6.7	7.1	5.8
29	8.3	10.5	7.0	13.5	7.0	204	60	49	11	6.7	7.1	5.8
30	8.3	10	6.5	13	------	*228	59	45	11	6.7	6.9	5.8
31	8.3	------	6.0	11.5	------	147	------	41	------	6.9	6.9	------
Total	266.4	293.2	336.0	245.5	401.0	1,518.0	1,991	1,549	593.5	260.9	220.4	189.2
Mean	8.59	9.77	10.8	7.92	13.8	49.0	66.4	50.0	19.8	8.42	7.11	6.31
Cfsm	0.239	0.271	0.300	0.220	0.383	1.36	1.84	1.39	0.550	0.234	0.198	0.175
In.	0.28	0.30	0.35	0.25	0.41	1.57	2.06	1.60	0.61	0.27	0.23	0.20
Ac-ft	528	582	666	487	795	3,010	3,950	3,070	1,180	517	437	375

Calendar year 1959: Max - Min - Mean - Cfsm - In. - Ac-ft -
Water year 1959-60: Max 228 Min 5.8 Mean 21.5 Cfsm 0.597 In. 8.13 Ac-ft 15,600

Peak discharge (base, 80 cfs).--Feb. 7 (3 a.m.) 93 cfs (1.78 ft); Mar. 29 (6:30 p.m.) 425 cfs (2.33 ft); Apr. 25 (2 p.m.) 93 cfs (1.83 ft); May 7 (11 a.m.) 93 cfs (1.87 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-17, 27, 28, Dec. 28 to Jan. 28, Feb. 26 to Mar. 5 (no gage-height record Nov. 13-17, Jan. 3-28, Mar. 1-5; discharge estimated on basis of 3 discharge measurements, recorded range in stage, weather records, and records for nearby stations). No gage-height record Mar. 6-13; discharge estimated on basis of weather records and records for nearby stations.

4077. Chewelah Creek at Chewelah, Wash.

Location.--Lat 48°17'00", long 117°43'00", on line between SE¼ sec.11 and SW¼ sec.12, T.32 N., R.40 E., on left bank downstream from small road bridge to highway north of city park, in northern part of Chewelah, 2 miles upstream from mouth.

Drainage area.--94 sq mi.

Records available.--March 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,660 ft (from topographic map).

Extremes.--Maximum discharge during year, 355 cfs Mar. 30 (gage height, 3.50 ft); minimum, 6.8 cfs Nov. 13 (gage height, 1.24 ft), result of freezeup.
1957-60: Maximum discharge, that of Mar. 30, 1960; minimum, 4.1 cfs Aug. 23, 1957 (gage height, 1.11 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. No regulation. Most of flow in South Fork used for irrigation in summer months.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 30, 31, Apr. 5 to May 16)

Oct. 1 to May 16				May 17 to Sept. 30			
1.2	6.4	2.0	72	1.8	6.9	2.6	78
1.3	10.5	2.5	142	2.0	15	2.9	130
1.5	22	3.0	228	2.3	37	3.3	207
1.7	40	3.5	330				

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17.5	16.5	21	13	24	12	*160	110	126	31	12.5	13.5
2	17	16.5	22	13	26	11.5	147	115	125	32	12.5	13
3	17	18.5	22	13.5	25	11	144	120	119	31	14	13.5
4	17	22	21	14	22	15	142	120	116	28	15.5	19
5	17	17.5	20	15.5	22	21	*150	115	110	27	14.5	22
6	*17	18.5	19.5	17	25	21	160	115	109	26	13.5	16.5
7	19	16.5	*20	20	46	21	161	140	102	26	12.5	16
8	20	16.5	18.5	*21	34	21	161	135	97	25	12.5	16.5
9	22	16.5	17	20	*28	20	166	130	92	24	*11	16.5
10	18.5	15.5	21	20	26	20	160	*130	85	24	11	16
11	21	15.5	22	20	25	20	148	126	81	*22	10.5	15.5
12	21	16	28	19	25	20	153	131	75	20	10	15
13	19	9.2	24	19.5	25	21	150	134	*72	19.5	10	14.5
14	18.5	8.5	23	19.5	25	*22	165	128	70	19.5	9.6	14.5
15	17.5	9.0	38	18	28	28	148	117	80	18	11	14
16	17	10	38	16	26	28	135	117	68	18.5	11.5	14
17	17	*11	28	15	24	27	130	*126	62	15	11	14
18	17	11	27	14	22	35	125	107	59	14.5	11	14
19	17	11.5	25	13	22	46	125	104	55	13.5	10.5	14
20	19.5	16.5	22	13	22	56	130	141	62	13.5	10.5	13.5
21	19.5	43	25	14	21	63	125	175	59	13	11	14
22	20	36	22	14.5	21	68	120	150	52	12.5	11.5	14
23	19.5	34	22	15.5	18	66	115	143	47	11	11.5	15
24	18.5	39	25	16	16	70	112	137	40	11.5	13.5	15
25	17.5	38	33	17.5	14	78	110	143	36	11	13	15
26	17	25	22	19	13	94	108	146	37	11	14.5	14.5
27	17	23	16	19	12	110	106	165	39	11	15.5	*14.5
28	17	22	15	19.5	12	140	105	148	35	11	14.5	14
29	16.5	23	14.5	29	12	*175	106	143	33	11.5	14	14
30	16.5	23	14	31	------	*280	108	137	32	12	13.5	14
31	16.5	------	13.5	28	------	201	------	132	------	12	13.5	------
Total	562.0	598.7	699.0	557.0	661	1,821.5	4,075	4,080	2,175	574.5	381.1	449.5
Mean	18.1	20.0	22.5	18.0	22.8	58.8	136	132	72.5	18.5	12.3	15.0
Cfsm	0.193	0.213	0.239	0.191	0.243	0.626	1.45	1.40	0.771	0.197	0.131	0.160
In.	0.22	0.24	0.28	0.22	0.26	0.72	1.61	1.61	0.86	0.23	0.15	0.18
Ac-ft	1,110	1,190	1,390	1,100	1,310	3,610	8,080	8,090	4,310	1,140	756	892

Calendar year 1959: Max 132 Min 6.8 Mean 36.8 Cfsm 0.391 In. 5.33 Ac-ft 26,690
Water year 1959-60: Max 280 Min 8.5 Mean 45.4 Cfsm 0.483 In. 6.58 Ac-ft 32,980

Peak discharge (base, 100 cfs).--Mar. 21 (8 p.m.) 114 cfs (2.32 ft); Mar. 30 (4 a.m.) 355 cfs (3.50 ft); about May 7 (time unknown) 172 cfs (3.00 ft); May 21 (1:30 a.m.) 199 cfs (3.26 ft); May 27 (1 to 3 a.m.) 177 cfs (3.15 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 14-16, Dec. 27 to Jan. 3, Jan. 15-21, Feb. 23 to Mar. 4 (no gage-height record Nov. 14-16, Dec. 31, Jan. 1, Jan. 15, 16, Feb. 23 to Mar. 4; discharge estimated on basis of weather records and records for nearby stations). No gage-height record Feb. 19-22, Mar. 5-14, Apr. 16 to May 10; discharge estimated on basis of 2 discharge measurements, recorded range in stage, weather records, and records for nearby stations.

4080. Colville River at Blue Creek, Wash.

Location.--Lat 48°19'10", long 117°49'10", in NW¼NW¼ sec.31, T.33 N., R.40 E., on right bank upstream from county road bridge, just downstream from mouth of Blue Creek at town of Blue Creek, 5½ miles northwest of Chewelah.

Drainage area.--428 sq mi (revised).

Records available.--October 1922 to September 1923, April to September 1924, July to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,620 ft (from topographic map). Prior to Oct. 1, 1924, staff gage and wooden control on left bank at different datum.

Extremes.--Maximum discharge during period July to September 1960, 112 cfs Sept. 5 (gage height, 1.35 ft); minimum, 52 cfs Aug. 3 (gage height, 0.99 ft).
1922-24, 1960: Maximum discharge observed, 468 cfs Apr. 8, 1923 (gage height, 4.5 ft, site and datum then in use); minimum observed, 5.3 cfs Aug. 13, 1924 (gage height, 0.09 ft).
Maximum discharge known, 750 cfs Mar. 30, 1960 (result of discharge measurement).

Remarks.--Records excellent. No regulation. Many small diversions for irrigation above station.

Rating table, July 22 to Sept. 30, 1960 (gage height, in feet, and discharge, in cubic feet per second)

1.0	53
1.1	67
1.3	102

Discharge, in cubic feet per second, July to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										-	60	75
2										-	63	72
3										-	56	70
4										-	73	80
5										-	83	108
6	†84									-	78	89
7										-	70	81
8										-	69	81
9										-	*66	81
10										-	63	80
11								†447		-	63	80
12										-	61	77
13										-	61	77
14										-	60	75
15										-	64	73
16										-	66	73
17										-	67	73
18										-	63	73
19										-	59	73
20										-	59	73
21										-	60	73
22										67	63	75
23										64	66	75
24										63	70	77
25										61	75	75
26										61	78	73
27										61	83	*73
28										59	78	72
29						†642				59	77	72
30					-------	†750				59	77	73
31		-------			-------		-------		-------	60	75	-------
Total										-	2,106	2,302
Mean										-	67.9	76.7
Ac-ft										-	4,180	4,570

Calendar year	: Max	Min	Mean	Ac-ft	
Water year	: Max	Min	Mean	Ac-ft	

* Discharge measurement made on this day.
† Result of discharge measurement.

4083. Little Pend Oreille River near Colville, Wash.

Location.--Lat 48°27'50", long 117°44'40", in NE¼ sec.10, T.34 N., R.40 E., on right bank 400 ft upstream from abandoned railroad bridge, half a mile downstream from Bear Creek, 6 miles east of Arden, and 9 miles southeast of Colville.

Drainage area.--129 sq mi.

Records available.--December 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,010 ft (from topographic map).

Extremes.--Maximum discharge during year, 668 cfs Apr. 7 (gage height, 3.17 ft); minimum, 11 cfs Jan. 16 (gage height, 0.25 ft), result of freezeup.
1957-60: Maximum discharge, that of Apr. 7, 1960; minimum, 7.0 cfs Jan. 6, 1958 (gage height, 0.14 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Minor regulation by fish screens at outlet of Lake Sherry. No diversion.

Revisions.--WSP 1636: Drainage area.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 30				Mar. 31 to Sept. 30			
0.4	17	1.5	131	0.3	16	1.4	131
.6	28	2.0	230	.6	34	2.2	330
1.0	62	3.0	530	1.0	71	3.1	640

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	23	28	21	32	21	339	235	189	57	38	20
2	25	23	27	21	31	20	312	253	180	57	37	20
3	24	24	27	22	31	19	318	264	169	55	36	19.5
4	23	34	26	23	31	22	357	256	160	52	42	29
5	23	29	25	24	32	27	472	261	149	50	40	38
6	24	27	25	25	32	26	568	256	141	48	37	28
7	*27	24	25	26	48	26	*604	339	131	45	34	24
8	29	24	26	*26	39	29	550	348	126	43	33	23
9	30	*24	*27	26	35	28	553	297	118	40	31	22
10	29	27	27	26	34	26	514	283	111	40	*29	20
11	30	24	27	25	32	26	441	*275	105	38	28	20
12	34	23	31	24	*33	27	420	272	99	*37	26	19.5
13	33	20	29	24	33	27	372	286	94	36	26	19
14	29	18	29	23	32	28	375	261	*96	35	26	18
15	28	19	34	22	35	30	354	235	111	33	28	17.5
16	26	20	42	21	33	29	315	235	105	32	29	17.5
17	25	21	43	21	31	*32	300	250	93	30	29	17.5
18	24	22	42	20	29	35	290	225	89	30	28	17
19	24	23	41	19	28	39	280	215	86	28	26	17
20	26	26	37	20	28	42	280	261	105	28	25	17
21	27	40	36	20	28	46	290	345	102	26	25	16.5
22	29	48	33	20	29	52	270	306	93	26	25	17
23	30	47	32	20	28	58	260	275	84	34	25	19
24	28	49	34	21	25	70	250	253	79	39	27	20
25	28	40	35	21	23	89	240	242	73	39	29	20
26	27	35	30	22	21	118	230	240	70	37	28	19
27	27	31	27	23	20	162	230	272	68	38	27	18
28	26	29	24	25	19	252	220	250	66	38	24	*18
29	25	29	22	30	20	317	225	230	62	39	22	18
30	24	29	21	45	------	*413	230	215	59	39	22	17.5
31	24	------	21	35	------	*390	------	198	------	38	21	------
Total	835	852	933	741	872	2,526	10,459	8,133	3,213	1,207	903	606.5
Mean	26.9	28.4	30.1	23.9	30.1	81.5	349	262	107	38.9	29.1	20.2
Cfsm	0.209	0.220	0.233	0.185	0.233	0.632	2.71	2.03	0.829	0.302	0.226	0.157
In.	0.24	0.25	0.27	0.21	0.25	0.73	3.02	2.34	0.93	0.35	0.26	0.17
Ac-ft	1,660	1,690	1,850	1,470	1,730	5,010	20,750	16,130	6,370	2,390	1,790	1,200

Calendar year 1959: Max 308 Min 16 Mean 67.9 Cfsm 0.526 In. 7.15 Ac-ft 49,180
Water year 1959-60: Max 604 Min 16.5 Mean 85.5 Cfsm 0.663 In. 9.02 Ac-ft 62,040

Peak discharge (base, 100 cfs).-- Mar. 30 (9 p.m.) 432 cfs (2.72 ft); Apr. 7 (4 a.m.) 668 cfs (3.17 ft); May 7 (7 p.m.) 387 cfs (2.39 ft); May 21 (8:30 a.m.) 363 cfs (2.31 ft); June 20 (2 p.m.) 120 cfs (1.34 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 13-16, Nov. 25 to Dec. 10, Dec 22, 23, Dec. 26 to Feb. 3, Feb. 17 to Mar. 4, Mar. 10, 12 (no gage-height record Dec. 31, Jan. 3-30, Mar. 2; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations). No gage-height record Apr. 17-28; discharge estimated on basis of weather records and records for nearby stations.

4084.2. Haller Creek near Arden, Wash.

Location.--Lat 48°28'05", long 117°54'30", in SW¼SW¼ sec.4, T.34 N., R.39 E., on left bank 10 ft downstream from county road bridge, three-quarters of a mile upstream from mouth, and 1½ miles northwest of Arden. Prior to Sept. 23, 1960, at site 30 ft upstream.

Drainage area.--37.0 sq mi.

Records available.--August 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,600 ft (from topographic map). Prior to Sept. 23, 1960, at site 30 ft upstream at datum 1.24 ft higher.

Extremes.--Maximum discharge during year, 148 cfs Mar. 29 (gage height, 2.65 ft); minimum, 0.5 cfs Aug. 12.
1959-60: Maximum discharge, that of Mar. 29, 1960; minimum, that of Aug. 12, 1960.

Remarks.--Records good except those for period of ice effect, which are fair, and those for periods of no gage-height record, which are poor. No regulation. Minor diversions for irrigation and domestic use above station.

Corrections.--The figures of cubic feet per second per square mile and runoff in inches for August and September 1959, published erroneously in WSP 1636, are corrected herewith:

	Aug.	Sept.
Cubic feet per second per square mile.....	0.041	0.072
Runoff in inches.....	.05	.08

Rating tables, water year 1959-60, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Sept. 22				Sept. 23-30	
0.9	0.6	1.4	15.5	0.7	0.9
1.0	1.6	1.6	28	.8	1.7
1.1	4.2	2.0	63		
1.3	11	2.5	126		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.9	2.6	3.3	2.4	4.0	2.5	*54	26	20	4.8	0.8	1.2
2	2.9	2.9	3.2	2.4	4.1	2.4	48	28	19	5.0	1.0	1.3
3	2.3	3.2	3.1	2.6	4.0	2.3	52	31	18	4.4	1.0	1.2
4	2.1	3.6	3.0	2.9	3.9	2.5	58	29	16.5	4.4	1.7	3.2
5	2.1	2.9	3.0	3.2	4.0	3.7	*63	28	16	4.2	1.3	2.9
6	*2.3	2.9	3.0	3.4	4.5	3.8	60	31	15	3.8	1.0	1.7
7	2.9	2.9	*3.1	3.6	5.5	a3.8	54	42	14	3.6	1.0	1.7
8	2.9	2.9	3.1	*3.8	5.0	a3.7	50	36	13.5	3.2	.9	1.7
9	3.2	a2.9	3.2	3.7	4.5	a3.6	47	33	13	3.6	.9	1.6
10	2.3	a2.9	3.3	3.6	4.3	a3.5	42	a31	12.5	3.2	.9	1.6
11	4.2	a2.8	3.5	3.5	4.2	a3.4	40	a29	12	*3.2	*.8	1.5
12	3.8	a2.7	3.7	3.3	*4.1	a3.4	38	*28	11	2.6	.7	1.3
13	3.2	2.4	3.8	3.1	4.1	a3.7	37	29	*11	2.3	.7	1.3
14	2.9	2.1	4.0	2.9	4.2	*a4.0	41	27	10.5	1.9	.7	1.3
15	2.6	2.2	5.0	2.8	4.5	4.8	38	24	13	1.5	.6	1.3
16	2.3	*2.4	4.5	2.8	4.3	5.0	35	26	10.5	1.2	.8	1.3
17	2.3	2.5	4.2	2.7	4.0	5.6	34	25	9.9	1.2	.8	1.3
18	2.3	2.7	4.0	2.7	3.7	7.0	33	24	9.6	1.1	.8	1.3
19	2.3	3.0	3.8	2.6	3.6	9.9	32	22	9.2	1.1	.7	1.3
20	2.9	3.5	3.6	2.6	3.5	13	36	30	9.6	1.1	.7	1.3
21	3.2	5.0	3.5	2.6	3.4	*15.5	34	32	9.2	1.1	.9	1.3
22	3.8	4.5	3.5	2.6	3.3	21	32	28	8.8	1.1	1.0	a1.3
23	3.6	4.7	3.8	2.7	3.2	26	32	27	8.1	1.1	1.0	a1.3
24	3.2	5.0	4.2	2.8	3.1	31	32	28	7.4	1.1	1.1	1.3
25	2.9	4.5	4.0	3.1	3.0	42	32	30	7.0	1.1	1.3	1.3
26	2.9	4.0	3.5	3.3	2.8	51	33	29	7.0	1.1	1.6	1.2
27	2.9	3.7	3.2	*3.5	2.6	49	28	29	6.6	1.0	1.5	1.2
28	2.9	3.5	3.0	3.8	2.5	80	28	27	6.3	.8	1.3	1.2
29	2.6	3.4	2.8	4.1	2.6	89	27	25	5.4	.8	1.3	*1.1
30	2.6	3.3	2.6	4.7	------	106	26	24	5.0	.7	1.2	1.0
31	2.6	------	2.5	------	------	*70	------	22	------	.8	1.1	------
Total	87.9	97.6	108.0	98.2	110.5	672.1	1,196	880	334.6	68.1	31.1	43.5
Mean	2.84	3.25	3.48	3.17	3.81	21.7	39.9	28.4	11.2	2.20	1.00	1.45
Cfsm	0.077	0.088	0.094	0.086	0.103	0.586	1.08	0.768	0.303	0.059	0.027	0.039
In.	0.09	0.10	0.11	0.10	0.11	0.68	1.20	0.88	0.34	0.07	0.03	0.04
Ac-ft	174	194	214	195	219	1,330	2,370	1,750	664	135	62	86

Calendar year 1959: Max - Min - Mean - Cfsm - In. - Ac-ft -
Water year 1959-60: Max 106 Min 0.6 Mean 10.2 Cfsm 0.276 In. 3.75 Ac-ft 7,390

Peak discharge (base, 45 cfs).--Mar. 29 (11:30 p.m.) 148 cfs (2.65 ft); Apr. 5 (4:30 a.m.) 65 cfs (2.02 ft); May 7 (10 a.m.) 48 cfs (1.85 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations.
Note.--Stage-discharge relation affected by ice Nov. 13 to Mar. 6 (no gage-height record Nov. 13-19, Jan. 1 to Mar. 6).

4085. Mill Creek near Colville, Wash.

Location.--Lat 48°34'45", long 117°52'00", in SW¼NW¼ sec.35, T.36 N., R.39 E., on right bank 3 miles northeast of Colville and 5 miles downstream from North Fork. Prior to Oct. 6, 1959, at site 300 ft upstream.

Drainage area.--85.1 sq mi.

Records available.--October 1939 to September 1960. Prior to February 1940 monthly discharge only, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 1,950 ft (from topographic map). Prior to Mar. 2, 1940, staff gage and Mar. 2, 1940, to Oct. 5, 1959, water-stage recorder (Nov. 2, 1952, to Oct. 5, 1959, used as supplementary gage), at site half a mile upstream at different datum. Nov. 2, 1952, to Oct. 5, 1959, staff gage and crest-stage gage at site 300 ft upstream at datum 0.47 ft higher.

Average discharge.--21 years, 50.3 cfs (36,420 acre-ft per year).

Extremes.--Maximum discharge during year, 433 cfs Mar. 30 (gage height, 4.23 ft); minimum, 10.5 cfs Jan. 16, result of freezeup.
1939-60: Maximum discharge, 609 cfs Apr. 22, 1956 (gage height, 7.16 ft, site and datum then in use); minimum, 3.6 cfs Aug. 28, 31, Sept. 1, 1940, but may have been less during period of no gage-height record Feb. 1-4, 1940.

Remarks.--Records good except those for periods of ice effect or backwater from beaver dam, which are fair. No regulation. Diversions for irrigation of about 50 acres above station.

Revisions (water years).--WSP 1042: 1940, 1942. WSP 1636: Drainage area.

Rating tables, water year 1959-60, except periods of ice effect or backwater from beaver dam (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 26 to Apr. 4)

Oct. 1-5		Oct. 6 to Sept. 30			
4.1	12	1.9	8.2	3.0	119
4.2	21	2.1	17.5	3.5	210
		2.3	31	4.0	325
		2.6	63	5.0	610

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14.5	19	21	14	23	13	*262	159	180	49	20	15
2	14.5	19	20	14	22	12.5	255	174	170	49	20	15
3	14	20	20	15	22	12	278	186	159	47	20	14.5
4	14	26	18	18	22	15	305	178	150	45	21	18
5	14	22	17.5	18.5	22	22	345	176	144	45	20	21
6	17	22	17.5	19	24	22	*350	176	137	43	18	16.5
7	17.5	21	17.5	*20	33	22	355	224	129	40	17.5	16
8	*18.5	20	15.5	19	31	22	348	218	122	40	17	15.5
9	22	20	*16	19	27	22	352	198	116	39	16.5	15
10	20	20	17.5	18.5	25	21	315	192	112	39	16	14.5
11	21	19	19	18.5	*24	21	295	194	106	37	15.5	14.5
12	24	18.5	21	17	24	20	285	*198	101	*35	*15	14
13	22	15	20	17	25	20	248	208	98	35	14.5	14
14	20	12	19	17	25	20	252	194	*96	33	15	14
15	20	12	23	17.5	26	21	234	176	103	32	15	13.5
16	19	*13	33	17	25	22	212	184	93	31	16	13.5
17	18.5	13	28	15	24	*24	198	188	89	30	16	13.5
18	18.5	14	26	14	23	29	188	170	86	28	15	13
19	18	16	24	13	24	39	186	161	82	27	14.5	13
20	19	18.5	23	13	24	48	196	208	84	26	14	12.5
21	21	35	22	13	24	56	194	280	80	24	14	13
22	22	32	22	14	24	68	178	252	73	24	14.5	13
23	22	28	22	15	19	79	172	234	70	23	15	14
24	21	29	23	15	16	98	166	222	66	22	15.5	14
25	22	33	27	16	14	133	165	218	63	21	16.5	13.5
26	22	25	20	16	13	196	157	218	62	21	17	13
27	20	24	17.5	17	12.5	230	156	236	59	20	17	13
28	20	22	16	18	13	308	152	226	57	20	16.5	13
29	20	22	15	26	13	335	*150	210	53	20	16.5	*13
30	20	22	14	31	------	*380	152	198	50	19	16	13
31	19	------	14	27	------	*310	------	188	------	20	15.5	------
Total	595.0	632.0	629.0	542.0	643.5	2,640.5	7,101	6,244	2,990	984	510.5	429.0
Mean	19.2	21.1	20.3	17.5	22.2	85.2	237	201	99.7	31.7	16.5	14.3
Cfsm	0.226	0.248	0.239	0.206	0.261	1.00	2.78	2.36	1.17	0.373	0.194	0.168
In.	0.26	0.28	0.27	0.24	0.28	1.15	3.10	2.73	1.31	0.43	0.22	0.19
Ac-ft	1,180	1,250	1,250	1,080	1,280	5,240	14,080	12,380	5,930	1,950	1,010	851

Calendar year 1959: Max 221 Min 8.5 Mean 51.2 Cfsm 0.602 In. 8.16 Ac-ft 37,050
Water year 1959-60: Max 380 Min 12 Mean 65.4 Cfsm 0.769 In. 10.46 Ac-ft 47,480

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-16, Dec. 28 to Jan. 3, Jan. 12-14, 17-27, Feb. 23 to Mar. 4 (no gage-height record Nov. 13-16, Jan. 17). Backwater from beaver dam Aug. 19 to Sept. 18.

4087. Mill Creek at mouth, near Colville, Wash.

Location.--Lat 48°34'25", long 117°56'40", in NE¼SW¼ sec.31, T.36 N., R.39 E., on left bank at upstream side of bridge on U. S. Highway 395, 2 miles northwest of Colville.

Drainage area.--146 sq mi.

Records available.--July 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,540 ft (from topographic map).

Extremes.--Maximum discharge during year, 542 cfs Apr. 6 (gage height, 3.14 ft); minimum daily, 17 cfs Nov. 15, 16.
1959-60: Maximum discharge, that of Apr. 6, 1960; minimum, 16.5 cfs Sept. 14, 1959.

Remarks.--Records good except those for periods of ice effect, which are fair. No regulation. Many small diversions above station for irrigation.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 20-23, Apr. 10-16)

Oct. 1 to Apr. 16				Apr. 17 to Sept. 30			
0.6	15	1.6	152	0.8	13.5	2.0	180
.8	32	2.2	282	1.0	32	2.5	285
1.1	66	3.1	530	1.5	95	3.0	405

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	25	30	21	40	24	*334	196	233	70	27	26
2	23	25	29	22	40	23	316	214	220	67	27	25
3	22	26	28	24	40	23	339	239	208	67	29	24
4	21	29	28	27	39	25	395	226	196	64	34	32
5	21	29	27	29	39	27	470	222	192	62	31	38
6	21	28	27	*31	40	31	*512	224	184	58	29	32
7	22	28	*27	31	50	35	500	278	172	53	27	30
8	*24	28	24	30	49	37	485	301	163	49	26	28
9	28	27	23	29	45	40	494	272	156	50	24	27
10	27	27	25	28	41	43	470	261	147	48	23	26
11	29	26	27	27	*39	42	420	265	136	46	22	25
12	30	*26	28	27	39	41	409	*274	129	*42	*21	25
13	29	21	28	26	39	40	365	281	123	40	19.5	24
14	28	19	27	26	39	37	368	270	*123	39	19.5	24
15	26	17	29	26	39	39	344	243	133	38	20	24
16	25	17	38	25	39	*40	306	245	123	37	20	23
17	24	18	37	24	37	42	281	261	115	35	21	23
18	23	20	35	23	36	49	267	239	108	34	19.5	22
19	23	22	33	23	37	60	261	222	108	34	18.5	22
20	24	25	31	23	37	70	267	265	110	32	18.5	22
21	26	37	31	24	39	*80	272	360	110	31	19.5	22
22	27	40	30	24	37	90	252	336	104	31	20	22
23	28	37	30	25	35	105	241	313	100	31	20	24
24	27	37	31	26	39	124	230	294	94	32	22	24
25	27	42	36	27	37	162	224	290	87	31	26	23
26	27	37	32	29	30	236	214	285	87	30	28	22
27	27	34	26	*32	25	292	204	306	85	29	28	22
28	27	31	22	35	23	370	200	301	81	28	27	22
29	26	31	21	42	24	426	*194	278	75	27	27	22
30	26	31	20	50	------	*491	190	261	73	27	27	*21
31	26	------	20	44	------	*595	------	248	------	28	26	------
Total	788	840	880	880	1,093	3,539	9,824	8,270	3,975	1,290	747.0	746
Mean	25.4	28.0	28.4	28.4	37.7	114	327	267	132	41.6	24.1	24.9
Cfsm	0.174	0.192	0.195	0.195	0.258	0.781	2.24	1.83	0.904	0.285	0.165	0.171
In.	0.20	0.21	0.22	0.22	0.28	0.90	2.50	2.11	1.01	0.33	0.19	0.19
Ac-ft	1,560	1,670	1,750	1,750	2,170	7,020	19,490	16,400	7,880	2,560	1,480	1,480

Calendar year 1959:	Max	-	Min	-	Mean	-	Cfsm	-	In.	-	Ac-ft	-
Water year 1959-60:	Max	512	Min	17	Mean	89.8	Cfsm	0.615	In.	8.36	Ac-ft	65,210

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-18, Dec. 28 to Jan. 27, Feb. 26 to Mar. 9 (no gage-height record Jan. 4-6, 18-27, Mar. 1, 2; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations).

4090. Colville River at Kettle Falls, Wash.

Location.--Lat 48°35'40", long 118°03'30", in sec.29, T.36 N., R.38 E., on right bank 600 ft downstream from Washington Water Power Co.'s plant at foot of Meyers Falls, half a mile south of town of Kettle Falls, and 2 miles upstream from Franklin D. Roosevelt Lake.

Drainage area.--1,007 sq mi.

Records available.--October 1922 to September 1960. Published as "at Meyers Falls" 1922-38.

Gage.--Water-stage recorder. Altitude of gage is 1,500 ft (from topographic map). Prior to Oct. 21, 1932, staff gage at site 500 ft upstream at different datum. Oct. 21, 1932, to Sept. 19, 1938, staff gages at site 200 ft upstream at different datum. Sept. 20, 1938, to Mar. 20, 1949, staff gage at present site and datum.

Average discharge.--38 years, 297 cfs (215,000 acre-ft per year).

Extremes.--Maximum discharge during year, 2,300 cfs Apr. 29 (gage height, 8.65 ft), result of power dam failure; minimum, 44 cfs Dec. 9 (gage height, 4.75 ft), result of freezeup; minimum daily, 112 cfs Nov. 16.
1922-60: Maximum discharge, 3,230 cfs Apr. 23, 1956 (gage height, 10.17 ft); minimum observed, 0.5 cfs Aug. 15, 1930.

Remarks.--Records good except those for periods of ice effect, which are fair. Several ditches above station divert water for irrigation. Prior to Apr. 30, 1960, slight regulation for power by small reservoir above falls.

Revisions (water years).--WSP 1316: 1938(M), 1941(M), 1948(M). WSP 1636: Drainage area.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 29				Mar. 30 to Sept. 30			
5.1	109	6.5	920	5.1	94	7.0	1,220
5.5	255	7.0	1,220	5.4	180	8.0	1,840
6.0	560	8.0	1,820	6.0	525	8.5	2,190

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	174	174	228	140	378	180	*1,880	1,000	876	310	134	137
2	170	170	214	145	344	180	1,790	918	862	304	137	131
3	164	174	214	150	338	175	1,760	946	855	298	139	128
4	160	186	206	160	349	200	1,790	1,040	812	286	145	137
5	160	202	202	180	322	265	1,820	1,290	745	269	173	184
6	160	190	194	200	310	290	*1,870	1,210	692	258	173	189
7	164	182	180	*210	372	300	1,880	1,190	648	236	159	162
8	*174	178	170	210	490	305	1,850	1,300	618	212	148	142
9	190	178	*150	205	483	327	1,810	1,210	610	216	139	148
10	198	174	160	200	448	327	1,780	1,130	595	212	134	142
11	194	170	202	195	*384	300	1,690	1,100	574	202	131	142
12	206	*170	219	190	354	280	1,600	1,100	553	194	*125	137
13	210	135	246	180	354	300	1,540	*1,110	546	189	120	131
14	198	129	228	175	366	305	1,500	1,110	525	*184	117	131
15	186	132	228	180	372	332	1,470	1,020	546	180	117	128
16	182	112	327	180	396	*408	1,410	960	*560	173	123	128
17	178	148	316	175	378	434	1,320	1,010	525	170	128	125
18	174	160	275	165	344	476	1,260	953	492	162	128	120
19	174	182	260	160	338	518	1,200	890	473	156	123	120
20	174	206	242	160	338	576	1,190	883	473	152	117	117
21	186	237	237	160	332	624	1,220	1,080	480	145	115	120
22	198	310	228	165	327	664	1,210	1,210	473	139	120	120
23	202	327	210	170	310	696	1,170	1,180	448	137	125	125
24	202	322	228	180	322	734	1,140	1,150	430	139	125	128
25	190	338	255	190	270	790	1,130	1,080	400	139	137	128
26	190	327	295	210	220	890	1,130	1,040	382	139	145	128
27	186	255	242	240	180	1,050	1,080	1,070	370	137	156	123
28	182	219	170	275	180	1,230	1,040	1,110	358	137	152	120
29	182	228	150	300	190	1,480	*1,010	1,060	340	131	145	120
30	178	232	140	332	-------	1,730	1,240	1,010	322	131	142	*117
31	174	-------	140	396	-------	*1,920	-------	939	-------	134	139	-------
Total	5,660	6,147	6,756	6,178	9,789	18,288	43,780	33,279	16,583	5,871	4,211	4,008
Mean	183	205	218	199	338	590	1,459	1,074	553	189	136	134
Ac-ft	11,230	12,190	13,400	12,250	19,420	36,270	86,840	66,010	32,890	11,640	8,350	7,950

Calendar year 1959: Max 1,110 Min 86 Mean 402 Ac-ft 291,100
Water year 1959-60: Max 1,920 Min 112 Mean 439 Ac-ft 318,400

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 7-10, Dec. 28 to Jan. 27, Feb. 25 to Mar. 4 (no gage-height record Jan. 1, 18, 20, 21).

4110. Coeur d'Alene River above Shoshone Creek, near Prichard, Idaho

Location.--Lat 47°42', long 115°59', in NE¼SW¼ sec.5, T.50 N., R.4 E., on left bank at Shoshone Creek ranger station, 0.2 mile downstream from Uranus Creek, 0.4 mile upstream from Shoshone Creek, and 3½ miles north of Prichard.

Drainage area.--335 sq mi.

Records available.--December 1950 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,485 ft (from river-profile map).

Average discharge.--9 years (1951-60), 780 cfs (564,700 acre-ft per year).

Extremes.--Maximum discharge during year, 5,890 cfs Apr. 9 (gage height, 5.85 ft); minimum, 85 cfs Sept. 19, 20, 30 (gage height, 0.97 ft).
1950-60: Maximum discharge, 9,610 cfs Feb. 11, 1951 (gage height, 7.17 ft), from rating curve extended above 5,500 cfs by logarithmic plotting; maximum gage height, 9.09 ft Feb. 26, 1957 (backwater from ice); minimum discharge, 34 cfs Dec. 26, 1952.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. No regulation or diversion above station.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.9	70	2.5	850
1.1	120	3.0	1,300
1.3	185	4.0	2,470
1.6	305	5.0	4,120
2.0	510	5.8	5,720

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	182	287	693	b440	444	b270	*2,640	1,800	1,880	318	154	112
2	160	274	624	b420	466	b250	2,110	2,210	1,710	305	192	108
3	144	355	582	b480	466	b250	2,000	2,440	1,680	300	160	102
4	135	898	534	b460	400	b260	2,620	2,400	1,540	282	157	120
5	123	826	477	b440	385	b275	3,910	2,370	1,340	274	154	160
6	120	679	450	b445	390	b270	4,900	2,430	1,190	264	141	129
7	123	564	455	450	b750	b250	5,360	2,660	1,100	252	141	115
8	144	482	422	411	b1,170	b270	5,260	3,570	984	244	138	108
9	360	433	395	b370	1,030	b260	5,720	3,120	900	236	129	105
10	300	*390	428	b300	794	b250	5,120	2,800	820	228	123	102
11	296	365	395	b310	679	b240	3,890	3,620	760	220	118	100
12	350	b340	*406	b320	600	*b230	2,990	4,010	700	213	115	98
13	318	b230	380	*b270	570	b240	2,540	3,480	*660	206	110	95
14	278	b220	350	b250	540	b230	2,850	2,730	644	202	108	95
15	269	b250	618	b270	540	b240	2,910	2,230	794	192	110	92
16	236	b220	1,590	b260	494	b245	2,430	2,030	679	185	120	90
17	213	b200	1,560	b230	472	b240	2,060	2,050	618	178	120	90
18	199	b250	1,270	b210	416	248	1,960	1,960	570	*174	118	90
19	188	b350	1,050	b200	b400	282	1,890	1,800	522	171	110	88
20	202	b450	898	b250	b380	370	1,940	1,820	516	168	*105	85
21	287	b700	802	b300	b370	582	2,100	*2,250	516	164	102	88
22	355	850	707	b350	b350	975	1,970	2,330	472	157	105	88
23	450	1,370	658	b400	b330	1,460	1,760	2,050	444	154	118	98
24	422	2,150	624	b440	b330	1,970	1,590	1,830	428	147	135	110
25	406	2,880	624	b450	b310	2,480	1,430	1,690	400	147	141	105
26	355	2,120	546	460	b270	3,200	1,300	1,580	390	147	147	98
27	332	1,500	477	466	b260	3,260	1,250	1,780	380	144	171	92
28	336	1,160	b460	406	b260	4,160	1,300	2,020	355	138	141	90
29	336	948	b450	b450	b260	4,120	1,380	2,020	341	138	126	88
30	310	802	b465	b470	------	4,760	1,540	1,960	328	132	123	85
31	300	------	b470	b480	------	5,700	------	1,950	------	138	118	------
Total	8,229	22,543	19,860	11,458	14,126	37,837	80,720	72,990	23,661	6,218	4,050	3,026
Mean	265	751	641	370	487	1,221	2,691	2,355	789	201	131	101
Cfsm	0.791	2.24	1.91	1.10	1.45	3.64	8.03	7.03	2.36	0.600	0.391	0.301
In.	0.91	2.50	2.20	1.27	1.57	4.20	8.96	8.10	2.63	0.69	0.45	0.34
Ac-ft	16,320	44,710	39,390	22,730	28,020	75,050	160,100	144,800	46,930	12,330	8,030	6,000

Calendar year 1959: Max 5,400 Min 98 Mean 877 Cfsm 2.62 In. 35.53 Ac-ft 634,900
Water year 1959-60: Max 5,720 Min 85 Mean 833 Cfsm 2.49 In. 33.82 Ac-ft 604,400

Peak discharge (base, 3,600 cfs).--Mar. 30 (12:30 p.m.) 4,980 cfs (5.41 ft); Apr. 9 (5:30 p.m.) 5,890 cfs (5.85 ft); May 8 (2 p.m.) 3,730 cfs (4.76 ft); May 12 (11 a.m.) 4,140 cfs (4.98 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record June 9-13; discharge estimated on basis of recorded range in stage and records for stations at Enaville and near Cataldo.

4130. Coeur d'Alene River at Enaville, Idaho

Location.--Lat 47°34'20", long 116°15'10", in NW¼ sec.30, T.49 N., R.2 E., on right bank 800 ft upstream from highway bridge, a quarter of a mile northwest of Enaville Post Office, 1.1 miles upstream from South Fork, and 3.5 miles downstream from North Fork.

Drainage area.--895 sq mi.

Records available.--March 1911 to April 1913 (fragmentary), October 1939 to September 1960. Published as North Fork of Coeur d'Alene River at Enaville 1911-13.

Gage.--Water-stage recorder. Datum of gage is 2,100.00 ft above mean sea level. Mar. 3, 1911, to Apr. 12, 1913, staff gage at site a quarter of a mile downstream at different datum. Oct. 18 to Dec. 22, 1939, staff gage at present site and datum.

Average discharge.--21 years (1939-60), 1,967 cfs (1,424,000 acre-ft per year).

Extremes.--Maximum discharge during year, 13,600 cfs Mar. 30 (gage height, 70.08 ft); minimum, 238 cfs Sept. 30 (gage height, 61.05 ft).
1911-13, 1939-60: Maximum discharge, 28,100 cfs Dec. 15, 1946, from rating curve extended above 13,000 cfs by logarithmic plotting; maximum gage height, 74.93 ft Feb. 11, 1951; minimum discharge, 104 cfs Dec. 26, 1952 (gage height, 60.10 ft).
Flood in December 1933 reached a stage of 79.47 ft and that in April 1938 a stage of 78.16 ft, from local information concerning high-water marks.

Remarks.--Records excellent except those for periods of ice effect, which are good. No appreciable regulation or diversion above station.

Revisions (water years).--WSP 1396: 1945.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

61.0	214	64.0	3,150
61.5	504	66.0	5,950
62.0	905	68.0	9,320
63.0	1,930	70.0	13,400

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	554	869	2,460	1,130	997	b940	*8,080	4,100	4,900	905	431	322
2	491	834	2,170	b1,050	1,060	b900	6,450	4,800	4,540	869	525	311
3	450	1,080	2,010	b1,200	1,130	b920	5,780	5,420	4,610	843	497	300
4	418	2,980	1,790	1,150	1,080	b940	6,770	5,480	4,400	808	464	339
5	393	2,760	1,590	1,090	1,080	b980	9,180	5,410	3,880	782	444	406
6	387	2,230	1,500	1,130	1,130	b960	11,200	5,500	3,460	756	431	380
7	393	1,850	1,460	1,060	2,380	b930	12,000	5,920	3,230	723	406	339
8	431	1,560	1,360	1,010	4,150	b960	11,900	7,590	2,880	699	399	316
9	933	1,370	1,270	960	3,590	b900	12,600	7,210	2,550	667	380	300
10	1,020	*1,260	1,240	816	2,960	b850	12,300	6,450	2,320	659	368	290
11	1,030	1,140	1,260	860	2,510	*834	9,570	7,740	2,210	628	357	284
12	1,230	1,090	1,300	923	2,160	756	7,810	8,670	2,120	613	345	279
13	1,220	834	*1,250	*808	2,010	740	6,640	8,080	*2,000	598	339	284
14	1,060	816	1,160	675	1,830	748	7,030	6,630	1,940	583	333	279
15	960	905	1,860	b730	1,890	756	7,260	5,410	2,140	561	339	274
16	869	b650	4,270	b700	1,740	756	6,360	4,890	2,120	547	345	268
17	782	675	4,710	b600	1,600	740	5,500	4,990	2,020	*532	351	268
18	723	816	4,020	484	1,490	765	5,210	4,970	1,800	511	345	258
19	667	896	3,370	399	1,410	852	5,040	4,620	1,580	497	333	258
20	699	1,040	2,880	b450	1,360	1,070	5,210	4,580	1,520	491	*322	253
21	887	3,500	2,530	b500	1,350	1,620	5,780	*5,600	1,500	477	311	253
22	1,110	4,290	2,250	b650	1,250	2,930	5,590	6,020	1,360	464	311	253
23	1,500	7,430	2,030	b740	1,090	4,690	5,080	5,380	1,250	457	328	268
24	1,450	9,370	1,930	b760	1,100	6,280	4,550	4,800	1,200	444	387	284
25	1,350	9,790	2,000	774	1,050	7,550	4,130	4,360	1,160	437	399	290
26	1,200	8,080	1,750	774	b1,000	9,010	3,710	3,990	1,120	431	406	279
27	1,090	5,760	1,520	774	b900	9,140	3,490	4,230	1,080	418	450	268
28	1,070	4,380	1,420	731	b900	10,400	3,410	4,800	1,020	412	418	258
29	1,050	3,600	1,320	860	b910	10,700	3,450	4,890	969	406	374	253
30	969	2,930	1,370	1,010	------	12,700	3,640	4,830	933	399	351	243
31	914	------	1,370	1,040	------	11,100	------	4,890	------	406	339	------
Total	27,300	84,785	62,420	25,838	47,107	103,417	204,720	172,250	67,812	18,023	11,828	8,657
Mean	881	2,826	2,014	833	1,624	3,336	6,824	5,556	2,260	581	382	289
Cfsm	0.984	3.16	2.25	0.931	1.81	3.73	7.62	6.21	2.53	0.649	0.427	0.323
In.	1.13	3.52	2.59	1.07	1.96	4.30	8.51	7.16	2.82	0.75	0.49	0.36
Ac-ft	54,150	168,200	123,800	51,250	93,440	205,100	406,100	341,700	134,500	35,750	23,460	17,170

Calendar year 1959: Max 13,400 Min 302 Mean 2,515 Cfsm 2.81 In. 38.13 Ac-ft 1,821,000
Water year 1959-60: Max 12,700 Min 243 Mean 2,279 Cfsm 2.55 In. 34.66 Ac-ft 1,655,000

Peak discharge (base, 8,000 cfs).--Nov. 25 (5 p.m.) 10,100 cfs (68.42 ft); Mar. 30 (4 p.m.) 13,600 cfs (70.08 ft); Apr. 9 (10:30 p.m.) 13,300 cfs (69.95 ft); May 12 (3 p.m.) 8,910 cfs (67.77 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

4135. Coeur d'Alene River near Cataldo, Idaho

Location.--Lat 47°34', long 116°18', in sec.26, T.49 N., R.1 E., on left bank 1½ miles upstream from Cataldo and 3 miles downstream from South Fork.

Drainage area.--1,220 sq mi, approximately.

Records available.--April 1911 to December 1912, July 1920 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,100 ft above mean sea level. Datum of 1929, supplementary adjustment of 1947 is 2.84 ft higher. Apr. 25, 1911, to Dec. 31, 1912, staff gage at site 300 ft downstream at different datum. July 29, 1920, to Oct. 10, 1925, staff gage at present site and datum.

Average discharge.--41 years, 2,521 cfs (1,825,000 acre-ft per year).

Extremes.--Maximum discharge during year, 16,300 cfs Apr. 9 (gage height, 46.70 ft); minimum, 352 cfs Sept. 20 (gage height, 38.11 ft).
1911-12, 1920-60: Maximum discharge, 55,300 cfs Dec. 22 or 23, 1933 (gage height, 56.9 ft, from floodmark), from rating curve extended above 24,000 cfs by logarithmic plotting; minimum, 122 cfs Dec. 4, 1929; minimum gage height, 37.03 ft Sept. 6, 1931.

Remarks.--Records good. No appreciable regulation or diversion above station.

Cooperation.--Water-stage-recorder graph furnished by Washington Water Power Co.

Revisions (water years).--WSP 1396: 1945.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 31 to June 19)

38.1	338	42.0	3,930
38.5	501	44.0	8,270
39.0	790	46.0	13,800
40.0	1,570	48.0	20,500
41.0	2,570		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*811	1,260	2,940	1,600	1,530	b1,400	*10,300	5,020	6,630	1,540	653	460
2	744	1,220	2,680	1,410	1,600	b1,300	8,050	5,790	6,290	1,460	818	434
3	689	1,420	2,530	1,520	1,680	b1,330	7,140	6,450	6,470	1,410	713	426
4	647	3,270	2,320	1,420	1,620	b1,380	8,250	6,540	6,200	1,380	659	473
5	611	3,180	2,110	1,450	1,610	b1,480	10,900	6,590	5,460	1,310	617	551
6	600	2,740	2,020	1,500	1,700	1,330	13,400	6,660	4,870	1,260	605	516
7	611	2,360	1,930	1,420	3,510	1,300	14,700	7,290	4,570	1,240	567	469
8	647	2,090	1,820	1,370	4,930	1,340	14,800	9,220	4,100	1,180	551	434
9	1,360	1,880	1,790	1,320	4,320	1,290	15,900	8,800	3,640	1,150	541	417
10	1,460	*1,750	1,660	1,140	3,580	1,200	15,600	8,080	3,430	1,090	516	413
11	1,500	1,620	1,690	1,180	3,150	*1,120	12,200	9,870	3,330	1,050	506	397
12	1,810	1,550	*1,730	1,250	2,820	1,070	9,560	11,200	3,200	998	492	390
13	1,830	1,230	1,660	*1,100	2,670	1,100	8,250	10,300	3,070	975	473	390
14	1,630	1,180	1,540	b1,150	2,470	1,100	8,530	8,270	*2,980	952	464	390
15	1,520	1,300	2,050	b1,180	2,480	1,120	8,780	6,680	3,200	909	473	382
16	1,390	b1,050	3,980	b1,100	2,330	1,110	7,740	6,070	3,230	888	496	374
17	1,260	b1,100	4,650	916	2,200	1,120	6,750	6,180	3,220	*839	492	367
18	1,150	1,220	4,070	b800	2,070	1,210	6,470	6,120	2,850	811	478	363
19	1,060	1,310	3,480	b700	1,950	1,420	6,310	5,610	2,580	770	460	360
20	1,060	1,540	3,100	b750	1,880	1,840	6,450	5,590	2,460	738	*447	356
21	1,300	4,140	2,830	b850	1,840	2,610	7,120	6,720	2,400	707	438	356
22	1,520	4,810	2,580	b940	1,740	4,050	6,910	*7,090	2,230	689	434	360
23	1,990	8,220	2,380	b980	1,540	6,070	6,200	6,500	2,080	683	460	374
24	1,970	10,700	2,320	b1,000	1,540	7,690	5,590	5,920	1,990	653	516	394
25	1,880	11,100	2,440	1,010	1,450	9,090	5,100	5,350	1,920	647	546	401
26	1,700	8,960	2,230	1,050	b1,350	10,800	4,670	5,020	1,850	641	546	394
27	1,590	6,360	2,020	1,040	b1,300	11,200	4,510	5,480	1,780	629	611	374
28	1,540	4,870	1,890	1,000	b1,310	12,500	4,260	6,140	1,740	600	573	367
29	1,500	4,020	1,760	1,240	b1,350	12,800	4,300	6,180	1,650	594	516	363
30	1,390	3,410	1,810	1,520	------	15,500	4,490	6,030	1,590	583	483	363
31	1,330	------	1,810	1,590	------	14,000	------	6,460	------	594	469	------
Total	40,100	100,860	73,820	36,496	63,520	131,870	253,230	213,220	101,010	28,970	16,613	12,108
Mean	1,294	3,362	2,381	1,177	2,190	4,254	8,441	6,878	3,367	935	536	404
Cfsm	1.06	2.76	1.95	0.965	1.80	3.49	6.92	5.64	2.76	0.766	0.439	0.331
In.	1.22	3.07	2.25	1.11	1.94	4.02	7.72	6.50	3.08	0.88	0.51	0.37
Ac-ft	79,540	200,100	146,400	72,390	126,000	261,600	502,300	422,900	200,400	57,460	32,950	24,020

Calendar year 1959: Max 17,200 Min 447 Mean 3,264 Cfsm 2.68 In. 36.33 Ac-ft 2,363,000
Water year 1959-60: Max 15,900 Min 356 Mean 2,928 Cfsm 2.40 In. 32.67 Ac-ft 2,126,000

Peak discharge (base, 11,000 cfs).--Nov. 25 (4:30 p.m.) 11,400 cfs (45.20 ft); Mar. 30 (6 p.m.) 16,100 cfs (46.65 ft); Apr. 9 (11:30 p.m.) 16,300 cfs (46.70 ft); May 12 (4 p.m.) 11,600 cfs (45.16 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

4145. St. Joe River at Calder, Idaho

Location.--Lat 47°16', long 116°11', in sec.3, T.45 N., R.2 E., on right bank 150 ft southwest of Chicago, Milwaukee, St. Paul and Pacific Railroad station at Calder.

Drainage area.--1,030 sq mi, approximately.

Records available.--April 1911 to September 1912 (published as "near Calder"), July 1920 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,096.76 ft above mean sea level, datum of 1929, supplementary adjustment of 1947, or 2,100 ft above mean sea level, datum of Geological Survey as given in Bulletin 567. Apr. 14, 1911, to Sept. 30, 1912, staff gage at site 2½ miles downstream at different datum. July 13 to Dec. 21, 1920, staff gage at present site and datum.

Average discharge.--41 years, 2,342 cfs (1,691,000 acre-ft per year).

Extremes.--Maximum discharge during year, 13,500 cfs Apr. 9 (gage height, 86.95 ft); minimum daily, 381 cfs Sept. 29-30; minimum gage height, 79.79 ft Sept. 27.
1911-12, 1920-60: Maximum discharge, 53,000 cfs Dec. 23, 1933, computed on basis of slope between gages downstream; maximum gage height, 93.1 ft Apr. 18, 1938, from floodmark; minimum discharge, 91 cfs Nov. 27, 1952; minimum gage height, 78.43 ft Dec. 5, 1928.

Remarks.--Records good except those for periods of ice effect or shifting control, which are fair. No diversion above gage.

Cooperation.--Water-stage-recorder graph furnished by Washington Water Power Co.

Revisions.--WSP 1182: Drainage area.

Rating tables, water year 1959-60, except periods of ice effect and shifting control (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 8		Nov. 9 to Sept. 30			
80.1	675	79.4	364	82.0	2,700
80.5	965	79.7	498	83.0	4,350
81.0	1,420	80.0	652	85.0	8,470
82.0	2,610	80.5	1,000	87.0	13,600
83.0	4,140	81.0	1,470		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	957	1,440	2,600	1,150	1,600	800	5,120	4,530	7,880	2,330	914	489
2	855	1,410	2,430	1,100	1,700	750	4,460	5,120	8,060	2,210	1,350	474
3	803	2,000	2,360	1,150	1,800	750	4,570	5,490	9,070	2,040	783	460
4	768	3,760	2,190	1,100	1,700	846	5,930	5,730	9,000	1,930	699	513
5	740	2,930	1,980	1,000	1,660	906	7,900	6,540	8,010	1,850	647	588
6	734	2,510	1,870	1,000	1,720	968	9,720	6,960	7,370	1,790	625	552
7	803	2,260	1,810	1,100	2,200	992	10,800	7,830	7,020	1,720	614	503
8	796	2,020	1,770	1,080	2,450	1,010	11,400	9,030	6,210	1,650	583	470
9	1,620	*1,890	1,680	1,050	1,990	921	13,100	8,310	5,650	1,620	572	451
10	1,610	1,790	1,690	1,000	1,770	846	11,900	8,790	5,270	1,550	567	442
11	1,830	1,740	1,690	1,040	1,560	854	9,460	11,200	5,200	1,460	557	433
12	3,160	1,830	*1,670	1,060	1,390	914	7,790	12,400	4,970	1,370	532	420
13	2,880	1,320	1,550	960	1,340	891	6,670	12,100	*4,760	1,320	518	420
14	2,370	1,300	1,460	980	1,260	832	6,440	9,650	4,660	1,260	513	420
15	2,010	1,400	1,680	1,000	1,260	825	5,770	7,970	5,080	*1,190	522	410
16	1,760	1,090	2,030	960	1,200	811	5,100	7,390	5,270	1,140	542	402
17	1,590	1,200	1,870	880	1,130	811	4,660	7,130	5,060	1,070	537	389
18	1,470	1,350	1,770	780	1,000	868	4,510	6,600	4,310	1,010	532	381
19	1,370	1,550	1,680	700	970	1,070	4,490	6,010	3,900	992	*518	389
20	1,310	1,850	1,570	750	960	1,440	4,510	6,070	3,700	953	498	381
21	1,420	2,920	1,510	850	940	2,110	4,700	6,350	3,400	945	484	381
22	1,690	2,660	1,430	950	900	3,080	4,400	5,970	3,130	929	474	385
23	2,120	6,520	1,460	1,000	839	4,100	4,190	5,630	2,920	945	513	402
24	2,070	7,390	1,560	1,050	891	4,990	3,890	5,330	2,860	898	552	410
25	2,020	8,220	1,670	1,100	*891	5,730	*3,650	*5,080	2,840	868	603	420
26	1,820	6,190	1,460	*1,100	740	*6,520	3,370	5,060	2,740	861	583	420
27	1,720	4,660	1,210	1,090	700	6,690	3,340	5,690	2,690	832	664	*402
28	1,690	3,820	1,200	1,080	700	7,570	3,500	5,930	2,560	783	641	385
29	1,670	3,370	1,150	1,400	730	6,710	3,670	6,010	2,450	763	557	381
30	1,570	2,960	1,200	1,600	------	7,130	3,990	6,460	2,380	756	522	381
31	1,500	------	1,200	1,650	------	6,230	------	7,110	------	763	498	------
Total	48,726	85,350	52,400	32,710	37,991	78,965	183,000	219,470	148,420	39,798	18,714	12,954
Mean	1,572	2,845	1,690	1,055	1,310	2,547	6,100	7,080	4,947	1,284	604	432
Cfsm	1.53	2.76	1.64	1.02	1.27	2.47	5.92	6.87	4.80	1.25	0.586	0.419
In.	1.76	3.08	1.89	1.18	1.37	2.85	6.61	7.92	5.36	1.44	0.68	0.47
Ac-ft	96,650	169,300	103,900	64,880	75,350	156,600	363,000	435,300	294,400	78,940	37,120	25,690

Calendar year 1959: Max 14,600 Min 510 Mean 3,162 Cfsm 3.07 In. 41.66 Ac-ft 2,289,000
Water year 1959-60: Max 13,100 Min 381 Mean 2,619 Cfsm 2.54 In. 34.61 Ac-ft 1,901,000

Peak discharge (base, 8,500 cfs).--Nov. 25 (12 m.) 8,650 cfs (85.08 ft); Apr. 9 (9 p.m.) 13,500 cfs (86.95 ft); May 13 (2 a.m.) 12,800 cfs (86.70 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 14, 15, 17-19, Dec. 6, 7, 9, 22, Dec. 28 to Feb. 3, Feb. 7, 18-22, Feb. 26 to Mar. 3. Shifting-control method used Oct. 1 to Nov. 8, July 13 to Sept. 30.

4150. St. Maries River at Lotus, Idaho

Location.--Lat 47°14'40", long 116°37'30", in sec.17, T.45 N., R.2 W., on left bank 1 mile northwest of Lotus, 1 mile downstream from Carlton Creek, and 5½ miles southwest of St. Maries.
Drainage area.--437 sq mi.
Records available.--July, August, October to December 1911, January 1912 (gage heights only), February to October 1912, July 1920 to September 1960.
Gage.--Water-stage recorder. Datum of gage is 2,140.19 ft above mean sea level, referenced to bench mark "U.S.G.S. 2155 1911 35" (Geological Survey Bull. 567, p. 45). Datum of 1929, supplementary adjustment of 1947, is 3.17 ft higher. Prior to Oct. 1, 1945, staff gages at sites 0.8 to 1.3 miles upstream at different datums. Oct. 1, 1945, to Feb. 21, 1949, staff gage at present site and datum.
Average discharge.--40 years (1920-60), 520 cfs (376,500 acre-ft per year).
Extremes.--Maximum discharge during year, 5,540 cfs Mar. 30 (gage height, 6.19 ft); minimum, 47 cfs Sept. 21, 22.
1911-12, 1920-60: Maximum discharge observed, 23,800 cfs Dec. 22, 23, 1933, from rating curve extended above 4,000 cfs by logarithmic plotting; maximum gage height, 13.4 ft probably Feb. 9, 1951, from floodmark (ice jam); minimum discharge, 11 cfs Nov. 23, 1952 (gage height, 0.98 ft).
Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No regulation or diversion above station.
Cooperation.--Water-stage-recorder graph furnished by Washington Water Power Co.
Revisions (water years).--WSP 1062: Drainage area at former site. WSP 1346: 1912.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 11				Dec. 12 to Sept. 30			
0.6	99	2.5	800	0.1	36	2.5	833
1.0	177	3.0	1,150	.5	94	3.0	1,180
1.5	317	4.0	2,070	1.0	193	4.0	2,070
2.0	521	5.0	3,360	1.5	332	5.0	3,360
				2.0	542	6.0	5,110

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	184	210	440	230	600	220	2,870	840	569	177	91	69
2	151	200	398	220	780	210	2,290	859	553	170	153	64
3	133	350	382	220	1,050	210	2,070	878	527	164	116	63
4	124	620	354	230	1,000	220	2,090	905	512	157	92	72
5	113	450	291	250	1,300	250	2,260	959	483	151	86	122
6	113	390	288	260	1,800	300	2,400	885	455	145	80	96
7	116	350	324	240	2,700	400	2,310	1,010	421	139	77	75
8	135	300	264	225	2,100	1,100	2,150	1,200	400	133	74	67
9	304	*270	219	210	1,700	820	2,400	1,040	377	127	71	64
10	288	255	282	200	1,500	700	2,330	973	356	125	67	63
11	357	238	285	230	1,300	580	1,880	973	342	122	66	60
12	516	258	*289	205	1,100	460	1,760	980	*320	120	61	60
13	327	140	284	190	1,000	500	1,500	1,010	304	116	58	58
14	264	150	255	175	900	480	1,770	939	301	113	57	57
15	227	160	261	180	800	450	1,600	814	417	*108	60	56
16	211	150	400	190	700	500	1,400	833	425	106	66	54
17	187	160	381	170	600	550	1,230	966	404	101	70	53
18	170	180	323	160	500	620	1,310	912	326	97	69	50
19	160	210	289	160	480	698	1,320	820	295	94	*64	49
20	200	350	247	175	450	946	1,460	820	289	92	58	48
21	220	650	278	185	400	1,370	1,710	1,130	298	89	56	47
22	300	1,180	226	190	350	1,860	1,520	1,030	272	86	56	47
23	400	2,760	250	205	320	2,400	1,430	925	252	82	58	52
24	330	2,070	278	225	300	2,760	1,310	*872	236	80	82	54
25	270	1,660	537	260	270	2,670	1,190	833	223	79	125	58
26	250	1,150	389	280	240	2,860	1,120	758	213	80	113	58
27	230	842	260	300	220	3,070	1,040	783	208	79	97	*57
28	210	658	250	340	200	3,320	980	740	198	75	94	54
29	230	592	245	380	210	2,990	905	669	188	72	84	53
30	240	506	240	430	------	5,000	859	624	182	71	79	53
31	220	------	235	500	------	*4,370	------	596	------	74	72	------
Total	7,180	17,459	9,444	7,415	24,870	42,884	50,464	27,576	10,346	3,424	2,452	1,833
Mean	232	582	305	239	858	1,383	1,682	890	345	110	79.1	61.1
Cfsm	0.531	1.33	0.698	0.547	1.96	3.16	3.85	2.04	0.789	0.252	0.181	0.140
In.	0.61	1.49	0.80	0.63	2.12	3.65	4.29	2.35	0.88	0.29	0.21	0.16
Ac-ft	14,240	34,630	18,730	14,710	49,330	85,060	100,100	54,700	20,520	6,790	4,860	3,640

Calendar year 1959: Max 6,240 Min 66 Mean 668 Cfsm 1.53 In. 20.77 Ac-ft 483,700
Water year 1959-60: Max 5,000 Min 47 Mean 561 Cfsm 1.28 In. 17.48 Ac-ft 407,300

Peak discharge (base, 2,200 cfs).--Nov. 23 (5 p.m.) 2,830 cfs (4.62 ft); Mar. 30 (11 p.m.) 5,540 cfs (6.19 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 13-21, Dec. 27 to Mar. 18. No gage-height record Oct. 18 to Nov. 9, Jan. 2-24, Feb. 7-25, Feb. 28 to Mar. 12 (stage-discharge relation affected by ice most of periods), Aug. 15-18; discharge estimated on basis of weather records, records for adjacent periods, and records for Potlatch River at Kendrick.

4155. Coeur d'Alene Lake at Coeur d'Alene, Idaho

Location.--Lat 47°39'55", long 116°46'05", in sec.24, T.50 N., R.4 W., 500 ft southwest of south end of Eleventh Street, Coeur d'Alene.

Drainage area.--3,700 sq mi, approximately.

Records available.--April 1903 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,100.00 ft above mean sea level, referred to originally accepted elevation (2,157.40 ft) of Geological Survey bench mark in southeast corner of Merriam Building (see WSP 882). Gage heights reduced to elevations above mean sea level. Datum of 1929, supplementary adjustment of 1947 is 3.00 ft higher. Apr. 26, 1903, to Feb. 14, 1905, staff gage at mouth of St. Joe River at datum about 18.7 ft higher. Feb. 15, 1905, to Mar. 23, 1921, staff gage and Mar. 24, 1921, to Dec. 22, 1930, water-stage recorder, at Johnson Wharf 800 ft southeast of railroad station and 1 mile northwest of present site at datum 19.75 ft higher. Dec. 23, 1930, to Feb. 9, 1931, staff gage at present site and datum.

Extremes.--Maximum contents during year, 444,900 acre-ft Apr. 12 (elevation, 2,131.98 ft); minimum, 106,600 acre-ft Mar. 18 (elevation, 2,123.95 ft).

1903-60: Maximum contents, 834,900 acre-ft Dec. 25, 1933 (elevation, 2,139.05 ft); minimum, 2,700 acre-ft below zero of contents table Oct. 10-12, 1904, Sept. 24, 25, 1905, Oct. 14 to Nov. 3, 1906 (elevation, 2,119.9 ft).

Maximum contents known prior to 1903, 753,300 acre-ft May 31, 1894 (elevation, 2,137.6 ft, from high-water marks).

Remarks.--The Washington Water Power Co. stores water in Coeur d'Alene Lake by regulation at Post Falls Dam for power generation at Post Falls and other plants on Spokane River. Storage is within natural range of lake stage. Contents given herein are those above elevation 2,120.0 ft. Capacity of lake between elevations 2,120 and 2,140 ft, 889,000 acre-ft.

Cooperation.--Water-stage-recorder graph furnished by Washington Water Power Co.

Revisions.--WSP 1182: Drainage area.

Capacity table, water year 1959-60 (elevation, in feet, and contents, in acre-feet)

2,123.0	80,700	2,129.0	288,100
2,125.0	135,200	2,131.0	392,500
2,127.0	195,300	2,133.0	500,000

Elevation, in feet, at 12 p.m., water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27.51	27.80	27.98	26.64	24.45	25.61	30.27	27.82	28.34	27.72	28.03	27.99
2	27.53	27.79	27.77	26.51	24.59	25.49	30.30	27.77	28.37	27.77	28.01	27.93
3	27.50	27.80	27.78	26.39	24.70	25.32	30.20	27.76	28.40	27.80	28.01	27.88
4	27.49	28.00	27.74	26.29	24.86	25.18	30.11	27.80	28.48	27.82	27.98	27.89
5	27.44	27.99	27.70	26.21	25.04	25.08	30.15	27.83	28.50	27.88	27.97	27.83
6	27.42	27.97	27.67	26.12	25.27	24.93	30.34	27.90	28.42	27.92	27.97	27.77
7	27.40	27.92	27.64	26.00	25.80	24.88	30.65	28.08	28.32	27.95	27.97	27.70
8	27.43	27.92	27.57	25.92	26.32	24.83	31.00	28.28	28.18	27.95	27.98	27.70
9	27.50	27.90	27.48	25.81	26.52	24.73	31.33	28.48	27.98	27.95	28.00	27.68
10	27.63	27.89	27.42	25.70	26.62	24.61	31.73	28.65	27.80	27.97	28.01	27.66
11	27.78	27.81	27.38	25.57	26.64	24.52	31.97	28.87	27.61	27.98	28.00	27.63
12	27.89	27.80	27.31	25.49	26.67	24.42	31.90	29.20	27.40	27.99	27.99	27.58
13	27.96	27.78	27.24	25.40	26.65	24.39	31.79	29.51	27.20	28.01	27.98	27.52
14	28.00	27.73	27.20	25.31	26.66	24.32	31.52	29.70	27.05	28.03	27.98	27.47
15	27.98	27.70	27.15	25.22	26.67	24.20	31.29	29.70	26.92	27.99	27.97	27.39
16	27.97	27.61	27.20	25.17	26.67	24.10	31.00	29.67	26.80	27.97	27.98	27.31
17	27.96	27.59	27.31	25.09	26.64	24.00	30.73	29.54	26.68	27.94	27.95	27.26
18	27.92	27.64	27.40	24.97	26.60	23.97	30.40	29.41	26.51	27.95	27.94	27.19
19	27.91	27.67	27.48	24.82	26.57	23.97	30.12	29.27	26.41	27.98	27.96	27.14
20	27.94	27.74	27.50	24.67	26.50	24.04	29.92	29.20	26.47	28.00	27.96	27.02
21	27.98	27.89	27.50	24.55	26.43	24.27	29.75	29.10	26.48	28.00	27.93	26.93
22	27.98	27.92	27.52	24.36	26.34	24.62	29.58	29.05	26.60	28.00	27.93	26.88
23	27.96	28.14	27.41	24.37	26.24	25.20	29.43	28.99	26.78	27.99	27.95	26.84
24	27.96	28.50	27.38	24.30	26.15	25.83	29.26	28.90	26.91	27.98	27.99	26.79
25	27.90	28.79	27.38	24.20	26.05	26.42	29.05	28.79	27.09	27.98	28.01	26.73
26	27.84	29.01	27.30	24.20	25.98	26.99	28.80	28.63	27.24	27.97	28.02	26.66
27	27.80	29.00	27.19	24.19	25.91	27.56	28.58	28.52	27.38	27.97	28.00	26.61
28	27.80	28.85	27.06	24.17	25.82	28.12	28.35	28.43	27.51	27.96	27.99	26.56
29	27.82	28.61	26.91	24.20	25.70	28.72	28.14	28.39	27.61	27.95	27.99	26.50
30	27.82	28.30	26.81	24.29	-------	29.40	27.94	28.36	27.69	27.96	27.98	26.45
31	27.80	-------	26.72	24.38	-------	29.94	-------	28.31	-------	28.00	27.99	-------
(†)	229,000	253,000	185,200	118,300	154,500	336,600	235,600	253,500	223,800	238,500	238,000	176,400
(‡)	+13,600	+24,000	-67,800	-66,900	+36,200	+182,100	-101,000	+17,900	-29,700	+14,700	-500	-61,600

Calendar year 1959..... ‡ -35,500
Water year 1959-60..... ‡ -39,000

† Contents, in acre-feet, at end of month.
‡ Change in contents, in acre-feet.
Note.--Add 2,100 ft to obtain elevation above mean sea level.

4170. Hayden Lake at Hayden Lake, Idaho

Location.--Lat 47°46', long 116°45', in sec.18, T.51 N., R.3 W., at Avondale pumping plant 1¼ miles northeast of Hayden Lake.

Drainage area.--62.3 sq mi.

Records available.--May 1920 to September 1960.

Gage.--Staff gage read once daily. Datum of gage is 2,200.21 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1925, at datum 30.35 ft higher. Oct. 1, 1925, to Mar. 26, 1931, at datum 21.60 ft higher.

Extremes.--Maximum gage height observed during year, 40.78 ft Apr. 6; minimum observed, 34.14 ft Sept. 30.
1920-60: Maximum gage height observed, 42.46 ft Apr. 22, 1956; minimum observed, 19.38 ft Dec. 16, 1931.

Remarks.--Water is pumped from lake for irrigation and domestic supply. Lake has no natural surface outlet, but due to the permeability of the lakebed, a considerable part of the total inflow leaves the lake by infiltration to the ground water of Rathdrum Prairie. Dike near southwest corner of lake was reported breached Apr. 6 and repaired July 20. Flow escaping through this breach seeped rapidly into the ground ir an extremely permeable area adjacent to the outflows.

Revisions (water years).--WSP 962: 1921(M). WSP 1216: 1950.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36.00	35.70	36.96	37.64	37.64	38.82	40.50	39.38	39.14	37.36	35.78	34.79
2	35.97	35.69	36.97	37.62	37.70	38.80	40.58	39.36	39.12	37.30	35.76	34.76
3	35.96	35.68	36.98	37.60	37.74	38.78	40.62	39.34	39.10	37.24	35.74	34.74
4	35.94	35.76	36.98	37.61	37.76	38.76	40.66	39.30	39.04	37.18	35.74	34.74
5	35.93	35.76	36.98	37.60	37.80	38.79	40.71	39.26	39.00	37.12	35.72	34.73
6	35.90	35.76	36.98	37.62	37.86	38.78	40.78	39.22	38.92	37.06	35.70	34.72
7	35.89	35.74	36.99	37.62	38.04	38.76	40.77	39.21	38.87	37.02	35.65	34.68
8	35.88	35.73	36.98	37.63	38.29	38.80	40.66	39.21	38.80	36.94	35.62	34.66
9	35.88	35.72	36.96	37.62	38.47	38.78	40.54	39.19	38.74	36.90	35.57	34.64
10	35.86	35.72	36.96	37.62	38.60	38.76	40.43	39.16	38.67	36.84	35.54	34.61
11	35.90	35.68	36.96	37.61	38.68	38.74	40.33	39.15	38.60	36.78	35.50	34.60
12	35.90	35.68	37.00	37.60	38.73	38.72	40.24	39.10	38.52	36.72	35.46	34.57
13	35.89	35.65	37.02	37.60	38.78	38.72	40.15	39.06	38.46	36.68	35.40	34.56
14	35.88	35.63	37.02	37.59	38.80	38.71	40.12	39.05	38.36	36.62	35.35	34.52
15	35.86	35.62	37.10	37.58	38.86	38.70	40.06	39.00	38.38	36.58	35.30	34.50
16	35.84	35.58	37.20	37.59	38.88	38.68	40.01	38.98	38.36	36.54	35.28	34.48
17	35.82	35.56	37.30	37.58	38.90	38.66	39.93	38.96	38.28	36.50	35.24	34.46
18	35.82	35.64	37.36	37.57	38.92	38.65	39.86	38.94	38.18	36.44	35.20	34.42
19	35.79	35.68	37.40	37.55	38.92	38.65	39.84	38.92	38.11	36.40	35.16	34.38
20	35.78	35.74	37.44	37.53	38.93	38.66	39.80	38.95	38.06	36.33	35.12	34.34
21	35.80	35.96	37.45	37.52	38.96	38.69	39.76	39.00	38.00	36.28	35.08	34.32
22	35.82	36.14	37.48	37.50	38.96	38.76	39.75	39.10	37.94	36.22	35.02	34.29
23	35.80	36.28	37.50	37.50	38.94	38.90	39.74	39.12	37.88	36.16	34.97	34.29
24	35.80	36.48	37.52	37.50	38.93	39.07	39.72	39.13	37.82	36.12	34.95	34.28
25	35.80	36.67	37.60	37.50	38.93	39.22	39.68	39.14	37.74	36.06	34.93	34.25
26	35.78	36.76	37.60	37.53	38.91	39.38	39.66	39.13	37.68	36.03	34.94	34.23
27	35.77	36.84	37.61	37.53	38.88	39.52	39.60	39.18	37.62	36.00	34.92	34.21
28	35.77	36.88	37.61	37.52	38.86	39.78	39.56	39.18	37.56	35.96	34.90	34.18
29	35.76	36.92	37.61	37.57	38.84	39.94	39.52	39.18	37.50	35.92	34.87	34.16
30	35.74	36.93	37.62	37.59	-------	40.18	39.46	39.17	37.42	35.88	34.85	34.14
31	35.72	-------	37.63	37.62	-------	40.36	-------	39.17	-------	-------	34.82	-------

4180. Rathdrum Prairie Canal at Huetter, Idaho

Location.--Lat 47°43', long 116°52', in sec.6, T.50 N., R.4 W., on left bank 450 ft downstream from outlet of discharge pipe, five-eighths of a mile north of pumping plant, and three-quarters of a mile northwest of Huetter.

Records available.--April 1946 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,273.02 ft above mean sea level (Bureau of Reclamation bench mark).

Extremes.--1946-60: Maximum daily discharge, 66 cfs June 29 to July 2, 1947; no flow for long periods in each year.

Remarks.--Records good. Canal carries water which is pumped from Spokane River in sec.7, T.50 N., R.4 W., for irrigation of first unit of Rathdrum Prairie project (about 3,000 acres).

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0	13	22	54	54	49
2	(*)						*0	13	22	53	53	49
3							0	13	25	52	53	48
4							0	13	36	52	54	46
5							0	13	46	51	54	44
6							0	13	46	51	55	42
7							0	13	47	50	55	42
8							0	13	47	49	55	42
9							0	13	48	50	55	33
10							0	13	48	49	54	26
11		(*)					0	13	48	49	55	26
12							0	18	48	49	55	25
13							0	21	47	50	55	25
14							0	22	47	50	55	24
15							0	22	*46	50	55	23
16							0	22	46	50	55	23
17							0	22	45	50	55	22
18							0	22	45	48	55	22
19							0	22	49	33	55	21
20							0	22	50	31	55	21
21							0	22	50	30	41	21
22							0	*22	51	31	*41	21
23							0	22	51	46	53	21
24							0	22	51	52	52	20
25							0	22	52	53	52	10
26							0	17	52	53	48	0
27							0	15	53	*54	50	0
28							9	22	52	54	50	0
29							13	22	54	55	50	0
30					-------		13	22	55	55	50	0
31		-------			-------		-------	21	-------	55	50	-------
Total	0	0	0	0	0	0	35	565	1,379	1,509	1,629	746
Mean	0	0	0	0	0	0	1.17	18.2	46.0	48.7	52.5	24.9
Ac-ft	0	0	0	0	0	0	69.0	1,120	2,740	2,990	3,230	1,480

Calendar year 1959: Max 55 Min 0 Mean 17.0 Ac-ft 12,280
Water year 1959-60: Max 55 Min 0 Mean 16.0 Ac-ft 11,630

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record May 15-21; discharge estimated on basis of record of pump operation furnished by Bureau of Reclamation.

4185. Spokane Valley Farms Co.'s Canal at Post Falls, Idaho

Location.--Lat 47°43', long 116°57', in sec.3, T.50 N., R.5 W., on left bank 300 ft downstream from headgate and half a mile northwest of Post Falls.

Records available.--May 1911 to September 1917, September 1919 to September 1960.

Gage.--Water-stage recorder. Prior to Apr. 22, 1938, staff gages at several sites within 1,000 ft of present site at various datums.

Extremes.--1911-17, 1919-60: Maximum daily discharge, 312 cfs May 22-24, 26, 28, 1956; no flow or small amount of leakage during nonirrigation seasons.

Remarks.--Records good except those below 5 cfs, which are poor. Canal diverts water for irrigation from Spokane River in SE¼ sec.3, T.50 N., R.5 W.

Cooperation.--Water-stage recorder inspected by employee of Spokane Valley Farms Co.. One discharge measurement furnished by Washington Water Power Co.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*1	0					0	72	157	262	261	203
2	1	0					*0	76	156	263	266	203
3	1	0					0	107	175	262	270	202
4	1	0					0	117	193	263	272	201
5	1	0					0	114	197	264	273	202
6	1	0					0	114	209	265	271	202
7	1	0					0	116	213	265	270	202
8	1	0					0	119	216	265	270	202
9	1	0					0	118	216	264	265	202
10	1	0				(*)	0	116	241	265	250	202
11	1	*0					0	164	239	264	*249	202
12	1	0					27	188	242	262	250	201
13	1	0	(*)				49	191	234	263	249	201
14	1	0					51	190	238	264	249	200
15	1	0					66	190	*248	263	247	191
16	1	1					76	188	245	263	246	50
17	1	0					74	185	239	263	246	50
18	1	1					74	184	232	261	240	50
19	1	1					75	185	234	260	237	50
20	0	1					75	184	242	261	238	50
21	0	0					75	183	242	262	236	50
22	0	0					74	182	240	261	*234	50
23	0	0					74	*164	253	261	234	22
24	0	0					72	184	260	261	228	0
25	0	0		(*)			72	187	260	261	218	0
26	0	0					73	189	262	260	211	0
27	0	0					73	181	262	*260	203	0
28	0	0					72	153	261	259	203	0
29	0	0					73	157	261	259	203	0
30	0	0			-------		72	157	262	260	203	0
31	0	-------			-------		-------	157	-------	260	204	-------
Total	19	4	0	0	0	0	1,297	4,812	6,929	8,126	7,496	3,388
Mean	0.6	0.1	0	0	0	0	43.2	155	231	262	242	113
Ac-ft	38	8	0	0	0	0	2,570	9,540	13,740	16,120	14,870	6,720

Calendar year 1959: Max 266 Min 0 Mean 86.9 Ac-ft 62,900
Water year 1959-60: Max 273 Min 0 Mean 87.6 Ac-ft 63,610

* Discharge measurement or observation of no flow made on this day.

4190. *Spokane River near Post Falls, Idaho*

Location.--Lat 47°42'10", long 116°58'40", in SW¼SW¼ sec.4, T.50 N., R.5 W., on right bank 1 mile downstream from powerplant of Washington Water Power Co., 1½ miles downstream from intake of Spokane Valley Farms Co.'s canal, and 1½ miles southwest of Post Falls.

Drainage area.--3,840 sq mi, approximately, of which about 122 sq mi in the vicinity of Hayden Lake is noncontributing to this station.

Records available.--October 1912 to September 1960 (prior to January 1913 monthly discharge only, published in WSP 870). Prior to October 1949, published as "at Post Falls."

Gage.--Water-stage recorder. Datum of gage is 2,000.00 ft above mean sea level, referenced to same datum as gage on Coeur d'Alene Lake at Coeur d'Alene (see p. 276). Datum of 1929, supplementary adjustment of 1947, is 3.00 ft higher. Jan. 1, 1913, to Nov. 21, 1920, staff gage and Sept. 16, 1934, to Nov. 15, 1949, water-stage recorder, at site 0.8 mile upstream. Nov. 22, 1920, to Sept. 15, 1934, water-stage recorder at site 0.6 mile upstream. All gages at present datum.

Average discharge.--River only, 48 years, 6,212 cfs (4,497,000 acre-ft per year); combined river, Spokane Valley Farms Co.'s canal, and Rathdrum Prairie Canal, 43 years, 6,318 cfs (4,574,000 acre-ft per year).

Extremes.--Maximum discharge during year, 27,100 cfs Apr. 12 (gage height, 70.04 ft); minimum, 171 cfs July 30, Aug. 21, 24, 25, 31 (gage height, 55.26 ft).

1912-60: Maximum discharge, 50,100 cfs when recorder was not operating Dec. 25, 1933 (determined from unpublished records collected by Washington Water Power Co. for station at Liberty Bridge); minimum daily, 104 cfs Aug. 18, 1958.

Remarks.--Records excellent except those below 800 cfs, which are good. Spokane Valley Farms Co.'s canal (see preceding page) and Rathdrum Prairie Canal (see p. 278) divert water above gage for irrigation. Figures of daily discharge do not include water diverted by these canals. Flow regulated by dam at Post Falls and affected by storage in Coeur d'Alene Lake (see p. 276).

Cooperation.--Water-stage-recorder graph furnished by Washington Water Power Co.

Revisions.--WSP 1182: Drainage area.

Corrections.--The figure of adjusted yearly mean discharge for the water year 1945, published erroneously in WSP 1316, has been corrected to 4,680 cfs.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*1,410	3,440	15,400	5,300	3,510	4,330	21,000	14,600	15,600	2,070	776	583
2	1,720	3,460	10,300	5,300	3,510	5,380	*21,800	14,200	15,700	2,070	1,390	1,220
3	2,050	3,460	6,800	5,300	2,760	5,630	21,800	14,200	15,600	2,070	1,470	1,720
4	2,030	5,390	6,800	5,300	1,910	5,520	21,400	14,100	15,600	1,730	1,820	1,930
5	2,050	7,550	6,110	5,290	3,010	5,460	21,300	14,200	15,600	1,490	1,090	1,770
6	1,810	7,090	5,750	5,270	3,500	5,400	21,400	14,400	15,900	1,460	646	1,780
7	1,620	6,290	5,750	5,260	3,940	5,340	22,300	14,700	15,600	1,720	188	1,540
8	2,040	4,820	5,800	5,230	5,510	5,340	23,400	15,200	15,200	1,870	192	940
9	1,520	4,820	5,880	5,230	8,690	5,300	24,600	15,900	14,800	1,800	370	848
10	790	4,810	5,840	5,190	9,580	*4,950	25,800	16,400	14,300	1,510	512	840
11	1,810	*4,810	*5,840	4,800	9,580	4,700	26,700	16,700	13,300	1,270	692	1,120
12	2,770	3,980	5,750	4,320	8,350	4,660	27,000	17,600	13,000	1,030	825	1,590
13	3,700	3,370	5,750	4,320	7,680	4,630	26,700	18,400	13,000	1,220	598	1,750
14	3,870	3,410	5,440	3,730	7,680	4,880	26,100	19,200	12,400	1,500	182	1,630
15	3,620	3,410	5,290	4,040	7,470	5,150	25,400	19,400	*12,100	2,110	182	1,780
16	3,420	3,640	5,450	3,700	6,240	5,030	24,600	19,400	11,800	1,630	340	1,880
17	3,410	3,490	5,360	3,720	6,260	4,950	23,800	19,200	11,600	1,500	484	1,860
18	3,370	3,500	5,450	3,760	6,280	4,960	22,800	18,900	11,200	1,070	380	1,870
19	2,750	3,500	5,450	4,080	5,760	5,030	21,700	18,700	7,940	602	185	1,860
20	2,760	4,240	5,450	4,100	6,280	5,050	20,900	18,200	5,990	578	174	1,860
21	2,770	9,590	5,360	4,120	6,260	5,100	20,200	18,000	5,620	632	596	1,860
22	4,450	14,000	4,670	3,940	6,260	5,240	19,600	17,800	2,930	662	*174	1,860
23	5,560	14,800	6,860	4,010	6,200	5,860	19,200	*17,600	2,380	692	174	1,790
24	5,540	16,100	6,500	4,030	5,740	7,410	18,600	17,200	2,010	678	174	1,770
25	5,560	16,800	6,500	*4,050	5,320	10,500	18,200	17,200	908	642	396	1,770
26	5,340	17,300	6,480	3,310	4,610	11,800	17,700	16,800	948	685	892	1,770
27	4,820	17,600	6,410	2,870	3,790	13,000	16,900	16,400	1,040	*685	1,240	1,760
28	3,860	17,400	6,350	3,350	4,390	14,500	16,100	16,200	1,120	685	1,070	1,770
29	3,380	16,900	6,350	3,980	4,380	16,000	15,600	15,900	1,800	755	699	1,760
30	3,40	16,100	6,350	3,970	-------	17,800	15,000	15,700	1,580	188	287	1,710
31	3,460	-------	5,800	3,500	-------	19,600	-------	15,600	-------	188	185	-------
Total	96,710	245,070	197,290	134,370	164,450	228,500	647,600	518,000	286,566	38,612	18,383	48,191
Mean	3,120	8,169	6,364	4,335	5,671	7,371	21,590	16,710	9,552	1,246	593	1,606
Ac-ft	191,800	486,100	391,300	266,500	326,200	453,200	‡1,284	‡1,027	568,400	76,590	36,460	95,590
(†)	38	8	0	0	0	0	2,640	10,660	16,480	19,110	18,100	8,200

Adjusted for diversions through Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal

Mean	3,120	8,169	6,364	4,335	5,671	7,371	21,630	16,880	9,829	1,556	887	1,744
Ac-ft	191,800	486,100	391,300	266,500	326,200	453,200	‡1,287	‡1,038	584,900	95,700	54,560	103,800

Observed

Calendar year 1959: Max 25,300 Min 131 Mean 8,463 Ac-ft 6,127,000
Water year 1959-60: Max 27,000 Min 174 Mean 7,169 Ac-ft 5,203,000

Adjusted

Calendar year 1959: Mean 8,567 Cfsm 2.23 In. 30.29 Ac-ft 6,202,000
Water year 1959-60: Mean 7,272 Cfsm 1.89 In. 25.78 Ac-ft 5,279,000

* Discharge measurement made on this day.
† Diversion, in acre-feet, through Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal.
‡ Expressed in thousands.

4192. Twin Lakes near Rathdrum, Idaho

Location.--Lat 47°51'30", long 116°52'00", in NW¼ sec.17, T.52 N., R.4 W., on left bank at outlet gate structure, 100 yards upstream from bridge across Rathdrum Creek and 3 miles northeast of Rathdrum.

Drainage area.--41.2 sq mi.

Records available.--September 1958 to September 1960.

Gage.--Staff gage read once daily. Datum of gage is 2,305.74 ft above mean sea level (Bureau of Reclamation datum).

Extremes.--Maximum gage height observed during year, 10.96 ft May 21; minimum observed, 3.28 ft Sept. 15.
1958-60: Maximum gage height observed, that of May 21, 1960; minimum observed, 2.85 ft Sept. 17, 18, 1958.

Remarks.--Stage controlled by outlet gate. Water used for irrigation on Rathdrum Prairie. A considerable part of total inflow leaves the lake by infiltration to ground water of Rathdrum Prairie.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.80	5.50	8.04	8.38	7.92	7.40	10.64	10.18	10.40	8.60	5.98	3.98
2	4.80	5.50	8.04	8.32	8.02	7.36	10.52	10.24	10.38	8.58	6.00	3.98
3	4.82	5.66	8.00	8.28	8.08	7.34	10.40	10.34	10.36	8.44	5.98	3.66
4	-	5.76	7.98	8.22	8.10	7.36	10.32	10.44	10.34	-	5.88	-
5	4.80	5.80	7.98	8.18	8.12	7.36	-	10.48	10.30	-	5.86	3.98
6	4.80	5.86	7.98	8.18	8.14	7.36	10.26	10.50	10.28	8.18	5.78	3.88
7	4.80	5.88	8.00	8.12	8.54	-	10.26	10.52	10.22	8.10	-	3.86
8	4.90	5.90	8.00	8.10	8.74	7.40	10.20	-	10.16	-	-	3.76
9	4.96	5.94	8.00	8.04	8.84	7.40	10.20	10.64	10.12	7.92	5.47	-
10	4.98	5.94	8.02	8.00	8.84	7.40	10.20	10.64	10.06	7.84	5.50	3.60
11	5.06	5.98	8.06	7.98	8.82	7.38	10.14	10.66	10.00	7.78	5.34	-
12	5.10	6.06	8.14	7.92	8.78	7.36	10.12	-	9.92	-	5.34	3.50
13	5.10	6.06	8.14	7.88	8.68	7.34	10.10	10.68	9.90	7.60	5.22	3.48
14	5.14	6.00	8.18	7.82	8.58	7.34	10.14	10.68	9.80	7.50	-	3.32
15	5.16	6.00	8.44	7.78	8.50	7.38	10.14	-	9.78	7.42	5.12	3.28
16	5.16	6.00	8.60	7.74	8.38	7.34	10.14	10.68	9.72	7.34	5.02	-
17	-	6.02	8.64	7.70	8.30	7.40	-	10.68	9.62	7.24	4.90	3.42
18	5.16	6.10	8.66	7.66	8.18	7.44	10.10	-	9.56	7.14	-	-
19	5.16	6.18	8.68	7.66	8.04	7.48	10.12	-	9.48	7.04	4.76	3.40
20	5.18	6.44	-	7.64	7.98	7.54	10.14	-	9.42	-	4.80	3.40
21	5.22	7.06	8.66	7.64	7.96	7.60	10.14	10.96	9.36	6.84	4.74	3.38
22	5.32	7.40	8.64	7.62	7.90	-	10.14	10.92	9.30	6.72	4.66	3.36
23	5.36	7.68	8.62	7.62	7.80	7.98	10.12	10.88	9.24	6.60	4.54	-
24	5.40	7.88	8.64	7.62	7.74	8.32	10.10	10.82	9.16	6.50	4.52	3.34
25	5.40	8.00	8.64	7.62	7.68	8.62	10.06	10.74	9.10	6.40	4.46	3.38
26	5.44	8.08	8.64	7.66	7.58	8.94	10.00	10.70	9.00	6.26	4.44	3.42
27	5.46	8.10	8.58	7.64	7.50	9.30	10.00	10.64	8.92	6.34	4.38	3.46
28	5.48	8.10	8.54	7.66	7.48	9.78	9.98	10.56	8.82	6.24	4.34	3.50
29	5.50	8.10	8.52	7.80	7.46	10.10	10.04	10.50	-	6.28	4.22	3.40
30	5.50	8.10	8.48	7.86	-------	10.60	-	10.46	-	6.20	4.12	3.34
31	5.50	-------	8.42	7.90	-------	10.70	-------	-	-------	-	-	-------

4195. Spokane River above Liberty Bridge, near Otis Orchards, Wash.

Location.--Lat 47°40'55", long 117°05'05", in NW¼ sec.11, T.25 N., R.45 E., on left bank 1.2 miles upstream from Liberty Bridge, 1¾ miles southeast of Otis Orchards, and 3.3 miles northeast of Greenacres.

Drainage area.--3,880 sq mi, approximately.

Records available.--October 1950 to September 1960 in reports of Geological Survey. January 1929 to September 1950 in reports of Washington Water Power Co.

Gage.--Water-stage recorder. Datum of gage is 2,000 ft above mean sea level (levels by Washington Water Power Co.).

Average discharge.--10 years, 6,834 cfs (4,948,000 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 26,700 cfs Apr. 12 (gage height, 17.97 ft); minimum, 143 cfs Aug. 14 (gage height, 7.93 ft).
1950-60: Maximum discharge, 38,800 cfs Apr. 26, 1956 (gage height, 20.43 ft); minimum, 61 cfs Aug. 7, 1951; minimum gage height observed, 7.67 ft Sept. 2, 1955.
Maximum stage known since 1932, 22.24 ft Dec. 25, 1933 (discharge, 50,100 cfs), determined from unpublished records collected by Washington Water Power Co. at this station.

Remarks.--Records excellent except those for periods of no gage-height record, which are fair. Flow partly regulated by powerplant at Post Falls, Idaho, and by Coeur d'Alene Lake (see p. 276). Spokane Valley Farms Co.'s canal (see p. 279) and Rathdrum Prairie Canal (see p. 278) divert water above station for irrigation. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Cooperation.--Gage-height record collected in cooperation with Washington Water Power Co.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 8				Feb. 8 to Sept. 30			
9.0	730	13.0	7,100	7.9	132	11.0	3,040
10.0	1,690	15.0	13,500	8.2	256	12.0	4,890
11.0	3,020	17.0	21,500	8.6	490	13.0	7,350
				9.0	785	15.0	14,000
				10.0	1,750	18.0	26,900

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,340	3,300	15,000	5,020	*3,360	4,000	20,800	14,500	*15,500	2,120	700	464
2	1,600	3,300	10,000	5,020	3,360	5,100	21,500	14,300	15,600	2,110	1,300	1,140
3	1,980	3,400	6,700	5,020	2,800	5,360	21,400	14,200	15,600	2,110	1,400	1,750
4	1,980	5,000	6,500	5,000	1,860	5,280	21,100	14,100	15,600	1,820	1,700	1,930
5	2,000	6,600	6,000	4,980	2,830	5,190	20,900	14,200	15,700	*1,480	1,000	1,790
6	1,870	6,600	5,500	4,960	3,360	5,140	21,000	14,300	15,600	1,460	600	1,770
7	1,490	5,500	5,500	4,940	3,710	5,100	21,700	14,600	15,500	1,690	150	1,580
8	1,990	4,700	5,500	4,940	5,160	5,080	22,800	15,000	15,100	1,910	150	950
9	1,560	4,500	5,600	4,920	8,430	5,040	23,800	15,500	14,600	1,850	350	849
10	745	4,500	5,600	4,900	9,380	4,740	24,900	16,100	14,100	1,580	450	857
11	1,510	4,500	5,600	4,570	9,410	4,470	26,000	*16,600	13,000	1,270	600	1,070
12	2,680	*3,400	5,600	4,120	8,320	4,410	*26,600	17,300	12,800	1,060	*762	1,550
13	3,540	3,200	5,600	4,120	7,600	4,370	26,000	18,200	12,700	1,180	598	1,760
14	3,710	3,200	5,200	3,630	7,600	4,620	25,500	19,000	12,100	1,390	143	1,640
15	3,520	3,300	5,000	3,880	7,430	4,930	24,800	19,400	11,700	2,060	147	*1,790
16	3,330	3,500	5,040	3,540	6,010	4,810	24,000	19,300	11,300	1,930	286	1,910
17	3,330	3,400	*5,020	3,560	5,990	4,720	23,000	19,100	11,200	1,510	497	1,890
18	3,310	3,400	5,140	3,660	6,060	4,720	22,100	18,800	10,800	1,170	392	1,890
19	2,710	3,400	5,140	3,900	5,500	4,780	21,300	18,500	7,910	643	210	1,870
20	2,710	4,000	5,160	3,900	6,010	4,810	20,500	18,100	5,640	598	159	1,860
21	2,710	9,500	5,160	3,920	5,960	4,850	20,000	17,900	5,340	833	560	1,860
22	4,200	14,000	4,380	3,740	5,910	5,000	19,400	17,700	2,930	882	209	1,830
23	5,000	14,500	6,580	3,830	5,520	5,500	18,900	17,500	2,340	850	159	1,750
24	5,200	15,800	6,130	3,910	*5,080	7,100	18,500	17,300	2,120	850	159	1,730
25	5,200	16,500	6,130	3,870	5,000	*10,100	18,000	17,000	841	850	308	1,730
26	5,000	17,000	6,080	3,350	4,300	11,500	17,500	16,600	825	850	849	1,710
27	4,700	17,500	6,030	2,740	3,500	13,100	16,700	16,000	1,150	850	1,250	1,690
28	3,700	17,200	5,980	3,270	4,000	14,600	16,000	16,000	887	850	1,160	1,730
29	3,200	16,700	5,960	3,740	4,000	16,000	15,500	15,700	1,760	700	794	1,700
30	3,500	16,000	5,940	3,850	-------	17,700	15,000	15,600	1,630	150	310	1,680
31	3,300	-------	5,490	3,390	-------	19,400	-------	15,500	-------	150	*166	-------
Total	92,415	237,400	188,260	128,190	157,450	221,520	635,200	513,900	281,873	38,756	17,518	47,720
Mean	2,981	7,913	6,073	4,135	5,429	7,146	21,170	16,580	9,396	1,250	565	1,591
Ac-ft	183,300	470,900	373,400	254,300	312,300	439,400	‡1,260	‡1,019	559,100	76,870	34,750	94,650

Calendar year 1959: Max 25,000 Min 90 Mean 8,298 Ac-ft 6,007,000
Water year 1959-60: Max 26,600 Min 143 Mean 6,995 Ac-ft 5,078,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
Note.--No gage-height record Oct. 23 to Dec. 15, Jan. 19, Feb. 25 to Mar. 2, June 10-13, July 23 to Aug. 11; discharge estimated on basis of 1 discharge measurement, recorded range in stage, and records for station near Post Falls, Idaho.

4198. Newman Lake near Newman Lake, Wash.

Location.--Lat 47°45'52", long 117°05'47", in NE¼SE¼ sec.10, T.26 N., R.45 E., on southwest shore 3 miles northwest of town of Newman Lake.

Drainage area.--31.6 sq mi.

Records available.--September 1958 to September 1960.

Gage.--Staff gage read occasionally. Altitude of gage is 2,120 ft (from topographic map).

Extremes.--Maximum gage height observed during year, 11.44 ft May 28; minimum observed, 8.01 ft Jan. 24.
1958-60: Maximum gage height observed, 11.44 ft May 21, 1959, May 28, 1960; minimum observed, 7.37 ft Oct. 9, 1958.

Remarks.--Lake controlled for elevation at medium and low stages at outlet by concrete headworks of Spokane Valley Irrigation canal. Many diversions for domestic use.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	-	-	-	9.30	-	10.36	11.34	11.11	-	9.04
2	-	-	-	-	-	-	10.72	-	11.32	11.09	9.98	9.02
3	8.68	-	-	-	-	-	-	-	-	11.09	9.96	9.00
4	8.65	-	8.68	8.15	-	9.26	10.80	10.58	-	11.02	9.94	9.00
5	-	-	-	8.14	8.38	-	10.82	-	11.34	11.00	9.90	8.98
6	-	-	-	-	8.42	-	10.85	10.62	-	10.98	9.88	8.96
7	8.60	-	-	-	-	9.22	-	10.72	11.34	10.96	-	8.93
8	-	-	-	-	8.78	9.25	10.85	-	11.34	10.90	9.80	8.90
9	8.60	-	8.51	-	-	9.24	10.86	-	11.34	10.88	9.76	8.88
10	8.58	-	-	-	-	9.22	10.86	-	-	10.86	9.72	8.86
11	8.60	-	8.50	-	-	-	10.82	10.88	11.34	-	9.68	8.83
12	-	-	-	8.07	9.08	9.18	10.78	10.96	11.34	10.76	9.63	-
13	8.58	8.45	-	-	9.12	-	10.76	-	-	10.73	9.60	-
14	8.56	-	-	-	-	9.16	10.80	11.35	11.32	10.69	-	8.77
15	-	-	8.42	-	-	9.14	10.77	-	11.36	10.66	9.52	8.74
16	8.54	-	8.41	8.02	9.32	9.14	10.74	-	11.38	10.64	9.50	-
17	8.52	-	8.39	-	-	-	10.70	-	11.34	10.60	9.46	8.68
18	8.50	-	-	-	9.40	9.17	10.66	11.10	11.34	-	-	8.64
19	-	-	-	-	-	-	10.64	11.12	11.30	10.54	9.40	-
20	8.50	8.61	8.32	-	9.44	9.26	10.64	-	11.31	10.50	-	-
21	8.48	-	-	-	-	9.30	-	-	11.30	-	9.30	8.54
22	-	-	8.30	-	9.52	9.34	10.58	-	11.30	10.40	9.28	8.50
23	-	-	-	-	-	9.45	10.60	11.40	11.29	10.33	9.26	8.50
24	-	-	8.27	8.01	9.50	9.54	10.58	-	11.28	-	9.24	8.48
25	8.48	8.98	-	8.02	-	9.60	-	-	11.26	10.24	9.21	8.45
26	-	-	-	-	-	9.68	-	-	11.24	10.22	-	-
27	8.46	-	-	8.06	9.43	9.78	10.48	11.42	11.22	10.18	9.18	8.38
28	-	-	-	-	-	9.96	10.44	11.44	11.20	-	9.15	8.34
29	8.44	-	8.26	8.15	-	10.22	10.40	11.43	11.17	10.10	9.12	-
30	-	-	-	8.18	-------	10.36	10.38	11.40	-	10.06	9.10	-
31	8.40	-------	-	-	-------	10.48	-------	-	-------	-	9.06	-------

4200. Liberty Lake at Liberty Lake, Wash.

Location.--Lat 47°39'10", long 117°05'20", in NE¼ sec.22, T.25 N., R.45 E., on right wall of concrete outlet flume at town of Liberty Lake, 15 miles east of Spokane.

Drainage area.--13.7 sq mi.

Records available.--December 1950 to September 1960 (fragmentary).

Gage.--Staff gage read once daily. Datum of gage is 2,046.48 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Gage readings have been reduced to elevations above mean sea level. Prior to Apr. 11, 1952, staff gages at various locations within a few feet of present site at same datum.

Extremes.--Maximum elevation observed during year, 2,048.98 ft May 20-24; minimum observed, 2,046.56 ft Sept. 29, 30.
1950-60: Maximum elevation observed, 2,050.90 ft May 1, 3, 1952; minimum observed, 2,045.96 ft Nov. 1-3, 1958.

Remarks.--Stage controlled by gate at outlet. No known diversion.

Elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46.70	46.62	46.86	-	47.24	47.80	48.58	48.82	48.83	48.32	47.54	46.92
2	46.70	46.60	46.86	-	47.24	47.78	48.68	48.82	48.82	48.30	47.52	46.92
3	46.70	46.60	46.86	-	47.34	47.78	48.72	48.82	48.82	48.28	47.50	46.90
4	46.68	46.60	46.86	-	47.34	47.78	48.76	48.80	48.80	48.26	47.48	46.88
5	46.68	46.60	46.86	-	47.42	47.78	48.78	48.80	48.78	48.25	47.46	46.88
6	46.66	46.60	46.86	-	47.46	47.78	48.84	48.80	48.78	48.20	47.46	46.88
7	46.66	46.60	46.86	-	47.50	47.80	48.88	48.80	48.76	48.18	47.44	46.88
8	46.66	46.60	-	-	47.52	47.82	48.88	48.82	48.74	48.16	47.42	46.86
9	46.64	46.60	-	-	47.60	47.84	48.88	48.82	48.72	48.12	47.39	46.86
10	46.64	46.60	-	-	47.70	47.82	48.90	48.80	48.68	48.10	47.36	46.86
11	46.66	46.60	46.88	-	47.74	47.82	48.90	48.80	48.68	48.08	47.32	46.84
12	46.66	46.60	46.88	-	47.76	47.82	48.90	48.82	48.66	48.06	47.30	46.84
13	46.66	46.60	46.88	-	47.78	47.80	48.90	48.86	48.64	48.04	47.26	46.82
14	46.66	-	-	-	47.80	47.78	48.90	48.86	48.64	48.00	47.22	46.80
15	46.66	-	-	-	47.84	47.78	48.90	48.84	48.62	47.98	47.20	46.78
16	46.66	-	46.92	-	47.86	47.78	48.90	48.86	48.60	47.96	47.18	46.76
17	46.64	-	46.92	-	47.86	47.78	48.90	48.88	48.58	47.94	47.16	46.74
18	46.64	-	46.92	-	47.88	47.78	48.90	48.92	48.56	47.90	47.14	46.72
19	46.64	-	46.92	-	47.88	47.78	48.90	48.94	48.54	47.88	47.12	46.70
20	46.64	-	46.92	-	47.88	47.78	48.90	48.98	48.52	47.84	47.10	46.68
21	46.64	46.70	46.92	-	47.88	47.78	48.90	48.98	48.50	47.82	47.08	46.66
22	46.64	-	46.92	-	47.88	47.78	48.90	48.98	48.48	47.78	47.06	46.64
23	46.64	46.76	46.92	-	47.88	47.82	48.90	48.98	48.46	47.76	47.06	46.62
24	46.64	46.78	46.92	-	47.85	47.84	48.88	48.98	48.44	47.72	47.04	46.62
25	46.66	46.82	-	-	47.84	47.88	48.88	48.96	48.44	47.68	47.04	46.60
26	46.66	46.84	-	-	47.84	47.90	48.88	48.96	48.42	47.66	47.02	46.60
27	46.66	46.84	-	-	47.84	47.92	48.88	48.92	48.42	47.64	47.00	46.58
28	46.64	46.84	-	-	47.84	48.02	48.88	48.90	48.42	47.62	46.98	46.58
29	46.64	46.84	-	47.26	47.82	48.16	48.84	48.88	48.38	47.60	46.98	46.56
30	46.64	46.86	-	47.24	-------	48.32	48.82	48.88	48.34	47.58	46.96	46.56
31	46.62	-------	-------	47.24	-------	48.48	-------	48.86	-------	47.56	46.94	-------

Note.--Add 2,000 ft to obtain elevation above mean sea level.

4225. Spokane River at Spokane, Wash.

Location.--Lat 47°39'35", long 117°26'50", in SW¼ sec.13, T.25 N., R.42 E., on right bank at Cochran Street in Spokane, half a mile upstream from Latah Creek.

Drainage area.--4,290 sq mi, approximately.

Records available.--April 1891 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,696.6 ft above mean sea level, datum of 1929 (river-profile survey). Prior to July 1, 1921, water-stage recorders and staff or wire-weight gages at several sites within 4 miles of present site at various datums.

Average discharge.--69 years, 6,864 cfs (4,969,000 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 27,400 cfs Apr. 12 (gage height, 25.74 ft); minimum, about 165 cfs Aug. 24, from powerplant records (gage height, about 15.8 ft); minimum daily, 1,060 cfs Aug. 24.
1891-1960: Maximum discharge, 49,000 cfs (estimated) May 31, 1894 (see WSP 532); minimum, 95 cfs Sept. 19, 1956 (gage height, 15.60 ft); minimum daily, 740 cfs Sept. 7, 1947.

Remarks.--Records excellent. Flow partly regulated by powerplant of Washington Water Power Co. at Post Falls, Idaho, and at Spokane, and by Coeur d'Alene Lake (see p. 276) Spokane Valley Farms Co.'s canal (see p. 279) and Rathdrum Prairie Canal (see p. 278) divert water above station for irrigation. In 1946, approximately 22,600 acres (of which about 15,000 acres utilized surface water) was under irrigation upstream from Spokane.

Cooperation.--Gage-height record collected in cooperation with Washington Water Power Co.

Revisions (water years).--WSP 532: 1891-1904‡ WSP 1246: Drainage area. WSP 1286: 1907-9.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 12				Apr. 13 to Sept. 30			
17.5	1,230	22.0	11,200	17.0	845	20.0	5,790
18.0	1,840	24.0	19,000	17.5	1,340	22.0	11,500
19.0	3,470	26.0	28,500	18.0	1,980	24.0	19,400
20.0	5,540			19.0	3,670	26.0	29,000

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,050	3,990	15,400	5,890	*4,190	4,940	20,800	15,400	16,300	*3,070	1,190	1,160
2	2,060	3,930	12,700	5,870	4,230	5,290	21,700	15,200	16,300	3,130	1,950	1,660
3	2,530	3,790	7,620	5,840	3,990	6,030	21,800	15,100	16,400	3,070	2,200	2,240
4	2,540	4,510	7,510	5,820	2,910	6,010	21,500	15,000	16,200	2,970	2,450	2,440
5	2,570	7,490	7,040	5,820	3,380	5,890	21,300	15,000	16,400	2,540	2,160	2,410
6	2,540	7,060	6,420	5,870	4,190	5,840	21,300	15,200	16,400	2,490	1,590	2,490
7	2,060	6,780	6,320	5,870	4,390	5,910	22,100	15,500	16,300	2,540	1,350	2,480
8	2,540	5,200	6,380	5,870	5,220	5,840	23,000	15,800	16,000	2,790	1,200	1,880
9	2,450	5,160	6,420	5,790	8,120	5,790	24,000	16,300	15,500	2,780	1,110	1,620
10	1,630	5,130	6,350	5,790	9,400	5,560	25,200	16,800	15,100	2,620	*1,360	1,570
11	1,840	5,160	6,350	5,590	9,520	5,310	26,400	17,200	14,400	2,240	1,380	1,750
12	3,040	4,720	6,280	5,090	8,860	5,270	*27,000	18,000	13,900	2,110	1,560	*2,330
13	*3,810	4,050	6,230	5,000	7,980	5,200	*26,900	18,800	13,800	2,040	1,520	2,460
14	4,090	4,030	*6,110	4,580	7,920	5,290	26,500	19,700	13,200	2,200	1,180	2,330
15	4,070	3,990	5,700	4,830	7,980	5,630	25,800	20,100	12,800	2,680	1,110	2,530
16	3,810	4,030	5,890	4,490	6,600	5,560	25,000	20,100	12,400	2,790	1,110	2,580
17	3,850	4,210	5,790	4,470	6,600	5,450	24,200	20,100	12,300	2,370	1,500	2,440
18	3,810	4,090	5,940	4,470	6,680	5,420	23,300	19,600	11,900	2,160	1,280	2,510
19	3,430	4,070	5,940	4,680	6,280	5,520	22,400	19,100	9,820	1,670	1,220	2,600
20	3,290	4,410	5,940	4,760	6,550	5,520	21,700	18,800	7,060	1,560	1,120	*2,620
21	3,310	7,820	5,960	4,660	6,620	5,560	21,000	18,600	6,950	1,740	1,130	2,590
22	4,170	12,700	4,990	4,600	6,600	5,660	20,500	18,400	5,040	1,760	1,380	2,590
23	5,490	*14,300	7,350	4,640	6,320	5,910	20,100	18,100	3,960	1,700	1,100	2,560
24	5,560	15,100	6,910	4,680	*5,840	*7,300	19,500	18,000	3,820	1,740	1,060	2,300
25	5,590	15,900	6,880	4,680	5,790	9,760	19,100	17,600	2,530	1,680	1,110	2,570
26	5,610	16,600	6,880	4,510	5,420	11,300	18,500	17,100	2,370	1,720	1,530	2,610
27	5,050	17,100	6,830	3,530	4,470	12,800	17,800	17,100	2,620	1,660	1,910	2,510
28	4,580	17,000	6,780	4,090	4,960	14,200	16,900	16,700	2,210	1,680	1,870	2,490
29	3,930	16,600	6,780	4,370	4,960	15,700	16,400	16,600	2,790	1,680	1,720	2,510
30	3,950	16,000	6,720	4,740	-------	17,300	15,900	16,500	2,830	1,320	1,400	2,270
31	3,930	-------	6,450	4,190	-------	19,100	-------	*16,400	-------	1,120	1,260	-------
Total	109,160	244,920	214,860	155,080	175,970	235,860	657,600	537,900	317,600	67,620	45,010	69,100
Mean	3,521	8,164	6,931	5,003	6,068	7,608	21,920	17,350	10,590	2,181	1,452	2,303
Ac-ft	216,500	485,800	426,200	307,600	349,000	467,800	‡1,304	‡1,067	630,000	134,100	89,280	137,100

Calendar year 1959: Max 25,200 Min 858 Mean 8,991 Ac-ft 6,509,000
Water year 1959-60: Max 27,000 Min 1,060 Mean 7,734 Ac-ft 5,614,000

* Discharge measurement made on this day.
‡ Expressed in thousands.

4240. Hangman Creek at Spokane, Wash.

Location.--Lat 47°39'10", long 117°26'55", in NW¼ sec.24, T.25 N., R.42 E., on left bank in Spokane, three-quarters of a mile upstream from mouth.

Drainage area.--619 sq mi.

Records available.--April 1948 to September 1960. Prior to October 1958, published as Latah Creek at Spokane.

Gage.--Water-stage recorder. Altitude of gage is 1,720 ft (from topographic map). Prior to Nov. 22, 1948, wire-weight gage at site half a mile upstream at different datum.

Average discharge.--12 years, 271 cfs (196,200 acre-ft per year).

Extremes.--Maximum discharge during year, 2,710 cfs Feb. 7 (gage height, 6.44 ft); minimum, 4.2 cfs July 29 (gage height, 1.67 ft).
1948-60: Maximum discharge, 16,200 cfs Jan. 24, 1959 (gage height, 12.30 ft); minimum, 3.8 cfs Sept. 4, 5, 8, 1955 (gage height, 2.12 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No regulation. Some diversions for irrigation above station.

Revisions.--WSP 1216: Drainage area.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.6	3.0	3.0	252
1.8	11	3.5	465
2.0	26	4.0	735
2.2	51	5.0	1,420
2.5	106	6.0	2,260

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	29	69	60	717	35	1,200	138	81	15	15	9.0
2	28	28	64	50	1,060	30	800	130	72	14	20	9.0
3	29	29	61	40	1,070	30	582	128	65	14	15	9.0
4	28	30	57	45	952	35	450	133	59	13.5	13	14
5	26	32	56	45	689	40	366	123	53	*13	11	13.5
6	26	35	47	50	1,180	50	326	111	47	13	10	12
7	25	47	50	50	2,170	100	290	104	43	12	9.0	13
8	27	38	51	45	1,560	500	252	130	40	12	8.4	12
9	28	35	40	43	1,250	860	220	159	38	12	*7.7	11.5
10	30	33	43	41	1,350	326	204	123	37	11	7.0	11
11	34	30	45	39	1,020	242	191	102	35	10.5	7.0	10.5
12	35	28	64	37	670	211	176	89	33	10	7.0	10.5
13	*35	25	100	35	530	242	188	80	32	9.5	7.0	10.5
14	35	23	*102	34	430	220	294	71	30	9.5	7.0	*10
15	36	22	96	33	784	358	358	67	33	9.0	8.0	10
16	*35	20	89	31	722	538	260	64	33	8.0	8.5	10
17	33	*22	104	29	490	455	211	61	33	8.0	8.5	10
18	30	24	93	27	392	515	191	89	37	8.5	8.5	10
19	28	29	81	25	306	620	217	116	36	8.0	8.0	10
20	28	36	74	26	245	587	242	102	34	7.5	8.0	10.5
21	*27	850	69	28	242	540	444	354	33	7.0	8.0	10
22	29	613	64	30	263	525	358	370	30	6.5	8.5	9.5
23	29	480	59	33	*198	525	302	234	28	7.0	8.5	10.5
24	32	387	61	36	188	*515	366	182	25	7.0	9.5	10.5
25	33	234	165	*40	156	470	286	162	23	6.5	10	10
26	35	162	185	47	70	410	271	162	22	6.5	10	10
27	35	116	111	57	30	392	252	151	21	6.5	10.5	10
28	33	93	85	70	32	540	217	162	19.5	5.1	10	10
29	30	87	89	882	35	550	188	143	18	5.1	10	10
30	29	76	80	1,840	------	1,670	159	111	16.5	5.2	9.5	10
31	29	------	71	1,150	------	1,480	------	*96	------	5.4	9.5	------
Total	945	3,693	2,425	4,998	18,801	13,611	9,861	4,247	1,107.0	283.8	297.6	316.5
Mean	30.5	123	78.2	161	648	439	329	137	36.9	9.22	9.60	10.6
Cfsm	0.049	0.199	0.126	0.260	1.05	0.709	0.532	0.221	0.060	0.015	0.016	0.017
In.	0.06	0.22	0.15	0.30	1.13	0.82	0.59	0.26	0.07	0.02	0.02	0.02
Ac-ft	1,870	7,320	4,810	9,910	37,290	27,000	19,560	8,420	2,200	567	590	628

Calendar year 1959: Max 9,560 Min 13.5 Mean 297 Cfsm 0.480 In. 6.52 Ac-ft 215,100
Water year 1959-60: Max 2,170 Min 5.1 Mean 166 Cfsm 0.268 In. 3.66 Ac-ft 120,200

Peak discharge (base, 2,500 cfs).--Feb. 7 (12:30 p.m.) 2,710 cfs (6.44 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12, 13, 15-18, Jan. 1-24, 28, Feb. 26 to Mar. 8 (no gage-height record Jan. 6-9, 12-16, Feb. 28 to Mar. 8; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations). No gage-height record July 30 to Aug. 9; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations.

4270. Little Spokane River at Elk, Wash.

Location.--Lat 48°01'20", long 117°16'20", in SE¼ sec.8, T.29 N., R.44 E., on right bank half a mile upstream and northeast of Elk.

Drainage area.--115 sq mi.

Records available.--July 1948 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,870 ft (from topographic map).

Average discharge.--12 years, 59.8 cfs (43,290 acre-ft per year).

Extremes.--Maximum discharge during year, 137 cfs Mar. 31 (gage height, 1.81 ft); maximum gage height, 1.83 ft Mar. 2 (backwater from ice); minimum discharge, 35 cfs Jan. 10 (gage height, 1.03 ft), result of freezeup.
1948-60: Maximum discharge, 148 cfs Apr. 7, 1956 (gage height, 1.87 ft); maximum gage height, 2.98 ft Jan. 16, 1957 (backwater from ice); minimum discharge, 28 cfs Jan. 16, 1954 (gage height, 1.01 ft).

Remarks.--Records good except those for periods of ice effect, which are fair. No regulation or diversion.

Revisions.--WSP 1216: Drainage area.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.0	32
1.2	50
1.4	71
1.8	135

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	42	51	45	56	49	133	89	83	60	51	51
2	44	42	51	42	60	48	124	90	*82	59	51	50
3	43	43	51	40	61	48	117	94	82	58	52	50
4	42	45	50	45	59	50	*110	92	80	58	53	53
5	42	44	50	51	61	57	107	90	79	57	54	54
6	42	43	50	53	63	57	105	89	79	57	53	53
7	42	43	50	53	102	*60	103	94	78	*57	52	52
8	45	42	50	53	82	66	100	92	76	57	*51	52
9	44	42	49	53	75	66	98	90	75	57	51	51
10	44	41	50	45	70	63	97	*88	75	57	50	50
11	46	41	52	52	67	61	95	84	74	57	50	50
12	45	41	54	51	64	60	94	83	72	57	50	50
13	44	36	54	51	67	60	94	82	71	57	50	50
14	43	36	54	45	67	59	97	82	71	57	49	*49
15	*43	37	60	43	70	61	98	82	71	57	50	49
16	42	39	*62	41	69	62	97	83	71	55	50	49
17	41	40	61	40	67	62	95	83	70	55	50	49
18	41	44	58	40	66	66	95	82	69	55	50	49
19	41	46	56	40	64	68	97	82	68	55	50	49
20	42	50	54	40	63	72	102	92	69	55	49	49
21	43	63	53	43	63	74	103	100	69	54	49	49
22	45	64	53	46	66	72	102	97	68	53	49	49
23	45	*63	52	49	64	72	102	94	67	53	50	50
24	44	64	55	50	64	75	100	90	66	53	52	50
25	44	63	61	50	63	82	98	89	64	53	52	50
26	43	61	58	50	*53	95	95	90	63	53	53	50
27	43	59	56	49	50	105	94	94	62	53	53	50
28	43	56	55	*48	50	*108	92	92	62	53	53	50
29	43	54	54	52	50	*112	90	90	61	53	52	50
30	42	52	54	59	------	121	89	88	60	53	52	50
31	42	------	54	58	------	130	------	84	------	52	51	------
Total	1,338	1,436	1,672	1,477	1,876	2,241	3,023	2,751	2,137	1,720	1,582	1,507
Mean	43.2	47.9	53.9	47.6	64.7	72.3	101	88.7	71.2	55.5	51.0	50.2
Cfsm	0.376	0.417	0.469	0.414	0.563	0.629	0.878	0.771	0.619	0.483	0.443	0.437
In.	0.43	0.46	0.54	0.48	0.61	0.72	0.98	0.89	0.69	0.56	0.51	0.49
Ac-ft	2,650	2,850	3,320	2,930	3,720	4,440	6,000	5,460	4,240	3,410	3,140	2,990

Calendar year 1959: Max 92 Min 36 Mean 56.8 Cfsm 0.494 In. 6.70 Ac-ft 41,160
Water year 1959-60: Max 133 Min 36 Mean 62.2 Cfsm 0.541 In. 7.36 Ac-ft 45,150

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 13-16, Jan. 1-4, 10, 14-29, Feb. 26 to Mar. 4 (no gage-height record Jan. 18-22).

4275. Diamond Lake near Newport, Wash.

Location.--Lat 48°08'05", long 117°10'35", in NE¼ sec.1, T.30 N., R.44 E., on southeast shore of Diamond Lake, 7 miles southwest of Newport.

Drainage area.--5.7 sq mi, approximately.

Records available.--July 1953 to September 1960 (fragmentary).

Gage.--Staff gage read intermittently. Altitude of gage is about 2,340 ft (from topographic map).

Extremes.--Maximum gage height observed during year, 4.87 ft May 26; minimum observed, 3.67 ft Oct. 6.
1953-60: Maximum gage height observed, 4.95 ft Feb. 25, 1958; minimum observed, 3.22 ft Sept. 30, Oct. 9, 1958.

Remarks.--No known regulation. Some diversion for domestic use.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.70	-	-	-	-	-	-	-	-	-	-	-
2	-	-	4.12	4.30	-	4.49	-	-	4.81	4.53	4.13	-
3	-	-	-	-	-	-	-	4.74	-	-	-	3.88
4	-	3.82	-	4.30	-	-	4.78	-	4.79	-	4.15	-
5	-	-	4.12	-	-	-	-	4.75	-	-	-	-
6	3.67	-	-	-	-	-	-	-	-	4.45	4.11	3.90
7	-	-	4.10	-	-	-	4.75	4.76	-	4.49	-	-
8	-	-	-	4.31	-	-	-	-	4.75	-	4.07	-
9	-	-	-	-	4.56	4.47	-	4.78	-	4.41	-	3.90
10	-	-	-	-	-	-	-	-	4.73	-	-	3.92
11	-	3.78	4.14	-	-	-	-	4.77	-	-	4.05	-
12	-	-	-	4.32	4.58	-	4.74	-	-	-	-	3.89
13	-	-	-	-	-	-	-	-	-	4.35	4.03	3.90
14	-	3.76	-	-	-	-	-	-	-	-	-	-
15	3.76	-	-	-	-	-	4.79	-	-	-	-	3.90
16	-	-	4.25	-	-	-	-	-	-	4.33	-	-
17	3.74	-	-	-	4.56	-	-	-	-	-	3.97	-
18	-	3.80	4.28	-	-	-	-	4.75	4.63	-	-	-
19	-	-	-	-	4.55	-	4.81	-	-	4.31	-	-
20	3.76	3.78	-	-	-	-	-	4.83	-	-	-	-
21	-	-	4.28	-	-	4.48	-	-	-	-	-	3.84
22	3.76	-	-	-	-	-	4.83	-	4.59	4.27	-	-
23	-	-	-	-	-	-	-	-	-	-	3.87	-
24	3.76	4.15	4.28	-	-	4.54	-	4.86	4.57	-	-	-
25	-	-	-	-	-	-	-	-	-	4.18	3.92	-
26	3.78	-	-	-	4.49	4.56	4.77	4.87	-	-	-	3.84
27	-	4.14	-	4.30	-	-	-	-	-	-	-	3.82
28	-	-	-	4.36	-	4.62	-	4.86	4.55	4.15	-	-
29	3.80	-	-	4.38	-	-	4.75	-	-	-	-	-
30	-	-	4.30	-	-------	-	-	-	-	-	3.90	3.82
31	-	-------	-	-	-------	4.87	-------	-	-------	-	-	-------

4280. Sacheen Lake near Newport, Wash.

Location.--Lat 48°09'55", long 117°18'05", in NW¼NW¼ sec.30, T.31 N., R.44 E., on concrete wall at southeast corner of bay at Sacheen Lake resort, 12 miles west of Newport.

Drainage area.--32.2 sq mi.

Records available.--April 1954 to September 1960 (fragmentary).

Gage.--Staff gage read occasionally. Altitude of gage is 2,240 ft (from topographic map).

Extremes.--Maximum gage height observed during year, 6.13 ft Mar. 30 (result of bridge construction at outlet); minimum observed, 3.79 ft Aug. 21.
1954-60: Maximum gage height observed, 6.46 ft Apr. 16, 1956; minimum observed, that of Aug. 21, 1960.

Remarks.--No known regulation or diversion.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	-			-	-	-	5.59	-	3.96	4.00
2	-	-	-			-	5.97	-	5.57	4.75	3.93	4.00
3	-	4.20	-			-	-	4.93	-	-	3.91	4.00
4	-	-	-			-	-	-	5.53	-	3.94	-
5	-	-	-			-	5.73	-	-	4.71	3.94	4.14
6	4.16	-	-			-	-	-	-	-	3.93	-
7	-	4.22	-			-	-	4.99	5.37	4.71	3.91	4.10
8	-	-	-			-	-	-	5.27	-	3.90	-
9	-	-	-			-	5.43	5.01	-	4.65	3.89	-
10	4.24	4.20	-			-	-	4.99	-	-	3.88	4.06
11	-	-	-			-	-	-	5.15	4.65	3.87	-
12	-	-	-			-	5.23	-	5.11	4.63	3.87	-
13	4.26	-	-			-	-	-	-	-	3.86	4.06
14	-	-	-			-	-	4.91	5.05	-	3.85	-
15	4.24	-	4.60			-	-	-	-	-	3.84	-
16	-	-	4.67			-	5.25	-	-	4.59	3.83	-
17	4.22	-	-			-	-	5.01	-	-	3.83	4.06
18	-	-	-			-	-	-	4.99	-	3.83	-
19	-	-	4.60			-	5.27	-	-	-	3.83	-
20	4.24	-	-			-	-	-	-	4.45	3.81	-
21	-	-	-			-	-	5.35	4.97	4.31	3.79	-
22	-	-	4.50			-	-	-	-	4.29	3.81	-
23	-	-	-			-	5.35	-	-	4.23	3.82	4.04
24	4.26	4.67	-			-	-	5.51	-	-	3.84	-
25	-	4.78	-			-	-	-	4.93	4.13	3.88	-
26	-	-	-		4.62	-	5.25	-	-	4.11	3.92	-
27	4.24	-	-			-	-	-	-	4.06	3.96	-
28	-	-	-	4.36		5.50	-	5.61	4.85	4.04	3.96	4.04
29	-	-	-			-	-	5.63	-	4.00	3.97	-
30	-	-	-		-------	6.13	4.99	-	-	3.98	3.98	-
31	4.22	-------	-		-------	-	-------	-	-------	3.97	4.00	-------

4285. Eloika Lake near Elk, Wash.

Location.--Lat 48°01'45", long 117°22'25", in NE¼ sec.9, T.29 N., R.43 E., on east shore 1½ miles upstream from outlet and 5 miles northwest of Elk.

Drainage area.--87.5 sq mi.

Records available.--May 1953 to September 1960.

Gage.--Staff gage read once daily. Datum of gage is 1,901.73 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Extremes.--Maximum gage height observed during year, 7.20 ft Apr. 2; minimum observed, 2.59 ft Aug. 23.
1953-60: Maximum gage height observed, 7.77 ft Feb. 28, 1958; minimum observed, 2.32 ft Sept. 3-6, 1955.
Maximum stage known, that of Feb. 28, 1958.

Remarks.--No known regulation or diversion.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.99	3.05	3.53	-	3.42	4.04	7.18	5.35	5.01	3.58	2.82	2.75
2	2.99	3.05	3.53	-	3.48	4.00	7.20	5.27	4.95	3.59	2.81	2.75
3	2.99	3.06	3.52	-	3.53	3.96	7.12	5.25	4.85	3.52	2.80	2.77
4	2.98	3.08	3.49	-	3.57	3.94	7.00	5.21	4.75	3.48	2.80	2.79
5	2.97	3.10	3.47	-	3.62	3.96	6.86	5.15	4.71	3.43	2.80	2.86
6	2.98	3.10	3.45	-	3.66	3.97	6.72	5.13	4.65	3.37	2.80	2.89
7	2.99	3.09	3.43	-	3.81	3.98	6.65	5.11	4.55	3.35	2.80	2.92
8	3.01	3.08	3.41	-	3.90	3.97	6.52	5.08	4.51	3.31	2.79	2.92
9	3.02	3.08	3.38	-	4.04	3.96	6.40	5.05	4.45	3.26	2.79	2.91
10	3.03	3.06	3.36	-	4.11	3.95	6.32	5.01	4.39	3.23	2.79	2.90
11	3.04	3.04	3.35	-	4.14	3.95	6.20	4.95	4.29	3.19	2.79	2.90
12	3.06	3.02	3.34	-	4.17	3.96	6.08	4.91	4.25	3.17	2.76	2.89
13	3.06	3.00	3.38	3.46	4.19	3.94	5.96	4.85	4.19	3.15	2.71	2.88
14	3.06	2.98	3.37	3.44	4.20	3.90	5.85	4.81	4.16	3.05	2.69	2.86
15	3.06	2.96	3.40	3.44	4.20	3.90	5.75	4.75	4.13	3.03	2.66	2.85
16	3.05	2.94	3.42	3.44	4.20	3.90	5.65	4.67	4.05	3.01	2.66	2.83
17	3.05	2.97	3.46	3.44	4.20	3.90	5.55	4.64	4.01	2.98	-	2.81
18	3.03	2.97	3.49	3.44	4.18	3.90	5.50	4.61	3.97	2.95	-	2.80
19	3.03	3.08	3.50	3.44	4.17	3.90	5.45	4.58	3.94	2.94	-	2.79
20	3.03	3.12	-	3.42	4.17	4.00	5.50	4.62	3.90	2.91	-	2.78
21	3.04	3.16	-	3.42	4.16	4.09	5.50	4.75	3.85	2.89	-	2.76
22	3.07	3.26	-	3.42	4.16	4.20	5.54	4.85	3.85	2.86	-	2.75
23	3.07	3.36	-	3.40	4.16	4.40	5.57	4.95	3.81	2.84	2.59	2.75
24	3.08	3.36	-	3.38	4.18	4.57	5.60	5.05	3.77	2.84	2.62	2.78
25	3.06	3.42	-	3.36	4.20	4.80	5.64	5.11	3.73	2.84	2.64	2.77
26	3.07	3.46	-	3.34	4.20	5.05	5.60	5.15	3.71	2.84	2.66	2.76
27	3.06	3.50	-	3.34	4.20	5.30	5.57	5.12	3.67	2.84	2.69	2.76
28	3.06	3.50	-	3.34	4.16	5.60	5.55	5.11	3.63	2.84	2.70	2.76
29	3.06	3.54	-	3.37	4.08	5.80	5.45	5.15	3.59	2.84	2.71	2.76
30	3.06	3.54	-	3.37	-------	6.28	5.41	5.13	3.55	2.83	2.73	2.76
31	3.05	-------	-	3.39	-------	6.84	-------	5.05	-------	2.83	2.74	-------

4310. Little Spokane River at Dartford, Wash.

Location.--Lat 47°47'00", long 117°24'50", in NE¼ sec.6, T.26 N., R.43 E., on right bank 50 ft downstream from highway bridge at Dartford, 6 miles upstream from mouth, and 8 miles north of Spokane.

Drainage area.--665 sq mi.

Records available.--April 1929 to September 1932, December 1946 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,580 ft (from topographic map). Prior to Mar. 16, 1951, staff gage at same site and datum.

Average discharge.--16 years (1929-32, 1947-60), 331 cfs (239,600 acre-ft per year).

Extremes.--Maximum discharge during year, 2,460 cfs Feb. 7 (gage height, 5.07 ft); minimum discharge, 122 cfs Nov. 16 (gage height, 1.54 ft), result of freezeup.
1929-32, 1946-60: Maximum discharge, that of Feb. 7, 1960; minimum observed, 63 cfs July 24, 1930 (gage height, 1.07 ft).

Remarks.--Records good. Small diversions for irrigation and domestic use above station. No known regulation.

Revisions (water years).--WSP 1216: Drainage area. WSP 1286: 1930, 1932(M), 1947-49(M). WSP 1446: 1951(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 6		Feb. 7 to Sept. 30			
1.6	147	1.6	153	3.0	790
2.0	282	2.0	288	4.0	1,530
2.5	510	2.5	505	5.0	2,400
3.0	760				

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	185	178	243	232	328	356	1,390	718	*599	281	190	165
2	181	178	236	239	486	311	1,350	712	588	273	190	162
3	178	188	236	225	690	319	1,250	742	572	262	196	162
4	175	218	229	239	525	319	1,180	742	545	248	213	174
5	175	204	225	247	495	304	1,120	712	530	234	206	190
6	175	197	221	247	640	300	1,080	676	510	223	203	177
7	175	191	225	247	*1,900	*304	1,030	712	486	213	190	174
8	185	188	218	251	*1,810	646	983	742	476	*203	180	177
9	207	188	214	247	920	688	941	664	462	203	*174	177
10	204	188	218	229	706	481	907	*610	452	203	168	177
11	214	185	232	247	652	398	874	594	443	200	168	174
12	218	185	295	251	566	377	842	577	434	200	165	174
13	197	*158	299	243	566	385	810	572	420	200	162	174
14	*188	172	262	229	588	364	848	560	420	200	162	171
15	185	172	*368	247	688	425	836	540	434	200	165	*171
16	178	147	570	239	676	481	810	540	420	196	168	168
17	175	172	350	197	588	481	778	555	398	193	165	168
18	175	178	290	201	530	452	760	545	385	193	165	168
19	172	185	274	207	505	550	784	520	381	190	162	168
20	178	204	266	214	486	604	810	588	381	190	159	165
21	188	423	259	236	491	599	920	881	372	186	159	165
22	201	540	255	247	486	616	874	888	364	183	162	168
23	214	486	251	251	443	640	868	810	356	180	162	174
24	201	476	266	251	452	658	914	778	343	174	165	177
25	194	452	570	251	425	*652	894	772	327	177	174	174
26	188	342	471	255	356	694	874	766	319	180	174	174
27	185	274	311	247	364	748	842	748	311	180	177	168
28	185	259	282	*221	368	868	803	778	304	180	177	165
29	185	255	259	255	368	920	760	718	296	180	174	165
30	181	239	266	423	------	1,270	736	670	288	183	168	162
31	178	------	266	386	------	1,400	------	634	------	186	168	------
Total	5,820	7,422	8,927	7,701	18,098	17,610	27,868	21,064	12,616	6,294	5,411	5,128
Mean	188	247	288	248	624	568	929	679	421	203	175	171
Cfsm	0.283	0.371	0.433	0.373	0.938	0.854	1.40	1.02	0.633	0.305	0.263	0.257
In.	0.33	0.42	0.50	0.43	1.01	0.98	1.56	1.18	0.71	0.35	0.30	0.29
Ac-ft	11,540	14,720	17,710	15,270	35,900	34,930	55,280	41,780	25,020	12,480	10,730	10,170

Calendar year 1959: Max 1,650 Min 130 Mean 378 Cfsm 0.568 In. 7.72 Ac-ft 273,700
Water year 1959-60: Max 1,900 Min 147 Mean 393 Cfsm 0.591 In. 8.06 Ac-ft 285,500

* Discharge measurement made on this day.

4325. Long Lake at Long Lake, Wash.

Location.--Lat 47°50'15", long 117°50'20", in NW¼SW¼ sec.13, T.27 N., R.39 E., at left end of spillway at Long Lake dam, 12 miles north of Reardan.

Drainage area.--5,920 sq mi, approximately.

Records available.--October 1913 to September 1960. Prior to October 1950 monthly contents only, published in WSP 1316.

Gage.--Water-stage recorder and staff gage, with long distance indicator in powerhouse. Datum of gage is at mean sea level (levels by Washington Water Power Co.).

Extremes.--Maximum contents during year, 104,050 acre-ft Aug. 14 (elevation, 1,535.97 ft); minimum, 64,900 acre-ft Mar. 30, 31 (elevation, 1,527.87 ft).
1913-60: Maximum contents, 104,200 acre-ft for many days in 1950-56 (elevation, 1,536.0 ft); minimum since filling reservoir in 1920, 7,950 acre-ft Mar. 31, 1955 (elevation, 1,514.20 ft).

Remarks.--Reservoir is formed by concrete dam, completed in 1913 and raised in 1950. Capacity, 104,200 acre-ft between elevations, 1,512 (lower limit of normal operation) and 1,536 ft (top of gates). Contents at elevation 1,512 ft by capacity table used prior to October 1915, 148,600 acre-ft. Records given herein represent usable contents. Water used for power. Diversions above station for irrigation of about 25,000 acres in Idaho and Washington. Other regulation in Coeur d'Alene Lake and at powerhouse along Spokane River.

Cooperation.--Lake elevations and capacity table furnished by Washington Water Power Co.

Month-end elevation and contents, water year October 1959 to September 1960

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	1,535.81	103,250	-
Oct. 31	1,535.45	101,450	-1,800
Nov. 30	1,535.00	99,200	-2,250
Dec. 31	1,535.88	103,600	+4,400
Calendar year 1959	-	-	+1,900
Jan. 31	1,533.23	90,450	-13,150
Feb. 29	1,533.33	90,900	+450
Mar. 31	1,529.50	72,450	-18,450
Apr. 30	1,528.00	65,500	-6,950
May 31	1,535.49	101,650	+36,150
June 30	1,535.58	102,100	+450
July 31	1,535.66	102,500	+400
Aug. 31	1,535.79	103,150	+650
Sept.30	1,533.71	92,800	-10,350
Water year 1959-60	-	-	-10,450

† Elevation at 12 p.m.

4330. Spokane River at Long Lake, Wash.

Location.--Lat 47°50'15", long 117°50'25", in SW¼ sec.13, T.27 N., R.39 E., on left bank at Long Lake powerhouse, 1½ miles upstream from Chamokane Creek and 12 miles north of Reardan.

Drainage area.--5,920 sq mi, approximately.

Records available.--April 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,299.00 ft above mean sea level, datum of 1929.

Average discharge.--21 years, 8,122 cfs (5,880,000 acre-ft per year), adjusted for storage.

Extremes.--Maximum discharge during year, 29,700 cfs Mar. 31 (gage height, 78.03 ft); minimum not determined; minimum daily, 330 cfs July 31.
1939-60: Maximum discharge recorded, 49,400 cfs May 24, 1948 (gage height, 78.66 ft); minimum not determined, occurred sometime during periods of backwater; minimum daily, 114 cfs Sept. 2, 1956.

Remarks.--Records good. Flow regulated above station by Coeur d'Alene Lake (see p. 276), Long Lake (see preceding page), and by powerplants of Washington Water Power Co. Water diverted for irrigation above station and is equivalent to that shown for Spokane River at Spokane (see p. 285). Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Cooperation.--Records furnished by Washington Water Power Co.

Revisions.--WSP 1216: Drainage area.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,250	4,330	16,100	7,170	6,840	10,200	26,800	17,100	17,300	3,840	2,000	2,520
2	3,100	4,120	15,200	7,080	6,980	9,900	24,000	16,300	17,700	3,670	2,280	3,410
3	3,230	4,830	7,510	7,110	7,130	7,130	23,800	16,500	17,300	3,860	2,710	3,290
4	2,680	5,850	7,030	6,740	7,130	7,130	23,300	16,200	17,100	3,730	2,870	2,040
5	3,440	7,490	7,650	6,720	7,150	7,140	23,000	16,100	17,300	3,520	3,270	2,500
6	3,750	7,780	7,120	6,720	7,180	7,180	22,800	16,500	17,300	3,320	2,760	2,190
7	4,360	7,920	7,180	6,800	7,010	7,140	23,400	16,800	17,100	3,500	1,180	3,680
8	3,470	6,190	7,030	7,130	7,020	7,140	24,200	16,800	16,800	3,700	1,900	3,300
9	3,320	7,200	7,120	7,140	7,020	7,140	25,000	17,500	16,600	3,790	2,080	2,570
10	2,210	4,560	7,070	7,190	10,900	7,170	25,900	17,900	15,800	3,120	1,920	2,200
11	1,260	6,100	7,120	6,760	10,900	7,170	26,800	18,300	15,400	3,890	1,950	1,760
12	4,170	5,410	7,140	6,280	9,160	7,150	*27,700	16,700	15,000	4,100	2,150	3,550
13	4,060	5,200	7,090	6,440	9,370	7,200	27,600	13,100	14,400	4,200	1,690	4,050
14	4,490	5,060	7,070	6,420	9,410	7,170	27,000	12,700	17,000	4,030	1,890	3,330
15	4,660	4,880	6,780	6,260	9,580	7,120	26,900	16,100	11,200	3,990	2,340	3,050
16	4,680	4,580	7,110	6,360	9,100	7,150	26,200	20,200	12,900	2,510	1,820	3,740
17	4,530	4,930	7,390	6,400	8,050	7,120	25,200	20,700	12,600	507	2,780	3,340
18	4,610	4,940	7,070	6,340	7,540	7,180	24,300	19,900	13,100	3,070	2,540	614
19	4,790	4,850	7,100	6,320	7,250	7,140	23,400	20,000	11,600	2,350	1,830	3,940
20	4,260	7,730	7,210	6,310	7,270	7,130	22,700	20,000	6,570	2,360	1,350	4,410
21	4,370	17,300	6,950	6,310	7,240	7,450	22,700	19,900	7,550	2,210	548	4,420
22	3,970	15,900	6,820	5,590	7,670	7,170	22,000	19,900	7,320	2,320	2,170	4,400
23	5,480	11,000	7,190	3,360	7,330	6,940	21,700	19,600	6,550	2,380	2,430	3,300
24	8,350	14,500	7,180	3,270	7,200	9,960	21,200	19,000	4,710	1,740	2,540	1,180
25	6,430	16,200	7,150	4,640	7,170	11,600	20,600	19,300	4,060	2,640	2,330	2,590
26	6,160	15,800	7,840	3,760	7,240	13,800	20,200	18,700	1,930	2,310	2,110	3,950
27	5,000	18,300	7,660	4,540	7,230	14,400	19,400	18,700	3,790	2,820	2,060	3,620
28	5,070	17,700	7,770	5,860	7,150	15,900	18,300	18,000	2,660	2,320	717	3,610
29	4,830	17,200	7,770	6,130	7,180	17,200	17,800	18,100	3,650	2,020	2,680	3,520
30	5,760	14,100	7,160	7,220	-------	20,200	17,300	18,100	3,620	1,350	1,710	3,580
31	4,400	-------	7,610	6,900	-------	18,500	-------	17,200	-------	330	2,010	-------
Total	134,140	271,950	241,190	191,280	227,400	291,920	701,200	551,900	345,910	89,497	64,595	93,654
Mean	4,327	9,065	7,780	6,170	7,841	9,417	23,370	17,800	11,530	2,887	2,084	3,122
Ac-ft	266,100	539,400	478,400	379,400	451,000	579,000	1,391,000	1,095,000	686,100	177,500	128,100	185,800
(†)	-1,800	-2,250	+4,400	-13,150	+450	-18,450	-6,950	+36,150	+450	+400	+650	-10,350

Adjusted for change in contents in Long Lake

Mean	4,298	9,028	7,852	5,956	7,848	9,117	23,260	18,390	11,540	2,893	2,095	2,948
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-
Ac-ft	264,300	537,200	482,800	366,200	451,400	560,600	1,384,000	1,131,000	686,600	177,900	128,800	175,400

Observed

Calendar year 1959: Max 36,100 Min 150 Mean 10,280 Ac-ft 7,444,000
Water year 1959-60: Max 27,700 Min 330 Mean 8,756 Ac-ft 6,357,000

Adjusted

Calendar year 1959: Mean 10,280 Cfsm 1.74 In. 23.58 Ac-ft 7,446,000
Water year 1959-60: Mean 8,743 Cfsm 1.48 In. 20.10 Ac-ft 6,347,000

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Long Lake.
Note.--Backwater from Little Falls throughout the year; discharge computed from powerplant records.

4355. Feeder canal at Grand Coulee, Wash.

Location.--Lat 47°57'00", long 118°59'40", on line between secs.1 and 2, T.28 N., R.30 E., on left bank at Grand Coulee, a quarter of a mile downstream from intake and half a mile southwest of Grand Coulee Dam.

Records available.--October 1951 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,550.0 ft above mean sea level, Bureau of Reclamation, adjustment of 1937. Supplementary water-stage recorder 3,100 ft downstream from base gage at same datum. Auxiliary water-stage recorder 1 mile downstream from base gage.

Extremes.--1951-60: Maximum daily discharge, 11,000 cfs July 11, 1954; no flow except during pumping seasons.

Remarks.--Records good. Water is pumped (beginning May 1951) from Franklin D. Roosevelt Lake behind Grand Coulee Dam, through a lift of about 280 ft into feeder canal for a distance of 2 miles into Banks Lake (formerly called equalizing reservoir). From Banks Lake it is distributed through a system of canals to the Columbia Basin project.

Cooperation.--Discharge records furnished by Bureau of Reclamation; three discharge measurements made and records reviewed by Geological Survey.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0	8,910	3,080	6,450	6,450	*4,840
2							0	8,930	3,080	6,450	6,450	4,570
3							0	8,940	3,080	6,450	6,450	3,230
4							0	8,960	3,080	6,450	5,330	2,200
5							0	8,970	3,080	6,450	4,840	1,620
6							0	8,970	*4,870	6,450	4,840	2,520
7							0	8,980	6,180	6,450	4,840	3,230
8							0	8,990	8,010	6,450	4,840	3,230
9							0	9,010	9,280	6,450	4,840	3,230
10							0	9,030	7,430	6,450	4,840	2,440
11							0	7,090	6,230	6,450	4,840	1,620
12							0	6,080	5,370	7,240	4,840	1,620
13							0	6,100	4,700	8,060	4,850	1,620
14							0	6,110	5,450	8,060	4,850	1,440
15							0	6,120	6,280	8,050	6,160	0
16							0	5,630	6,290	7,060	6,450	0
17							0	4,600	6,310	6,450	6,460	0
18							0	4,610	6,320	6,450	6,450	0
19							0	4,610	6,330	6,450	6,450	0
20							0	3,650	6,300	6,450	6,450	0
21							0	3,080	6,350	6,450	5,830	0
22							0	3,080	6,350	6,450	4,670	3,010
23							0	3,080	6,360	6,450	4,840	6,490
24							0	3,080	6,370	6,450	4,840	5,740
25							0	3,080	6,380	6,450	4,840	0
26							3,890	3,080	6,400	6,450	2,610	0
27							8,880	3,080	6,410	6,450	1,620	0
28							8,890	3,080	*6,430	6,450	1,620	0
29							8,900	3,080	6,440	6,450	4,110	0
30					-------		8,900	3,070	6,450	6,450	6,450	0
31		-------			-------		-------	3,080	-------	6,450	5,390	-------
Total	0	0	0	0	0	0	39,460	178,160	174,690	206,170	158,340	52,650
Mean	0	0	0	0	0	0	1,315	5,747	5,823	6,651	5,108	1,755
Ac-ft	0	0	0	0	0	0	78,270	353,400	346,500	408,900	314,100	104,400

Calendar year 1959: Max 9,590 Min 0 Mean 1,718 Ac-ft 1,244,000
Water year 1959-60: Max 9,280 Min 0 Mean 2,212 Ac-ft 1,606,000

* Discharge measurement made on this day.
Note.--Discharge obtained from pumping records for entire year.

4360. Franklin D. Roosevelt Lake at Grand Coulee Dam, Wash.

Location.--Lat 47°57'20", long 118°59'10", in lot 3, sec.1, T.28 N., R.30 E., in block 12 of Grand Coulee Dam at Grand Coulee.

Drainage area.--74,100 sq mi, approximately.

Records available.--April 1938 to September 1960. Prior to October 1943, published as Columbia River Reservoir at Grand Coulee Dam.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, Bureau of Reclamation datum, or 1.425 ft above mean seal elvel, datum of 1929, supplementary adjustment of 1947 (levels by Bureau of Reclamation). Prior to Apr. 24, 1942, staff gage at site 2,000 ft upstream at same datum.

Extremes.--Maximum contents during year, 9,573,300 acre-ft Sept. 8 (elevation, 1,290.14 ft); minimum, 6,788,100 acre-ft Mar. 21 (elevation, 1,251.92 ft).
1938-60: Maximum contents recorded, 9,586,200 acre-ft July 17, 1942, Jure 3, 1945 (elevation, 1,290.3 ft); minimum observed, 16,200 acre-ft Aug. 29, 1938 (elevation, 956.1 ft).

Remarks.--Reservoir is formed by concrete dam; construction of dam began in 1934; completed in 1941; storage began early in construction period. Capacity, 5,071,700 acre-ft between elevations 1,208 (proposed lower limit of operation) and 1,288 ft (top of gates) above mean sea level. Storage below 1,208 ft, 4,330,000 acre-ft. Figures given herein represent total contents. Water is used for power development and diversion by pumping for irrigation of Grand Coulee project (began in May 1951) of Bureau of Reclamation.

Revisions (water years).--WSP 1286: 1942, 1945(M). WSP 1316: 1942 (May montr-end contents).

Capacity table, water year 1959-60 (elevation, in feet, and contents, in acre-feet)
(Prepared by Geological Survey from data furnished by Bureau of Reclamation)

1,250.0	6,663,200	1,280.0	8,775,400
1,260.0	7,327,500	1,290.0	9,562,000
1,270.0	8,030,700		

Elevation, in feet, at 12 p.m., water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	89.90	89.85	88.00	81.66	64.65	54.45	56.71	57.62	70.07	89.82	89.87	89.46
2	89.95	89.88	87.21	81.37	63.81	54.06	56.81	58.30	70.09	89.84	89.89	89.63
3	89.82	89.98	86.30	81.10	63.10	53.51	57.03	58.91	70.13	89.90	89.87	89.86
4	89.89	89.89	85.50	80.81	62.40	53.21	56.87	59.72	70.38	89.89	89.95	89.90
5	89.85	89.86	84.66	80.73	61.88	52.84	56.81	60.40	70.99	89.83	89.96	90.12
6	89.82	89.87	83.88	80.68	61.49	52.62	56.79	60.66	71.70	89.85	89.85	90.03
7	89.89	89.88	83.51	80.61	61.35	52.35	56.58	61.23	72.68	89.85	89.87	90.09
8	89.81	89.85	83.24	80.44	60.69	52.08	56.42	62.10	73.52	89.79	89.88	90.00
9	89.92	89.86	83.01	80.33	60.04	52.29	56.60	62.99	74.30	89.85	89.90	89.96
10	89.92	89.84	82.98	80.01	59.59	52.45	56.79	64.09	75.05	89.83	89.86	89.94
11	89.96	89.92	83.20	79.79	59.29	52.51	56.60	65.44	75.83	89.82	89.78	89.96
12	89.99	89.86	83.21	79.61	58.63	52.73	56.36	66.76	76.61	89.85	89.86	89.93
13	89.92	89.90	83.28	79.46	57.98	52.81	56.15	67.67	77.44	89.80	89.84	90.01
14	89.98	89.85	83.22	79.14	57.31	52.67	55.75	68.32	78.41	89.86	89.88	89.95
15	89.99	89.82	82.90	78.66	57.11	52.57	55.50	68.73	78.95	89.84	89.89	89.96
16	89.97	89.87	82.88	78.07	57.09	52.51	55.42	69.12	79.97	89.85	89.90	89.97
17	89.90	89.86	82.89	77.40	56.91	52.33	55.31	69.63	81.08	89.85	89.84	89.90
18	89.92	89.84	82.89	76.73	56.88	52.21	55.31	69.94	81.73	89.82	89.87	89.93
19	89.86	89.82	82.97	75.92	56.69	52.16	55.25	69.98	82.32	89.89	89.88	89.88
20	89.90	89.70	82.99	75.15	56.44	52.00	55.26	70.04	82.69	89.84	89.86	89.89
21	89.85	89.76	82.99	74.20	56.28	51.98	55.46	70.00	83.23	89.85	89.79	89.86
22	89.81	89.82	83.01	73.11	55.95	52.15	55.38	70.08	83.72	89.87	89.76	89.51
23	89.83	89.78	82.99	72.29	55.57	52.30	55.26	69.99	84.10	89.82	89.83	89.13
24	89.79	89.78	83.00	71.40	55.39	52.25	55.21	70.07	84.73	89.82	89.85	88.70
25	89.88	89.87	82.92	70.45	55.02	52.20	55.30	70.03	85.86	89.86	89.78	88.40
26	89.89	89.70	83.00	69.70	54.90	52.44	55.31	69.97	86.86	89.84	89.84	88.11
27	89.87	89.66	83.01	a68.98	54.92	53.20	55.47	70.09	87.85	89.87	89.87	87.82
28	89.89	89.53	82.88	a68.30	54.89	53.66	56.08	70.17	88.69	89.82	89.83	87.69
29	89.89	89.25	82.66	67.59	54.72	54.20	56.53	70.00	89.36	89.83	89.71	87.66
30	89.89	88.81	82.29	66.58	-------	55.06	57.04	69.96	89.80	89.81	89.56	87.72
31	89.87	-------	82.01	65.39	-------	56.00	-------	70.06	-------	89.84	89.36	-------
(†)	9,551.6	9,466.5	8,930.4	7,701.5	6,972.4	7,057.6	7,127.3	8,035.1	9,545.9	9,549.1	9,510.6	9,379.4
(‡)	+5,700	-85,100	-536,100	††-1,229	-729,100	+85,200	+69,700	+907,800	††+1,511	+3,200	-38,500	-131,200

Calendar year 1959 ..... ‡ -546,500
Water year 1959-60 ..... ‡ -166,500

† Total contents, in thousands of acre-feet, at end of month.
‡ Change in contents, in acre-feet.
†† Expressed in thousands.
a Forebay elevation furnished by Bureau of Reclamation.
Note.--Add 1,200 ft to obtain elevation above mean sea level (Bureau of Reclamtion).

4365. Columbia River at Grand Coulee Dam, Wash.

Location.--Lat 47°58'00", long 118°58'45", opposite lot 4, sec.36, T.29 N., R.30 E., in pier 3 of highway bridge, 2,500 ft downstream from Grand Coulee Dam ard 14 miles upstream from Nespelem River.

Drainage area.--74,100 sq mi, approximately.

Records available.--April 1913 to June 1923 (monthly discharge only), July to December 1923, January 1924 to May 1928 (monthly discharge only), June 1928 to September 1960. Published as "at Grand Coulee, near Nespelem" prior to 1936 and as "at Grand Coulee" 1936-42.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, Bureau of Reclamation adjustment of 1937. June 27 to Dec. 31, 1923, June 12, 1928, to Mar. 31, 1931, staff gages at site half a mile upstream at datum 2.4 ft lower. Apr. 1, 1931, to Dec. 31, 1935, water-stage recorder at site 850 ft downstream at present datum. Since June 12, 1955, auxiliary water-stage recorder 6 miles downstream from base gage.

Average discharge.--47 years, 109,500 cfs (79,270,000 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 297,700 cfs July 1; maximum elevation, 970.42 ft July 1, 4; minimum discharge, 38,300 cfs Mar. 9; minimum elevation, 945.08 ft Feb. 8; minimum daily discharge, 49,800 cfs Mar. 10.

1913-60: Maximum discharge, 637,800 cfs June 12, 1948 (elevation, 987.90 ft); minimum, 14,900 cfs Dec. 17, 1956 (elevation, 934.37 ft); minimum daily, 15,300 cfs Feb. 1, 1937.

Maximum discharge known, 725,000 cfs (estimated) during flood in June 1894.

Remarks.--Records excellent. Feeder canal diverts water by pumping from Franklin D. Roosevelt Lake for Columbia Basin project (see p. 295). Other diversions above station for irrigation are a small percentage of flow past gage. Flow regulated by Franklin D. Roosevelt Lake (see preceding page) and reservoirs in Kootenai, Pend Oreille, and Spokane River basins.

Revisions (water years).--WSP 1286: 1942, 1947.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	110,200	111,800	114,800	62,400	78,500	60,400	106,000	116,700	215,400	277,900	*141,800	59,100
2	111,200	110,400	114,600	60,500	79,100	63,200	117,000	116,500	218,600	274,000	148,700	*59,100
3	110,600	109,600	*113,100	59,700	78,200	67,000	121,100	116,000	229,300	280,500	147,800	57,300
4	99,500	104,800	108,200	59,900	78,300	59,600	133,700	111,700	240,500	283,900	148,800	56,700
5	105,400	101,700	105,800	56,300	70,800	59,100	137,100	104,700	238,100	283,900	147,700	59,200
6	98,200	106,700	100,500	51,800	70,800	56,500	139,000	104,700	236,500	a281,000	146,300	66,100
7	94,100	105,200	87,400	54,400	63,800	56,500	147,400	103,500	*242,000	a279,000	138,000	67,000
8	*92,500	105,300	75,700	56,900	69,900	*55,200	151,100	104,700	246,800	a286,000	135,400	75,300
9	91,300	102,700	73,800	55,900	79,200	50,800	152,900	108,900	245,400	a286,000	134,100	73,800
10	94,600	94,900	67,600	56,900	75,900	49,800	164,500	106,900	246,200	286,300	136,700	74,900
11	92,200	84,800	60,900	56,800	73,700	52,400	173,000	110,000	248,500	281,300	135,700	70,500
12	94,600	81,900	66,200	*80,100	75,800	53,800	180,500	131,800	247,700	253,300	126,500	72,000
13	95,200	85,600	70,300	60,000	82,900	55,700	177,900	152,800	247,100	249,700	121,500	68,100
14	95,100	80,400	71,600	66,500	80,000	59,800	176,600	170,600	a251,000	231,300	117,400	70,700
15	96,800	84,700	76,000	71,900	66,000	63,200	172,300	182,100	a258,000	240,000	117,800	65,300
16	103,200	74,100	74,400	79,000	59,300	63,100	175,800	194,300	257,100	229,200	118,300	71,300
17	102,300	74,700	69,600	79,700	61,000	63,800	170,600	201,300	258,800	229,100	117,900	66,900
18	103,400	71,100	71,900	79,000	57,400	63,700	172,700	212,100	274,800	230,900	108,800	60,900
19	108,900	76,500	73,700	79,200	57,600	61,000	168,700	222,700	279,800	221,200	104,200	66,700
20	108,300	78,300	73,800	79,100	60,800	64,600	157,200	224,500	280,200	224,700	102,600	66,900
21	111,300	78,200	72,500	82,900	61,400	58,200	148,500	234,500	277,400	212,900	99,100	70,200
22	109,900	79,700	69,800	85,700	61,400	60,300	149,500	229,900	262,700	202,700	97,500	74,900
23	110,900	85,400	70,000	77,200	60,200	62,400	145,600	231,700	254,100	209,600	93,400	79,700
24	107,600	94,000	65,300	78,000	59,700	74,500	143,600	220,800	236,400	209,800	86,400	80,500
25	108,500	107,700	65,900	75,900	61,400	*79,000	138,600	226,000	221,800	199,600	87,200	81,400
26	110,300	115,200	65,600	77,300	59,000	79,900	137,400	222,000	221,800	191,800	81,300	81,000
27	112,200	114,900	65,800	76,100	53,100	74,100	127,700	216,600	*221,800	180,400	74,600	80,700
28	119,200	115,000	65,100	76,800	54,300	87,800	102,900	211,600	227,800	169,900	77,700	75,200
29	120,100	115,700	62,000	80,400	58,400	97,600	108,700	217,800	a239,000	157,400	76,700	66,100
30	116,200	115,200	64,900	97,500	-------	94,800	116,400	212,700	251,700	147,400	73,400	63,300
31	114,500	-------	63,600	97,300	-------	97,900	-------	207,300	-------	144,400	71,400	-------
Total	‡3,244.3	‡2,868	‡2,400.4	‡2,191.1	‡1,945.9	‡2,045.5	‡4,414	‡5,327.2	‡7,376.3	‡4,178.1	‡3,512.7	‡2,080.8
Mean	104,700	95,530	77,430	70,680	67,100	65,980	147,100	171,800	245,900	231,800	113,300	69,360
Ac-ft	‡6,435	‡5,685	‡4,761	‡4,348	‡3,860	‡4,057	‡8,755	‡10,570	‡14,630	‡14,230	‡6,967	‡4,127

Calendar year 1959: Max 413,900 Min 42,000 Mean 139,900 Ac-ft 101,200,000
Water year 1959-60: Max 286,000 Min 49,800 Mean 121,800 Ac-ft 88,420,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
a No gage-height record at base gage; discharge estimated on basis of records for station at Bridgeport and change in contents of Rufus Woods Lake.

4379. Rufus Woods Lake at Bridgeport, Wash.

Location.--Lat 47°59'40", long 119°38'05", in SW¼ sec.24, T.29 N., R.25 E., in intake structure of Chief Joseph Dam, half a mile upstream from Foster Creek and 1½ miles southeast of Bridgeport.

Drainage area.--75,000 sq mi, approximately.

Records available.--November 1954 to September 1960.

Gage.--Water-stage transmitter and recorder. Datum of gage is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to June 28, 1955, staff gage at same site and datum.

Extremes.--Maximum contents during year, 516,300 acre-ft Jan. 1 (elevation, 946.0 ft); minimum, 468,200 acre-ft Apr. 15, 25, Sept. 30 (elevation, 939.5 ft).
1954-60: Maximum contents, 532,200 acre-ft June 27, 1956 (elevation, 948.1 ft); minimum since normal low operating level reached in November 1954, 380,500 acre-ft July 6, 1958 (elevation, 927.0 ft).

Remarks.--Reservoir is formed by concrete gravity-type dam completed in June 1955; storage began in November 1954. Capacity, 287,600 acre-ft between elevations 901.5 (spillway crest and lower limit of operation) and 946.0 ft (normal maximum operating pool). Storage below 901.5 ft, 228,600 acre-ft. Records given herein represent total contents. Water used for power development.

Cooperation.--Lake elevations furnished by Corps of Engineers.

Month-end elevation and contents, water year October 1959 to September 1960

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	943.0	493,900	-
Oct. 31	943.1	494,600	+700
Nov. 30	943.4	496,900	+2,300
Dec. 31	945.7	514,000	+17,100
Calendar year 1959	-	-	+40,700
Jan. 31	940.8	477,600	-36,400
Feb. 29	944.1	502,000	+24,400
Mar. 31	941.5	482,800	-19,200
Apr. 30	942.9	493,200	+10,400
May 31	941.6	483,500	-9,700
June 30	942.7	491,700	+8,200
July 31	945.4	511,800	+20,100
Aug. 31	944.3	503,600	-8,200
Sept.30	939.5	468,200	-35,400
Water year 1959-60	-	-	-25,700

† Elevation at 12 p.m.

4380. Columbia River at Bridgeport, Wash.

Location.--Lat 48°00'25", long 119°39'50", in SW¼SW¼ sec.14, T.29 N., R.25 E., on left bank at Bridgeport, 1 mile downstream from Foster Creek and 1½ miles downstream from Chief Joseph Dam.

Drainage area.--75,000 sq mi, approximately.

Records available.--April 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers).

Average discharge.--8 years, 119,900 cfs (86,800,000 acre-ft per year).

Extremes.--Maximum discharge during year, 288,300 cfs July 5 (elevation, 780.53 ft); minimum, 41,600 cfs Mar. 11 (elevation, 756.31 ft); minimum daily, 50,100 cfs Mar. 10. 1952-60: Maximum discharge, 488,600 cfs June 7, 1956 (elevation, 792.20 ft); minimum recorded, 31,000 cfs Dec. 21, 1956 (elevation, 753.88 ft); minimum daily, 31,000 cfs Jan. 11, 1953.

Remarks.--Records excellent. Feeder canal diverts water by pumping from Franklin D. Roosevelt Lake for Columbia Basin project (see p. 295). Other diversions above station for irrigation are small percentage of flow past gage. Flow regulated by Rufus Woods Lake (see preceding page), Franklin D. Roosevelt Lake (see p. 295) and reservoirs in Kootenai, Flathead, Pend Oreille, and Spokane River basins.

Rating table, water year 1959-60 (elevation, in feet, and discharge, in cubic feet per second)

57.9	50,000	75.0	203,800
60.0	62,000	80.0	279,800
65.0	97,800	85.0	363,000
70.0	142,800		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116,100	110,700	*115,000	59,700	79,100	62,100	99,800	115,100	211,600	268,000	146,300	*61,500
2	110,300	109,300	115,000	61,800	78,700	63,600	104,900	115,500	217,200	278,400	145,400	60,200
3	108,000	106,900	115,100	61,900	78,000	68,200	122,800	114,800	227,400	279,600	150,700	57,700
4	104,400	105,600	110,600	64,100	78,900	61,100	127,600	115,300	240,600	281,700	148,500	57,700
5	101,200	103,800	105,100	56,500	74,200	57,500	140,200	107,000	240,200	286,200	149,600	57,800
6	100,300	105,300	101,200	53,600	70,500	57,800	146,200	105,600	239,100	285,200	150,400	63,400
7	96,500	104,900	83,600	51,600	67,400	55,700	143,200	104,900	240,200	286,200	135,300	69,400
8	94,400	102,100	74,200	52,400	61,500	56,200	149,000	105,000	248,000	277,700	136,000	71,000
9	*92,800	100,000	73,000	54,800	*74,100	50,200	160,000	105,800	248,400	271,800	135,400	72,800
10	91,600	96,800	67,000	57,600	77,400	*50,100	164,500	105,600	248,400	270,700	139,100	73,300
11	93,200	91,600	65,100	61,200	75,800	53,100	170,500	110,200	248,300	265,200	136,600	72,800
12	93,600	85,200	66,800	59,800	72,600	54,100	176,300	127,100	248,800	253,600	122,200	72,500
13	94,500	79,400	68,300	56,100	83,300	54,400	179,600	148,500	248,000	245,600	125,700	68,500
14	97,100	77,300	71,200	75,400	84,700	60,000	180,800	174,100	252,300	236,600	114,600	69,500
15	95,300	79,900	75,500	74,300	84,700	62,600	176,700	185,000	258,700	228,000	119,400	68,800
16	97,500	80,800	73,100	75,800	60,100	64,100	173,500	194,800	258,200	233,800	117,300	69,600
17	100,800	76,100	70,000	76,800	60,200	63,700	167,700	203,000	261,400	235,000	116,200	69,700
18	101,200	71,200	71,200	79,200	60,600	63,400	164,100	205,300	269,600	230,100	110,000	67,900
19	105,200	75,000	72,300	81,700	61,300	61,800	165,300	219,600	277,700	226,200	102,400	61,500
20	110,900	78,800	72,000	83,100	59,900	60,300	162,200	226,000	277,400	222,200	104,800	64,900
21	109,600	78,700	74,000	83,300	60,100	62,000	153,000	235,200	271,800	218,000	98,800	66,400
22	110,600	80,300	73,400	85,700	60,900	63,400	153,700	237,200	267,200	210,200	95,900	75,200
23	111,200	84,700	69,600	88,400	61,400	61,800	153,800	233,200	255,200	207,400	94,300	78,600
24	108,400	91,600	68,600	84,000	53,800	*69,200	151,600	227,600	237,600	203,200	91,200	78,000
25	107,300	104,000	68,300	78,300	59,100	76,900	145,100	221,200	221,000	196,800	85,600	77,400
26	108,300	113,800	68,600	78,400	56,000	80,500	136,100	220,500	220,600	183,800	83,800	78,900
27	113,200	114,600	68,400	77,700	53,100	80,800	122,500	216,000	220,800	176,000	76,800	79,800
28	120,200	115,500	65,500	76,800	53,100	87,400	104,800	215,100	228,000	164,600	74,200	79,600
29	120,800	115,200	62,800	76,800	54,200	97,000	104,400	219,200	*241,800	158,400	72,800	76,800
30	114,500	115,200	61,500	97,100	-------	96,600	114,400	219,900	253,900	150,300	71,400	73,800
31	111,600	-------	60,400	98,400	-------	98,400	-------	216,400	-------	139,200	76,100	-------
Total	‡3,240.6	‡2,854.3	‡2,406.4	‡2,202.3	‡1,934.7	‡2,054	‡4,414.3	‡5,349.7	‡7,379.4	‡7,169.7	‡3,526.8	‡2,095
Mean	104,500	95,140	77,630	71,040	66,710	66,260	147,100	172,600	246,000	231,300	113,800	69,830
Ac-ft	‡6,428	‡5,661	‡4,773	‡4,368	‡3,837	‡4,074	‡8,756	‡10,610	‡14,640	‡14,220	‡6,995	‡4,155

Calendar year 1959: Max 396,000 Min 43,600 Mean 139,800 Ac-ft 101,200,000
Water year 1959-60: Max 286,200 Min 50,100 Mean 121,900 Ac-ft 88,520,000

* Discharge measurement made on this day.
‡ Expressed in thousands.

4385. Okanagan River at Okanagan Falls, British Columbia

(International gaging station)

Location.--Lat 49°20', long 119°35', on right bank 0.1 mile downstream from dam at outlet of Skaha Lake at Okanagan Falls.

Drainage area.--2,650 sq mi, approximately.

Records available.--January 1915 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 1,092.82 ft above mean sea level (Geodetic Survey of Canada, 1947 joint adjustment). Prior to Oct. 2, 1933, staff gages at sites 600 to 700 ft upstream at different datums. Oct. 2, 1933, to Apr. 13, 1936, staff gage and Apr. 14, 1936, to Nov. 12, 1954, water-stage recorder, at site 200 ft upstream at same datum.

Average discharge.--45 years, 529 cfs (383,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,380 cfs Nov. 26 (gage height, 1.89 ft); minimum, 310 cfs June 3 (gage height, 0.65 ft).
1915-60: Maximum discharge, 2,790 cfs Apr. 25, 1958 (gage height, 2.88 ft); minimum observed, 4.6 cfs Mar. 14, 1931.

Remarks.--Diversions above station for irrigation of approximately 38,000 acres. Flow regulated by control dams at outlets of Okanagan and Skaha Lakes.

Cooperation.--This station is maintained by Canada under agreement with the United States.

Revisions.--WSP 1152: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 25		Nov. 26 to Sept. 30	
0.7	338	0.6	281
1.0	538	1.0	528
1.5	960	1.5	960
2.0	1,510	2.0	1,510

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	407	941	1,340	1,150	770	381	381	476	375	508	557	571
2	400	941	1,310	1,150	780	381	388	476	375	542	564	571
3	400	950	1,290	1,150	770	357	388	406	338	542	571	571
4	400	701	1,280	1,140	761	338	388	363	315	542	578	571
5	388	420	1,170	*1,140	761	338	388	381	315	542	578	571
6	*381	645	1,080	1,140	770	338	388	432	344	542	578	571
7	381	865	1,080	990	770	338	388	432	375	542	578	571
8	*381	865	1,080	874	770	338	388	438	375	542	578	571
9	388	865	1,080	874	770	338	388	438	375	*542	578	571
10	388	990	1,080	874	770	338	388	438	375	542	578	571
11	388	1,200	1,090	874	770	338	388	444	375	542	578	571
12	388	1,210	1,090	874	770	338	388	457	369	542	*578	571
13	388	1,210	1,090	874	770	338	388	463	419	542	578	571
14	388	1,200	1,080	865	770	338	388	463	457	542	578	571
15	388	1,210	1,090	856	586	338	388	463	463	535	578	571
16	388	1,180	*1,130	856	463	350	388	470	463	535	578	*571
17	388	1,160	1,150	846	463	363	388	470	457	535	571	571
18	388	1,160	1,150	846	470	363	388	463	457	535	571	571
19	474	1,170	1,160	846	476	369	419	*463	457	535	571	564
20	590	1,170	1,170	836	476	369	450	463	463	535	571	564
21	590	1,170	1,170	836	476	369	450	463	463	535	571	564
22	590	1,170	1,170	846	476	369	496	463	*457	535	571	564
23	590	1,170	1,160	846	457	369	*496	463	457	535	571	564
24	598	1,180	1,160	846	444	369	489	413	457	535	571	550
25	598	1,180	1,170	846	444	369	489	381	457	542	571	535
26	606	1,290	1,160	836	444	369	482	381	457	550	571	522
27	613	1,370	1,160	798	444	369	482	381	457	550	571	506
28	*613	1,360	1,160	*770	438	369	*482	375	457	550	571	508
29	613	1,350	1,150	770	413	369	482	375	457	557	571	508
30	785	1,350	1,150	770	-------	369	482	375	457	557	571	508
31	941	-------	1,150	770	-------	369	-------	375	-------	557	571	-------
Total	15,219	32,643	35,750	27,989	17,742	11,048	12,676	13,344	12,518	16,767	17,771	16,737
Mean	491	1,090	1,150	903	612	356	423	430	417	541	573	558
Ac-ft	30,190	64,750	70,910	55,520	35,190	21,910	25,140	26,470	24,830	33,260	35,250	33,200

Calendar year 1959: Max 2,120 Min 326 Mean 895 Ac-ft 647,900
Water year 1959-60: Max 1,370 Min 315 Mean 629 Ac-ft 456,600

* Discharge measurement made on this day.

4390. Osoyoos Lake near Oroville, Wash.

(International gaging station)

Location.--Lat 48°59'15", long 119°27'15", in lot 1, sec.8, T.40 N., R.27 E., on west shore 1 mile south of international boundary and 3 miles north of Oroville.

Drainage area.--3,150 sq mi, approximately.

Records available.--July 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, U. S. Coast and Geodetic Survey datum of 1929. Prior to Sept. 2, 1928, staff gage and Sept. 2, 1928, to Nov. 9, 1929, water-stage recorder, 100 ft south of international bourdary. Nov. 10, 1929, to Apr. 11, 1956, staff gage or water-stage recorder at present site. All elevations prior to Oct. 1, 1944, at datum 2.39 ft lower. To convert from present datum to Geodetic Survey of Canada 1934 datum, subtract 1.63 ft; to convert from present datum to 1947 joint adjustment of U. S. Coast and Geodetic Survey and Geodetic Survey of Canada, subtract 0.26 ft.

Extremes.--Maximum elevation during year, 912.67 ft Dec. 2, 3, 4; minimum, 910.54 ft Mar. 15.

1928-60: Maximum elevation, 916.74 ft May 31, 1948; minimum, 908.82 ft Oct. 14, 1929 (present datum).

Flood of May 29, 1894, reached an elevation of 918.8 ft ±0.5 ft (present datum), 1 mile below present lake outlet, from floodmark on old Okanogan Hotel Building, pointed out in 1930 by Mr. and Mrs. Stansbury, who kept a diary and operated the hotel in 1894.

Remarks.--Approximately 44,000 acres are irrigated above station in Canada. Elevation may occasionally be affected by dam at Zosel's mill in Oroville.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Revisions.--WSP 1346: Drainage area.

Mean elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11.77	11.80	12.65	12.41	11.74	10.91	12.19	12.24	12.43	11.62	11.72	11.89
2	11.70	11.85	12.66	12.40	11.75	10.87	12.19	12.25	12.41	11.59	11.73	11.89
3	11.64	11.94	12.66	12.41	11.73	10.85	12.18	12.26	12.42	11.58	11.75	11.92
4	11.59	11.95	12.66	12.40	11.73	10.84	12.18	12.25	12.40	11.60	11.79	11.94
5	11.54	11.96	12.66	12.40	11.82	10.81	12.18	12.21	12.36	11.59	11.81	11.96
6	11.48	11.92	12.65	12.39	11.70	10.77	12.18	12.17	12.32	11.59	11.81	11.99
7	11.43	11.89	12.62	12.39	11.70	10.75	12.19	12.19	12.26	11.61	11.80	12.00
8	11.41	11.86	12.58	12.36	11.69	10.71	12.18	12.20	12.18	11.61	11.79	11.98
9	11.41	11.82	12.52	12.28	11.67	10.67	12.18	12.21	12.11	11.61	11.80	11.99
10	11.37	11.80	12.44	12.20	11.67	10.63	12.18	12.21	12.07	11.60	11.79	11.98
11	11.35	11.82	12.37	12.14	11.66	10.59	12.19	12.26	12.03	11.61	11.80	11.98
12	11.35	11.90	12.36	12.10	11.65	10.57	12.20	12.37	11.96	11.62	11.79	11.98
13	11.34	12.01	12.34	12.07	11.65	10.56	12.20	12.49	11.91	11.65	11.77	11.97
14	11.34	12.18	12.32	12.03	11.64	10.55	12.19	12.55	11.88	11.67	11.73	11.96
15	11.37	12.30	12.32	11.95	11.64	10.56	12.20	12.57	11.88	11.65	11.70	11.95
16	11.38	12.32	12.31	11.93	11.58	10.62	12.18	12.57	11.87	11.67	11.70	11.92
17	11.40	12.35	12.29	11.90	11.48	10.67	12.17	12.56	11.84	11.67	11.72	11.91
18	11.42	12.37	12.27	11.87	11.40	10.72	12.15	12.53	11.81	11.69	11.74	11.90
19	11.43	12.37	12.26	11.85	11.33	10.74	12.13	12.47	11.80	11.70	11.76	11.91
20	11.44	12.36	12.26	11.83	11.27	10.77	12.13	12.46	11.77	11.69	11.76	11.89
21	11.45	12.38	12.26	11.81	11.22	10.86	12.13	12.49	11.76	11.69	11.73	11.87
22	11.47	12.39	12.27	11.81	11.17	11.02	12.13	12.51	11.75	11.68	11.77	11.87
23	11.49	12.40	12.28	11.79	11.12	11.17	12.12	12.52	11.73	11.64	11.77	11.88
24	11.50	12.42	12.32	11.79	11.09	11.31	12.14	12.51	11.71	11.62	11.77	11.91
25	11.52	12.43	12.35	11.78	11.05	11.47	12.15	12.49	11.70	11.62	11.78	11.95
26	11.54	12.42	12.35	11.78	11.02	11.63	12.18	12.49	11.68	11.63	11.80	11.97
27	11.55	12.47	12.34	11.77	10.98	11.79	12.21	12.51	11.66	11.64	11.82	11.97
28	11.60	12.54	12.36	11.75	10.95	11.96	12.23	12.50	11.65	11.63	11.82	11.97
29	11.66	12.60	12.35	11.76	10.93	12.09	12.23	12.48	11.64	11.64	11.84	11.95
30	11.71	12.63	12.36	11.76	-------	12.17	12.23	12.44	11.64	11.67	11.85	11.96
31	11.74	-------	12.40	11.75	-------	12.18	-------	12.46	-------	11.69	11.88	-------

Note.--Add 900.00 ft to obtain elevation above mean sea level.

4395. Okanogan River at Oroville, Wash.

Location.--Lat 48°55'55", long 119°25'05", in SW¼ sec.27, T.40 N., R.27 E., on left bank in Oroville, 20 ft downstream from Great Northern Railway trestle, half a mile downstream from Tonasket Creek, and 1½ miles downstream from Osoyoos Lake.

Drainage area.--3,210 sq mi, approximately.

Records available.--October 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 899.77 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 26, 1944, staff gage at Zosel's milldam 200 ft upstream at same datum. Oct. 26, 1944, to Mar. 6, 1948, water-stage recorder on railroad trestle 20 ft upstream at same datum. Auxiliary water-stage recorder half a mile downstream used during high-water periods since Apr. 10, 1948. May 15, 1946, to Apr. 9, 1948, auxiliary staff gage at same site and datum.

Average discharge.--18 years, 737 cfs (533,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,410 cfs Nov. 30; maximum gage height, 10.22 ft June 4 (backwater from Similkameen River); maximum daily reverse flow, 100 cfs June 3; minimum gage height, 5.35 ft, result of gravel fill from Tonasket Creek.
1942-60: Maximum discharge recorded, 3,430 cfs June 2, 1948 (gage height, 15.28 ft); maximum gage height, 16.50 ft May 31, 1948 (backwater from Similkameen River); maximum daily reverse flow, 2,270 cfs May 29, 1948; minimum gage height, 3.98 ft Mar. 1, 1948.

Remarks.--Records good except those for periods Mar. 21-29, May 11-20, May 31 to June 20, which are fair. Diversions made to irrigate approximately 44,000 acres in Canada and minor diversions in the United States above station. Natural regulation in several large lakes and artificial regulation in Okanagan Lake as an aid to navigation in that lake; also variations in pondage back of Zosel's milldam at Oroville, 200 ft above gage. Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Rating tables, water year 1959-60, except periods of backwater from Similkameen River (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-22		Oct. 23 to Sept. 30			
6.5	445	5.3	1	6.1	150
7.0	745	5.4	4	6.5	410
		5.6	20	7.0	645
		5.8	55	8.0	1,540

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	625	751	*1,360	1,280	981	625	418	538	620	410	362	529
2	607	820	1,370	1,280	973	589	452	563	571	386	386	538
3	589	925	1,370	1,280	965	580	470	563	-100	386	402	538
4	583	*941	1,370	1,280	957	563	512	572	0	386	427	554
5	*571	885	1,370	*1,270	957	546	529	554	794	378	444	563
6	553	853	1,370	1,270	949	529	538	546	700	378	461	563
7	517	877	1,360	1,270	949	520	546	554	638	378	470	580
8	505	917	1,340	1,260	941	512	554	563	598	386	452	580
9	505	820	1,300	1,230	941	512	563	563	566	378	427	580
10	499	811	1,280	1,180	941	478	563	563	*551	*370	436	580
11	494	828	1,260	1,160	933	478	580	540	546	338	452	572
12	494	909	1,270	1,140	933	461	572	388	520	346	470	572
13	494	941	1,260	1,110	933	452	572	634	487	338	461	572
14	494	989	1,240	1,090	925	336	563	705	456	346	*444	563
15	499	1,060	1,260	1,080	925	281	572	686	531	338	427	*563
16	505	1,070	1,270	1,080	901	274	533	685	451	338	418	554
17	505	1,150	1,260	1,060	877	281	520	688	449	330	436	546
18	511	1,170	1,250	1,060	*836	354	520	704	437	338	436	538
19	511	1,160	1,240	1,040	802	410	520	738	487	338	444	546
20	517	1,160	1,240	1,040	768	372	520	772	514	330	444	546
21	517	1,170	1,220	1,040	751	112	512	853	504	323	436	546
22	523	1,170	1,210	1,030	733	24	512	845	486	362	461	538
23	554	1,190	1,210	1,020	706	107	*520	845	461	330	461	546
24	572	1,200	1,230	1,020	688	17	504	828	461	323	461	554
25	580	1,230	1,250	1,010	679	19	512	820	461	323	470	554
26	580	1,230	1,260	1,000	652	11	520	828	444	323	478	572
27	589	1,240	1,240	997	643	3	538	845	427	370	478	580
28	598	1,280	1,260	989	625	29	546	828	410	323	478	589
29	679	1,310	1,250	997	616	165	520	820	418	316	495	569
30	715	1,350	1,260	981	------	*309	520	802	410	338	495	598
31	724	------	1,280	981	-------	378	-------	757	-------	346	512	------
Total	17,209	31,407	39,710	34,525	24,480	10,327	15,821	21,190	14,298	10,893	13,924	16,843
Mean	555	1,047	1,281	1,114	844	333	527	684	477	351	449	561
Ac-ft	34,130	62,290	78,760	68,480	48,560	20,480	31,380	42,030	28,360	21,610	27,620	33,410

Calendar year 1959: Max 2,600 Min 100 Mean 1,007 Ac-ft 729,100
Water year 1959-60: Max 1,370 Min -100 Mean 685 Ac-ft 497,100

* Discharge measurement made on this day.
Note.--Backwater from Similkameen River May 11-20, May 31 to June 20.

4420. Toats Coulee Creek near Loomis, Wash.

Location.--Lat 48°50'00", long 119°41'50", in SE¼ sec.33, T.39 N., R.25 E., on left bank 600 ft upstream from Deer Creek, 1,800 ft upstream from intake of Whitestone Irrigation Canal, and 3 miles northwest of Loomis.

Drainage area.--130 sq mi.

Records available.--May 1920 to September 1926 (fragmentary), April 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,880 ft (from topographic map). May 11 to June 2, 1920, staff gage 1,000 ft downstream at different datum. June 3, 1920, to Sept. 30, 1926, water-stage recorder 600 ft downstream at different datum.

Extremes.--Maximum discharge during year, 626 cfs May 12 (gage height, 4.53 ft); minimum daily, 4.7 cfs Jan. 21.
1920-26, 1957-60: Maximum discharge, 1,100 cfs May 19, 1957 (gage height, 5.67 ft); minimum, 1.6 cfs Sept. 13, 14, 1926 (gage height, 0.72 ft, site and datum then in use). Flood of May 28, 1948, 6,010 cfs, result of slope-area measurement of peak flow.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. No regulation or diversion above station.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	3.4	2.5	138
1.0	7.4	3.0	230
1.3	16.5	3.5	330
1.6	30	4.0	460
1.9	51	4.5	615
2.2	89		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	22	14	8.0	9.0	9.0	17.5	57	216	84	22	14.5
2	28	21	*14	7.0	9.5	8.5	19	65	409	73	23	14.5
3	28	22	13.5	7.0	9.0	8.0	26	76	430	71	19.5	13.5
4	25	12.5	13	7.0	9.2	8.5	43	88	348	64	31	13.5
5	23	12	12	8.0	9.5	9.0	50	100	290	57	24	15
6	23	*20	12	9.0	9.5	10	45	111	294	53	19	13.5
7	23	18	11.5	*9.3	9.5	10	56	119	240	50	16	12
8	*24	20	11	9.5	9.5	10	77	108	*216	*47	13.5	11
9	25	20	10.5	9.2	9.5	9.5	83	105	230	45	12.5	10.5
10	23	18	10.5	8.7	9.5	9.0	58	161	244	42	11	9.7
11	24	18.5	10.5	7.9	9.7	8.8	49	314	266	39	*10.5	9.2
12	26	9.7	11	7.4	9.7	8.6	26	514	242	36	9.5	9.0
13	28	6.0	11	7.0	10	8.5	36	296	230	34	8.7	8.2
14	36	5.5	10.5	6.7	10.5	8.5	33	*202	214	32	8.4	7.7
15	36	5.0	11	6.5	10.5	8.6	31	182	214	31	8.7	7.4
16	30	5.0	12	6.5	*10	8.8	26	186	193	23	10	7.0
17	27	6.0	11.5	6.5	10	9.0	28	160	168	23	10.5	*6.7
18	26	8.0	11	6.3	10	9.5	26	143	150	23	9.0	6.5
19	26	10	11	5.6	10	11	26	136	141	23	7.9	6.3
20	25	15	11	5.0	10	15	28	135	131	21	7.2	6.3
21	25	16.5	10.5	4.7	10	18.5	26	124	124	20	7.2	6.3
22	24	17.5	10.5	5.0	9.7	24	*23	111	124	19.5	14.5	6.5
23	24	18	10.5	6.0	9.7	35	25	108	123	18	17.5	7.0
24	24	18	10.5	7.0	9.7	32	26	118	121	17	16	7.4
25	28	17.5	10.5	8.0	9.7	41	26	121	111	16	24	7.7
26	26	16	10	8.0	10	52	25	133	107	15	23	7.2
27	24	15.5	9.7	8.0	9.0	41	24	135	111	13	19.5	6.7
28	23	15	9.5	8.0	8.0	31	30	121	100	15	16.5	6.5
29	20	15	9.0	8.5	8.0	26	36	150	94	13.5	15	6.3
30	16.5	14.5	9.0	9.0	------	22	48	189	91	12.5	15	6.3
31	23	------	9.0	9.0	------	19.5	------	214	------	16.5	14.5	------
Total	789.5	437.7	341.2	229.3	277.9	529.8	1,072.5	4,782	5,972	1,065.0	464.6	269.9
Mean	25.5	14.6	11.0	7.40	9.58	17.1	35.8	154	199	34.4	15.0	9.00
Cfsm	0.196	0.112	0.085	0.057	0.074	0.132	0.275	1.18	1.53	0.265	0.115	0.069
In.	0.23	0.13	0.10	0.07	0.08	0.15	0.31	1.37	1.71	0.30	0.13	0.08
Ac-ft	1,570	868	677	455	551	1,050	2,130	9,480	11,850	2,110	922	535

Calendar year 1959: Max 570 Min 5.0 Mean 67.4 Cfsm 0.518 In. 7.06 Ac-ft 48,820
Water year 1959-60: Max 514 Min 4.7 Mean 44.3 Cfsm 0.341 In. 4.66 Ac-ft 32,200

Peak discharge (base, 200 cfs).--May 12 (10:30 a.m.) 626 cfs (4.53 ft); June 3 (10 p.m.) 550 cfs (4.30 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-23, Dec. 29, Jan. 1-7, 22-29, Feb. 27 to Mar. 6. No gage-height record Jan. 4-7, Jan. 22 to Feb. 3, Feb. 27 to Mar. 17; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations.

4422. Whitestone Irrigation Canal near Loomis, Wash.

Location.--Lat 48°49'50", long 119°41'25", in SW¼ sec.34, T.39 N., R.25 E., on right bank 200 ft downstream from headworks and 2½ miles northwest of Loomis.

Records available.--April 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,650 ft (from topographic map).

Extremes.--1957-60: Maximum daily discharge, 48 cfs May 21, 1958, May 14-16, June 2, 3, July 12, 13, 1959; no flow during nonirrigation season.

Remarks.--Records excellent except those for period of no gage-height record, which are poor. Canal diverts from Toats Coulee Creek for irrigation of about 2,000 acres in Whitestone Irrigation District.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.8	1.6					0	33	37	38	20	15
2	4.8	1.6					0	35	38	34	21	15
3	4.8	1.6					0	37	36	34	18	14
4	4.8	2.2					0	30	32	35	28	13.5
5	4.8	1.2					a5.0	19	32	39	22	15
6	4.8	*0						19	33	38	18	13.5
7	4.8	0						19	34	39	15.5	12.5
8	*4.8	0						18	*35	*40	14	11.5
9	4.8	0						26	38	39	13	10.5
10	4.8	0						35	40	38	11.5	10
11	4.8	0						39	40	36	11	9.7
12	4.8	0						39	40	33	*10	9.2
13	5.0	0						38	40	32	9.2	8.8
14	5.0	0					a10	36	40	30	9.0	8.8
15	5.0	0						35	40	29	9.2	8.6
16	4.8	0						38	40	27	10.5	8.2
17	4.8	0						40	40	25	10.5	*7.9
18	4.8	0						40	40	24	9.7	7.7
19	4.7	0						41	40	22	8.8	7.7
20	4.7	0						42	40	21	8.4	7.5
21	4.7	0						41	40	19.5	8.4	7.5
22	4.7	0					*14	40	40	18	14.5	7.9
23	4.7	0					21	35	40	17.5	17	8.4
24	2.9	0					21	35	41	17	16	8.6
25	1.1	0					21	17	42	16	22	8.4
26	1.0	0					21	14	43	15.5	22	8.2
27	1.0	0					20	15.5	43	15	19.5	7.7
28	1.2	0					23	15.5	42	15	16.5	7.5
29	1.8	0					28	17	43	14	15.5	7.3
30	1.7	0			-------		32	22	43	13	15	7.3
31	1.7	-------			-------		-------	32	-------	16	15	-------
Total	122.9	8.2	0	0	0	0	366.0	933.0	1,172	829.5	458.7	293.4
Mean	3.96	0.27	0	0	0	0	12.2	30.1	39.1	26.8	14.8	9.78
Ac-ft	244	16	0	0	0	0	726	1,850	2,320	1,650	910	582

Calendar year 1959: Max 48 Min 0 Mean 13.1 Ac-ft 9,450
Water year 1959-60: Max 43 Min 0 Mean 11.4 Ac-ft 8,300

* Discharge measurement or observation of no flow made on this day.
a No gage-height record; discharge estimated on basis of District Watermaster's notes.

4423. Sinlahekin Creek above Chopaka Creek, near Loomis, Wash.

Location.--Lat 48°51'10", long 119°38'50", in NE¼ sec.26, T.39 N., R.25 E., on right bank 400 ft upstream from Chopaka Creek, 2 miles upstream from mouth, and 2¼ miles north of Loomis.

Drainage area.--256 sq mi.

Records available.--April 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,150 ft (from topographic map).

Extremes.--Maximum discharge during year, 494 cfs June 4; maximum gage height, 6.65 ft May 12; minimum, 10 cfs Aug. 20, 21, but may have been less during period of no gage-height record.
1957-60: Maximum discharge, 1,680 cfs May 19, 1957 (gage height, 8.62 ft); minimum, 8.6 cfs Sept. 18, 1957.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. No regulation. Diversion above station by Whitestone Irrigation Canal (see p. 303) and other smaller diversions for irrigation.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-17		Oct. 18 to Sept. 30			
1.9	38	1.1	8.1	4.0	168
2.1	48	1.5	20	5.0	273
2.4	63	2.0	40	7.0	551
		3.0	93		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47	45	36	b25	26	28	36	21	166	47	17.5	17
2	48	44	*36	b24	35	b27	35	26	245	47	17	18
3	48	45	36	b24	28	b24	37	30	398	44	16	17.5
4	45	40	35	b25	24	b25	48	38	364	38	16	17
5	43	35	34	26	32	28	56	59	290	32	17	19
6	42	*43	34	27	30	28	54	71	292	29	16	17.5
7	*42	43	33	*28	32	28	56	77	239	26	15	15.5
8	44	44	33	28	30	28	66	71	*202	*21	14.5	14.5
9	46	45	32	28	28	28	68	58	200	19.5	13.5	14.5
10	44	43	32	28	28	28	56	80	207	19	13	14.5
11	46	43	32	27	29	28	46	200	225	18.5	12.5	14
12	48	39	33	b26	29	28	34	429	197	17.5	*11	14
13	50	b30	33	b25	30	28	29	286	183	17.5	11	13.5
14	54	b27	32	26	31	28	25	*177	188	17.5	10.5	13
15	59	b25	33	25	32	28	23	141	182	18	11.5	12
16	54	b25	33	25	*31	28	22	143	153	17	14.5	12
17	52	b30	33	25	30	28	20	121	127	17.5	13.5	*12
18	56	38	32	b23	30	30	17	102	111	17.5	12	12
19	48	39	32	b22	29	31	17	94	107	17	12	11.5
20	46	40	32	b21	29	34	16	92	97	17	11	11
21	45	42	32	b20	29	36	16	89	89	17	11	11
22	44	43	32	b20	29	40	*13	76	88	17	12.5	11.5
23	44	43	32	b21	29	49	11.5	76	84	17	13	12
24	44	43	34	23	29	47	14.5	94	79	18.5	13.5	12.5
25	49	41	35	23	30	54	17.5	102	69	18.5	14.5	13
26	49	39	32	23	30	64	17	116	62	18.5	15	12.5
27	47	38	31	24	b25	58	17	122	66	18	16.5	12
28	45	37	30	24	b24	49	16	110	58	17	16.5	11.5
29	43	37	29	26	b26	44	15	124	53	17	17	11
30	40	36	30	30	-------	*42	17	155	47	18.5	17	11
31	47	-------	29	28	-------	39	-------	167	-------	19	17	-------
Total	1,459	1,162	1,012	770	844	1,085	915.5	3,547	4,868	683.5	438.5	408.0
Mean	47.1	38.7	32.6	24.8	29.1	35.0	30.5	114	162	22.0	14.1	13.6
Ac-ft	2,890	2,300	2,010	1,530	1,670	2,150	1,820	7,040	9,660	1,360	870	809

Calendar year 1959: Max 655 Min 17.5 Mean 96.6 Ac-ft 69,900
Water year 1959-60: Max 429 Min 10.5 Mean 47.0 Ac-ft 34,110

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Sept. 18-30; discharge estimated on basis of weather records and records for nearby stations.

4424. Palmer Lake near Nighthawk, Wash.

Location.--Lat 48°54'30", long 119°36'50", in SW¼NE¼ sec.6, T.39 N., R.26 E., on northeast shore 2 miles east of outlet and 4 miles south of Nighthawk.

Drainage area.--293 sq mi.

Records available.--April 1956 to September 1960.

Gage.--Staff gage read once daily. Datum of gage is 1,100 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Extremes.--Maximum elevation observed during year, 1,154.66 ft June 7; minimum observed, 1,144.39 ft Sept. 24-30.
1956-60: Maximum elevation observed, 1,159.47 ft May 22, 1956; minimum observed, 1,144.26 ft Sept. 22, 23, 1957.

Remarks.--Lake affords natural pondage for high stages of Similkameen River. No known regulation. Diversions for irrigation of about 1,000 acres above station. Whitestone Irrigation District diverts water from Toats Coulee Creek for irrigation of about 2,000 acres in Whitestone Creek basin.

Elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45.16	46.52	46.88	45.17			-	-	50.60	49.52	45.14	44.44
2	45.16	46.47	46.79	45.15			-	-	51.08	49.42	45.10	44.44
3	45.16	46.47	46.64	45.14			-	-	52.12	49.14	45.04	44.44
4	45.16	46.45	46.53	45.14			-	-	53.66	48.90	45.00	44.44
5	45.16	46.39	46.42	45.12			-	47.82	54.48	48.64	44.98	44.46
6	45.14	46.35	46.27	45.10			-	47.90	54.62	48.44	44.96	44.46
7	45.12	46.32	46.20	45.09			-	48.42	54.66	48.28	44.92	44.46
8	45.12	46.28	46.14	45.09			-	48.88	54.32	48.12	44.88	44.45
9	45.11	46.17	46.04	45.09			-	49.30	53.09	47.93	44.86	44.45
10	45.10	46.08	45.92	45.09			-	49.56	53.68	47.69	44.82	44.45
11	45.10	45.97	45.84	45.08			47.74	49.90	53.50	-	44.79	44.44
12	45.10	45.88	45.80	45.07			47.94	50.80	53.46	-	44.76	44.44
13	45.17	45.82	45.73	45.06			48.06	52.18	53.40	-	44.72	44.44
14	45.37	45.72	45.68	45.04			48.22	53.04	53.38	-	44.68	44.44
15	45.57	45.67	45.62	-			48.14	53.31	53.26	-	44.65	44.43
16	45.79	45.69	45.61	-			48.04	53.12	53.10	-	44.63	44.43
17	45.98	45.73	45.59	-	45.07		47.84	52.93	52.96	-	44.60	44.42
18	45.98	45.79	45.58	-			47.79	52.61	52.70	-	44.58	44.42
19	45.95	45.90	45.55	-			-	52.26	52.48	-	44.58	44.41
20	45.92	46.22	45.52	-			-	51.80	52.00	-	44.58	44.41
21	45.87	46.34	45.49	-			-	51.52	51.66	45.97	44.58	44.40
22	45.82	46.38	45.46	-			47.04	51.24	51.10	45.88	44.58	44.40
23	45.79	46.40	45.43	-			-	50.80	50.66	45.74	44.54	44.40
24	45.82	46.46	45.41	-			-	50.60	50.44	45.66	44.51	44.39
25	45.92	46.50	45.38	-			-	50.32	50.37	45.56	44.48	44.39
26	46.12	46.58	45.35	-			46.68	50.06	50.30	45.48	44.48	44.39
27	46.22	46.70	45.32	-			-	49.96	50.10	45.42	44.46	44.39
28	46.32	46.82	45.29	-			-	49.86	49.94	45.36	44.45	44.39
29	46.42	46.88	45.26	-		45.24	-	49.85	49.79	45.30	44.45	44.39
30	46.52	46.98	45.23	-			-	49.84	49.62	45.24	44.44	44.39
31	46.62		45.20					50.00		45.18	44.44	

Note.--Add 1,100 ft to obtain elevation above mean sea level.

4425. Similkameen River near Nighthawk, Wash.

(International gaging station)

Location.--Lat 48°59'10", long 119°37'00", in NW¼ sec.7, T.40 N., R.26 E., on left bank three-quarters of a mile upstream from Oroville-Tonasket Irrigation D'strict canal intake, about 1¾ miles downstream from and northeast of Nighthawk, and 12 miles upstream from mouth.

Drainage area.--3,550 sq mi, approximately.

Records available.--May 1911 to September 1960 (prior to September 1928, mean monthly discharge included Oroville-Tonasket Irrigation District canal). Published as "near Oroville" 1911-28.

Gage.--Water-stage recorder. Datum of gage is 1,137.70 ft above mean sea level, international joint adjustment of 1947. Prior to Sept. 11, 1928, staff gages at sites 7 miles downstream (below Oroville-Tonasket Irrigation District canal) at various datums.

Average discharge.--49 years, 2,271 cfs (1,644,000 acre-ft per year).

Extremes.--Maximum discharge during year, 15,200 cfs June 4 (gage height, 11.55 ft); minimum, 415 cfs Sept. 20 (gage height, 3.08 ft).
1928-60: Maximum discharge, 38,700 cfs May 30, 1948 (gage height, 17.62 ft); minimum, 120 cfs Jan. 6, 1930 (gage height, 2.05 ft).

Remarks.--Records excellent except those for periods of ice effect, which are fair. Flow at high stages regulated by natural diversion into and release from Palmer Lake. Several small diversions above station for irrigation of about 2,900 acres in the United States in 1946 and approximately 10,500 acres in Canada in 1957.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Revisions.--WSP 1182: Drainage area.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 3				Feb. 4 to Sept. 30			
3.7	800	6.0	3,150	3.1	425	6.0	3,150
4.0	1,010	7.0	4,700	3.5	660	8.0	6,550
5.0	1,940			4.0	1,010	10.0	10,800
				5.0	1,940	12.0	16,500

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,700	2,570	*2,470	850	840	470	1,730	3,070	7,940	5,020	1,000	642
2	1,630	2,590	2,330	800	830	440	1,640	*3,490	9,420	4,600	978	630
3	1,640	2,490	2,250	760	850	460	1,650	3,810	13,100	4,210	923	618
4	1,650	2,630	2,170	750	867	504	1,980	4,090	14,600	3,980	916	612
5	1,560	*2,350	1,960	710	860	594	2,510	4,680	12,200	3,810	923	588
6	*1,480	2,240	1,860	*700	860	648	3,120	5,240	11,900	3,630	867	564
7	*1,440	2,270	1,840	710	853	660	3,400	5,980	11,200	3,500	825	600
8	1,400	2,130	1,820	710	846	666	3,950	6,250	9,940	3,370	784	600
9	1,370	2,060	1,610	700	839	642	4,860	5,880	*9,310	*3,180	758	570
10	1,540	1,970	1,510	680	846	624	5,330	6,090	9,440	2,900	725	540
11	1,480	1,870	1,650	690	832	606	4,950	7,740	9,660	2,670	692	516
12	1,590	1,840	1,730	710	797	600	4,620	10,400	9,940	2,490	660	492
13	2,610	1,580	1,660	700	797	582	4,310	12,700	9,640	2,330	*642	480
14	2,490	1,210	1,560	700	790	564	4,090	10,900	9,420	2,240	618	464
15	2,880	1,100	1,630	720	790	564	3,870	*9,490	9,180	2,180	600	452
16	3,280	900	2,180	740	777	558	3,600	8,850	8,830	2,060	594	*447
17	2,760	814	2,000	750	*764	558	3,430	8,500	9,070	1,920	588	447
18	2,520	856	1,760	700	718	564	3,260	7,800	8,060	1,810	588	442
19	2,340	1,160	1,730	650	673	594	3,120	7,100	7,240	1,710	576	430
20	2,220	1,350	1,650	600	673	612	2,980	6,720	6,700	1,640	546	425
21	2,090	1,630	1,570	550	718	686	2,890	6,550	6,130	1,550	534	458
22	2,020	2,000	1,460	580	718	804	2,760	6,130	5,660	1,460	552	516
23	2,000	2,000	1,350	620	692	916	2,710	5,750	5,550	1,350	558	492
24	2,070	2,530	1,350	660	660	1,040	*2,640	5,440	5,830	1,270	576	480
25	3,420	4,440	1,440	800	666	1,220	2,580	5,260	6,110	1,210	582	480
26	4,260	4,360	1,370	*880	654	1,470	2,510	5,220	5,900	1,140	588	480
27	3,460	3,370	1,240	900	580	1,850	2,460	5,290	5,440	1,070	588	474
28	3,080	3,180	1,180	900	510	2,020	2,460	5,310	5,310	1,010	588	458
29	2,930	2,820	1,100	880	490	*1,980	2,570	5,260	5,190	986	582	442
30	2,730	2,660	1,000	860	-------	1,920	2,730	5,700	5,170	938	588	430
31	2,580	-------	900	850	-------	1,810	-------	6,800	-------	930	673	-------
Total	70,220	64,970	51,330	22,790	21,790	27,226	94,710	201,490	253,080	72,164	21,212	15,269
Mean	2,265	2,165	1,656	735	751	878	3,157	6,500	8,436	2,328	684	509
Ac-ft	139,300	128,900	101,800	45,200	43,220	54,000	187,900	399,600	502,000	143,100	42,070	30,290

Calendar year 1959: Max 19,400 Min 600 Mean 3,516 Ac-ft 2,546,000
Water year 1959-60: Max 14,600 Min 425 Mean 2,503 Ac-ft 1,817,000

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 15,16, Dec. 29 to Feb. 3, Feb. 27 to Mar. 3.

4438. Spectacle Lake near Loomis, Wash.

Location.--Lat 48°48'50", long 119°31'20", in SE¼ sec.2, T.38 N., R.26 E., on east shore 5 miles east of Loomis and 8½ miles northwest of Tonasket.

Drainage area.--17.2 sq mi.

Records available.--October 1958 to September 1960 (fragmentary).

Gage.--Staff gage read at various times. Altitude of gage is 1,360 ft (from topographic map).

Extremes.--Maximum gage height observed during year, 11.50 ft July 5; minimum observed, 4.04 ft Sept. 26, 30.
1958-60: Maximum gage height observed, that of July 5, 1960; minimum observed, 3.58 ft Oct. 4, 1958.

Remarks.--Whitestone Irrigation District controls elevation of lake by flow into lake from Whitestone Irrigation Canal (see p. 303) and regulation of outlet gates at headworks of Spectacle Lake Diversion for irrigation. Several small diversions for irrigation.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	-	-	-	-	-	-	-	-	8.20	5.40
2	-	-	8.18	-	-	-	-	-	-	-	-	-
3	-	-	-	-	8.80	-	-	-	11.35	-	-	-
4	-	-	-	-	-	9.40	-	-	-	-	-	-
5	-	7.88	-	-	-	-	-	-	-	11.50	8.78	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	8.54	-	-	9.30	-	-	-	-	4.78
8	7.20	7.90	-	-	-	-	-	-	11.37	11.40	8.31	-
9	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	4.50
11	-	-	8.30	-	-	9.20	-	11.00	-	-	7.92	-
12	-	-	-	8.69	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	11.10	-	4.30
14	-	7.92	-	-	-	-	-	11.10	11.39	-	-	-
15	-	-	-	-	-	-	9.80	-	-	-	7.40	-
16	-	-	8.26	-	-	-	-	-	-	-	-	4.20
17	-	-	-	-	9.00	-	-	-	-	-	-	4.14
18	-	-	-	-	-	-	-	-	-	10.60	7.05	-
19	7.56	-	-	8.72	-	9.16	-	-	11.40	-	-	4.10
20	-	-	-	-	-	-	-	11.20	-	-	-	-
21	-	8.06	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	10.37	-	-	10.30	8.48	-
23	-	-	-	-	-	-	-	-	11.42	-	-	4.07
24	-	-	-	-	9.20	9.18	-	-	-	-	8.20	-
25	-	-	-	-	-	-	-	11.35	-	9.90	-	-
26	-	-	8.40	-	-	-	-	-	11.44	-	-	4.04
27	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	8.76	-	-	-	11.35	-	9.50	-	-
30	-	-	-	-	-------	9.19	10.60	-	11.47	-	5.58	4.04
31	-	-------	-	-	-------	-	-------	-	-------	-	-	-------

4440. Whitestone Lake near Tonasket, Wash.

Location.--Lat 48°47'15", long 119°27'50", in SE¼SW¼ sec.17, T.38 N., R.27 E., at outlet of lake, 6½ miles north of Tonasket.

Drainage area.--36.5 sq mi.

Records available.--October 1958 to September 1960. Records fragmentary October 1958 to May 1959.

Gage.--Water-stage recorder. Altitude of gage is 1,250 ft (from topographic map). Prior to May 27, 1959, staff gage at same site and datum.

Extremes.--Maximum gage height during year, 4.96 ft Dec. 2; minimum not determined. 1958-60: Maximum gage height, that of Dec. 2, 1959; minimum observed, 1.36 ft Oct. 5, 1958.

Remarks.--Lake controlled for elevation by dam at outlet and by pumping from lake to Whitestone Irrigation Canal (see p. 303). Some diversions for irrigation.

Mean gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.45	-	4.93	-	2.70	2.44	3.58	4.23	4.76	3.48	1.82	1.78
2	2.49	-	4.94	-	2.71	2.42	3.61	4.23	4.80	3.44	1.74	1.82
3	2.54	-	4.86	-	2.70	2.40	3.64	4.23	4.81	3.41	1.67	1.86
4	2.59	-	4.81	-	2.68	2.40	3.67	4.24	4.82	3.38	1.64	1.91
5	2.64	-	4.74	-	2.71	2.40	3.70	4.24	4.83	3.34	1.58	1.95
6	-	4.06	4.68	-	2.73	2.43	3.74	4.25	4.82	3.30	1.51	1.99
7	-	4.08	4.63	3.37	2.76	2.49	3.76	4.25	4.76	3.27	1.46	2.04
8	-	4.12	4.58	3.34	2.75	2.53	3.75	4.24	4.69	3.21	1.42	2.07
9	2.87	4.15	4.53	3.30	2.74	2.59	3.75	4.24	4.63	3.15	-	2.10
10	2.91	4.19	4.48	3.27	2.73	2.63	3.75	4.23	4.57	3.10	-	2.12
11	2.97	4.23	4.44	3.24	2.71	2.68	3.76	4.23	4.51	3.02	-	2.16
12	3.03	4.26	4.39	3.20	2.70	2.72	3.78	4.24	4.45	2.95	-	2.19
13	3.09	4.27	-	3.17	2.69	2.77	3.80	4.25	4.39	2.90	-	2.21
14	3.13	4.31	-	3.14	2.68	2.81	3.86	4.25	4.34	2.84	-	2.23
15	3.18	4.34	-	3.11	2.68	2.86	3.87	4.25	4.28	2.76	-	2.24
16	3.23	4.37	-	3.08	2.66	2.90	3.86	4.28	4.21	2.70	-	2.25
17	-	4.41	-	3.05	2.65	2.94	3.88	4.30	4.15	2.64	-	2.25
18	-	-	-	3.02	2.63	2.99	3.89	4.32	4.09	2.56	-	2.26
19	-	-	-	2.98	2.61	3.04	3.90	4.32	4.03	2.49	-	2.26
20	-	-	-	2.95	2.60	3.09	3.93	4.35	3.98	2.42	-	2.25
21	-	-	-	2.91	2.58	3.13	3.94	4.41	3.97	2.36	-	2.19
22	-	-	-	2.88	2.57	3.18	3.96	4.44	4.00	2.26	-	2.14
23	-	-	-	2.85	2.55	3.22	4.00	4.47	3.99	2.16	-	2.10
24	-	4.71	-	2.84	2.54	3.26	4.03	4.50	3.94	2.07	-	2.05
25	-	4.74	-	2.82	2.52	3.30	4.06	4.53	3.88	1.99	-	2.01
26	-	4.78	-	2.81	2.50	3.33	4.09	4.60	3.81	1.99	-	1.99
27	-	4.81	-	2.78	2.48	3.37	4.12	4.66	3.75	2.00	1.54	2.00
28	-	4.84	-	2.76	2.47	3.42	4.15	4.68	3.69	1.98	1.58	2.01
29	-	4.87	-	2.76	2.45	3.46	4.20	4.71	3.64	1.97	1.62	2.02
30	-	4.90	-	2.75	-------	3.51	4.22	4.73	3.56	1.91	1.67	2.04
31	-	-------	-	2.73	-------	3.54	-------	4.75	-------	1.89	1.72	-------

4441. Whitestone Creek near Tonasket, Wash.

Location.--Lat 48°47'05", long 119°26'00", in NE¼NE¼ sec.21, T.38 N., R.27 E., 1,000 ft above Greenaway Diversion and 6 miles north of Tonasket.

Drainage area.--39.5 sq mi.

Records available.--October 1958 to September 1960.

Gage.--Water-stage recorder. Artificial weir control since Mar. 31, 1960. Altitude of gage is 1,180 ft (from topographic map).

Extremes.--Maximum discharge during year, 8.3 cfs Dec. 3; maximum gage height, 6.74 ft Sept. 15; minimum, 0.1 cfs Apr. 27 to May 1.
1958-60: Maximum discharge, 25 cfs Jan. 9, 1959 (gage height, 7.27 ft); minimum, that of Apr. 27 to May 1, 1960.

Remarks.--Records good except those for period of no gage-height record, which are fair. Flow regulated by headworks on Whitestone Lake by Whitestone Water Users' Association. Some diversion for irrigation above station.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 4-12)

Oct. 1 to Mar. 31				Mar. 31 to Sept. 30			
5.7	0.1	6.0	2.5	6.17	0.1	6.5	3.0
5.8	.6	6.2	4.8	6.3	1.0	6.8	4.4
5.9	1.5	6.5	9.3	6.4	1.9	6.8	7.8

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	0.6	0.8	6.2	5.6	5.0	0.6	0.1	1.8	3.4	4.1	5.5
2	.8	.6	3.4	6.2	5.9	5.0	.4	2.9	1.8	3.3	4.1	5.5
3	.8	.7	*8.0	6.1	5.8	4.8	.3	1.8	1.7	3.3	4.3	5.6
4	.7	.7	7.4	5.9	5.8	4.8	.3	1.6	1.7	3.4	4.1	5.8
5	.6	.5	7.4	5.9	6.6	2.5	.3	1.7	2.8	3.6	4.1	5.8
6	.6	.5	7.6	5.9	6.1		.2	1.6	3.2	3.6	4.1	5.8
7	.6	*.5	7.4	*5.9	6.5		.6	1.6	3.6	3.6	4.0	6.2
8	.9	.5	7.4	5.9	5.9		4.1	1.6	3.7	*3.4	4.0	6.3
9	*.7	.4	7.4	5.9	5.9		2.6	1.6	3.6	3.4	3.8	6.5
10	.7	.4	7.2	5.9	5.9		2.4	1.5	*3.6	3.4	3.7	6.3
11	1.0	.4	7.2	5.9	5.8		1.8	1.5	3.6	3.6	*3.7	6.3
12	.9	.4	7.2	5.9	5.9		1.0	1.7	3.3	3.6	3.7	6.3
13	.8	.3	7.1	5.9	5.8		1.0	1.5	3.4	3.4	3.7	6.3
14	.8	.4	7.1	5.9	5.8		1.0	1.5	3.6	3.4	3.6	6.3
15	.8	.4	7.1	5.9	*5.8		1.0	*1.5	3.7	3.4	3.4	6.3
16	.7	.2	7.0	5.9	5.5		1.0	1.9	3.6	3.3	3.3	6.3
17	.7	.2	7.0	5.8	5.5		1.0	1.6	3.6	3.4	3.3	*6.3
18	.7	.3	7.0	5.8	5.5	.7	.9	1.5	3.3	3.8	3.2	6.3
19	.7	.4	6.8	5.8	5.4		.9	1.5	3.6	3.8	3.4	6.3
20	.7	.6	6.8	5.9	5.4		*.9	1.9	3.7	3.8	3.6	6.3
21	.7	1.0	6.8	5.9	5.4		.8	1.8	3.4	3.8	3.8	6.3
22	.8	1.0	6.8	5.9	5.4		.2	1.7	3.4	3.7	4.8	5.8
23	.7	1.0	6.6	5.9	5.2		.2	1.6	3.4	3.7	4.6	5.6
24	.7	1.0	6.6	5.8	5.2		.3	1.7	3.4	3.8	4.8	5.6
25	.7	1.0	6.5	5.8	5.2		.2	1.9	3.6	3.8	4.8	5.5
26	.7	1.0	6.4	5.6	5.1		.2	2.3	3.6	3.8	5.0	5.5
27	.7	.8	6.4	5.6	5.1		.1	1.9	3.4	4.0	5.0	5.5
28	.6	.9	6.4	5.6	5.1		.1	1.8	3.4	4.0	5.2	5.5
29	.6	.8	6.4	5.8	5.0		.1	1.8	3.4	4.0	5.2	5.5
30	.6	.8	6.2	5.8	-------		.1	1.8	3.3	4.1	5.2	5.5
31	.6	-------	6.2	5.6	-------	*.6	-------	1.8	-------	4.1	5.3	-------
Total	22.4	18.3	205.6	181.8	163.1	40.2	24.6	52.2	97.2	112.7	128.7	178.6
Mean	0.72	0.61	6.63	5.86	5.62	1.30	0.82	1.68	3.24	3.64	4.15	5.95
Ac-ft	44	36	408	361	324	80	49	104	193	224	255	354

Calendar year 1959: Max 14.5 Min 0.2 Mean 4.08 Ac-ft 2,960
Water year 1959-60: Max 8.0 Min 0.1 Mean 3.35 Ac-ft 2,430

* Discharge measurement made on this day.
Note.--No gage-height record Feb. 17 to Mar. 30; discharge estimated on basis of recorded range in stage and records for Whitestone Lake.

4450. Okanogan River near Tonasket, Wash.

(International gaging station)

Location.--Lat 48°38'00", long 119°27'50", in lot 3, sec.8, T.36 N., R.27 E., on right bank 1,000 ft upstream from Chewilken Creek and 5½ miles south of Tonasket.

Drainage area.--7,270 sq mi, approximately.

Records available.--April 1929 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 860.78 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--31 years, 2,975 cfs (2,154,000 acre-ft per year).

Extremes.--Maximum discharge during year, 14,100 cfs June 5 (gage height, 13.46 ft); minimum, 852 cfs Aug. 21 (gage height, 4.78 ft).
1929-60: Maximum discharge, 40,900 cfs May 31, 1948 (gage height, 21.79 ft, from floodmark); minimum recorded, 126 cfs Sept. 5, 1931 (gage height, 3.43 ft).

Remarks.--Records excellent except those for periods of ice effect, which are fair. Diversions above station for irrigation of about 10,700 acres in the United States and 45,580 acres in Canada. Flow affected by regulation of Okanagan and Skaha Lakes and by natural storage in other lakes. Some diurnal fluctuation at low flow caused by powerplant on Similkameen River.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Revisions (water years).--WSP 862: 1937. WSP 1216: Drainage area: WSP 1316: 1934(M), 1938(M).

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 26, 27)

Oct. 1 to Mar. 27				Mar. 28 to Sept. 30			
5.0	1,120	9.0	5,750	4.8	865	10.0	7,000
6.0	1,880	11.0	9,440	6.0	1,720	12.0	10,800
7.0	2,940			8.0	3,920	14.0	15,400

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,460	3,350	4,070	2,300	1,950	1,150	2,210	3,370	7,880	5,300	1,210	1,080
2	2,370	3,430	3,910	2,200	1,900	1,100	2,130	*3,760	8,560	5,070	1,280	1,070
3	2,290	3,430	*3,830	2,100	1,850	1,050	2,110	4,210	11,300	4,670	1,260	1,070
4	2,300	3,500	3,780	2,000	1,800	1,160	2,220	4,460	13,200	4,360	1,260	1,070
5	2,280	3,480	3,620	2,000	1,850	1,130	2,710	4,880	14,000	4,130	1,240	1,080
6	*2,180	3,180	3,450	2,000	1,900	1,170	3,290	5,450	12,600	3,980	1,240	1,050
7	2,080	*3,180	3,440	2,100	1,950	1,190	3,760	6,090	12,300	3,820	1,190	1,030
8	2,000	3,140	3,340	*2,150	1,880	1,190	4,120	6,680	11,100	3,710	1,150	1,080
9	*1,960	3,010	3,240	2,100	1,860	1,240	4,800	6,470	10,000	3,560	1,100	1,080
10	1,970	2,880	2,960	2,000	1,870	1,320	5,620	6,240	*9,720	*3,330	1,050	1,040
11	2,110	2,810	2,960	1,950	1,850	1,300	5,570	7,110	9,820	3,030	1,030	1,020
12	2,040	2,740	3,080	1,900	1,830	1,270	5,290	9,440	10,000	2,790	1,010	1,000
13	2,480	2,700	3,070	1,900	1,790	1,250	4,940	12,000	10,100	2,620	984	977
14	3,080	2,480	2,950	1,850	1,780	1,220	4,710	12,200	9,880	2,480	*963	949
15	3,070	2,000	2,890	1,900	1,780	1,130	4,540	10,700	9,700	2,390	914	949
16	3,740	1,800	3,210	1,900	*1,760	1,110	4,310	*9,760	9,380	2,320	900	928
17	3,570	1,900	3,470	1,800	1,700	1,120	4,060	9,420	9,060	2,170	893	907
18	3,220	2,030	3,240	1,700	1,640	1,130	3,920	8,850	8,980	2,060	907	*893
19	3,060	2,110	3,080	1,600	1,560	1,240	3,760	8,100	7,940	1,990	900	886
20	2,870	2,390	3,060	1,500	1,520	1,300	3,650	7,540	7,270	1,870	886	886
21	2,740	2,630	2,950	1,450	1,520	1,250	*3,510	7,310	6,680	1,780	865	872
22	2,660	2,980	2,890	1,500	1,510	1,140	3,400	6,970	6,100	1,700	886	914
23	2,590	3,230	2,780	1,600	1,480	1,160	3,290	6,560	5,770	1,620	886	984
24	2,670	3,320	2,710	1,700	1,460	1,230	3,270	6,180	5,720	1,540	893	984
25	2,830	4,460	2,770	1,800	1,430	1,350	3,150	5,990	6,050	1,470	921	1,000
26	4,800	5,860	2,820	*1,900	1,400	1,510	3,100	5,910	6,220	1,410	949	1,010
27	4,390	4,860	2,700	1,950	1,370	1,690	3,040	5,910	5,890	1,350	963	1,010
28	3,860	4,400	2,570	2,000	1,320	*1,950	2,980	5,960	5,540	1,330	963	998
29	3,690	4,320	2,520	2,000	1,250	2,080	3,040	5,830	5,410	1,240	963	991
30	3,580	4,210	2,510	1,950	-------	2,260	3,150	5,990	5,350	1,230	956	970
31	3,390	-------	2,400	1,950	-------	2,260	-------	6,680	-------	1,210	991	-------
Total	88,330	95,810	96,270	58,750	48,760	41,650	109,650	216,020	261,520	81,530	31,603	29,778
Mean	2,849	3,194	3,105	1,895	1,681	1,344	3,655	6,968	8,717	2,630	1,019	993
Ac-ft	175,200	190,000	190,900	116,500	96,710	82,610	217,500	428,500	518,700	161,700	62,680	59,060

Calendar year 1959: Max 21,400 Min 640 Mean 4,542 Ac-ft 3,288,000
Water year 1959-60: Max 14,000 Min 865 Mean 3,168 Ac-ft 2,300,000

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 15-17, Dec. 31 to Feb. 6, Mar. 1-3.

4473. Okanogan River near Malott, Wash.

Location.--Lat 48°14'20", long 119°43'50", in SE¼ sec.30, T.32 N., R.25 E., on left bank 2 miles downstream from Chilliwist Creek, 4 miles southwest of Malott, and 13 miles upstream from mouth.

Drainage area.--8,210 sq mi, approximately.

Records available.--April 1958 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, supplementary adjustment of 1947.

Extremes.--Maximum discharge during year, 14,100 cfs June 5 (elevation, 788.03 ft); minimum, 908 cfs Aug. 22 (elevation, 778.98 ft).
1958-60: Maximum discharge, 21,400 cfs June 6, 1959 (elevation, 791.28 ft); minimum, 610 cfs Aug. 27, 1958 (elevation, 778.54 ft).

Remarks.--Records excellent except those for periods of ice effect, which are fair. Diversions above station for irrigation of about 15,000 acres in the United States and 45,580 acres in Canada. Flow affected by regulation of Okanagan and Skaha Lakes, and by natural storage in other lakes.

Rating tables, water year 1959-60, except periods of ice effect (elevation, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 10		Feb. 11 to Sept. 30			
780.0	1,700	779.0	920	784.0	6,860
781.0	2,780	780.0	1,660	786.0	10,300
783.0	5,500	782.0	3,910	788.0	14,000

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,610	3,460	4,360	2,400	2,000	1,300	2,320	3,240	7,230	5,260	1,250	1,090
2	2,540	3,440	4,220	2,300	1,950	1,200	2,260	3,500	8,180	5,150	1,260	1,130
3	2,450	3,520	4,080	2,200	1,900	1,150	2,210	3,900	9,870	4,800	1,320	1,130
4	2,420	3,520	*3,990	*2,100	1,850	1,100	2,190	4,240	12,700	4,380	1,290	1,140
5	2,430	3,640	3,750	2,050	1,900	1,200	2,460	4,450	13,900	4,180	1,290	1,130
6	2,360	3,440	3,600	2,050	2,000	1,290	2,910	4,940	13,200	4,000	1,280	1,140
7	2,280	3,220	3,510	2,100	2,000	1,340	3,450	5,500	12,300	3,830	1,270	1,110
8	2,200	3,290	3,480	*2,100	1,950	1,350	3,790	6,190	11,900	3,680	1,240	1,110
9	2,120	*3,200	3,380	2,100	1,900	1,370	4,260	6,460	10,800	3,560	1,190	1,150
10	*2,090	3,090	3,180	2,050	1,900	1,340	5.040	6,170	10,100	3,410	1,130	1,130
11	2,210	3,020	3,030	2,000	1,960	1,310	5,480	6,360	*10,000	*3,180	1,100	1,110
12	2,230	2,960	3,080	1,950	1,910	1,280	5,240	8,080	10,200	2,940	1,070	1,090
13	2,210	2,910	3,180	1,900	1,890	1,270	4,970	10,800	10,300	2,780	1,050	1,060
14	3,010	2,770	3,120	1,900	1,870	1,250	4,720	12,400	10,200	2,620	*1,020	1,040
15	3,160	2,520	3,020	1,900	*1,860	1,200	4,510	11,400	10,000	2,510	1,010	1,020
16	3,380	2,100	3,020	1,950	1,840	1,130	4,310	*10,200	9,740	2,460	966	998
17	3,880	2,000	3,470	1,900	1,820	1,130	4,080	9,560	9,340	2,350	946	985
18	3,510	2,000	3,440	1,800	1,760	1,180	3,920	9,130	9,380	2,230	933	*978
19	3,250	2,100	3,180	1,700	1,700	1,250	*3,770	8,450	8,450	2,140	940	972
20	3,120	2,300	3,130	1,600	1,640	1,350	3,650	7,740	7,670	1,920	933	978
21	2,980	2,600	3,080	1,550	1,600	1,400	3,550	7,440	7,080	1,920	920	972
22	2,860	3,000	2,980	1,500	1,600	1,360	3,460	7,210	6,480	1,840	920	972
23	2,780	3,310	2,940	1,600	1,580	*1,220	3,390	6,810	5,980	1,750	926	1,020
24	2,770	3,380	2,860	1,700	1,570	1,210	3,300	6,400	5,750	1,660	933	1,060
25	2,820	3,770	2,840	1,800	1,550	1,320	3,260	6,140	5,870	1,580	940	1,060
26	3,780	5,470	2,860	1,900	1,500	1,450	3,170	6,010	6,170	1,510	978	1,080
27	4,810	5,420	2,800	2,000	1,490	1,580	3,110	6,060	6,110	1,470	1,010	1,110
28	4,160	4,680	2,680	2,050	1,450	1,830	3,050	6,080	5,620	1,400	1,030	1,110
29	3,830	4,510	2,600	2,050	1,400	2,060	3,030	6,060	5,420	1,360	1,040	1,080
30	3,740	4,500	2,500	2,000	-------	2,260	3,080	5,980	5,300	1,290	1,050	1,060
31	3,610	-------	2,500	2,000	-------	2,340	-------	6,300	-------	1,280	1,050	-------
Total	91,600	99,140	99,860	60,200	51,340	43,020	107,940	215,200	265,240	84,440	33,285	32,015
Mean	2,955	3,305	3,221	1,942	1,770	1,388	3,598	6,877	8,841	2,724	1,074	1,067
Ac-ft	181,700	196,600	198,100	119,400	101,800	85,330	214,100	422,900	526,100	167,500	66,020	63,500

Calendar year 1959: Max 21,100 Min 700 Mean 4,663 Ac-ft 3,376,000
Water year 1959-60: Max 13,900 Min 920 Mean 3,228 Ac-ft 2,343,000

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 16-22, Dec. 29 to Feb. 10, Mar. 1-5.

4495. Methow River at Twisp, Wash.

Location.--Lat 48°21'40", long 120°06'50", in NW¼ sec.17, T.33 N., R.22 E., on left bank a quarter of a mile downstream from Twisp River and 0.3 mile east of center of Twisp.

Drainage area.--1,330 sq mi, approximately.

Records available.--June 1919 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 1,580 ft (from topographic map). Prior to Oct. 3, 1919, several staff gages in the immediate vicinity at different datum. Oct. 3, 1919, to Sept. 30, 1929, and Oct. 31 to Nov. 6, 1933, chain gage on road bridge 40 ft upstream at same datum as staff gages. Nov. 7 to Dec. 18, 1933, staff gage at present site at different datum.

Average discharge.--41 years, 1,335 cfs (966,500 acre-ft per year).

Extremes.--Maximum discharge during year, 11,000 cfs June 4 (gage height, 7.03 ft); minimum, 232 cfs Sept. 20 (gage height, 1.45 ft).
1919-29, 1933-60: Maximum discharge, 40,800 cfs May 29, 1948 (gage height, 12.94 ft in gage well), from rating curve extended above 18,000 cfs on basis of slope-area measurement of peak flow; minimum observed, 134 cfs Sept. 4, 5, 1926, Sept. 9, 10, 1929, but may have been less during period of ice effect Jan. 6 to Mar. 4, 1937.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. A large part of the flow diverted above station for irrigation by two canals of Methow Valley Irrigation District, by Risley ditch, and by many other smaller ditches. Diversions for irrigation of 7,410 acres above station (1946 estimate).

Revisions (water years).--WSP 512: Drainage area. WSP 1316: 1921(M), 1928(M), 1934.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 23		Nov. 24 to Sept. 30			
2.2	670	1.4	209	3.0	1,660
2.6	1,090	2.0	540	5.0	5,640
3.2	2,120	2.5	940	7.0	10,900

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,020	1,450	1,230	580	451	300	*1,320	1,880	4,550	3,790	693	336
2	1,010	1,400	1,170	560	445	300	1,290	2,160	5,660	3,270	709	364
3	1,020	1,300	1,120	560	433	300	1,380	2,420	9,500	3,020	701	364
4	1,010	1,250	*1,060	560	427	320	1,580	2,520	9,810	2,970	693	358
5	959	1,200	1,020	560	433	353	1,860	2,660	7,910	2,970	678	353
6	937	1,200	990	560	427	347	2,080	3,060	7,780	2,910	632	353
7	893	1,150	950	560	433	342	2,540	3,430	*6,680	*2,970	603	347
8	926	*1,080	913	560	427	336	3,240	3,380	5,920	2,800	568	336
9	959	1,050	895	*554	415	331	3,660	3,240	5,920	2,400	540	320
10	893	1,010	886	547	409	331	3,430	3,560	6,390	2,100	*501	304
11	926	959	877	534	404	331	3,160	5,080	7,100	1,900	488	299
12	1,020	937	868	520	404	331	2,880	5,670	7,200	1,780	457	289
13	1,070	733	833	534	400	326	2,680	*8,320	6,940	1,740	445	274
14	1,160	690	824	540	400	326	2,480	6,360	6,680	1,800	439	264
15	1,870	660	1,160	520	390	331	2,240	5,390	6,120	1,640	427	259
16	1,900	610	1,240	514	380	331	2,060	4,990	5,760	1,530	415	259
17	1,740	682	1,090	508	380	336	1,940	4,360	5,320	1,470	398	254
18	1,650	760	1,040	460	*381	342	1,840	3,880	4,470	1,420	386	250
19	1,580	780	990	430	381	353	1,780	3,540	4,060	1,370	398	*245
20	1,510	820	960	460	375	375	*1,700	3,380	3,620	1,270	375	236
21	1,460	871	931	514	375	427	1,620	3,150	3,250	1,190	347	236
22	1,500	840	904	482	369	534	1,560	2,880	3,160	1,100	358	240
23	1,700	1,290	877	482	364	678	1,560	2,710	3,470	1,010	358	240
24	2,100	1,490	868	482	364	833	1,530	2,560	4,260	950	364	236
25	2,000	1,900	842	482	358	1,220	1,490	2,520	4,340	868	358	240
26	1,900	1,700	790	475	353	1,720	1,450	2,500	3,690	816	353	240
27	1,800	1,530	710	469	326	1,780	1,420	2,600	3,560	782	353	240
28	1,700	1,450	660	457	310	1,640	1,440	2,460	3,660	774	342	240
29	1,600	1,380	650	463	305	1,560	1,490	2,620	3,840	733	342	245
30	1,550	1,290	640	457	-------	1,510	1,640	3,090	4,040	717	342	254
31	1,500	-------	610	445	-------	1,420	-------	4,060	-------	717	336	-------
Total	42,863	33,462	28,598	15,829	11,319	19,964	60,340	113,430	164,660	54,777	14,399	8,475
Mean	1,383	1,115	923	511	390	644	2,011	3,659	5,489	1,767	464	282
Ac-ft	85,020	66,370	56,720	31,400	22,450	39,600	119,700	225,000	326,600	108,600	28,560	16,810

Calendar year 1959: Max 10,200 Min 300 Mean 1,934 Ac-ft 1,400,000
Water year 1959-60: Max 9,810 Min 236 Mean 1,552 Ac-ft 1,127,000

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 22 to Nov. 7, Feb. 13-17; discharge estimated on basis of recorded range in stage, weather records, and records for station near Pateros. Stage-discharge relation affected by ice Nov. 14-17, Dec. 27 to Jan. 8, Jan. 18-20, Feb. 28 to Mar. 4.

4496. Beaver Creek below South Fork, near Twisp, Wash.

Location.--Lat 48°25'45", long 120°01'10", in center sec.24, T.34 N., R.22 E., on right bank 300 ft downstream from South Fork Beaver Creek and 6½ miles northeast of Twisp.

Drainage area.--58 sq mi, approximately.

Records available.--April to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,800 ft (from topographic map).

Extremes.--Maximum discharge during period, 166 cfs May 12 (gage height, 5.96 ft); minimum, 6.9 cfs Sept. 19 (gage height, 4.65 ft).

Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation or diversion above station.

Rating table, Apr. 1 to Sept. 30, 1960 (gage height, in feet, and discharge, in cubic feet per second)

4.6	5.7	5.2	45
4.7	9.9	5.5	82
4.9	20	6.0	175

Discharge, in cubic feet per second, April to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							14.5	33	87	35	15.5	9.4
2							15	34	100	34	15.5	9.4
3							17	43	98	32	14.5	8.9
4							22	45	87	32	14.5	9.9
5							25	50	84	30	14	9.9
6							26	56	79	29	13	9.4
7							32	64	*74	*28	12.6	8.9
8							36	60	72	27	12	8.9
9							33	64	71	26	11.5	8.5
10							30	79	69	25	*11.5	8.1
11							28	113	68	25	11.5	8.1
12							26	*145	64	24	11	7.7
13							25	108	64	23	11	7.7
14							23	98	62	22	10.5	8.1
15							22	93	61	22	10.5	7.7
16							23	93	58	21	10.5	7.3
17							22	82	55	20	10	7.3
18							21	78	53	18.5	9.5	7.3
19							21	75	52	18	9.5	*7.3
20							*21	75	49	17.5	10	7.3
21							21	71	48	17	10.5	7.5
22							20	68	47	16.5	14	7.5
23							22	67	46	16	11.5	8.0
24							22	67	44	16	11	8.5
25							21	71	42	15.5	11	8.0
26							21	75	41	15	11	7.5
27							22	74	42	14.5	11.5	7.0
28							24	72	40	14	10.5	7.0
29							25	76	38	13.5	10.5	7.0
30					------		31	82	36	13.5	9.4	7.5
31		------			------		------	85	------	15	9.9	------
Total							711.5	2,296	1,831	675.5	359.3	242.6
Mean							23.7	74.1	61.0	21.8	11.6	8.09
Cfsm							0.409	1.28	1.05	0.376	0.200	0.139
In.							0.46	1.47	1.17	0.43	0.23	0.16
Ac-ft							1,410	4,550	3,630	1,340	713	481

Calendar year	: Max	Min	Mean	Cfsm	In.	Ac-ft
Water year	: Max	Min	Mean	Cfsm	In.	Ac-ft

Peak discharge (base, 80 cfs).--May 12 (8 a.m.) 166 cfs (5.96 ft); June 2 (7 p.m.) 120 cfs (5.73 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Aug. 15-22, Sept. 21-30; discharge estimated on basis of recorded range in stage, weather records, and records for station near Twisp.

4497. Beaver Creek near Twisp, Wash.

Location.--Lat 48°23'50", long 120°02'20", in SE¼ sec.35, T.34 N., R.22 E., on left bank 3 miles downstream from South Fork and 4 miles northeast of Twisp.

Drainage area.--62 sq mi, approximately.

Records available.--May 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,250 ft (from topographic map).

Extremes.--Maximum discharge during year, 160 cfs May 11 (gage height, 2.38 ft); maximum gage height, 2.63 ft Jan. 3 (backwater from ice); minimum discharge, 3.1 cfs Nov. 13 (gage height, 1.27 ft), result of freezeup.
1956-60: Maximum discharge, 966 cfs May 18, 1957; maximum gage height, 3.35 ft May 16, 1956; minimum discharge, that of Nov. 13, 1959.

Remarks.--Records good except those for periods of ice effect, which are fair. No regulation. Several small diversions for irrigation above station.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 11				May 11 to Sept. 30			
1.2	2.2	1.6	23	1.2	5.0	1.6	24
1.3	4.3	1.8	49	1.3	8.1	1.8	49
1.4	7.8	2.0	83	1.4	12	2.0	89
1.5	14.5	2.3	148	1.5	16.5	2.2	142

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14.5	13.5	10.5	8.5	8.9	9.0	15	35	96	34	14	9.5
2	13.5	13.5	11.5	8.0	9.5	8.0	15	39	106	32	14.5	9.5
3	13.5	13.5	11	8.0	8.9	7.5	20	48	109	30	13.5	9.1
4	12.5	10.5	11	8.5	8.9	7.5	25	52	99	28	13	9.5
5	12.5	8.3	*11	9.0	8.9	7.8	30	55	94	27	13	9.5
6	12	11.5	11	10	8.9	7.8	31	65	92	25	12.5	9.1
7	12.5	10	11	10	8.9	7.8	39	72	*78	*23	12.5	8.8
8	13.5	*12.5	10	9.5	8.9	7.8	45	69	71	22	12	8.4
9	14.5	12.5	10	*9.5	8.9	7.8	42	70	71	22	11.5	8.1
10	13.5	12	10	9.0	8.9	7.8	35	91	67	21	*11	8.1
11	16	13.5	11.5	9.0	8.9	7.3	33	135	65	21	11	8.1
12	16	8.3	11.5	9.0	8.9	7.3	29	*131	63	21	10.5	7.7
13	16.5	5.1	11	8.9	8.9	7.3	28	117	65	20	10.5	8.4
14	18.5	5.0	11.5	8.9	8.9	7.3	27	109	61	19.5	10.5	8.4
15	20	4.5	12	8.9	8.9	7.3	24	104	61	18.5	10.5	8.1
16	16.5	4.0	12	8.9	8.9	7.3	23	104	60	18	10.5	7.7
17	15	5.0	11.5	8.9	8.5	7.3	23	94	56	17.5	9.9	7.4
18	15	7.0	11.5	8.9	*8.5	7.8	22	87	54	16.5	9.5	7.4
19	14.5	12	11.5	8.3	8.9	8.9	22	82	52	15.5	9.1	7.1
20	16	15	11.5	8.3	8.9	9.5	*22	82	50	15	9.1	7.1
21	15	13.5	11.5	8.3	8.9	12	21	80	50	14	9.5	7.4
22	16	12	11.5	8.3	8.9	17.5	20	71	49	13	12.5	7.4
23	14.5	14.5	11.5	8.3	8.5	19.5	22	69	49	13	11	7.7
24	15	13.5	11.5	8.9	8.9	25	21	67	46	13.5	10.5	7.7
25	16	13.5	12	8.9	8.9	29	20	71	44	13.5	10.5	7.4
26	14.5	11.5	11	8.9	8.0	28	20	80	44	13.5	10.5	6.8
27	13.5	11	10	8.9	7.0	24	22	80	46	13	10.5	6.5
28	14.5	11.5	9.5	8.9	8.0	19.5	25	76	41	12.5	10.5	6.5
29	12.5	10.5	9.5	8.9	8.0	18.5	25	82	37	12.5	10.5	6.5
30	12.5	10.5	9.2	8.9	------	17.5	31	92	36	12.5	9.9	6.8
31	13.5	------	9.0	8.9	------	*15	------	94	------	13	9.9	------
Total	454.0	319.2	338.7	274.1	252.9	381.6	777	2,503	1,912	590.5	344.4	237.7
Mean	14.6	10.6	10.9	8.84	8.72	12.3	25.9	80.7	63.7	19.0	11.1	7.92
Cfsm	0.235	0.171	0.176	0.143	0.141	0.198	0.418	1.30	1.03	0.306	0.179	0.128
In.	0.27	0.19	0.20	0.16	0.15	0.23	0.47	1.50	1.15	0.35	0.21	0.14
Ac-ft	900	633	672	544	502	757	1,540	4,960	3,790	1,170	683	471

Calendar year 1959: Max 157 Min 4.0 Mean 28.6 Cfsm 0.461 In. 6.25 Ac-ft 20,740
Water year 1959-60: Max 135 Min 4.0 Mean 22.9 Cfsm 0.369 In. 5.02 Ac-ft 16,620

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 14-19, 27, Dec. 3-10, 13, Dec. 26 to Jan. 12, Feb. 17, 18, 23, Feb. 26 to Mar. 4.

4499.5. Methow River near Pateros, Wash.

Location.--Lat 48°04'40", long 119°59'00", in SE¼SW¼ sec.20, T.30 N., R.23 E., on right bank 1.2 miles downstream from Black Canyon Creek and 4 miles northwest of Pateros.

Drainage area.--1,780 sq mi, approximately.

Records available.--April 1959 to September 1960.

Gage.--Staff gage read once daily. Altitude of gage is 900 ft (from topographic map).

Extremes.--Maximum discharge observed during year, 10,800 cfs May 12 (gage height, 8.40 ft); minimum observed, 364 cfs Sept. 21 (gage height, 2.79 ft).
1959-60: Maximum discharge, 12,400 cfs June 4, 1959 (gage height, 8.86 ft); minimum, that of Sept. 21, 1960.
Maximum discharge known, 46,700 cfs May 29, 1948, from slope-area measurement of peak flow at site 1 mile downstream.

Remarks.--Records good except those for periods of ice effect or doubtful or no gage-height record, which are fair. No regulation. Diversions for irrigation of about 11,000 acres above station (1959 Bureau of Reclamation land classification).

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 1				June 2 to Sept. 30			
2.7	340	5.0	2,540	2.7	305	5.0	2,720
3.3	700	6.0	4,240	3.3	730	6.0	4,650
4.0	1,320	8.0	9,450	4.0	1,380	8.1	10,600

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,180	1,600	1,460	700	565	380	1,660	a2,200	4,680	4,610	a900	520
2	1,140	1,520	1,400	660	553	370	1,680	a2,400	9,760	3,880	913	512
3	1,140	1,490	1,370	650	553	370	1,750	2,660	10,300	3,780	1,000	505
4	1,010	1,340	1,300	650	535	380	1,780	a2,800	10,100	3,620	940	498
5	1,020	1,300	*1,180	660	529	400	1,950	a3,000	9,490	3,490	895	498
6	1,040	1,280	1,200	670	517	428	2,200	a3,200	*9,490	*3,410	a860	491
7	1,030	1,270	1,140	670	517	423	2,480	3,500	9,160	3,390	818	498
8	1,050	1,240	1,100	660	499	423	3,050	3,520	7,290	3,370	770	484
9	1,070	*1,190	1,070	670	493	428	3,680	3,470	6,960	2,880	762	491
10	1,050	1,020	1,060	*686	487	423	3,680	3,570	7,290	2,420	738	484
11	a1,050	994	1,070	679	487	418	3,360	4,520	8,170	2,380	a660	477
12	a1,050	967	1,030	686	481	412	3,180	9,180	8,320	2,340	a630	477
13	a1,050	889	1,010	686	481	412	2,860	*9,240	8,290	2,240	a610	470
14	a1,100	855	940	679	481	412	2,810	7,170	a7,930	2,160	a590	463
15	a1,300	839	1,030	672	481	423	2,540	6,050	7,070	2,080	a580	463
16	a2,000	745	1,140	672	469	428	2,510	a5,600	6,680	2,000	a570	449
17	a1,900	720	1,330	679	*463	434	2,230	4,730	6,630	1,870	a560	409
18	1,760	750	1,230	640	463	451	*2,130	4,360	5,460	1,790	a540	383
19	1,750	800	1,200	600	463	469	2,130	a4,280	4,720	1,770	a530	376
20	1,620	850	1,190	570	457	487	2,050	3,720	4,470	1,650	a520	*370
21	1,300	906	1,140	610	451	541	2,000	3,570	3,960	1,560	a500	364
22	1,530	914	1,130	679	445	665	1,960	3,300	3,760	1,450	a500	370
23	1,640	1,370	1,120	686	440	*914	1,900	3,060	3,920	1,340	a510	376
24	1,880	1,630	1,100	686	451	1,990	1,870	2,870	4,650	1,200	a520	376
25	2,210	2,010	1,060	672	434	1,930	1,840	2,840	4,720	1,160	a520	370
26	2,130	2,030	940	637	440	1,830	1,880	2,780	4,500	1,080	a510	370
27	2,100	1,980	906	630	434	1,900	1,860	2,840	4,210	1,020	a500	370
28	1,990	1,720	864	604	423	1,840	1,870	2,970	4,170	a1,000	a500	376
29	1,760	1,620	807	598	400	1,780	1,890	a3,160	4,650	a960	a500	376
30	1,700	1,540	770	598	------	1,760	2,050	4,090	4,670	a920	a500	370
31	1,640	------	730	565	------	1,640	------	4,240	------	a920	a500	------
Total	45,190	37,379	34,017	20,204	13,892	25,161	68,830	124,890	195,470	67,740	19,946	13,036
Mean	1,458	1,246	1,097	652	479	812	2,294	4,029	6,516	2,185	643	435
Ac-ft	89,630	74,140	67,470	40,070	27,550	49,910	136,500	247,700	387,700	134,400	39,560	25,860

Calendar year 1959: Max - Min - Mean - Ac-ft -
Water year 1959-60: Max 10,300 Min 364 Mean 1,819 Ac-ft 1,320,000

* Discharge measurement made on this day.
a Doubtful or no gage-height record; discharge estimated on basis of weather records and records for station at Twisp.
Note.--Stage-discharge relation affected by ice Nov. 17-20, Dec. 30 to Jan. 6, Jan. 18-21, Feb. 29 to Mar. 5.

4500. Alta Lake near Pateros, Wash.

Location.--Lat 48°01'30", long 119°56'30", in SW¼NE¼ sec.10, T.29 N., R.23 E., on west shore 2½ miles southwest of Pateros.

Drainage area.--4.03 sq mi.

Records available.--November 1954 to September 1960 (fragmentary).

Gage.--Staff gage read occasionally. Altitude of gage is 1,175 ft (from topographic map).

Extremes.--Maximum gage height observed during year, 12.73 ft May 28, June 3; minimum observed, 11.30 ft Sept. 30.
1954-60: Maximum gage height observed, that of May 28, June 3, 1960; minimum observed, 6.16 ft Nov. 17, 1955.
Revisions.--The figure of maximum gage height observed for the water year 1959 has been revised to 12.55 ft June 2, 6, 1959, superseding that published in WSP 1636.

Remarks.--Small diversion for irrigation. No known regulation. Lake has no natural surface outlet.

Revisions (water years).--WSP 1716: 1959. Revised figures of gage height for the water year 1959, superseding those published in WSP 1636, are given herewith:

Date	Gage height	Date	Gage height	Date	Gage height	Date	Gage height	Date	Gage height
1959		1959-Con.		1959-Con.		1959-Con.		1959-Con.	
May 9	12.32	June 17	12.52	July 9	12.34	Aug. 14	11.82	Sept. 3	11.56
11	12.32	18	12.52	11	12.33	15	11.80	9	11.48
12	12.32	19	12.52	14	12.30	16	11.80	11	11.49
16	12.42	20	12.52	16	12.26	17	11.77	16	11.55
23	12.50	21	12.52	18	12.24	18	11.75	19	11.60
27	12.53	23	12.51	19	12.23	20	11.72	21	11.60
28	12.53	25	12.48	21	12.22	21	11.72	22	11.61
30	12.54	27	12.46	25	12.15	22	11.70	26	11.61
31	12.54	29	12.48	26	12.14	28	11.62	27	11.61
June 2	12.55	30	12.47	27	12.12	29	11.61	28	11.59
6	12.55	July 2	12.47	Aug. 4	11.99	30	11.59	29	11.58
7	12.54	4	12.42	8	11.90	31	11.58		
11	12.54	6	12.38	9	11.88	Sept. 1	11.58		
13	12.54	8	12.36	13	11.82	2	11.57		

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	11.52	11.54	-	-	-	-	12.44	12.71	12.49	12.01	11.52
2	11.57	11.52	11.53	-	-	-	-	-	12.72	12.47	-	11.51
3	11.56	11.52	11.53	11.50	-	-	12.06	-	12.73	-	11.97	11.51
4	-	11.52	-	-	-	-	-	12.52	12.71	-	11.97	11.51
5	-	-	11.52	-	-	-	-	12.54	12.71	12.43	11.95	-
6	11.55	11.51	11.52	-	-	-	-	-	12.71	12.42	-	11.49
7	-	11.51	-	-	-	-	-	-	-	12.41	-	11.54
8	11.55	11.50	-	-	-	-	-	12.59	12.70	12.40	-	-
9	11.56	11.50	-	11.50	-	-	12.11	12.59	12.69	12.38	11.88	-
10	11.55	-	-	-	-	-	-	-	-	12.36	11.88	-
11	11.58	11.50	-	-	-	-	12.12	-	12.69	12.35	11.87	11.45
12	11.57	11.49	-	-	-	-	-	-	-	-	11.84	11.45
13	11.58	11.49	-	-	-	-	-	-	12.65	-	11.81	11.45
14	11.57	11.49	-	-	-	-	-	-	-	12.30	-	11.44
15	11.57	11.48	-	-	-	11.93	-	-	-	12.28	11.75	-
16	11.57	11.48	11.52	-	-	-	12.16	12.63	-	12.27	11.74	11.43
17	11.56	11.47	-	-	12.02	-	-	12.63	12.59	12.27	11.72	11.41
18	11.56	11.46	-	-	-	-	12.11	-	12.58	-	11.72	-
19	11.56	-	11.52	-	-	11.94	-	12.63	12.58	12.23	11.70	11.39
20	11.56	11.48	-	-	-	-	-	-	12.61	12.22	11.69	11.39
21	11.55	11.52	11.52	-	-	11.95	12.13	12.62	12.59	12.21	-	-
22	11.56	11.54	-	-	-	-	-	-	-	-	-	11.36
23	11.56	11.55	-	-	-	11.96	12.27	-	-	12.17	11.63	11.35
24	11.56	-	-	-	-	-	-	-	12.58	12.12	-	11.33
25	11.56	11.55	11.57	-	-	-	-	12.69	12.10	12.10	11.61	-
26	11.55	11.55	11.57	-	-	11.98	12.37	-	-	-	11.59	11.33
27	11.55	-	-	-	-	12.01	12.39	12.71	-	-	11.59	11.32
28	11.54	-	-	-	-	-	-	12.73	-	12.06	-	-
29	11.54	-	-	-	-	-	12.43	-	12.51	12.05	-	11.31
30	11.53	11.54	-	-	-------	-	12.43	-	12.51	12.02	-	11.30
31	11.53	-------	11.54	-	-------	12.04	-------	-	-------	12.03	11.53	-------

4510. Stehekin River at Stehekin, Wash.

Location.--Lat 48°19'30", long 120°41'20", in SE¼ sec.26, T.33 N., R.17 E., on left bank 1,200 ft upstream from Boulder Creek, 1¾ miles upstream from Lake Chelan, and 2 miles northwest of Stehekin. Records include flow of Boulder Creek.

Drainage area.--372 sq mi, includes that of Boulder Creek.

Records available.--October 1910 to October 1915, October 1926 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 1,100 ft above mean sea level (unadjusted). Prior to Aug. 17, 1911, staff gage three-eighths of a mile upstream from mouth at Lake Chelan at different datums (datum change made June 13, 1911). Aug. 17, 1911, to Oct. 31, 1915, staff gage a quarter of a mile downstream from Boulder Creek at different datum.

Average discharge.--39 years, 1,406 cfs (1,018,000 acre-ft per year).

Extremes.--Maximum discharge during year, 10,300 cfs June 3 (gage height, 26.02 ft); minimum daily, 210 cfs Mar. 3; minimum gage height, 18.29 ft Mar. 13, 14, 16, 17.
1910-15, 1926-60: Maximum discharge, 18,900 cfs May 29, 1948 (gage height, 29.00 ft), from rating curve extended above 11,000 cfs on basis of slope-area measurement of peak flow; minimum, 56 cfs Jan. 21, 1930.

Remarks.--Records good except those for periods of no gage-height record or ice effect, which are fair. No regulation or diversion.

Cooperation.--Gage-height record collected in cooperation with, and one discharge measurement furnished by Public Utility District No. 1 of Chelan County.

Revisions (water years).--WSP 412: 1914. WSP 1316: 1911(M), 1914-15(M). WSP 1446: 1912(M).

Rating tables, water year 1959-60, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 15				Dec. 16 to Sept. 30			
19.3	600	22.0	2,940	18.2	189	21.0	1,960
20.0	1,020	24.0	5,940	18.5	293	22.0	3,110
21.0	1,880			19.0	507	24.0	6,200
				20.0	1,110	26.0	10,300

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,070	1,380	1,470	643	327	b225	1,050	1,900	4,500	4,220	2,230	780
2	1,060	1,270	1,350	626	323	b226	1,090	2,200	7,920	3,640	1,980	704
3	1,000	1,300	*1,270	600	308	b210	1,290	2,300	9,530	3,680	1,910	660
4	940	1,160	*1,160	580	297	240	1,550	2,200	7,600	4,080	1,760	786
5	880	1,050	1,080	560	308	243	1,860	2,300	5,710	4,420	1,660	931
6	826	999	1,010	540	304	243	2,150	2,600	5,930	4,830	1,610	762
7	760	929	950	527	316	240	2,600	3,400	4,700	5,070	1,620	680
8	802	887	887	512	304	229	3,270	3,100	4,140	4,340	1,650	605
9	850	830	810	497	297	226	3,400	3,100	4,320	3,510	1,640	574
10	749	780	750	482	293	222	2,860	3,400	4,960	3,140	1,650	584
11	1,050	740	700	468	286	222	2,480	4,500	5,540	2,930	1,700	626
12	1,990	710	670	449	289	222	2,170	7,000	5,490	2,900	1,510	692
13	1,730	680	640	440	289	219	1,950	5,000	5,440	3,510	1,300	780
14	3,030	660	900	436	297	219	1,760	4,000	5,070	3,740	1,090	834
15	4,060	640	3,200	422	301	222	1,590	3,500	*4,730	3,380	964	762
16	2,570	630	2,600	413	297	219	1,430	3,200	5,630	*3,290	905	687
17	2,040	620	2,300	400	293	222	1,350	3,000	4,540	3,400	1,090	626
18	1,760	610	2,000	379	282	230	1,260	2,700	3,530	3,750	1,120	589
19	1,580	700	1,700	359	271	240	1,190	2,500	3,110	3,670	1,100	626
20	1,480	850	1,500	359	268	280	1,190	2,500	2,680	3,210	970	626
21	1,390	1,000	1,300	355	279	400	1,120	2,200	2,380	2,790	892	543
22	3,000	1,300	1,150	350	268	500	1,080	2,000	2,510	2,470	804	497
23	2,400	3,000	1,050	340	261	600	1,090	2,000	3,510	2,120	732	527
24	4,330	5,400	950	339	261	800	1,080	1,950	4,610	1,830	676	553
25	4,530	4,910	900	339	*257	1,200	1,060	1,900	4,310	1,740	648	638
26	2,930	3,160	850	335	254	1,400	1,050	1,930	3,580	1,910	648	543
27	2,340	2,490	800	327	b220	1,500	*1,040	1,950	3,770	2,200	*594	497
28	2,000	2,100	760	327	b220	1,400	1,120	1,970	4,160	2,320	568	478
29	1,730	1,830	730	293	b220	1,300	1,280	2,150	4,750	2,460	1,040	468
30	1,560	1,630	700	339	------	1,200	1,600	2,810	4,930	2,320	834	*478
31	1,500	------	680	331	------	1,130	------	4,240	------	2,220	892	------
Total	57,937	44,245	36,817	13,367	8,190	16,029	49,010	89,500	143,580	99,090	37,787	19,116
Mean	1,869	1,475	1,188	431	282	517	1,634	2,887	4,786	3,196	1,219	637
Cfsm	5.02	3.97	3.19	1.16	0.758	1.39	4.39	7.76	12.9	8.59	3.28	1.71
In.	5.79	4.42	3.68	1.34	0.82	1.60	4.90	8.95	14.35	9.91	3.78	1.91
Ac-ft	114,900	87,760	73,030	26,510	16,240	31,790	97,210	177,500	284,800	196,500	74,950	37,920

Calendar year 1959: Max 8,480 Min 320 Mean 1,952 Cfsm 5.25 In. 71.20 Ac-ft 1,413,000
Water year 1959-60: Max 9,530 Min 210 Mean 1,679 Cfsm 4.51 In. 61.45 Ac-ft 1,219,000

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Oct. 3, 4, Nov. 9-24, Dec. 9-31, Jan. 4-6, 22, 23, Mar. 18-30, Apr. 25-27, Apr. 30 to May 26; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations.

4517. Antilon Lake Feeder System near Manson, Wash.

Location.--Lat 47°58'30", long 120°09'30", in SE¼ sec.26, T.29 N., R.21 E., on left bank at tunnel outlet, 500 ft upstream from Antilon Lake and 6 miles north of Manson.

Records available.--March 1958 to September 1960 (seasonal records only).

Gage.--Water-stage recorder. Altitude of gage is 2,500 ft (from topographic map).

Extremes.--1958-60: Maximum daily discharge, 68 cfs May 17-20, 1958; minimum daily determined, 0.5 cfs Sept. 26, Nov. 26-30, 1958, Apr. 11-16, 1959.

Remarks.--Records good. Flow at site represents total diversion from headwaters of 10 streams, which have a drainage area of 52 sq mi and are tributaries to Lake Chelan. Water stored in Antilon Lake is used for irrigation of 4,000 acres near Manson.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.5	5.5				-	4.4	19.5	22	40	18.5	9.8
2	8.2	5.5				-	7.9	20	26	40	18.5	8.6
3	8.0	5.5				-	9.8	19.5	26	37	18	8.5
4	7.7	-				-	12	19.5	28	36	17.5	9.2
5	7.4	-	†0.5			-	14.5	20	29	35	17	8.8
6	7.4	-				-	16.5	20	29	38	16	8.5
7	7.4	-				-	20	22	30	37	15.5	8.2
8	8.2	-				-	26	22	34	34	15	7.9
9	8.5	-				-	36	14	*37	33	14.5	7.9
10	7.7	-				-	37	9.8	36	32	14	7.3
11	8.5	-				-	34	14	36	32	14	7.3
12	8.8	-				-	33	16	37	32	13.5	7.0
13	9.4	-				-	32	13	43	31	13	7.0
14	10	-				-	30	8.2	47	29	13	6.8
15	10	-				-	29	4.8	51	29	14	6.5
16	10.5	-				-	27	*4.6	51	*27	13.5	6.5
17	10	-				-	26	5.8	50	27	12.5	6.5
18	10	-				-	25	8.2	49	26	12	6.5
19	9.7	-				-	24	11	48	25	12	6.3
20	10	-				-	24	14.5	45	24	11.5	6.5
21	9.7	-				-	23	15.5	44	23	12	3.2
22	10.5	-				‡2.2	22	14.5	44	22	12	.9
23	10	-				3.0	23	17	42	22	12	.9
24	10.5	-				3.6	22	26	42	21	12	.9
25	10.5	-				4.8	21	31	40	21	12	.9
26	10	-				6.8	*21	29	37	20	*12	.9
27	*9.7	-				5.8	22	26	36	19	12	3.1
28	8.2	-				5.0	26	25	37	18	11.5	*5.5
29	5.8	-				4.4	25	25	37	19.5	11.5	6.5
30	5.5	-			-------	4.2	19	22	37	19.5	11.5	6.5
31	5.5	-------			-------	3.8	-------	19.5	-------	19	11.5	-------
Total	271.8	-	-	-	-	-	692.1	536.9	1,150	869.0	423.5	181.1
Mean	8.77	-	-	-	-	-	23.1	17.3	38.3	28.0	13.7	6.04
Ac-ft	539	-	-	-	-	-	1,370	1,060	2,280	1,720	840	359

Calendar year	: Max	Min	Mean	Ac-ft
Water year	: Max	Min	Mean	Ac-ft

* Discharge measurement made on this day.
† Result of field estimate.
‡ Result of discharge measurement.

4520. Lake Chelan at Chelan, Wash.

Location.--Lat 47°50'00", long 120°03'40", in lot 3, sec.15, T.27 N., R.22 E., on south shore of Lake Chelan at Lakeside, 2 miles west of Chelan.

Drainage area.--951 sq mi.

Records available.--September 1897 to December 1899, January to June 1905 and December 1910 to September 1911 (fragmentary gage heights only); October 1911 to September 1960. Records of change in contents prior to October 1911, published in WSP 482 and 492 in conjunction with records for Chelan River near Chelan, have been found to be unreliable and should not be used. Month-end contents October 1911 to September 1950 published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, adjustment of 1912. Prior to Jan. 1, 1900, staff gage at Lakeside about 1 mile west of Chelan at datum 1,070.18 ft above mean sea level, adjustment of 1912. Jan. 1 to June 30, 1905, staff gage at upper highway bridge at Chelan at different datum. Dec. 5, 1910, to Nov. 13, 1927, staff gage at Forest Service boat landing at Chelan at datum 1,076.07 ft above mean sea level, adjustment of 1912.

Extremes.--Maximum elevation during year, 1,100.01 ft Aug. 12 (contents, 676,400 acre-ft); minimum, 1,089.69 ft Mar. 24 (contents, 340,200 acre-ft).
1897-99, 1905, 1910-60: Maximum elevation, 1,100.05 ft July 19, 1947 (contents, 677,800 acre-ft); minimum since completion of dam in 1927, 1,079.68 ft Apr. 3, 4, 1937 (contents, 21,400 acre-ft). Minimum elevation, 1,076.78 ft Jan. 27, 28, Dec. 2-5, 1898.

Remarks.--Reservoir is formed by low concrete dam at lake outlet, completed Sept. 3, 1927. Usable capacity between elevations 1,079 and 1,100 ft, 676,100 acre-ft. Regulation between these elevations is allowed by stipulation of Federal Power Commission. Water is used for power development. Elevation of lake maintained between 1,092 and 1,100 ft each year during period Aug. 16 to Sept. 15 for scenic effect and recreational purposes. Diversions for irrigation of about 6,280 acres with an annual depletion of about 11,000 acre-ft (1946 estimate).

Cooperation.--Gage-height record collected in cooperation with Public Utility District No. 1 of Chelan County.

Revisions (water years).--WSP 1246: 1951. WSP 1286: 1952. WSP 1446: Drainage area. See also Records available.

Capacity table, water year 1959-60 (elevation, in feet, and contents, in acre-feet)

1,085	189,800
1,090	350,200
1,095	512,600
1,100	676,100

Mean elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	99.55	99.65	99.55	98.41	94.71	91.85	89.79	90.99	96.35	99.68	98.96	99.90
2	99.50	99.67	99.54	98.30	94.66	91.74	89.80	91.01	96.72	99.65	98.88	99.77
3	99.46	99.68	99.53	98.20	94.55	91.64	89.85	91.03	97.40	99.69	98.89	99.66
4	99.43	99.63	99.49	98.10	94.48	91.55	89.91	91.00	97.99	99.77	98.89	99.60
5	99.40	99.59	99.45	98.00	94.40	91.45	90.02	90.98	98.19	99.85	98.88	99.53
6	99.32	99.54	99.40	97.89	94.32	91.33	90.11	91.00	98.26	99.79	98.84	99.43
7	99.23	99.53	99.35	97.75	94.29	91.24	90.20	91.09	98.30	99.74	98.85	99.32
8	99.22	99.52	99.30	97.62	94.19	91.14	90.35	91.13	98.38	99.70	99.88	99.22
9	99.23	99.50	99.23	97.50	94.10	91.05	90.60	91.21	98.49	99.73	99.89	99.13
10	99.16	99.44	99.19	97.39	94.00	90.92	90.80	91.40	98.60	99.78	98.90	99.04
11	99.18	99.37	99.15	97.25	93.89	90.81	91.00	91.71	98.80	99.77	98.94	98.94
12	99.28	99.28	99.12	97.10	93.81	90.70	91.16	92.22	99.00	99.87	98.97	98.85
13	99.35	99.19	99.07	96.92	93.73	90.60	91.29	92.76	99.05	99.92	98.93	98.77
14	99.43	99.10	99.00	96.79	93.65	90.49	91.41	93.12	99.03	99.95	98.87	98.70
15	99.64	99.00	99.12	96.67	93.55	90.41	91.55	93.40	98.99	99.91	98.79	98.61
16	99.71	98.93	99.28	96.52	93.44	90.28	91.63	93.69	99.00	99.86	98.76	98.51
17	99.69	98.84	99.30	96.37	93.33	90.17	91.76	93.90	99.19	99.83	98.73	98.42
18	99.65	98.80	99.30	96.21	93.22	90.07	91.84	94.10	99.26	99.86	98.73	98.32
19	99.64	98.70	99.29	96.05	93.12	89.98	91.72	94.21	99.31	99.98	98.76	98.22
20	99.65	98.71	99.27	95.90	93.02	89.89	91.49	94.38	99.31	99.94	98.80	98.15
21	99.66	98.74	99.23	95.73	92.94	89.81	91.23	94.54	99.26	99.88	98.82	98.02
22	99.75	98.77	99.20	95.60	92.80	89.75	91.01	94.66	99.25	99.91	98.83	97.92
23	99.73	99.01	99.17	95.50	92.68	89.72	90.99	94.76	99.31	99.94	98.82	97.84
24	99.74	99.32	99.12	95.41	92.59	89.70	91.00	94.89	99.49	99.90	98.80	97.76
25	99.84	99.51	99.06	95.31	92.44	89.71	90.96	95.00	99.67	99.88	98.79	97.62
26	99.65	99.50	98.98	95.21	92.32	89.74	90.95	95.11	99.59	99.90	98.80	97.55
27	99.62	99.45	98.89	95.11	92.21	89.78	90.93	95.23	99.48	99.93	98.80	97.44
28	99.61	99.42	98.80	95.02	92.10	89.80	90.91	95.37	99.47	99.92	98.81	97.32
29	99.58	99.50	98.70	94.99	91.99	89.80	90.92	95.53	99.51	99.92	99.86	97.21
30	99.57	99.52	98.60	94.89	-------	89.82	90.98	95.72	99.63	99.96	98.90	97.12
31	99.60	-------	98.52	94.78	-------	89.80	-------	96.04	-------	99.97	98.93	-------
(†)	663,700	661,700	625,900	504,100	412,700	343,400	382,200	551,000	665,300	674,800	673,800	579,700
(‡)	+700	-2,000	-35,800	-121,800	-91,400	-69,300	+38,800	+168,800	+114,300	+9,500	-1,000	-94,100

Calendar year 1959..... ‡ +136,500
Water year 1959-60..... ‡ -83,300

† Contents, in acre-feet, at end of month, based on elevations at 12 p.m. at Lakeside.
‡ Change in contents, in acre-feet.
Note.--Add 1,000 ft to obtain elevation above mean sea level.

4525. Chelan River at Chelan, Wash.

Location.--Lat 47°50'05", long 120°00'40", in SE¼ sec.13, T.27 N., R.22 E., near right bank in forebay upstream from control dam at outlet of Lake Chelan, a quarter of a mile south of Chelan.

Drainage area.--951 sq mi.

Records available.--November 1903 to September 1960. Published as "below Chelan Lake" 1904-5. Adjusted records for October 1903 to September 1911, published in WSP 482, 492, and 870, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder and concrete power dam. Datum of gage is at mean sea level, adjustment of 1912. Prior to Jan. 7, 1927, staff gage at site 800 ft downstream at same datum. Jan. 7 to Sept. 30, 1927, staff gage about 500 to 1,000 ft below dam at same datum. Oct. 1, 1927, to Nov. 10, 1928, staff gage and Nov. 11, 1928, to Mar. 19, 1939, water-stage recorder at sites 2½ miles downstream at same datum.

Average discharge.--56 years (1904-60), 2,058 cfs (1,490,000 acre-ft per year), adjusted for storage since October 1911.

Extremes.--Maximum daily discharge during year, 8,510 cfs June 14; minimum daily, 0.8 cfs Apr. 16, 17.

1903-60: Maximum daily discharge, 16,000 cfs May 30, 1948; no flow for part of day Jan. 30, 1917, when lake outlet was blocked with ice, and at other times owing to artificial regulation.

Remarks.--Unmeasured water that is diverted for irrigation above station is small percentage of total runoff. Chelan County Public Utility District No. 1 diverts water at Chelan to develop about 54,000 horsepower and to irrigate an unknown area near Chelan, which quantity is included in records of daily discharge. Diversions for irrigation of about 6,280 acres, depletion, 11,000 acre-ft (1946 estimate). Flow regulated by Lake Chelan (see preceding page).

Cooperation.--Records of water used for power and irrigation furnished by Public Utility District No. 1 of Chelan County.

Revisions (water years).--WSP 482: 1904-13. WSP 612: 1924. WSP 1216: Drainage area. WSP 1246: 1951. WSP 1286: 1952. See also Records available.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,900	1,580	1,750	2,600	2,300	2,330	2,000	2,550	1,120	5,580	3,740	1,860
2	2,050	1,610	2,300	2,600	2,290	2,330	1,170	2,840	1,120	4,990	2,760	2,190
3	2,180	1,740	2,300	2,620	2,310	2,330	1,160	3,440	1,400	3,610	2,040	2,200
4	1,550	2,510	2,310	2,600	2,320	2,330	1,100	3,850	3,770	3,360	2,310	2,220
5	1,760	1,830	2,300	2,590	2,310	2,340	1,160	3,690	7,720	3,920	2,070	2,210
6	2,240	1,780	2,310	2,590	2,320	2,340	2,120	3,350	7,770	7,780	1,840	2,180
7	2,250	1,640	2,300	3,290	2,320	2,320	2,320	3,460	6,340	7,730	1,420	2,200
8	1,870	1,520	2,290	3,290	2,300	2,330	1,820	3,540	4,630	5,690	1,690	2,200
9	1,830	1,690	2,290	2,570	2,290	2,330	1,040	1,750	*4,980	3,800	1,690	2,210
10	1,630	1,760	2,310	2,590	2,290	2,330	1,040	1,110	5,030	4,070	1,690	2,210
11	454	2,260	2,290	3,220	2,300	2,340	729	1,110	4,700	3,180	1,820	2,220
12	920	2,270	2,290	*3,210	2,320	2,350	1,040	1,110	6,170	2,240	2,140	2,200
13	1,390	2,280	2,310	3,210	2,310	2,350	1,060	1,120	8,010	4,490	2,140	2,200
14	1,480	2,280	2,300	3,190	2,330	2,330	1,000	1,100	8,510	4,810	1,700	2,210
15	1,700	2,290	2,220	2,800	2,320	2,330	936	1,100	7,950	*4,810	1,630	2,180
16	3,090	2,300	2,300	3,140	2,320	2,330	.8	1,130	5,950	4,800	1,200	2,200
17	3,340	2,280	2,300	3,170	2,320	2,340	.8	1,120	4,800	4,810	1,120	2,200
18	2,900	2,290	2,300	3,110	2,310	2,340	1,680	1,120	4,660	3,440	1,160	2,200
19	2,230	2,250	2,320	3,120	2,330	2,340	5,980	1,120	4,720	4,420	1,040	2,200
20	1,590	2,290	2,310	3,110	2,300	2,400	6,060	1,130	4,920	5,030	71	2,210
21	1,440	2,150	2,300	3,090	2,340	2,390	5,560	1,120	4,100	3,450	71	2,200
22	2,580	1,370	2,310	2,810	2,330	2,310	*5,780	1,130	3,330	2,580	1,050	2,080
23	4,980	1,520	2,450	2,330	2,330	2,340	1,720	1,170	3,260	2,600	983	2,200
24	3,440	3,090	2,600	2,310	2,320	2,270	1,270	1,130	3,680	2,450	910	2,210
25	8,260	5,430	2,600	2,310	2,320	2,300	1,890	1,120	4,930	1,910	749	2,220
26	5,550	5,530	2,630	2,300	2,330	2,320	2,070	1,120	7,190	1,900	705	2,210
27	*3,370	4,580	2,640	2,310	2,330	2,330	2,090	1,120	6,210	2,330	70	2,190
28	3,380	2,240	2,610	2,320	2,340	2,310	1,740	61	5,710	3,180	70	2,200
29	2,710	1,570	2,610	2,310	2,320	2,310	1,620	61	5,490	2,540	576	*2,200
30	1,690	2,000	2,590	2,320	-------	2,310	1,900	61	5,590	2,540	143	2,200
31	1,460	-------	2,590	2,330	-------	2,340	-------	1,120	-------	3,200	*1,120	-------
Total	77,214	69,930	73,330	85,360	67,170	72,290	57,056.6	49,953	153,760	123,240	41,718	65,610
Mean	2,491	2,331	2,365	2,754	2,316	2,332	1,902	1,611	5,125	3,975	1,346	2,187
Ac-ft	153,200	138,700	145,400	169,300	133,200	143,400	113,200	99,080	305,000	244,400	82,750	130,100
(†)	+700	-2,000	-35,800	-121,800	-91,400	-69,300	+38,800	+168,800	+114,300	+9,500	-1,000	-94,100

Adjusted for change in contents in Lake Chelan

Mean	2,503	2,297	1,782	773	727	1,205	2,554	4,357	7,047	4,129	1,330	605
Cfsm	2.63	2.42	1.87	0.813	0.764	1.27	2.69	4.58	7.41	4.34	1.40	0.636
In.	3.03	2.70	2.16	0.94	0.82	1.46	3.00	5.28	8.27	5.01	1.61	0.71
Ac-ft	153,900	136,700	109,600	47,500	41,800	74,100	152,000	267,900	419,300	253,900	81,750	36,000

Observed

Calendar year 1959: Max 12,500 Min 65 Mean 2,689 Ac-ft 1,947,000
Water year 1959-60: Max 8,510 Min 0.8 Mean 2,559 Ac-ft 1,858,000

Adjusted

Calendar year 1959: Mean 2,879 Cfsm 3.03 In. 41.08 Ac-ft 2,084,000
Water year 1959-60: Mean 2,445 Cfsm 2.57 In. 34.99 Ac-ft 1,775,000

* Discharge measurement made on this day.

† Change in contents, in acre-feet, in Lake Chelan, furnished by Chelan County Public Utility District No. 1.

Note.--Discharges are combined flows of power conduit, irrigation diversions below dam, and waste water.

4528. Entiat River near Ardenvoir, Wash.

Location.--Lat 47°48'30", long 120°24'50", in N½NE¼NE¼ sec.27 (revised), T.27 N., R.19 E., on left bank 6 miles northwest of Ardenvoir.

Drainage area.--207 sq mi.

Records available.--September 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,563.22 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (from Conservation Division planetable survey).

Extremes.--Maximum discharge during year, 2,470 cfs June 4 (gage height, 6.35 ft); minimum, 71 cfs Feb. 28 (gage height, 1.11 ft).
1957-60: Maximum discharge, 4,110 cfs May 25, 1958 (gage height, 7.72 ft); minimum, 52 cfs Jan. 1, 1958 (gage height, 0.83 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. No known regulation or diversion.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 1 to July 16)

1.1	70	3.0	510
1.5	114	4.0	990
2.0	198	5.0	1,600
2.5	328	6.0	2,350

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	174	322	388	180	134	80	287	420	1,150	1,270	322	128
2	169	304	370	170	130	80	284	470	1,450	1,130	301	128
3	165	301	347	170	127	80	301	522	2,110	1,040	281	121
4	160	270	322	170	125	80	338	538	2,310	1,030	270	124
5	152	252	*310	170	127	80	398	572	1,960	1,040	260	132
6	150	247	295	170	124	100	470	694	2,010	1,080	247	125
7	143	237	287	165	121	100	604	830	1,840	1,120	239	118
8	160	230	257	160	124	99	785	815	1,640	1,030	234	114
9	176	220	257	155	121	85	865	815	*1,570	891	227	109
10	153	209	260	150	118	85	845	891	1,620	790	222	106
11	167	205	249	145	115	88	815	1,170	1,800	712	222	105
12	213	198	244	*140	114	87	750	1,900	1,890	662	216	104
13	196	145	225	135	114	86	698	1,930	1,890	694	202	105
14	225	140	257	130	114	85	658	*1,590	1,840	730	188	106
15	316	140	818	130	113	89	604	1,350	1,660	*672	180	108
16	307	130	790	130	110	89	559	1,230	1,630	636	171	106
17	292	140	640	130	105	93	526	1,110	1,520	622	165	102
18	281	150	586	125	100	100	498	1,010	1,320	636	165	100
19	273	160	534	110	100	105	478	946	1,200	622	167	97
20	267	170	498	110	102	110	466	913	1,070	568	162	99
21	257	230	458	115	105	140	434	840	962	502	157	97
22	372	260	430	120	95	*180	412	785	946	446	160	95
23	412	350	374	130	90	202	412	730	1,020	398	152	94
24	466	700	344	143	90	227	395	703	1,260	350	146	91
25	690	600	319	143	90	273	347	672	1,320	322	*142	93
26	*604	550	270	140	80	354	334	658	1,220	316	137	89
27	526	500	250	136	75	364	325	649	1,180	328	131	88
28	462	450	240	134	75	344	325	644	1,210	338	128	*86
29	409	420	230	134	80	331	341	680	1,260	338	136	85
30	374	400	220	138	------	316	378	805	1,320	338	130	83
31	350	------	200	134	------	298	------	1,030	------	325	131	------
Total	9,061	8,630	11,269	4,412	3,118	4,830	14,932	27,912	45,178	20,976	5,991	3,138
Mean	292	288	364	142	108	156	498	900	1,506	677	193	105
Cfsm	1.41	1.39	1.76	0.686	0.522	0.754	2.41	4.35	7.28	3.27	0.932	0.507
In.	1.63	1.55	2.02	0.79	0.56	0.87	2.68	5.01	8.12	3.77	1.08	0.56
Ac-ft	17,970	17,120	22,350	8,750	6,180	9,580	29,620	55,360	89,610	41,610	11,880	6,220

Calendar year 1959: Max 2,450 Min 80 Mean 491 Cfsm 2.37 In. 32.21 Ac-ft 355,700
Water year 1959-60: Max 2,310 Min 75 Mean 436 Cfsm 2.11 In. 28.64 Ac-ft 316,200

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 14-20, Dec. 26 to Jan. 23, Feb. 18, 19, Feb. 22 to Mar. 5, Mar. 9, 10 (no gage-height record Nov. 16-20). No gage-height record Nov. 21-30, Mar. 18-22; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations.

4540. White River near Plain, Wash.

Location.--Lat 47°52'30", long 120°52'10", in NE¼ sec.5, T.27 N., R.16 E., on left bank at downstream side of Forest Service bridge, 1¼ miles downstream from Sears Creek, 4 miles upstream from Wenatchee Lake, and 12½ miles northwest of Plain.

Drainage area.--150 sq mi.

Records available.--May 1911 to April 1912; May to September 1912, July to August 1913, and October 1913 to March 1914 (monthly discharge only); April to September 1914; August 1954 to September 1960. Published as "near Chiwaukum" 1911-14.

Gage.--Water-stage recorder. Altitude of gage is 1,880 ft (from river-profile map). May 1911 to September 1914, staff gage at same site at different datum.

Average discharge.--6 years (1954-60), 878 cfs (635,600 acre-ft per year).

Extremes.--Maximum discharge during year, 4,320 cfs Dec. 15 (gage height, 12.02 ft); minimum, 124 cfs Feb. 27 (gage height, 2.23 ft).
1911-14, 1954-60: Maximum discharge, 5,780 cfs May 26, 1958 (gage height, 13.25 ft); minimum, 104 cfs Mar. 10, 1956; minimum gage height observed, 2.16 ft Oct. 18, 1957.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 1316: 1914.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 22, 24, 25, Nov. 23-26, Dec. 15, 16, Apr. 8, 9, May 7, 10-14, May 31 to June 18, June 23 to July 9, July 13-15, 17-19)

Oct. 1-11				Oct. 12 to Sept. 30			
3.0	265	4.5	750	2.3	135	6.0	1,390
3.5	415	5.0	950	2.6	190	8.0	2,330
4.0	570			3.0	280	10.0	3,330
				4.0	590	12.0	4,520

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	535	758	886	350	214	150	770	1,090	1,910	2,280	950	285
2	517	678	862	340	212	145	754	1,200	2,680	1,900	836	260
3	490	786	794	330	210	140	758	1,200	3,530	1,940	842	235
4	454	646	710	330	206	140	930	1,120	3,220	2,150	774	302
5	418	580	662	348	204	145	1,110	1,150	2,640	2,300	702	402
6	386	548	610	339	198	156	1,270	1,430	2,740	2,570	646	298
7	361	513	*576	325	194	156	1,610	1,800	*2,200	2,640	642	245
8	451	495	538	305	192	154	1,900	1,570	1,980	2,270	654	220
9	580	457	506	292	188	152	1,820	1,510	2,060	1,840	654	210
10	451	429	499	278	188	150	1,550	1,720	2,350	1,700	634	214
11	861	426	482	*272	186	148	1,390	2,300	2,700	1,550	642	220
12	1,510	417	464	265	184	146	1,220	3,070	2,720	*1,580	562	242
13	1,150	345	429	255	184	144	1,090	2,340	2,680	1,860	488	275
14	1,520	351	586	252	182	142	1,000	1,840	2,470	1,870	408	305
15	1,720	345	2,880	242	182	142	898	*1,640	2,380	1,720	363	288
16	1,240	300	2,200	238	180	141	826	1,640	3,220	1,630	333	250
17	1,030	270	1,590	232	176	141	762	1,450	2,350	1,710	399	230
18	906	260	1,320	228	*170	141	706	1,310	1,820	1,820	432	212
19	810	351	1,130	190	170	142	*670	1,220	1,670	1,800	426	238
20	814	598	998	200	170	162	666	1,300	1,450	1,630	369	252
21	762	610	882	200	172	222	614	1,160	1,300	1,410	336	206
22	1,690	906	798	200	168	351	580	1,070	1,370	1,210	300	188
23	1,330	3,210	722	200	158	*426	562	1,000	1,800	1,040	265	198
24	2,140	3,460	674	205	152	460	541	986	2,220	910	*262	210
25	*2,220	2,990	606	205	148	662	527	954	2,060	932	245	248
26	1,530	1,900	555	200	145	906	530	1,020	1,840	970	278	210
27	1,260	1,540	520	200	140	886	538	1,060	1,940	1,040	232	*188
28	1,090	1,310	492	200	140	862	626	1,070	2,080	1,090	208	186
29	942	1,140	457	200	145	838	782	1,200	2,360	1,040	354	182
30	842	994	441	205	------	818	930	1,590	2,600	934	280	184
31	838	------	417	214	------	790	------	2,040	------	970	328	------
Total	30,850	27,623	25,286	7,840	5,158	10,158	27,930	45,050	68,340	50,376	14,846	7,183
Mean	995	921	816	253	178	328	931	1,453	2,278	1,625	479	239
Cfsm	6.63	6.14	5.44	1.69	1.19	2.19	6.21	9.69	15.2	10.8	3.19	1.59
In.	7.65	6.85	6.27	1.94	1.28	2.52	6.92	11.17	16.94	12.49	3.68	1.78
Ac-ft	61,190	54,790	50,150	15,550	10,230	20,150	55,400	89,360	135,600	99,930	29,450	14,250

Calendar year 1959: Max 4,230 Min 210 Mean 1,089 Cfsm 7.26 In. 98.54 Ac-ft 788,400
Water year 1959-60: Max 3,530 Min 140 Mean 876 Cfsm 5.84 In. 79.49 Ac-ft 636,000

Peak discharge (base, 3,500 cfs).--Oct. 24 (11:30 p.m.) 3,510 cfs (10.62 ft); Nov. 25 (12:30 a.m.) 4,080 cfs (11.61 ft); Dec. 15 (7 p.m.) 4,320 cfs (12.02 ft); June 4 (1:30 a.m.) 3,900 cfs (11.31 ft); June 16 (11:30 a.m.) 3,610 cfs (10.81 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 16-18, Jan. 1-4, 19-23, Feb. 26 to Mar. 5 (no gage-height record Jan. 20-30).

4545. Wenatchee Lake near Plain, Wash.

Location.--Lat 47°49'50", long 120°46'30", in sec.19, T.27 N., R.17 E., on north (left) shore 2¾ miles uplake from outlet, 7½ miles northwest of Plain, and 33 miles upstream from Leavenworth.

Drainage area.--276 sq mi.

Records available.--January 1932 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,860.00 ft above mean sea level, subject to correction to datum of 1929. Prior to Jan. 4, 1935, staff gage at same site and datum.

Extremes.--Maximum elevation during year, 1,876.20 ft Nov. 25; minimum, 1,869.76 ft Sept. 24.
1932-60: Maximum elevation recorded, 1,879.65 ft May 29, 1948; minimum, 1,869.27 ft Dec. 1, 1936.

Remarks.--No regulation or diversion.

Revisions (water years).--WSP 1216: Drainage area. WSP 1396: 1944.

Mean elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70.78	71.08	71.59	70.54	70.09	69.85	71.00	71.38	72.98	72.96	70.85	70.05
2	70.66	70.97	71.40	70.47	70.11	69.85	70.95	71.60	73.27	72.68	70.80	70.04
3	70.58	70.95	71.31	70.43	70.09	69.85	71.08	71.75	74.16	72.47	70.77	70.01
4	70.49	71.04	71.20	70.39	70.06	69.86	71.27	71.76	74.60	72.50	70.71	69.99
5	70.41	70.93	71.07	70.39	70.07	69.87	71.54	71.69	74.23	72.60	70.65	70.05
6	70.35	70.83	70.97	70.39	70.08	69.90	71.82	71.80	74.04	72.74	70.60	70.11
7	70.29	70.74	70.89	70.36	70.11	69.91	72.21	72.34	73.70	72.91	70.55	70.07
8	70.33	70.67	70.82	70.33	70.11	69.91	72.70	72.55	73.27	72.85	70.52	70.02
9	70.63	70.60	70.75	70.31	70.09	69.90	73.01	72.42	73.06	72.51	70.51	69.96
10	70.67	70.55	70.71	70.28	70.08	69.90	72.87	72.45	73.13	72.23	70.49	69.93
11	70.75	70.49	70.69	70.26	70.05	69.89	72.54	72.91	73.42	72.01	70.47	69.90
12	71.64	70.50	70.69	70.24	70.03	69.87	72.23	73.83	73.62	71.84	70.41	69.89
13	71.87	70.45	70.62	70.20	70.04	69.87	71.98	74.09	73.69	71.89	70.34	69.90
14	71.79	70.38	70.67	70.18	70.06	69.86	71.83	73.53	73.61	72.02	70.26	69.91
15	72.08	70.36	72.64	70.16	70.09	69.92	71.63	73.02	73.51	71.98	70.19	69.92
16	71.93	70.29	75.34	70.15	70.06	69.91	71.46	72.74	73.77	71.89	70.12	69.91
17	71.62	70.26	74.20	70.13	70.03	69.89	71.33	72.52	73.95	71.83	70.11	69.89
18	71.36	70.25	73.15	70.09	70.00	69.89	71.21	72.25	73.32	71.85	70.13	69.86
19	71.17	70.26	72.47	70.03	69.98	69.89	71.13	72.02	72.82	71.89	70.15	69.83
20	71.04	70.54	72.02	70.02	69.97	69.93	71.10	71.99	72.43	71.81	70.13	69.82
21	71.03	71.16	71.71	70.04	69.99	69.99	71.07	71.98	72.10	71.64	70.08	69.82
22	71.45	71.35	71.48	70.04	69.99	70.11	70.99	71.81	71.92	71.43	70.06	69.80
23	72.08	73.87	71.32	70.03	69.97	70.27	70.94	71.64	72.05	71.23	70.02	69.78
24	72.18	75.79	71.18	70.04	69.96	70.41	70.90	71.56	72.52	71.05	70.00	69.77
25	72.88	75.93	71.07	70.04	69.94	70.62	70.86	71.52	72.77	70.94	69.97	69.80
26	72.62	74.73	70.96	70.03	69.92	70.95	70.83	71.50	72.61	70.89	69.96	69.82
27	72.15	73.57	70.86	70.03	69.88	71.17	70.81	71.58	72.54	70.91	69.97	69.81
28	71.79	72.76	70.79	70.02	69.87	71.21	70.83	71.62	72.60	70.96	69.94	69.80
29	71.53	72.23	70.75	70.06	69.85	71.19	70.95	71.69	72.74	70.97	69.98	69.78
30	71.31	71.87	70.67	70.06	-------	71.17	71.15	71.98	72.97	70.95	70.03	69.77
31	71.17	-------	70.62	70.08	-------	71.09	-------	72.67	-------	70.90	70.04	-------

Note.--Add 1,800 ft to obtain elevation above mean sea level.

4570. Wenatchee River at Plain, Wash.

Location.--Lat 47°45'50", long 120°39'30", in lot 8, sec.12, T.26 N., R.17 E., on left bank at Plain, a quarter of a mile downstream from Beaver Creek, 7½ miles downstream from Nason Creek, and 12 miles north of Leavenworth.

Drainage area.--591 sq mi.

Records available.--October 1910 to September 1960. Published as "near Leavenworth" 1910-31.

Gage.--Water-stage recorder. Altitude of gage is 1,805 ft (from river-profile map). Prior to Jan. 8, 1932, staff gages at site a quarter of a mile downstream at different datum.

Average discharge.--50 years, 2,217 cfs (1,605,000 acre-ft per year).

Extremes.--Maximum discharge during year, 11,500 cfs Nov. 25 (gage height, 8.61 ft); minimum, 470 cfs Sept. 30 (gage height, 1.99 ft).
1910-29, 1931-60: Maximum discharge, 22,700 cfs May 29, 1948 (gage height, 12.43 ft, from high-water mark in well); minimum, 168 cfs Nov. 30, 1952 (gage height, 1.31 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Wenatchee Park Land & Irrigation Co. diverts a maximum of about 12 cfs from Chiwawa River for irrigation of 1,400 acres near Plain. Natural regulation by Wenatchee Lake.

Revisions (water years).--WSP 482: 1911-14. WSP 1316: 1914(M), 1916(M), 1919(M), 1921-23(M), 1927(M).

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.0	475	5.0	3,840
2.5	810	6.0	5,520
3.0	1,230	8.0	9,900
4.0	2,350	10.0	15,500

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,710	2,340	3,300	1,550	906	b580	2,320	3,340	6,200	6,120	1,840	754
2	1,520	2,120	3,000	1,500	906	b600	2,300	3,710	7,010	5,410	1,730	733
3	1,420	2,190	2,800	1,460	890	b570	2,700	3,940	8,940	5,000	1,660	705
4	1,320	2,270	2,600	1,430	842	b600	3,080	3,950	10,100	5,070	1,590	684
5	1,230	2,020	2,400	1,400	866	677	3,680	3,840	9,040	5,200	1,490	754
6	1,150	1,870	2,200	1,350	866	691	4,190	4,180	8,660	5,470	1,400	803
7	1,090	1,750	*2,000	1,300	898	691	4,780	5,250	*7,870	5,770	1,320	747
8	1,170	1,640	1,900	1,250	890	691	5,650	5,450	6,950	5,590	1,280	684
9	1,760	1,550	1,800	1,200	858	677	6,240	5,180	6,560	4,870	1,250	649
10	1,600	1,470	1,730	1,150	842	663	5,860	5,320	6,720	4,350	1,230	614
11	1,800	1,420	1,680	1,100	810	649	5,250	6,360	7,360	3,980	1,220	594
12	3,320	1,430	1,680	1,070	796	635	4,670	8,300	7,780	*3,620	1,180	587
13	3,500	1,300	1,580	*1,050	803	621	4,260	*8,940	7,890	3,780	1,080	594
14	3,320	1,230	1,740	1,040	818	621	4,020	7,670	7,670	4,050	994	607
15	3,970	1,220	6,340	1,030	842	677	3,620	6,520	7,410	3,870	930	614
16	3,650	b1,000	9,850	1,000	*826	649	3,300	6,000	7,800	3,680	858	600
17	3,100	b1,000	7,500	978	818	649	3,070	5,500	7,940	3,540	834	580
18	2,670	b1,050	5,740	b880	810	663	2,830	4,960	6,660	3,580	850	548
19	2,350	1,130	4,660	b800	796	677	2,700	4,540	5,720	3,650	866	523
20	2,140	1,860	3,980	b820	782	712	*2,690	4,620	4,980	3,490	842	535
21	2,170	2,770	3,440	874	796	796	2,600	4,450	4,420	3,190	803	517
22	3,200	3,160	3,160	874	782	978	2,420	4,110	4,110	2,800	775	511
23	4,320	8,160	2,900	882	761	1,200	2,360	3,810	4,380	2,460	740	511
24	4,140	10,700	2,670	890	761	*1,420	2,310	3,650	5,380	2,120	*733	505
25	5,750	11,000	2,430	890	733	1,800	2,210	3,570	5,790	1,950	698	517
26	5,020	8,420	2,200	874	705	2,460	2,180	3,520	5,390	1,850	684	523
27	4,190	6,360	2,100	858	b650	2,780	2,160	3,660	5,290	1,710	691	*511
28	3,550	5,070	2,000	842	b600	2,780	2,260	3,660	5,390	1,960	663	493
29	3,080	4,500	1,900	906	b580	2,710	2,520	3,840	5,660	1,960	719	481
30	2,700	3,800	1,800	946	------	2,690	2,900	4,430	6,140	1,920	754	475
31	2,480	------	1,650	922	------	2,500	------	5,660	------	1,860	754	------
Total	84,390	95,800	94,730	33,116	23,233	35,107	101,130	151,930	201,210	114,070	32,458	17,953
Mean	2,722	3,193	3,056	1,068	801	1,132	3,371	4,901	6,707	3,680	1,047	598
Cfsm	4.61	5.40	5.17	1.81	1.36	1.92	5.70	8.29	11.3	6.23	1.77	1.01
In.	5.31	6.03	5.96	2.08	1.46	2.21	6.36	9.56	12.66	7.18	2.04	1.13
Ac-ft	167,400	190,000	187,900	65,680	46,080	69,630	200,600	301,300	399,100	226,300	64,380	35,610

Calendar year 1959: Max 11,200 Min 834 Mean 3,272 Cfsm 5.54 In. 75.14 Ac-ft 2,369,000
Water year 1959-60: Max 11,000 Min 475 Mean 2,692 Cfsm 4.55 In. 61.98 Ac-ft 1,954,000

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Nov. 29 to Dec. 7, Dec. 26 to Jan. 12; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations.

4580. Icicle Creek above Snow Creek, near Leavenworth, Wash.

Location.--Lat 47°32'25", long 120°42'55", in SE¼ sec.28, T.24 N., R.17 E., on right bank three-eighths of a mile upstream from Snow Creek and 4½ miles southwest of Leavenworth.

Drainage area.--193 sq mi.

Records available.--September 1936 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,450 ft (from river-profile map).

Average discharge.--24 years, 628 cfs (454,700 acre-ft per year).

Extremes.--Maximum discharge during year, 8,620 cfs Nov. 23 (gage height, 12.55 ft); minimum, 94 cfs Sept. 30 (gage height, 2.21 ft).
1936-60: Maximum discharge, 11,600 cfs May 28, 1948 (gage height, 13.93 ft), from rating curve extended above 7,000 cfs on basis of slope-area measurement of peak flow; minimum daily, 44 cfs Nov. 30, 1936.

Remarks.--Records good except those for period of ice effect, which are fair. No diversion. Some regulation in headwater lakes for irrigation.

Revisions (water years).--WSP 1246: 1936-41. WSP 1286: 1948. WSP 1446: 1943(M).

Rating table, water year 1959-60, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	92	6.0	1,080
2.5	125	7.0	1,640
3.0	192	8.0	2,390
4.0	382	10.0	4,550
5.0	670	12.0	7,610

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	427	604	832	378	236	b160	568	804	2,080	1,260	331	158
2	389	547	784	384	227	b150	596	868	2,890	1,070	309	154
3	360	621	744	362	216	b140	716	864	3,650	1,040	307	147
4	331	642	670	391	210	b150	828	828	3,040	1,080	290	146
5	307	514	621	391	211	194	976	828	2,620	1,110	274	167
6	288	499	*586	364	211	186	1,140	1,020	2,730	1,180	259	166
7	274	467	559	343	263	180	1,440	1,470	2,150	1,200	248	150
8	337	441	502	331	239	173	1,710	1,240	*1,880	1,080	241	144
9	562	427	488	*317	222	169	1,700	1,170	1,890	904	236	140
10	411	413	477	295	213	167	1,330	1,490	2,100	824	229	138
11	793	409	467	297	206	166	1,140	2,410	2,330	764	227	133
12	1,200	429	467	295	203	162	1,000	3,530	2,280	712	213	130
13	932	325	434	280	202	162	920	*2,480	2,280	756	203	129
14	808	329	644	282	203	158	856	1,830	2,280	*764	189	126
15	756	321	5,110	282	210	164	796	*1,510	2,190	716	188	123
16	649	261	3,160	269	202	166	726	1,470	2,620	680	180	117
17	556	286	1,830	265	*200	170	680	1,260	2,050	660	186	113
18	497	315	1,360	216	200	174	635	1,110	1,520	670	188	108
19	446	339	1,120	211	195	184	600	1,040	1,330	656	178	106
20	451	842	968	227	194	208	596	1,210	1,120	596	167	105
21	491	908	864	216	194	267	*559	1,060	990	529	162	105
22	1,430	1,740	800	211	b180	345	526	944	968	474	173	103
23	1,600	6,420	748	211	b170	416	535	876	1,140	429	*162	103
24	*1,160	3,810	702	213	b170	*538	505	860	1,490	391	176	103
25	1,520	3,020	649	211	b170	638	488	832	1,420	367	164	107
26	1,100	1,940	582	210	b150	852	483	872	1,250	362	166	106
27	896	1,450	562	203	b140	812	483	944	1,270	378	166	*103
28	820	1,200	529	202	b140	736	523	928	1,310	373	151	103
29	719	1,030	488	269	b150	702	614	1,040	1,390	356	162	100
30	652	912	483	319	------	684	716	1,480	1,430	354	162	97
31	635	------	451	254	------	618	------	2,130	------	345	160	------
Total	21,797	31,463	28,681	8,699	5,727	9,971	24,385	40,398	57,688	22,080	6,447	3,730
Mean	703	1,049	925	281	197	322	813	1,303	1,923	712	208	124
Cfsm	3.64	5.44	4.79	1.46	1.02	1.67	4.21	6.75	9.96	3.69	1.08	0.642
In.	4.20	6.06	5.53	1.68	1.10	1.92	4.70	7.78	11.12	4.25	1.24	0.72
Ac-ft	43,230	62,410	56,890	17,250	11,360	19,780	48,370	80,130	114,400	43,800	12,790	7,400

Calendar year 1959: Max 6,420 Min 173 Mean 900 Cfsm 4.66 In. 63.27 Ac-ft 651,200
Water year 1959-60: Max 6,420 Min 97 Mean 713 Cfsm 3.69 In. 50.30 Ac-ft 517,800

Peak discharge (base, 2,500 cfs).--Nov. 23 (4 a.m.) 8,620 cfs (12.55 ft); Dec. 15 (5 p.m.) 7,200 cfs (11.76 ft); May 12 (7 a.m.) 3,960 cfs (9.45 ft); June 3 (8 p.m.) 3,860 cfs (9.37 ft); June 16 (2 p.m.) 2,860 cfs (8.44 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

4590. Wenatchee River at Peshastin, Wash.

Location.--Lat 47°34'50", long 120°37'00", in SE¼SW¼ sec.8, T.24 N., R.18 E., on right bank 1 mile northwest of Peshastin and 3½ miles upstream from Peshastin Creek.

Drainage area.--1,000 sq mi, approximately.

Records available.--October 1928 to February 1929 (monthly discharge only), March 1929 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,028.04 ft above mean sea level, datum of 1929. Prior to Mar. 24, 1932, staff gage at site 1¼ miles downstream at different datum.

Average discharge.--32 years, 3,070 cfs (2,223,000 acre-ft per year).

Extremes.--Maximum discharge during year, 16,400 cfs Dec. 16 (gage height, 10.62 ft); minimum, 554 cfs Sept. 30 (gage height, 1.94 ft).
1929-60: Maximum discharge, 32,300 cfs May 28, 1948 (gage height, 15.88 ft); minimum, 183 cfs Oct. 14, 1939; minimum gage height, 1.24 ft Nov. 1, 1952; minimum daily discharge, 270 cfs Oct. 2, 1929, Nov. 30, 1936, Dec. 1, 1952.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. Numerous diversions upstream for irrigation of an estimated 3,200 acres above station and domestic use above and below station. Diversion by Icicle Creek irrigation canal 8 miles upstream from station is used for irrigation of a substantial part of the 22,000 acres irrigated below station.

Revisions (water years).--WSP 1316: 1929-32(M).

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22				Nov. 23 to Sept. 30			
3.0	1,320	6.0	5,580	1.9	530	5.0	3,840
4.0	2,420	8.0	9,680	2.4	840	7.0	7,530
5.0	3,840			3.0	1,290	9.0	12,100
				4.0	2,420	11.0	17,500

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,260	3,170	4,520	2,120	1,230	850	3,190	4,160	a9,200	7,900	2,170	847
2	2,080	2,910	4,100	2,000	1,220	850	3,100	4,670	a11,000	6,930	2,080	840
3	1,950	2,910	3,840	1,950	1,180	750	3,560	4,960	13,200	6,400	1,960	814
4	1,800	3,160	3,520	1,920	1,140	750	4,050	4,960	13,900	6,470	1,870	794
5	1,660	2,780	3,230	1,900	1,150	850	4,760	4,850	12,400	6,630	1,760	840
6	1,560	2,580	*3,030	1,850	1,150	987	5,480	5,320	12,000	6,950	1,650	917
7	1,490	2,410	2,890	1,780	1,240	959	6,530	6,910	10,700	7,330	1,540	889
8	1,540	2,260	2,680	1,700	1,250	931	7,790	7,030	*9,360	7,110	1,470	820
9	2,380	2,170	2,540	1,620	1,180	910	8,440	6,650	8,880	6,230	1,420	762
10	2,200	2,060	2,450	1,550	1,160	896	7,750	6,950	9,100	5,480	1,380	736
11	2,670	1,960	2,410	1,500	a1,150	889	6,930	8,790	9,980	4,980	1,370	710
12	4,550	2,000	2,390	1,460	a1,100	861	6,150	12,400	10,400	4,480	1,340	698
13	4,810	1,780	2,240	*1,430	a1,100	854	5,580	12,100	10,500	*4,520	1,260	698
14	4,400	1,690	2,360	1,400	a1,120	847	5,190	10,100	10,400	4,850	1,150	710
15	4,830	1,500	10,900	1,370	*a1,150	917	4,710	*8,570	10,100	4,650	1,070	716
16	4,600	1,400	14,600	1,340	1,120	924	4,260	7,940	10,700	4,420	1,010	716
17	3,940	1,380	10,700	1,320	*1,090	959	3,970	7,230	10,700	4,210	952	686
18	3,410	1,400	8,130	1,200	1,070	1,020	3,700	6,510	8,810	4,240	987	662
19	3,030	1,580	6,610	1,130	1,040	1,040	3,500	5,960	7,610	4,310	987	608
20	2,780	2,520	5,620	1,160	1,020	1,120	*3,440	6,090	6,630	4,140	980	626
21	2,820	4,130	4,890	1,150	1,040	1,320	3,350	5,830	5,830	3,710	938	620
22	4,380	4,900	4,310	1,150	1,030	1,640	3,120	5,300	5,390	3,290	910	602
23	6,710	15,500	3,980	1,170	1,000	1,980	3,090	4,890	5,570	2,940	875	596
24	5,710	16,000	3,680	1,160	1,020	2,320	3,050	4,670	7,170	2,560	854	602
25	7,550	15,400	3,420	1,160	994	*2,870	2,890	4,550	7,770	2,320	*827	614
26	*6,750	11,900	3,120	1,140	945	3,700	2,870	4,520	7,190	2,190	794	644
27	5,580	8,970	2,920	1,120	850	4,050	2,810	4,740	7,010	2,240	808	608
28	4,720	7,130	2,760	1,100	800	3,890	2,890	a5,000	7,110	2,330	775	596
29	4,110	5,960	2,590	1,200	800	3,780	3,200	a6,000	7,430	2,330	775	*584
30	3,640	5,160	2,500	1,330	-------	3,700	3,620	a7,000	8,020	2,290	854	572
31	3,350	-------	2,370	1,250	-------	3,420	-------	a8,000	-------	2,240	847	-------
Total	113,260	138,670	135,300	44,630	31,339	50,834	132,970	202,650	274,240	140,670	37,663	21,127
Mean	3,654	4,622	4,365	1,440	1,081	1,640	4,432	6,537	9,141	4,538	1,215	704
Ac-ft	224,600	275,000	268,400	88,520	62,160	100,800	263,700	402,000	543,900	279,000	74,700	41,900

Calendar year 1959: Max 16,000 Min 995 Mean 4,507 Ac-ft 3,263,000
Water year 1959-60: Max 16,000 Min 572 Mean 3,616 Ac-ft 2,625,000

Peak discharge (base, 11,000 cfs).--Nov. 23 (9 to 10 a.m.) 16,300 cfs (10.58 ft); Dec. 16 (1 a.m.) 16,400 cfs (10.62 ft); May 12 (5 p.m.) 13,200 cfs (9.42 ft); June 3 (12 p.m.) 14,400 cfs (9.89 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations.
Note.--Stage-discharge relation affected by ice Nov. 15-18, Jan. 3-14, 18-23, Feb. 27 to Mar. 5 (no gage-height record Jan. 3-13, 18-23; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations).

4614. Mission Creek above Sand Creek, near Cashmere, Wash.

Location.--Lat 47°25'45", long 120°30'45", in SE¼NW¼ sec.6, T.22 N., R.19 E., on left bank 400 ft upstream from Sand Creek, 3 miles downstream from East Fork, and 7 miles south of Cashmere.

Drainage area.--40 sq mi, approximately.

Records available.--December 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,750 ft (from topographic map).

Extremes.--Maximum discharge during year, 240 cfs Nov. 22 (gage height, 3.10 ft); maximum gage height, 3.48 ft Nov. 22 (backwater from ice); minimum discharge recorded, 2.2 cfs Nov. 12 (gage height, 1.15 ft).
1958-60: Maximum discharge, that of Nov. 22, 1959; maximum gage height, 4.31 ft Jan. 7, 1959 (backwater from ice); minimum discharge, 2.1 cfs Sept. 12, 13, 1959 (gage height, 1.14 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. No regulation or diversion above station.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22				Nov. 22 to Sept. 30			
1.16	2.4	1.6	17.5	1.2	1.9	1.6	20
1.2	3.1	1.8	32	1.3	4.8	2.0	62
1.4	8.7	2.1	66	1.4	8.3	2.5	130
				1.5	13		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.0	5.1	4.8		5.0	8.5	39	102	44	12	6.6	3.4
2	3.7	4.8	4.8		5.0	8.5	42	102	49	11.5	6.2	3.2
3	3.7	5.4	4.4		5.0	7.0	50	96	49	11	18.5	a3.0
4	3.5	4.8	4.4		5.0	7.0	56	102	46	11	6.2	a2.9
5	3.5	4.3	4.0		6.0	7.5	64	92	42	10.5	6.2	a2.8
6	3.3	4.3	*4.5		7.2	8.0	70	96	40	10	5.5	a2.8
7	3.3	4.6	5.0		8.3	8.0	71	116	*38	9.4	5.5	a2.8
8	5.4	4.3	6.0		8.3	7.5	72	96	36	9.4	5.2	a2.8
9	5.4	4.0	7.0	(*)	8.3	7.0	63	81	34	9.4	4.8	a2.8
10	4.8	4.0	7.6		8.3	7.0	48	92	33	9.4	4.4	a2.7
11	18	3.7	7.6		8.3	7.0	42	104	31	9.4	4.1	a2.6
12	9.1	3.5	7.6		8.3	7.2	34	*108	29	9.4	3.8	a2.5
13	7.5	2.5	8.0		8.3	7.2	30	86	28	*9.4	3.8	a2.4
14	6.6	2.5	8.3		9.4	7.6	28	*78	27	9.4	3.8	a2.3
15	5.7	3.0	19.5	5.0	11	10	25	*70	26	9.4	4.1	a2.5
16	5.4	3.5	9.4		*11	10	23	68	24	9.0	4.1	2.6
17	5.4	3.5	8.0		10.5	12	23	55	22	9.0	3.8	2.6
18	5.1	3.5	7.6		10.5	15	22	48	21	8.6	3.8	2.6
19	4.8	3.5	7.2		9.4	20	*20	44	19.5	8.3	3.2	2.4
20	5.1	3.5	7.2		9.4	30	20	46	18.5	8.0	3.2	2.6
21	4.8	10	6.9		10	40	18.5	41	18	7.6	3.2	2.8
22	9.5	63	6.6		10.5	50	19.5	37	17	7.6	3.4	2.8
23	7.2	93	6.6		11	60	31	35	17	7.6	*4.8	2.8
24	*7.2	50	6.9		10.5	70	44	35	16	7.6	5.2	2.8
25	7.5	31	6.6		10.5	*80	52	37	15	7.2	5.2	2.6
26	6.6	18.5	6.0		10.5	100	71	40	15	6.9	a3.0	*2.6
27	6.3	12	5.5		8.0	81	78	40	14.5	6.9	3.4	2.6
28	6.0	9.4	5.0		8.0	69	92	38	13.5	6.6	3.4	2.4
29	5.7	7.2	5.0		8.0	59	100	38	13	6.2	3.2	2.4
30	5.4	5.5	5.0		------	54	102	42	12.5	6.9	3.2	2.4
31	5.1	------	5.0		------	47	------	44	------	7.2	3.4	------
Total	184.6	378.9	208.0	155.0	249.5	912.0	1,450.0	2,109	808.5	271.8	148.2	80.5
Mean	5.95	12.6	6.71	5.00	8.60	29.4	48.3	68.0	27.0	8.77	4.78	2.68
Cfsm	0.149	0.315	0.168	0.125	0.215	0.735	1.21	1.70	0.675	0.219	0.120	0.067
In.	0.17	0.35	0.19	0.14	0.23	0.85	1.35	1.96	0.75	0.25	0.14	0.07
Ac-ft	366	752	413	307	495	1,810	2,880	4,180	1,600	539	294	160

Calendar year 1959: Max 103 Min 2.4 Mean 17.1 Cfsm 0.428 In. 5.82 Ac-ft 12,400
Water year 1959-60: Max 116 Min 2.3 Mean 19.0 Cfsm 0.475 In. 6.45 Ac-ft 13,800

Peak discharge (base, 60 cfs).--Nov. 22 (11:30 p.m.) 240 cfs (3.10 ft); Mar. 26 (1:30 a.m.) 112 cfs (2.39 ft); Apr. 8 (7 to 10 p.m.) 78 cfs (2.14 ft); May 7 (4:30 a.m.) 124 cfs (2.46 ft); May 12 (4:30 p.m.) 127 cfs (2.48 ft); Aug. 3 (2:30 p.m.) 193 cfs (2.86 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for nearby stations.

Note.--Stage-discharge relation affected by ice Nov. 13-21, Dec. 5-9, Dec. 26 to Feb. 5, Feb. 27 to Mar. 11 Mar. 17-25 (no gage-height record Jan. 13 to Feb. 5, Mar. 6-11; discharge estimated on basis of weather records and records for nearby stations).

4645. Columbia River at Trinidad, Wash.

Location.--Lat 47°13'30", long 120°00'50", in SE¼ sec.13, T.20 N., R.22 E., on left bank half a mile southwest of Trinidad, 8½ miles downstream from Colocham Creek, and 12 miles downstream from Rock Island Dam.

Drainage area.--89,700 sq mi, approximately.

Records available.--January to December 1910 (gage heights only), May 1913 to September 1960. Published as "at Wenatchee" 1910, 1913-16 and as "at Vernita" 1917-30.

Gage.--Water-stage recorder. Datum of gage is 499.3 ft above mean sea level (river-profile survey). Prior to Jan. 1, 1916, staff gage 1 mile upstream from highway bridge at Wenatchee (24 miles upstream) at datum 583 ft above mean sea level, unadjusted. Jan. 1 to Dec. 31, 1916, staff gage on pier of highway bridge at Wenatchee at datum 579.30 ft above mean sea level, unadjusted. Jan. 14, 1917, to Sept. 30, 1930, staff gages at ferry at Vernita (50 miles downstream) at datum 388.7 ft above mean sea level, unadjusted.

Average discharge.--47 years, 120,300 cfs (87,090,000 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 311,400 cfs July 8 (gage height, 43.57 ft); minimum, 39,800 cfs Feb. 25 (gage height, 19.88 ft).
1913-60: Maximum discharge, 692,600 cfs June 12, 1948 (gage height, 59.35 ft); minimum, 4,120 cfs Feb. 10, 1932 (gage height, 11.40 ft).
Maximum discharge known, about 740,000 cfs June 7, 1894 (based on information obtained at other points).

Remarks.--Records excellent except those for period of no gage-height record, which are good. Diversion above station for irrigation of about 500,000 acres is small percentage of flow past gage. Some diurnal fluctuation caused by powerplants at Rock Island, Chief Joseph, and Grand Coulee Dams. Flow regulated by Rufus Woods Lake (see p. 297), Franklin D. Roosevelt Lake (see p. 295), and reservoirs in Kootenai, Flathead, Pend Oreille, Spokane, Okanogan, and Chelan River basins.

Corrections.--The figures of daily discharge for May 5, 1915, and June 23, 1932, published erroneously in WSP 462 and 737, respectively, have been corrected to 150,000 and 381,000 cfs, respectively.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

22.0	52,500	35.0	177,500
23.0	59,500	40.0	250,100
26.0	82,500	45.0	338,300
30.0	118,800		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	127,100	124,100	131,400	68,300	100,000	60,600	112,300	130,500	238,900	285,000	155,500	78,000
2	124,200	123,200	130,700	68,700	87,200	67,500	108,800	132,500	244,800	299,300	158,400	86,000
3	119,800	120,300	130,500	68,700	86,700	70,700	127,000	133,800	256,500	299,700	159,000	85,100
4	118,400	119,800	130,000	71,500	86,500	74,300	135,800	134,800	281,300	299,700	160,600	82,100
5	111,200	116,900	120,900	69,700	86,600	64,100	146,700	132,000	290,800	305,200	163,300	82,600
6	110,600	116,900	118,300	64,000	82,500	62,900	161,600	125,100	287,800	309,00	158,000	81,700
7	108,700	117,500	107,000	61,700	77,900	62,100	164,100	127,500	282,100	310,500	158,700	72,100
8	104,300	115,200	91,200	60,100	72,000	62,400	165,700	130,300	283,600	309,000	141,700	75,400
9	103,600	111,600	86,800	60,600	70,800	61,600	175,900	128,900	284,200	292,100	146,500	74,900
10	101,100	109,700	85,000	63,700	83,100	53,300	185,000	127,500	*282,600	288,900	145,500	79,000
11	101,200	104,400	77,500	65,700	83,500	55,400	187,100	130,600	283,500	286,200	148,500	77,200
12	103,400	99,600	76,500	68,600	*83,900	60,100	195,500	147,800	285,500	273,800	*140,800	78,900
13	104,400	91,800	77,800	66,300	81,200	59,700	197,300	174,900	288,900	265,100	130,400	76,700
14	*107,200	88,500	79,700	68,600	89,300	61,000	199,400	198,300	289,400	261,000	131,100	74,400
15	109,100	85,900	87,100	83,700	90,400	67,000	197,800	216,000	296,400	249,600	122,800	75,800
16	109,100	a86,000	100,400	82,700	70,000	67,500	190,700	216,400	295,900	246,600	127,000	72,800
17	114,600	a88,000	91,900	84,700	66,700	71,100	186,200	231,800	293,200	253,100	123,100	76,300
18	115,600	a84,000	88,600	85,500	67,400	69,800	181,700	227,400	297,500	249,500	122,800	75,600
19	114,300	a81,000	88,000	88,900	67,400	69,700	182,700	236,000	300,700	243,900	112,500	69,300
20	120,100	a81,000	87,100	89,100	67,100	66,900	187,600	249,600	304,700	240,800	109,300	67,000
21	123,000	a90,000	86,100	91,000	66,100	*67,100	175,200	249,900	297,500	237,300	108,300	71,500
22	121,000	a90,000	87,900	91,700	66,200	69,300	172,300	261,300	293,000	228,100	102,600	73,500
23	131,500	104,600	85,700	90,000	66,200	70,600	169,700	254,100	282,400	221,200	100,000	79,300
24	127,000	114,400	83,100	80,200	67,000	70,000	168,800	251,100	272,600	219,100	97,100	83,100
25	126,300	122,800	79,900	89,400	60,100	85,800	164,400	243,900	253,600	213,600	93,800	83,900
26	127,200	139,100	81,700	86,400	64,400	90,300	156,100	240,300	250,900	202,900	89,100	82,100
27	130,400	139,800	79,900	86,300	59,000	93,300	143,400	239,400	249,500	192,800	86,800	83,800
28	133,900	136,200	79,200	86,000	58,700	93,200	127,300	233,500	249,000	187,400	82,700	84,600
29	138,700	133,400	74,500	84,100	57,500	106,600	117,400	235,500	260,500	171,500	74,200	84,800
30	132,000	*132,400	73,600	91,500	-------	109,800	121,900	239,900	*273,800	167,100	78,900	82,700
31	127,800	-------	70,300	105,500	-------	109,300	-------	242,600	-------	157,300	76,300	-------
Total	‡3,646.9	‡3,267.1	‡2,869.3	‡2,422.9	‡2,165.4	‡2,253	‡4,905.4	‡6,023.2	8,351.1	‡7,766.3	‡3,805.3	‡2,250
Mean	117,600	108,900	92,560	78,160	74,670	72,680	163,500	194,300	278,400	250,500	122,800	75,000
Ac-ft	‡7,234	‡6,480	‡5,691	‡4,806	‡4,295	‡4,469	‡9,730	‡11,950	‡16,560	‡15,400	‡7,548	‡4,463

Calendar year 1959: Max 435,800 Min 51,700 Mean 156,400 Ac-ft 113,200,000
Water year 1959-60: Max 310,500 Min 53,300 Mean 135,900 Ac-ft 98,630,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
a No gage-height record; discharge estimated on basis of records for station below Priest Rapids Dam.

4646.7. Clear Lake near Medical Lake, Wash.

Location.--Lat 47°32'30", long 117°41'20", in NW¼SW¼ sec.30, T.24 N., R.41 E., on north shore of lake, 2 miles south of town of Medical Lake.

Drainage area.--7.25 sq mi.

Records available.--September 1958 to September 1960.

Gage.--Staff gage read at various times. Altitude of gage is 2,300 ft (from topographic map).

Extremes.--Maximum gage height observed during year, 43.11 ft May 21, 23, 25; minimum observed, 40.96 ft Sept. 14.
1958-60: Maximum gage height observed, 43.58 ft Apr. 4, 6, 8, 10, 1959; minimum observed, 40.62 ft Nov. 3, 1959.

Remarks.--No known regulation. Some pumping for domestic use.

Gage height, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	-	41.80	41.92	42.36	-	-	-	-	41.65	41.07
2	-	41.50	41.66	-	-	-	42.72	-	43.08	42.49	-	-
3	41.57	-	-	-	41.98	-	-	43.00	-	-	41.65	-
4	-	41.50	41.66	41.80	-	-	-	43.02	43.06	42.44	-	-
5	41.52	-	-	-	42.02	42.38	42.80	-	-	42.43	-	-
6	-	41.50	-	41.78	-	-	-	43.04	43.04	-	41.63	-
7	41.50	-	41.66	-	-	42.42	42.80	43.08	-	-	-	41.05
8	-	-	-	41.78	42.10	-	-	43.08	43.00	42.34	-	41.03
9	41.52	41.49	41.66	-	-	42.44	42.82	43.04	-	-	41.57	-
10	-	-	-	-	42.18	-	-	-	42.98	-	41.53	41.01
11	-	41.48	41.68	41.80	-	42.46	42.84	43.08	42.94	42.24	-	-
12	41.54	-	-	-	42.20	-	-	-	-	-	41.47	-
13	41.52	41.44	-	41.80	-	-	42.86	-	42.90	-	41.41	-
14	41.54	-	41.68	-	-	42.48	-	43.08	-	42.18	-	40.96
15	-	-	-	41.80	42.22	-	-	-	42.86	-	41.37	-
16	-	41.41	41.70	-	-	42.48	42.88	-	-	42.10	-	-
17	41.54	41.40	-	-	42.26	-	-	43.08	-	-	41.35	-
18	-	41.52	41.70	41.80	-	42.50	42.88	-	42.80	-	-	-
19	41.54	-	-	-	-	-	-	43.10	-	-	-	-
20	-	41.58	-	41.80	42.22	-	42.90	-	-	-	41.27	-
21	41.54	-	41.70	-	-	42.52	-	43.11	42.72	41.98	-	-
22	-	-	-	41.80	-	-	42.92	-	42.70	-	-	-
23	41.54	41.64	41.72	-	42.29	42.54	42.98	43.11	-	41.88	41.19	-
24	-	-	-	-	-	42.54	42.98	-	42.68	-	-	-
25	-	41.66	41.76	41.82	-	-	-	43.11	42.66	41.84	41.17	-
26	41.54	-	-	-	42.32	42.58	43.00	-	-	-	-	-
27	-	41.66	-	41.84	-	-	-	43.10	42.62	41.80	41.17	-
28	41.52	-	41.76	-	42.34	42.60	43.00	-	-	-	-	-
29	-	-	-	41.88	-	-	-	43.10	42.57	41.76	-	-
30	41.52	41.66	41.78	-	-------	42.62	43.00	-	42.54	-	41.11	-
31	-	-------	-	-	-------	-	-------	43.10	-------	-	-	-------

4650. Crab Creek at Irby, Wash.

Location.--Lat 47°21'30", long 118°51'00", in NW¼ sec.31, T.22 N., R.32 E., on right bank 8 ft upstream from highway bridge at Irby, 5 miles downstream from Lake Creek, and 7 miles west of Odessa.

Drainage area.--974 sq mi.

Records available.--September 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,386.30 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--18 years, 91.4 cfs (66,170 acre-ft per year).

Extremes.--Maximum discharge during year, 1,290 cfs Feb. 8 (gage height, 6.98 ft); minimum, 6.7 cfs Sept. 2 (gage height, 1.81 ft).
1942-60: Maximum discharge, 8,370 cfs Feb. 27, 1957 (gage height, 11.94 ft); minimum, 2.0 cfs Jan. 12, 1948 (gage height, 1.80 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No regulation. Some diversion above station for irrigation.

Revisions (water years).--WSP 1446: 1949-51.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 8				Feb. 9 to Sept. 30			
1.8	5.0	3.0	212	1.8	6.0	2.6	115
1.9	12	3.5	385	1.9	13	3.0	212
2.0	22	4.0	550	2.0	22	3.5	385
2.2	47	5.0	740	2.2	47	4.0	550
2.4	77	6.0	935	2.4	77	5.0	740
2.6	115	7.0	1,300				

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10.5	13	17	30	768	75	79	39	40	22	15	9.5
2	10.5	13	18	30	*686	70	79	37	42	22	14	8.1
3	10.5	13	19	30	981	65	79	37	38	21	14	8.8
4	10.5	13	19	30	714	70	77	35	35	21	15	8.8
5	11.5	13	20	30	424	75	77	33	33	20	15	9.5
6	11.5	13	21	32	350	80	75	32	30	20	14	9.5
7	11.5	13	22	32	462	85	74	32	29	19.5	14	9.5
8	11.5	13	22	34	1,050	88	72	32	29	19.5	14	9.5
9	11.5	13	22	34	690	107	71	35	29	19.5	14	9.5
10	12	13	23	34	416	135	71	37	28	19.5	14	9.5
11	12	13	23	35	338	139	69	35	28	19.5	14	8.8
12	12	14	24	35	318	135	67	33	27	19.5	13	8.8
13	12	14	24	35	278	128	66	32	27	18.5	13	8.8
14	12	14	24	37	252	122	66	32	27	17.5	13	8.8
15	12	13	26	37	224	116	64	38	27	17.5	13	8.8
16	12	12	26	37	204	111	64	38	27	18.5	13	8.8
17	12	13	26	37	198	*106	64	33	26	17.5	12.5	8.8
18	12	14	26	37	188	101	*63	33	26	17.5	*11.5	8.8
19	12	14	26	38	178	97	60	33	24	16.5	11	8.8
20	*12	14	27	40	168	93	58	39	24	16.5	11	8.8
21	12	15	27	40	153	91	57	44	24	16.5	11	8.8
22	12	14	27	40	148	88	50	43	24	15.5	11	8.8
23	12	*14	27	42	142	86	51	*43	24	15.5	11	8.8
24	12	15	28	42	135	82	54	44	24	16.5	11	8.1
25	12	15	27	44	130	81	55	46	23	16.5	11	8.1
26	12	15	27	44	100	77	54	46	23	15.5	10	*8.1
27	12	15	28	45	70	77	48	43	23	15.5	10	8.1
28	12	16	28	47	70	79	44	39	*23	15.5	10	8.1
29	12	16	28	66	75	77	43	43	22	15	10	7.4
30	12	17	29	291	-------	77	44	47	22	15	10	8.1
31	12	-------	30	977	-------	77	-------	47	-------	15	9.5	-------
Total	363.5	417	761	2,362	9,910	2,890	1,895	1,180	828	555.0	382.5	262.6
Mean	11.7	13.9	24.5	76.2	342	93.2	63.2	38.1	27.6	17.9	12.3	8.75
Ac-ft	721	827	1,510	4,680	19,660	5,730	3,760	2,340	1,640	1,100	759	521

Calendar year 1959: Max 5,080 Min 9.9 Mean 141 Ac-ft 120,400
Water year 1959-60: Max 1,050 Min 7.4 Mean 59.6 Ac-ft 43,250

Peak discharge (base, 300 cfs).--Jan. 31 (7 a.m.) 1,040 cfs (6.35 ft); Feb. 3 (2:30 p.m.) 1,160 cfs (6.68 ft); Feb. 8 (11:30 a.m.) 1,290 cfs (6.98 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 15, 16, Feb. 26 to Mar. 7 (no gage-height record Feb. 26 to Mar. 7). No gage-height record Jan. 9-29, Mar. 14-17; discharge estimated on basis of weather records.

4655. Wilson Creek at Wilson Creek, Wash.

Location.--Lat 47°26', long 119°06', in SW¼ sec.6, T.22 N., R.30 E., on right bank 1 mile upstream from mouth and 1 mile northeast of town of Wilson Creek.

Drainage area.--About 470 sq mi.

Records available.--February 1951 to March 1957, October 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,280 ft (from Great Northern Railway). Feb. 28 to Mar. 25, 1957, staff gage at same site and datum. Prior to flood of Feb. 26, 1957, water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 2,900 cfs Feb. 7; maximum gage height, 13.07 ft Feb. 2; no flow for many days.
1951-57, 1958-60: Maximum discharge, 12,900 cfs Feb. 26, 1957 (gage height, 20.74 ft), result of slope-area measurement of peak flow; no flow for long periods each year.

Remarks.--Records fair. Some regulation by small dams above station. Numerous diversions for irrigation above station.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	0	122	0	0					
2			0	0	*1,440	0	19					
3			0	0	*491	0	21					
4			0	0	*288	0	9.0					
5			0	0	714	0	0					
6			0	0	468	0	0					
7			0	0	*1,790	0	0					
8			0	0	*550	0	0					
9			0	0	*175	0	0					
10			0	0	103	0	0					
11			0	0	*170	0	0					
12			0	0	91	0	0					
13			0	0	48	0	0					
14			0	0	46	0	0					
15			0	0	*104	0	0					
16			0	0	128	0	0					
17			0	0	56	*0	0					
18			0	0	45	0	*0				(*)	
19			0	0	28	0	0					
20	(*)		0	0	21	0	0					
21			0	0	18.5	0	0					
22		(*)	0	0	12	0	0					
23			0	0	7.0	0	0	(*)				
24			0	0	5.8	0	0					
25			40	0	3.4	0	0					
26			22	0	.5	19.5	0					(*)
27			1.0	0	0	6.4	0					
28			0	0	0	8.6	0		(*)			
29			0	0	0	4.2	0					
30		(*)	*0	418	-------	0	0					(*)
31		-------	0	184	-------	0	-------		-------			-------
Total	0	0	63.0	602	6,925.2	38.7	49.0	0	0	0	0	0
Mean	0	0	2.03	19.4	239	1.25	1.63	0	0	0	0	0
Ac-ft	0	0	125	1,190	13,740	77	97	0	0	0	0	0

Calendar year 1959: Max 3,090 Min 0 Mean 63.7 Ac-ft 46,090
Water year 1959-60: Max 1,790 Min 0 Mean 21.0 Ac-ft 15,230

* Discharge measurement or observation of no flow made on this day.

4670. Crab Creek near Moses Lake, Wash.

Location.--Lat 47°11'25", long 119°16'00", in NW¼NE¼ sec.35, T.20 N., R.28 E., on left bank on downstream side of highway bridge, 3 miles upstream from Parker Horn and 4 miles north of town of Moses Lake.

Drainage area.--About 2,040 sq mi.

Records available.--September 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,070.39 ft above mean sea level (Bureau of Reclamation bench mark). Prior to July 14, 1956, at site 300 ft upstream at same datum.

Extremes.--Maximum discharge during year, 1,230 cfs Feb. 9 (gage height, 4.59 ft); minimum, 8.0 cfs Jan. 29 (gage height, 1.41 ft), but may have been less during period of no gage-height record.
1942-60: Maximum discharge, 10,400 cfs Feb. 28, 1957 (gage height, 6.81 ft); no flow for several months each year prior to 1952, and part of each day Jan. 14, 15, 1953.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Numerous small diversions for irrigation and domestic use above station. Most of natural flow from upper basin passes this station underground. No regulation. Beginning in 1952, return flow from irrigation on Columbia Basin project has increased runoff during summer months.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 16		Nov. 17 to Sept. 30			
1.7	16.5	1.4	7.8	3.0	134
2.0	28	1.6	12.5	3.4	265
2.2	38	2.0	26	3.8	475
		2.4	49	4.2	760
		2.7	80	4.6	1,240

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	24	15.5		12.5	b90	34	40	13.5	24	40	46
2	37	24	15.5		12.5	b80	31	38	15	25	41	45
3	36	25	15.5		14	b80	29	36	13.5	26	44	44
4	36	23	14		28	b75	27	32	12.5	26	43	56
5	36	22	13.5		330	86	26	28	12.5	26	43	51
6	35	22	13.5		735	74	26	27	13.5	26	43	47
7	34	22	14		1,050	68	25	48	13.5	26	43	45
8	34	22	14		*1,110	63	24	32	13.5	27	43	43
9	34	22	14		*1,210	58	31	26	13.5	28	43	43
10	34	21	14		1,070	50	49	23	13.5	29	44	42
11	38	22	14.5		*957	46	56	20	13.5	30	43	41
12	36	21	15		800	41	54	20	14	30	41	40
13	35	19	14		682	38	55	17.5	14	31	41	39
14	34	19	14		568	36	57	17	15.5	32	41	39
15	32	b18	15.5	a10	*482	37	54	15.5	17	32	42	38
16	32	b16	14		410	31	49	15.5	16.5	32	43	37
17	31	16.5	13.5		355	*35	48	14.5	16	32	41	37
18	30	16.5	13.5		335	38	49	14.5	16.5	34	41	36
19	30	17.5	13		315	40	*49	14.5	16.5	34	41	36
20	32	19	13		274	41	51	19	17.5	34	42	40
21	30	28	13.5		249	41	48	22	18.5	35	43	41
22	*32	26	13.5		229	41	46	18	19.5	36	*43	a40
23	30	24	13.5		197	42	51	15.5	19.5	36	43	a39
24	29	*21	16.5		178	43	53	*15	19.5	37	44	a38
25	28	18.5	16.5		162	42	51	16.5	19.5	37	43	a37
26	27	17	13.5		b140	41	51	15.5	21	37	44	a36
27	27	16.5	12		b130	46	48	15.5	22	37	44	a35
28	26	16.5	12		b110	50	44	14.5	23	37	45	a34
29	26	16.5	*11.5	8.0	b100	38	41	14.5	*22	37	45	*33
30	25	16	11.5	9.3	-------	38	40	14	22	39	45	34
31	24	-------	11.5	10	-------	35	-------	14	-------	40	45	-------
Total	988	611.5	429.0	307.3	12,245.0	1,564	1,297	673.0	498.0	992	1,327	1,212
Mean	31.9	20.4	13.8	9.91	422	50.5	43.2	21.7	16.6	32.0	42.8	40.4
Ac-ft	1,960	1,210	851	610	24,290	3,100	2,570	1,330	988	1,970	2,630	2,400

Calendar year 1959: Max 4,130 Min 11.5 Mean 157 Ac-ft 113,400
Water year 1959-60: Max 1,210 Min 8.0 Mean 60.5 Ac-ft 43,910

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for nearby stations.
b Stage-discharge relation affected by ice.

4680. Park Lake near Coulee City, Wash.

Location.--Lat 47°34'30", long 119°24'55", in NE¼SW¼ sec.15, T.24 N., R.27 E., on southeast shore 0.4 mile northeast of outlet and 6½ miles southwest of Coulee City.

Records available.--March 1938 to December 1956 (fragmentary), January 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Prior to Dec. 20, 1956, staff gage at site half a mile uplake at same datum.

Extremes.--Maximum elevation during year, 1,096.36 ft Nov. 23; minimum, 1,095.43 ft Sept. 29.
1938-60: Maximum elevation, 1,096.74 ft Jan. 12, 1959; minimum observed, 1,094.17 ft Sept. 30, 1939.
Maximum elevation known, 1,101.3 ft (from well-defined alkali line at gage), date of occurrence unknown.

Remarks.--Some diversion from tributary for irrigation. Some regulation by flashboards on fish-screen structure at outlet.

Mean elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95.72	95.76	95.86	95.53	95.52	95.47	95.52	95.95	95.92	95.72	95.71	95.74
2	95.72	95.77	95.82	95.51	95.59	95.47	95.52	95.97	95.90	95.72	95.72	95.74
3	95.72	95.78	95.78	95.51	95.59	95.47	95.52	96.01	95.88	95.73	95.73	95.74
4	95.72	95.78	95.75	95.50	95.58	95.47	95.51	96.02	95.88	95.74	95.73	95.80
5	95.71	95.78	95.72	95.50	95.60	95.47	95.51	96.03	95.88	95.74	95.74	95.83
6	95.69	95.79	95.69	95.50	95.60	95.48	95.51	96.05	95.87	95.75	95.75	95.83
7	95.68	95.79	95.67	95.50	95.62	95.49	95.51	96.08	95.85	95.76	95.75	95.82
8	95.69	95.80	95.65	95.50	95.63	95.50	95.51	96.08	95.84	95.74	95.75	95.79
9	95.69	95.80	95.63	95.50	95.63	95.50	95.49	96.07	95.83	95.73	95.75	95.77
10	95.68	95.81	95.62	95.50	95.63	95.50	95.49	96.06	95.83	95.73	95.75	95.75
11	95.70	95.81	95.61	95.50	95.62	95.50	95.48	96.05	95.82	95.74	95.75	95.73
12	95.71	95.81	95.59	95.49	95.61	95.50	95.47	96.03	95.81	95.74	95.72	95.72
13	95.71	95.80	95.58	95.49	95.60	95.51	95.47	96.01	95.80	95.74	95.70	95.71
14	95.72	95.82	95.57	95.49	95.60	95.50	95.47	96.00	95.79	95.74	95.68	95.68
15	95.72	95.84	95.57	95.50	95.59	95.50	95.46	95.99	95.78	95.74	95.68	95.66
16	95.71	95.87	95.56	95.50	95.58	95.50	95.45	95.98	95.78	95.74	95.69	95.63
17	95.71	95.93	95.54	95.50	95.58	95.51	95.45	95.98	95.76	95.75	95.69	95.62
18	95.71	96.02	95.53	95.49	95.57	95.52	95.45	95.98	95.75	95.76	95.70	95.60
19	95.71	96.09	95.53	95.49	95.56	95.52	95.45	95.97	95.74	95.73	95.69	95.58
20	95.72	96.16	95.53	95.48	95.55	95.51	95.46	95.99	95.73	95.71	95.69	95.56
21	95.72	96.24	95.53	95.48	95.54	95.51	95.47	95.99	95.71	95.70	95.70	95.54
22	95.73	96.31	95.52	95.47	95.54	95.50	95.52	95.99	95.72	95.69	95.70	95.52
23	95.73	96.34	95.52	95.47	95.53	95.50	95.62	95.98	95.73	95.67	95.70	95.52
24	95.73	96.28	95.56	95.48	95.52	95.50	95.69	95.98	95.73	95.66	95.70	95.51
25	95.73	96.20	95.56	95.49	95.52	95.50	95.75	95.98	95.72	95.66	95.70	95.50
26	95.73	96.13	95.55	95.49	95.51	95.50	95.80	95.98	95.72	95.67	95.71	95.49
27	95.74	96.07	95.55	95.49	95.50	95.51	95.84	95.97	95.73	95.68	95.72	95.48
28	95.74	96.01	95.53	95.50	95.49	95.54	95.88	95.97	95.73	95.68	95.72	95.46
29	95.74	95.95	95.53	95.51	95.49	95.54	95.91	95.95	95.74	95.69	95.73	95.44
30	95.74	95.90	95.54	95.51	-------	95.53	95.93	95.95	95.73	95.70	95.74	95.44
31	95.75	-------	95.55	95.51	-------	95.53	-------	95.93	-------	95.71	95.74	-------

Note.--Add 1,000 ft to obtain elevation above mean sea level.

4685. Park Creek below Park Lake, near Coulee City, Wash.

Location.--Lat 47°34'20", long 119°25'10", in SW¼ sec.15, T.24 N., R.27 E., on left bank at highway crossing, 100 ft upstream from mouth, 500 ft downstream from Park Lake, and 6½ miles southwest of Coulee City.

Drainage area.--38.4 sq mi.

Records available.--July 1945 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,091.52 ft above mean sea level (Bureau of Reclamation bench mark).

Average discharge.--15 years, 9.76 cfs (7,070 acre-ft per year).

Extremes.--Maximum discharge during year, about 40 cfs Nov. 24, during period of indefinite stage-discharge relation; minimum, 2.9 cfs Nov. 15 (gage height, 1.82 ft), result of freezeup.

1945-60: Maximum discharge, 47 cfs Feb. 9, 1951 (gage height, 2.71 ft); maximum gage height, 3.05 ft Jan. 28, 1950 (backwater from ice); minimum discharge not determined, probably less than 0.1 cfs during period Aug. 17 to Sept. 21, or Oct. 1-17, 1945 (gage height, less than 1.4 ft).

Remarks.--Records good except those for periods of indefinite stage-discharge relation, which are fair. Some diversion during summer months for irrigation above Park Lake. Occasional regulation by operation of fish screen at outlet of Park Lake.

Revisions.--WSP 1566: Drainage area.

Rating tables, water year 1959-60, except periods of indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 27 to Dec. 8, May 18-26)

Oct. 1 to Nov. 22, Feb. 21 to Sept. 30		Nov. 23 to Feb. 20	
1.9	4.0	2.1	11
2.0	6.0	2.2	16
2.2	12.5	2.3	22
2.5	25	2.5	41

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	18	31	18.5	21	18	20	12.5	16	8.5	9.4	8.5
2	18	18	30	19	21	18	20	12.5	*16	7.3	9.1	8.5
3	18	18	29	19	21	18	19.5	12.5	14.5	7.0	9.4	8.8
4	18	18	27	19	21	17.5	19.5	13	14	7.0	10	9.8
5	18	18	26	19	22	17	19.5	13	14	7.0	10.5	10.5
6	18	18	26	19.5	22	17.5	19	14	14	7.0	10.5	10.5
7	18	18	25	19.5	23	18	19	15	13.5	7.6	10.5	14
8	18	18.5	*25	19.5	22	18	19	16	13	8.2	10.5	17
9	18	18.5	e22	19.5	23	18	18.5	20	13	8.5	10.5	17
10	18	19	19	19.5	23	18	18.5	18	*14	8.8	10.5	16.5
11	18.5	19	19.5	19	*23	18	18	18	13	8.8	10.5	16
12	18.5	17	20	19	23	18	18	17	12.5	8.8	9.8	16
13	18.5	16	19.5	19	22	18	18	17	12.5	8.8	9.4	15.5
14	18.5	16	19.5	19	22	18	18	17	12	9.1	9.1	15.5
15	18.5	8.6	19.5	19	22	18	18	15.5	12	9.4	9.1	15
16	18.5	4.4	19.5	19	22	*18	17.5	16	12.5	9.4	9.1	14
17	18.5	4.2	19	19	22	18	18	16	12	9.8	7.9	14
18	18.5	4.2	19	19	22	19	*17.5	16.5	12.5	10	*7.6	14
19	18.5	4.8	19	19	22	20	17	16	12	9.8	7.6	14
20	18.5	5.6	19	18.5	22	20	17	16.5	12	9.4	6.7	13.5
21	*18.5	6.2	19	18	21	20	11.5	16.5	11.5	9.4	7.0	13.5
22	18.5	7.0	19	18	20	19.5	5.8	16	12	8.8	6.7	*13.5
23	19	*e21	18.5	18.5	20	19.5	5.6	*15	11.5	8.8	6.7	13
24	19	*e39	18.5	19	20	19	5.8	15	11	8.5	7.0	12.5
25	18.5	e38	18.5	19	20	19	6.2	15.5	10.5	8.5	6.7	12.5
26	18	e37	18.5	19.5	19.5	19.5	7.3	16	10	8.5	7.0	12.5
27	18	36	18.5	19.5	19.5	19.5	8.2	16	9.8	8.8	7.3	11.5
28	18	34	*18	19.5	19	19.5	*8.5	16	*9.6	8.8	7.6	11
29	17.5	33	18	20	19	20	9.1	16.5	9.1	8.8	7.9	10
30	17	33	18	20	-------	20	12.5	16.5	9.1	9.4	7.9	10
31	17.5	-------	18	20	-------	20	-------	16.5	-------	9.1	8.2	-------
Total	564.5	566.0	656.0	592.5	619.0	578.5	450.0	487.5	369.1	267.6	267.7	388.6
Mean	18.2	18.9	21.2	19.1	21.3	18.7	15.0	15.7	12.3	8.63	8.64	13.0
Ac-ft	1,120	1,120	1,300	1,180	1,230	1,150	893	967	732	531	531	771

Calendar year 1959: Max 39 Min 3.0 Mean 17.0 Ac-ft 12,320
Water year 1959-60: Max 39 Min 4.2 Mean 15.9 Ac-ft 11,520

* Discharge measurement made on this day.
e Stage-discharge relation indefinite; discharge estimated on basis of 2 discharge measurements and recorder graph.

4690. Blue Lake near Coulee City, Wash.

Location.--Lat 47°34'25", long 119°25'15", in SW¼ sec.15, T.24 N., R.27 E., on northeast shore near mouth of Park Creek, 6½ miles southwest of Coulee City.

Records available.--March 1938 to November 1956 (fragmentary), December 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Prior to Nov. 16, 1956, staff gage at site 0.3 mile downlake at same datum.

Extremes.--Maximum elevation during year, 1,093.68 ft Dec. 3; minimum, 1,092.84 ft Aug. 24, 25.
1938-60: Maximum elevation, 1,093.81 ft Jan. 24, 1959; minimum observed, 1,090.50 ft Nov. 10, 1939.
Maximum elevation known, 1,101.2 ft (from alkali line at former staff gage), date of occurrence unknown.

Remarks.--Some diversion from tributaries for irrigation.

Mean elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	93.52	93.50	93.66	93.53	93.50	93.44	93.40	93.18	93.43	93.22	92.95	92.87
2	93.52	93.50	93.66	93.52	93.56	93.43	93.40	93.19	93.43	93.19	92.95	92.86
3	93.52	93.50	93.67	93.52	93.55	93.42	93.40	93.20	93.41	93.18	92.95	92.86
4	93.52	93.49	93.67	93.51	93.55	93.42	93.40	93.21	93.39	93.15	92.96	92.93
5	93.50	93.48	93.67	93.51	93.56	93.42	93.40	93.22	93.39	93.14	92.96	92.95
6	93.49	93.48	93.67	93.51	93.56	93.41	93.39	93.24	93.39	93.14	92.96	92.95
7	93.49	93.48	93.67	93.51	93.57	93.42	93.38	93.28	93.38	93.15	92.96	92.94
8	93.50	93.48	93.66	93.51	93.57	93.41	93.38	93.28	93.37	93.12	92.96	92.96
9	93.50	93.48	93.65	93.51	93.57	93.41	93.37	93.30	93.38	93.11	92.96	92.99
10	93.49	93.47	93.65	93.50	93.56	93.39	93.36	93.32	93.38	93.10	92.96	93.02
11	93.52	93.47	93.65	93.51	93.56	93.39	93.35	93.33	93.37	93.10	92.97	93.05
12	93.52	93.44	93.65	93.51	93.55	93.38	93.35	93.35	93.36	93.09	92.96	93.08
13	93.52	93.44	93.64	93.50	93.54	93.38	93.34	93.35	93.35	93.10	92.92	93.09
14	93.53	93.43	93.63	93.50	93.54	93.36	93.34	93.34	93.34	93.09	92.90	93.11
15	93.54	93.38	93.63	93.50	93.54	93.35	93.33	93.33	93.34	93.09	92.90	93.12
16	93.53	93.35	93.62	93.50	93.53	93.34	93.33	93.34	93.33	93.08	92.90	93.12
17	93.54	93.33	93.60	93.50	93.52	93.34	93.33	93.33	93.31	93.08	92.89	93.13
18	93.54	93.33	93.59	93.50	93.51	93.34	93.32	93.33	93.30	93.08	92.89	93.15
19	93.54	93.32	93.58	93.50	93.51	93.34	93.32	93.33	93.29	93.07	92.89	93.16
20	93.54	93.31	93.58	93.49	93.50	93.35	93.33	93.35	93.27	93.05	92.87	93.15
21	93.54	93.32	93.58	93.48	93.50	93.35	93.32	93.36	93.26	93.03	92.86	93.14
22	93.55	93.31	93.57	93.48	93.49	93.36	93.28	93.37	93.25	93.02	92.86	93.15
23	93.55	93.33	93.57	93.48	93.48	93.36	93.29	93.37	93.26	92.99	92.85	93.16
24	93.55	93.41	93.59	93.49	93.48	93.36	93.27	93.38	93.26	92.95	92.85	93.17
25	93.55	93.47	93.59	93.49	93.48	93.37	93.24	93.39	93.25	92.95	92.85	93.18
26	93.55	93.51	93.58	93.49	93.47	93.37	93.22	93.41	93.24	92.95	92.85	93.17
27	93.54	93.55	93.57	93.49	93.46	93.37	93.20	93.42	93.23	92.96	92.85	93.16
28	93.53	93.59	93.56	93.49	93.45	93.41	93.18	93.42	93.23	92.95	92.85	93.15
29	93.52	93.62	93.55	93.50	93.45	93.41	93.16	93.43	93.23	92.95	92.86	93.13
30	93.51	93.64	93.56	93.49	-------	93.41	93.17	93.44	93.23	92.95	92.86	93.14
31	93.50	-------	93.54	93.49	-------	93.41	-------	93.43	-------	92.95	92.87	-------

Note.--Add 1,000 ft to obtain elevation above mean sea level.

4695. Lenore Lake near Soap Lake, Wash.

Location.--Lat 47°31', long 119°30', in SW¼ sec.1, T.23 N., R.26 E., on east shore 300 ft downlake from outlet gate on Alkali Lake and 8.3 miles north of town of Soap Lake.

Records available.--July 1936, March 1938 to December 1956 (fragmentary), January 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Prior to Dec. 20, 1956, reference point and various staff gages at site 800 ft uplake at same datum.

Extremes.--Maximum elevation during year, 1,080.43 ft May 11 (affected by wind); minimum, 1,074.08 ft Oct. 5 (affected by wind).
1936, 1938-60: *Maximum elevation observed*, 1,087.73 ft *June* 12, 1953; *minimum*, 1,072.72 ft Jan. 2, 1959 (affected by wind).
Maximum elevation known, 1,092.2 ft (from well-defined alkali line at gage), date of occurrence unknown.

Remarks.--Some diversion from tributaries for irrigation, and pumping into and out of lake.

Mean elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74.13	74.62	75.35	76.71	77.78	78.84	79.64	80.26	79.96	78.93	77.30	75.78
2	74.13	74.64	75.41	76.76	77.87	78.86	79.67	80.27	79.94	78.87	77.24	75.74
3	74.13	d74.67	75.45	76.79	77.89	78.89	79.69	80.29	d79.95	78.82	d77.23	75.72
4	74.13	74.68	75.50	76.82	77.92	78.92	79.72	80.31	79.92	78.75	77.18	75.76
5	74.13	74.69	75.56	76.85	77.97	78.95	79.74	80.32	79.90	78.71	77.13	75.76
6	74.14	74.73	75.61	76.89	78.02	78.98	79.77	80.35	79.87	78.68	77.08	75.73
7	74.14	74.75	75.66	-	78.07	79.02	79.79	80.38	79.82	78.63	77.03	d75.67
8	74.15	74.77	75.71	-	78.12	79.06	79.81	80.39	79.77	78.56	76.98	75.66
9	74.14	74.80	75.77	-	78.17	79.09	79.83	80.40	79.74	78.51	76.93	75.64
10	74.16	74.83	75.82	-	78.20	79.10	79.84	80.40	79.74	78.45	76.88	75.63
11	74.19	74.85	75.88	77.06	78.25	79.11	79.86	80.39	79.74	78.40	76.84	75.62
12	74.20	d74.83	75.92	77.09	78.28	79.13	79.88	80.39	79.74	78.35	76.77	75.61
13	74.21	74.88	75.96	77.12	78.31	79.15	79.90	80.37	79.73	78.32	76.70	75.59
14	74.22	74.89	76.00	77.16	78.35	d79.17	79.93	80.34	79.70	78.26	76.62	75.57
15	74.23	d74.84	d76.07	77.19	78.39	79.18	79.91	80.31	79.66	78.21	76.58	75.53
16	74.24	74.90	76.08	77.22	78.42	79.21	79.93	80.30	79.62	78.15	76.54	75.49
17	74.26	74.93	76.13	77.25	78.45	79.23	79.95	80.29	79.54	78.11	76.48	75.48
18	74.28	74.96	76.18	77.29	78.48	79.26	79.97	80.27	79.50	78.11	76.44	75.46
19	74.31	75.00	76.21	77.32	78.51	79.28	80.00	80.25	79.45	78.05	76.37	d75.45
20	74.34	75.03	76.25	77.35	78.55	79.30	d80.02	80.23	79.39	77.98	76.31	75.40
21	74.36	75.08	76.29	77.38	78.58	79.33	80.02	80.22	79.34	77.91	76.26	75.38
22	74.40	75.11	76.33	77.42	78.61	79.35	80.03	80.18	79.29	77.84	76.20	75.36
23	74.43	75.14	76.38	77.45	78.64	79.37	80.10	80.16	79.26	77.76	76.15	75.35
24	74.45	d75.17	76.44	77.49	78.66	79.39	80.13	80.15	d79.24	77.69	76.09	75.33
25	74.47	75.18	76.49	77.53	78.69	79.43	80.15	80.13	79.18	77.64	76.05	75.30
26	74.50	75.20	76.51	77.56	78.73	79.47	80.17	80.11	79.14	77.60	76.01	75.28
27	74.52	75.23	76.55	77.59	78.76	79.49	80.19	80.10	79.11	77.56	75.97	75.26
28	74.54	75.26	76.58	77.63	78.79	79.55	80.21	80.07	79.09	77.49	75.93	75.23
29	74.53	75.28	76.62	77.67	78.81	d79.59	80.23	80.06	79.04	77.44	75.89	75.22
30	74.58	75.30	76.66	77.70	-------	79.60	80.24	80.05	78.99	77.39	75.86	75.22
31	74.60	-------	76.68	77.73	-------	79.62	-------	79.99	-------	77.36	75.83	-------

d Gage height affected by wind.
Note.--Add 1,000 ft to obtain elevation above mean sea level.

4700. Soap Lake near Soap Lake, Wash.

Location.--Lat 47°24'10", long 119°29'10", in NW¼SW¼ sec.18, T.22 N., R.27 E., on east shore half a mile north of town of Soap Lake.

Records available.--May to August 1936, March 1938 to February 1957 (fragmentary), March 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Prior to Feb. 4, 1953, staff gage or reference point at site 0.2 mile uplake. Feb. 4, 1953, to June 8, 1954, staff gage at site 1.5 miles uplake and June 9, 1954, to June 21, 1957, water-stage recorder at site 0.2 mile uplake.

Extremes.--Maximum elevation during year, 1,074.38 ft Apr. 4-9; minimum, 1,073.02 ft Sept. 2.

1936, 1938-60: Maximum elevation observed, 1,079.20 ft Jan. 28, 1953; minimum observed, 1,070.87 ft Oct. 21, 1939.

Maximum elevation known, 1,083.1 ft (from well-defined alkali line at gage), date of occurrence unknown.

Remarks.--Some diversion from tributaries for irrigation. Water pumped from lake to reduce or limit high stages.

Mean elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73.70	73.77	73.82	73.97	74.14	74.29	74.37	74.31	74.21	73.80	73.34	73.04
2	73.70	73.78	73.82	73.97	d74.19	74.28	74.37	74.31	74.20	73.77	73.33	73.03
3	73.71	73.79	73.83	73.97	74.20	74.29	74.37	74.31	74.20	73.75	73.32	73.04
4	73.71	73.78	73.83	73.98	74.20	74.29	74.36	74.31	74.17	73.74	73.31	73.07
5	73.70	73.77	73.84	73.98	74.22	74.30	74.36	74.31	74.17	73.73	73.31	73.09
6	73.70	73.77	73.84	73.98	74.24	74.31	74.38	74.31	74.16	73.73	73.30	73.08
7	73.70	73.77	73.84	73.99	74.25	74.32	74.38	74.34	74.13	73.72	73.30	73.07
8	73.70	73.77	73.85	74.00	74.27	74.32	74.37	74.33	74.12	73.69	73.29	73.07
9	73.69	73.78	73.85	74.00	74.28	74.32	74.36	74.32	74.11	73.67	73.28	73.08
10	73.68	73.78	73.86	74.01	74.29	74.32	74.35	74.31	74.11	73.65	73.28	73.08
11	73.71	73.78	73.86	74.01	74.29	74.33	74.35	74.31	74.10	73.64	73.27	73.09
12	73.72	73.77	73.87	74.01	74.30	74.33	74.34	74.30	74.08	73.63	73.24	73.10
13	73.73	73.75	73.87	74.01	74.30	74.33	74.34	74.31	74.07	73.62	73.22	73.10
14	73.73	73.75	73.88	74.02	74.30	74.33	74.33	74.29	74.05	73.61	73.18	73.10
15	73.73	73.74	73.88	74.02	74.30	74.32	74.32	74.27	74.04	73.60	73.17	73.10
16	73.74	73.71	73.88	74.03	74.30	74.29	74.31	74.26	74.03	73.58	73.16	73.10
17	73.74	73.72	73.88	74.03	74.30	74.30	74.30	74.25	74.00	73.58	73.15	73.10
18	73.74	73.73	73.89	74.04	74.31	74.31	74.30	74.23	73.99	73.58	73.15	73.10
19	73.75	73.75	73.89	74.04	74.31	74.31	74.30	74.21	73.96	73.56	73.13	73.10
20	73.75	73.76	73.90	74.04	74.31	74.32	74.30	74.22	73.93	73.53	73.10	73.08
21	73.76	73.78	73.90	74.04	74.32	74.32	74.29	74.23	73.90	73.51	73.09	73.08
22	73.77	73.79	73.91	74.04	74.32	74.33	74.28	74.22	73.90	73.49	73.09	73.08
23	73.78	73.80	73.92	74.05	74.31	74.33	74.32	74.22	73.89	73.45	73.07	73.09
24	73.78	73.80	73.94	74.06	74.31	74.32	74.33	74.22	73.89	73.42	73.07	73.09
25	73.78	73.80	73.95	74.07	74.30	74.33	74.34	74.23	73.86	73.41	73.06	73.09
26	73.78	73.80	73.95	74.08	74.30	74.33	74.33	74.24	73.85	73.40	73.06	73.10
27	73.78	73.81	73.95	74.08	74.30	74.34	74.32	74.26	73.84	73.40	73.05	73.10
28	73.78	73.81	73.96	74.09	74.29	74.36	74.32	74.25	73.84	73.38	73.04	73.10
29	73.77	73.82	73.96	74.10	74.29	74.37	74.32	74.24	73.83	73.38	73.04	73.10
30	73.77	73.82	73.97	74.11	-------	74.37	74.32	74.23	73.82	73.37	73.04	73.10
31	73.77	-------	73.97	74.12	-------	74.37	-------	74.23	-------	73.36	73.04	-------

d Gage height affected by wind.

Note.--Add 1,000 ft to obtain elevation above mean sea level.

4705. Rocky Ford Creek near Ephrata, Wash.

Location.--Lat 47°18'20", long 119°26'50", in NW¼NW¼ sec.21, T.21 N., R.27 E., on right bank 1½ miles downstream from source at Rocky Ford Springs, 5 miles upstream from mouth, and 5 miles east of Ephrata.

Drainage area.--11.7 sq mi.

Records available.--June 1909 to April 1910, July to December 1911, August 1942 to September 1960. Prior to January 1910, published as Upper Crab Creek near Ephrata.

Gage.--Water-stage recorder. Datum of gage is 1,064.88 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Jan. 1, 1912, staff gages at sites 4½ to 5½ miles downstream at different datums. Aug. 19, 1942, to May 23, 1945, water-stage recorder at site 3½ miles downstream at datum 5.37 ft lower.

Average discharge.--18 years (1942-60), 82.4 cfs (59,660 acre-ft per year).

Extremes.--Maximum discharge during year, 106 cfs Aug. 15; maximum gage height, 2.51 ft Oct. 1; minimum daily discharge, 67 cfs Feb. 10-15.
1909-11, 1942-60: Maximum discharge, 212 cfs Apr. 15-18, 1956 (gage height, 3.58 ft); minimum observed, 20 cfs Aug. 13-18, 1911.

Remarks.--Records good. A few small diversions for domestic use above station. Slight regulation by fish hatchery.

Revisions.--WSP 1566: Drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-8)

1.9	63
2.1	76
2.3	92
2.5	110

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	99	96	90	80	70	77	94	98	90	90	99	100
2	99	96	90	80	69	78	95	98	90	90	99	99
3	99	95	90	79	68	78	96	98	90	90	99	99
4	99	95	90	78	69	78	96	98	90	90	99	99
5	98	95	89	78	69	79	96	98	90	90	99	99
6	97	95	89	78	69	81	96	98	89	89	99	100
7	97	95	89	78	69	82	96	98	88	89	99	101
8	98	95	88	78	68	82	98	96	87	88	99	101
9	98	95	88	77	*68	84	97	96	86	88	99	101
10	98	95	88	77	67	84	98	95	87	89	99	100
11	97	95	88	77	67	85	98	94	86	90	100	100
12	97	94	87	77	67	86	99	95	86	90	101	102
13	97	94	87	76	67	86	100	95	86	90	102	104
14	97	94	87	75	67	86	100	94	86	89	102	104
15	97	91	86	75	67	85	101	93	86	90	103	104
16	98	95	86	74	68	*86	102	93	86	90	103	104
17	98	95	86	73	68	86	101	93	86	90	102	104
18	98	94	86	73	69	86	101	91	86	90	102	104
19	98	93	85	73	70	87	*100	91	86	90	*102	102
20	98	93	85	73	70	87	100	93	86	91	102	100
21	*97	93	85	72	71	87	99	91	86	91	99	100
22	97	92	84	72	72	87	99	91	86	91	98	99
23	97	93	84	71	72	88	100	90	86	91	97	99
24	97	*93	84	70	72	89	99	*91	85	91	97	97
25	97	92	83	70	72	90	98	90	86	92	97	98
26	97	91	83	70	73	90	98	91	86	91	97	98
27	97	91	83	70	75	90	98	90	87	93	98	98
28	97	91	82	69	75	91	98	90	88	95	101	98
29	96	91	*82	69	76	92	98	90	*90	96	101	98
30	96	91	82	68	-------	92	98	90	90	97	102	*98
31	96	-------	82	68	-------	93	-------	90	-------	98	101	-------
Total	3,021	2,808	2,668	2,298	2,024	2,652	2,949	2,899	2,617	2,819	3,097	3,010
Mean	97.5	93.6	86.1	74.1	69.8	85.5	98.3	93.5	87.2	90.9	99.9	100
Ac-ft	5,990	5,570	5,290	4,560	4,010	5,260	5,850	5,750	5,190	5,590	6,140	5,970

Calendar year 1959: Max 148 Min 72 Mean 107 Ac-ft 77,550
Water year 1959-60: Max 104 Min 67 Mean 89.8 Ac-ft 65,170

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 3-29; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations.

4710. Moses Lake at Moses Lake, Wash.

Location.--Lat 47°06'00", long 119°19'20", in NW¼ sec.33, T.19 N., R.28 E., on east shore 100 ft north of U. S. Highway 10, 1½ miles upstream from outlet, and 2 miles southwest of town of Moses Lake.

Drainage area.--2,970 sq mi, approximately.

Records available.--June 1909 to September 1914, November 1936 to September 1945 (fragmentary), October 1945 to September 1960. Published as "at Neppel" 1912-14.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Prior to Apr. 3, 1910, staff gage at site 1 mile northeast at different datum. Apr. 3, 1910, to Sept. 30, 1914, and Nov. 19, 1936, to Nov. 24, 1944, staff gages at site 3¼ miles northeast at Parker Horn at various datums. Oct. 30, 1945, to Mar. 14, 1955, water-stage recorder at site near west shore on downstream side of bridge on U. S. Highway 10 at same datum.

Extremes.--Maximum elevation during year, 1,046.90 ft May 11; minimum, 1,043.50 ft Feb. 1. 1909-14, 1936-60: Maximum elevation, 1,048.29 ft Mar. 10, 1950; minimum observed, 1,038.17 ft Aug. 27, 1910.

Remarks.--Elevation controlled by dam at lake outlet. Many small diversions for irrigation.

Mean elevation, in feet, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46.18	45.94	43.71	43.83	43.51	45.82	45.40	46.54	46.21	46.15	46.17	46.49
2	46.15	45.81	43.74	43.81	43.52	45.76	45.41	46.58	46.11	46.15	46.20	46.48
3	46.14	45.71	43.78	43.79	43.53	45.76	45.43	46.61	46.03	46.16	46.24	46.48
4	46.13	45.56	43.81	43.77	43.53	45.72	45.44	46.64	45.99	46.18	46.26	46.51
5	46.11	45.44	43.84	43.76	43.57	45.70	45.46	46.66	45.99	46.17	46.27	46.52
6	46.08	45.31	43.87	43.74	43.71	45.67	45.50	46.70	46.02	46.16	46.28	46.52
7	46.05	45.21	43.91	43.73	43.99	45.65	45.55	46.79	46.00	46.17	46.31	46.52
8	46.03	45.10	43.96	43.73	44.31	45.62	45.58	46.81	46.02	46.16	46.32	46.53
9	46.02	45.00	43.97	43.72	44.64	45.59	45.62	46.85	46.03	46.17	46.33	46.53
10	46.00	44.91	43.98	43.71	44.95	45.56	45.66	46.88	46.04	46.17	46.34	46.53
11	45.99	44.81	43.99	43.71	45.20	45.54	45.71	46.88	46.05	46.18	46.36	46.53
12	45.98	44.72	44.00	43.69	45.41	45.51	45.73	46.82	46.05	46.19	46.37	46.53
13	45.96	44.61	44.01	43.68	45.56	45.47	45.77	46.76	46.06	46.19	46.38	46.53
14	45.94	44.51	43.99	43.67	45.68	45.42	45.80	46.70	46.06	46.18	46.38	46.53
15	45.93	44.46	43.98	43.66	45.77	45.40	45.85	46.66	46.07	46.18	46.39	46.53
16	45.92	44.31	44.02	43.65	45.82	45.36	45.88	46.57	46.08	46.17	46.40	46.55
17	45.90	44.23	44.03	43.63	45.87	45.34	45.93	46.51	46.07	46.16	46.42	46.66
18	45.88	44.17	44.02	43.62	45.90	45.32	45.97	46.49	46.08	46.15	46.44	46.79
19	45.87	44.12	44.02	43.61	45.92	45.29	46.00	46.51	46.07	46.14	46.47	46.83
20	45.91	44.05	44.01	43.60	45.94	45.26	46.05	46.56	46.08	46.12	46.48	46.80
21	45.97	44.01	43.99	43.58	45.96	45.26	46.10	46.60	46.07	46.12	46.49	46.74
22	46.04	43.95	43.98	43.57	45.97	45.29	46.15	46.65	46.08	46.12	46.50	46.60
23	46.10	43.92	43.97	43.56	45.94	45.31	46.21	46.67	46.10	46.13	46.51	46.40
24	46.10	43.85	43.97	43.55	45.94	45.32	46.26	46.70	46.12	46.12	46.52	46.20
25	46.10	43.83	43.96	43.55	45.93	45.33	46.31	46.74	46.11	46.14	46.53	46.04
26	46.09	43.77	43.94	43.54	45.90	45.22	46.35	46.77	46.12	46.16	46.52	46.07
27	46.07	43.73	43.92	43.53	45.88	45.09	46.41	46.80	46.13	46.15	46.51	46.11
28	46.05	43.68	43.90	43.52	45.86	44.97	46.44	46.71	46.15	46.14	46.50	46.16
29	46.02	43.64	43.88	43.52	45.84	44.91	46.47	46.58	46.16	46.15	46.49	46.20
30	45.99	43.67	43.87	43.52	-------	45.22	46.50	46.45	46.16	46.16	46.49	46.23
31	45.97	-------	43.84	43.51	-------	45.39	-------	46.32	-------	46.17	46.49	-------

Note.--Add 1,000 ft to obtain elevation above mean sea level.

4715. Crab Creek near Warden, Wash.

Location.--Lat 46°57'00", long 119°15'20", in SW¼NW¼ sec.24, T.17 N., R.28 E., on left bank half a mile east of Goose Lake, 2¼ miles downstream from O'Sullivan Dam, and 10 miles west of Warden.

Drainage area.--About 4,150 sq mi, of which 500 sq mi in the vicinity of Soap Lake is probably noncontributing.

Records available.--June to December 1909, March to December 1910, February to December 1911, February to June 1912, October 1912 to September 1952, October 1955 to September 1960. Published as Lower Crab Creek near Warden 1909-12. Records for September 1952 to September 1955 at site 2 miles upstream not equivalent owing to seepage bypassing gage.

Gage.--Water-stage recorder and timber control; prior to May 8, 1958, rock and culvert control. Altitude of gage is 880 ft (from topographic map). Prior to June 27, 1912, staff gages at several sites within 3 miles of present station at various datums. October 1912 to September 1950 water-stage recorder at site 1.6 miles upstream at different datum. October 1950 to September 1952 water-stage recorder at site 2 miles upstream at different datum.

Extremes.--Maximum discharge during year, 372 cfs Oct. 21 (gage height, 4.37 ft), caused by partial failure of Fish and Wildlife Service Dam half a mile upstream, from rating curve extended above 72 cfs; minimum, 9.0 cfs about Jan. 13 (gage height, 1.95 ft); minimum daily, 10 cfs Jan. 13-16.

1909-12, 1942-52, 1955-60: Maximum discharge, 3,000 cfs Feb. 7, 1943 (gage height, 4.25 ft, site and datum then in use), from rating curve extended above 20 cfs on basis of slope-area measurement of flood in Lind Coulee; no flow for short intervals in June and July 1948 and part of each day Feb. 2-21, 1952, when water was shut off at O'Sullivan Dam.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Many diversions for irrigation. Flow regulated by Potholes Reservoir and partially by Fish and Wildlife Service Dam since January 1958. Storage began in Potholes Reservoir in September 1952 and from this time until September 1955 the flow consisted of a small part of dam seepage. Discharge at present location includes essentially all of the seepage.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 24-30, Sept. 13-30)

Oct. 1 to June 30		June 30 to Sept. 30	
2.2	18	2.2	18
2.4	35	2.3	22
2.6	55	2.5	28

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	26	32	41	39	27	30	29	20	19.5	23	26
2	22	28	32	35	39	27	30	28	21	19.5	23	26
3	23	30	32	25	40	27	30	28	20	20	24	25
4	23	29	32	20	40	28	30	28	20	20	24	25
5	23	30	32	15	41	29	30	28	20	20	24	24
6	23	30	33	12	40	30	30	28	21	20	24	23
7	23	31	33	12	40	30	30	34	20	21	23	25
8	23	31	33	12	39	29	30	30	21	20	23	26
9	23	31	32	13	35	28	30	28	21	20	23	25
10	23	30	33	13	*29	27	30	27	22	20	23	26
11	25	30	33	12	29	28	30	27	21	21	22	25
12	25	30	34	11	29	27	29	27	20	21	22	25
13	25	29	34	10	29	27	29	26	18.5	21	22	25
14	25	30	33	10	30	26	29	25	19.5	21	22	25
15	25	30	33	10	29	25	28	25	20	21	23	25
16	25	28	32	10	27	25	27	25	20	21	23	25
17	24	31	32	11	28	*25	27	25	19.5	21	24	25
18	24	34	32	12	29	26	27	25	19.5	21	24	25
19	24	36	35	12	28	27	*27	25	20	21	*24	25
20	25	38	40	13	27	27	28	28	20	21	24	25
21	43	43	43	14	27	27	29	27	20	21	24	25
22	*31	40	42	15	27	27	28	26	20	21	24	25
23	27	36	48	17	27	27	30	25	20	21	24	25
24	29	32	51	20	27	28	30	*24	21	21	26	25
25	30	*30	42	25	27	28	28	23	20	21	24	25
26	30	30	37	30	26	28	28	24	20	22	24	25
27	32	30	36	35	27	29	27	23	21	22	26	*25
28	30	31	34	36	27	31	27	22	22	22	25	25
29	30	32	*34	37	27	30	30	22	22	22	26	25
30	28	32	39	38	-------	30	30	21	*20	23	26	25
31	26	-------	42	38	-------	30	-------	20	-------	23	26	-------
Total	812	948	1,110	614	909	860	868	803	610.0	649.0	739	751
Mean	26.2	31.6	35.8	19.8	31.3	27.7	28.9	25.9	20.3	20.9	23.8	25.0
Ac-ft	1,610	1,880	2,200	1,220	1,800	1,710	1,720	1,590	1,210	1,290	1,470	1,490

Calendar year 1959: Max 51 Min 11.5 Mean 26.9 Ac-ft 19,490
Water year 1959-60: Max 51 Min 10 Mean 26.4 Ac-ft 19,190

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 1 to Feb. 4, Aug. 4-19, Sept. 22-25, 30; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations.

4726. Crab Creek near Beverly, Wash.

Location.--Lat 46°49'45", long 119°49'45", in NW¼SW¼ sec.33, T.16 N., R.24 E., on right bank 4½ miles upstream from mouth and 5 miles east of Beverly.

Drainage area.--About 4,550 sq mi, of which about 500 sq mi in the vicinity of Soap Lake is probably noncontributing.

Records available.--February 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 500 ft (from topographic map).

Extremes.--Maximum discharge during year, 177 cfs Feb. 4 (gage height, 3.62 ft), from rating curve extended above 83 cfs by logarithmic plotting; maximum gage height, 3.88 ft Jan. 4 (backwater from ice); minimum discharge, 14.5 cfs Mar. 2 (gage height, 1.39 ft), result of freezeup.
1959-60: Maximum discharge, that of Feb. 4, 1960; maximum gage height, that of Jan. 4, 1960; minimum discharge, that of Mar. 2, 1960.

Remarks.--Records good except those for periods of ice effect, which are poor. Many diversions above station for irrigation. Flow is entirely regulated by Potholes Reservoir. Flow by station is essentially seepage from Potholes Reservoir and return flow from part of the Columbia Basin project.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 20 to Feb. 25)

1.7	30	3.0	127
2.0	47	3.5	175
2.5	84		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	82	74	63	40	166	40	60	45	52	63	46	64
2	79	74	63	37	170	35	57	45	51	65	47	66
3	78	73	63	35	167	35	56	46	48	66	49	69
4	78	72	61	35	174	35	55	45	49	65	51	70
5	78	74	50	37	164	45	54	45	49	64	53	70
6	78	73	45	40	135	59	53	45	44	64	56	72
7	76	73	50	45	116	74	53	44	46	63	59	73
8	78	72	63	50	96	70	53	45	44	62	61	73
9	76	72	63	50	96	70	51	49	42	63	64	73
10	78	72	61	50	*95	67	53	51	43	62	66	73
11	80	71	60	40	94	64	52	52	50	56	65	74
12	80	71	59	35	88	62	51	51	58	51	60	74
13	81	70	60	33	81	61	52	50	66	49	57	74
14	82	68	57	33	76	56	51	49	71	49	56	73
15	82	50	53	*33	73	55	51	49	75	51	55	73
16	81	40	58	33	70	58	51	46	77	50	54	73
17	80	40	58	35	69	*56	51	48	75	50	55	69
18	79	40	54	40	66	55	48	48	78	50	59	66
19	78	45	56	40	64	54	46	50	74	44	*54	65
20	80	52	56	40	62	54	*46	52	73	42	52	64
21	80	68	56	45	59	54	48	53	71	42	49	66
22	81	80	59	55	61	54	49	56	72	40	52	65
23	*80	78	63	88	58	54	52	58	72	41	54	64
24	80	79	67	94	56	53	53	*59	72	43	56	64
25	79	*73	69	100	56	52	55	60	71	41	57	66
26	82	69	73	104	40	50	58	59	72	39	58	66
27	80	66	70	118	40	52	55	56	73	39	59	63
28	75	65	60	132	40	55	53	58	70	39	63	*61
29	77	63	55	144	40	56	51	56	67	43	63	59
30	77	63	50	157	-------	59	50	54	*65	45	65	59
31	75	-------	45	154	-------	61	-------	51	-------	46	64	-------
Total	2,450	1,980	1,820	1,972	2,572	1,705	1,568	1,575	1,870	1,587	1,759	2,041
Mean	79.0	66.0	58.7	63.6	88.7	55.0	52.3	50.8	62.3	51.2	56.7	68.0
Ac-ft	4,860	3,930	3,610	3,910	5,100	3,380	3,110	3,120	3,710	3,150	3,490	4,050

Calendar year 1959: Max - Min - Mean - Ac-ft
Water year 1959-60: Max 174 Min 33 Mean 62.6 Ac-ft 45,420

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 15-19, Dec. 5-7, Dec. 27 to Jan. 22, Feb. 26 to Mar. 4.

4728. Columbia River below Priest Rapids Dam, Wash.

Location.--Lat 46°37'45", long 119°52'00", in SE¼NW¼ sec.7, T.13 N., R.24 E., on left bank 2½ miles downstream from Priest Rapids Dam and 14 miles south of Beverly.
Drainage area.--95,500 sq mi, approximately.
Records available.--January 1917 to September 1930, at site 3 miles downstream, published as "at Vernita." October 1930 to July 1959, at site 47 miles upstream, published as "at Trinidad." July 1959 to September 1960.
Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 1, 1930, staff gages at ferry at Vernita (3 miles downstream) at datum 388.7 ft above mean sea level, unadjusted. Oct. 1, 1930, to July 27, 1959, water-stage recorder at Trinidad (47 miles upstream) at datum 499.3 ft above mean sea level (river-profile survey).
Extremes.--1959: Maximum daily discharge during period July to September, 251,100 cfs July 28; minimum, 81,000 cfs Sept. 9 (elevation, 402.10 ft); minimum daily, 90,000 cfs Sept. 9.
1959-60: Maximum discharge during water year, 325,000 cfs July 7 (elevation, 418.30 ft), from rating curve extended above 140,000 cfs; minimum, 40,100 cfs Mar. 15 (elevation, 396.84 ft).
Remarks.--Records excellent except those for periods of no gage-height record and those above 150,000 cfs, which are good. Diversion above station for irrigation of about 500,000 acres is small percentage of flow past gage. Some diurnal fluctuation caused by Priest Rapids Dam. Flow regulated by Franklin D. Roosevelt Lake (see p. 295) and reservoirs in Kootenai, Flathead, Pend Oreille, Spokane, Okanogan, and Chelan River basins.

Discharge, in cubic feet per second, 1959

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	-	217,300	97,400	9	-	159,600	90,000	17	-	126,000	134,100	25	-	101,800	128,400
2	-	208,100	97,800	10	-	156,900	93,900	18	-	120,800	140,800	26	-	106,100	126,500
3	-	202,000	98,300	11	-	150,900	102,600	19	-	114,900	145,500	27	-	105,100	129,200
4	-	185,200	95,200	12	-	145,000	108,800	20	-	111,300	146,200	28	251,100	97,000	130,400
5	-	179,200	96,800	13	-	142,300	108,600	21	-	105,000	146,700	29	245,500	97,200	138,200
6	-	170,000	95,200	14	-	137,600	110,000	22	-	101,900	147,300	30	234,500	100,700	136,100
7	-	162,800	92,800	15	-	131,300	110,800	23	-	101,300	144,500	31	229,000	98,500	-
8	-	161,300	92,900	16	-	125,800	*118,800	24	-	101,600	136,900				
Total													-	‡4,224.5	‡3,540.7
Mean													-	136,300	118,000
Runoff in acre-feet													-	‡8,379	‡7,023

* Discharge measurement made on this day.
‡ Expressed in thousands.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	133,100	125,700	131,300	68,500	a104,000	60,500	110,900	129,100	242,800	282,900	151,600	79,100
2	127,800	124,800	130,400	68,500	a87,000	63,800	107,000	130,100	243,600	295,600	158,800	65,100
3	121,800	121,500	130,000	69,400	87,000	69,500	121,200	133,800	254,700	299,600	157,100	65,100
4	119,400	118,600	130,000	70,200	85,800	74,300	134,700	134,300	276,500	298,700	161,100	a64,000
5	114,200	119,700	123,500	71,600	87,400	66,200	143,800	135,800	291,600	303,800	158,900	60,500
6	110,400	115,200	118,600	64,200	84,000	63,300	156,000	126,200	289,700	310,300	157,600	61,600
7	109,500	116,000	112,600	62,300	78,100	65,300	165,700	125,800	283,100	311,000	160,600	68,800
8	105,400	116,800	96,000	59,800	74,800	64,100	166,300	130,100	282,500	308,600	142,200	a76,000
9	103,200	112,800	86,600	60,100	68,100	58,400	173,400	128,600	286,500	293,700	146,400	a75,000
10	101,800	110,300	87,400	60,700	80,600	56,500	184,800	127,900	283,700	290,700	*145,000	a79,000
11	100,900	107,000	78,200	64,600	84,700	59,600	187,600	128,400	284,000	287,100	a149,000	a78,000
12	101,600	100,900	76,300	67,500	81,500	52,100	191,800	140,400	286,700	277,600	144,300	a79,000
13	*104,400	93,900	76,200	67,600	81,000	61,000	197,600	168,400	288,400	267,300	127,900	a77,000
14	105,600	89,600	79,700	64,000	90,300	59,400	200,600	192,600	291,300	261,900	133,800	a76,000
15	108,800	86,000	81,300	80,900	90,900	55,200	199,200	215,900	292,200	251,500	120,200	*72,900
16	109,200	87,500	99,400	82,100	75,300	54,500	192,600	217,100	297,200	245,900	128,000	74,300
17	112,100	89,300	94,400	82,900	65,900	69,600	189,200	227,800	294,500	254,700	123,000	73,700
18	116,300	*85,200	89,500	85,600	67,200	55,600	183,800	228,700	294,900	251,300	123,600	75,200
19	115,600	79,200	87,300	87,400	68,000	55,900	182,400	232,900	298,500	245,000	117,000	73,100
20	116,700	82,900	87,500	88,400	67,600	57,400	187,300	247,900	304,600	244,000	105,800	64,900
21	122,100	88,900	85,600	89,700	69,100	58,400	179,500	249,500	300,200	238,900	110,000	69,800
22	121,200	89,500	86,000	91,300	65,300	59,200	174,000	260,300	292,200	229,200	100,200	72,000
23	127,500	100,000	86,200	91,700	64,700	59,400	172,400	259,400	288,800	224,300	100,400	74,900
24	129,300	110,800	82,800	80,300	69,000	62,000	a169,000	253,100	276,500	218,500	99,000	82,200
25	127,000	118,800	80,200	87,700	61,700	78,000	165,200	247,500	259,600	217,100	93,400	87,600
26	131,400	132,600	80,300	85,300	61,400	89,300	160,300	241,900	252,000	205,400	87,900	80,500
27	130,100	139,900	79,600	85,800	62,000	91,900	148,400	240,800	252,400	193,700	86,800	82,500
28	131,900	137,000	78,900	85,900	60,200	91,800	125,600	234,600	249,500	187,800	79,100	80,600
29	137,600	133,900	76,900	85,200	56,200	100,200	117,800	237,000	258,700	173,500	72,500	82,300
30	136,900	132,300	72,100	84,600	-------	108,300	120,600	239,400	270,400	172,800	*77,200	74,900
31	129,800	-------	70,800	103,800	-------	116,300	-------	243,300	-------	159,200	74,600	-------
Total	‡3,662.6	‡3,266.6	‡2,875.6	‡2,397.6	‡2,178.8	‡2,137	‡4,908.7	‡6,008.6	‡8,367.3	‡7,801.6	‡3,793	‡2,225.6
Mean	118,100	108,900	92,760	77,340	75,130	68,940	163,600	193,800	278,900	251,700	122,400	74,190
Ac-ft	‡7,265	‡6,479	‡5,704	‡4,756	‡4,322	‡4,239	‡9,736	‡11,920	‡16,600	‡15,470	‡7,523	‡4,414

Calendar year 1959: Max - Min - Mean - Ac-ft -
Water year 1959-60: Max 311,000 Min 52,100 Mean 135,600 Ac-ft 98,430,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
a No gage-height record; discharge estimated on basis of 1 discharge measurement and records for station at Trinidad.

4745. Yakima River near Martin, Wash.

Location.--Lat 47°19'10", long 121°20'10", in NE¼ sec.12, T.21 N., R.11 E., on left bank 800 ft downstream from dam at outlet of Keechelus Lake, 3½ miles northwest of Martin, and 9½ miles northwest of Easton.
Drainage area.--55.8 sq mi.
Records available.--October 1903 to September 1960.
Gage.--Water-stage recorder and masonry channel. Datum of gage is 2,422.40 ft above mean sea level (Bureau of Reclamation bench mark). Prior to July 20, 1923, staff gages at several sites within 2 miles of present site at various datums.
Average discharge.--57 years, 334 cfs (241,800 acre-ft per year), adjusted for storage since January 1906.
Extremes.--Maximum discharge during year, 1,310 cfs May 20; maximum gage height, 7.92 ft Aug. 11; minimum discharge, 6.4 cfs Mar. 12-17 (gage height, 2.26 ft).
1903-60: Maximum discharge, 7,370 cfs Mar. 26, 1915, when temporary crib dam was washed out; practically no flow when gates in Keechelus Lake Dam are closed.
Remarks.--Records excellent except those for periods of combined flow at gage and over spillway, which are good. Flow regulated by Keechelus Lake (see p. 362). Keechelus Lake spillway discharge, computed from reservoir elevations and spillway rating, bypasses gage and is added to flow at station. No diversion above station.
Cooperation.--Gage-height record, 9 discharge measurements, and records of daily discharge furnished by Bureau of Reclamation; reviewed by Geological Survey.
Revisions (water years).--WSP 1216: Drainage area. WSP 1286: 1910.

Rating tables, water year 1959-60, except periods of combined flow at gage and over spillway (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 5				July 5 to Sept. 30	
2.2	5.6	4.0	157	5.0	316
2.4	14	5.0	316	6.0	521
2.7	31	6.0	521	7.0	800
3.0	54	8.0	1,140	8.0	1,140
3.5	102				

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	519	521	806	960	134	6.8	8.0	10.5	489	297	1,050	785
2	512	521	964	960	52	6.8	8.0	10.5	491	277	1,050	782
3	510	523	960	960	25	6.8	8.4	10.5	491	258	1,050	797
4	507	523	956	960	7.6	6.8	8.4	10.5	494	268	1,040	794
5	468	521	956	960	7.2	6.8	8.4	10.5	491	369	1,020	785
6	461	521	956	960	7.2	6.8	8.8	10.5	411	398	1,010	779
7	487	521	953	960	8.4	6.8	8.8	11	433	377	992	686
8	485	521	960	960	8.0	6.8	8.8	11	481	449	1,040	*626
9	489	521	*960	960	7.6	6.8	9.2	10.5	*515	606	1,070	629
10	487	521	964	960	7.6	6.8	8.8	10.5	522	674	1,060	631
11	498	521	960	700	7.2	6.8	8.8	10.5	568	671	1,060	631
12	201	521	960	535	7.2	6.4	9.2	10.5	584	674	1,070	631
13	14	521	960	386	7.2	6.4	9.2	307	568	671	1,070	629
14	11	519	960	299	7.2	6.4	9.2	694	554	671	1,060	629
15	213	516	397	295	7.6	6.4	9.2	734	569	748	1,070	626
16	519	512	21	297	7.2	6.4	9.2	756	878	788	1,060	620
17	519	507	503	297	7.2	6.4	9.2	715	868	791	1,060	612
18	519	505	970	297	6.8	6.8	9.2	*683	684	*791	995	607
19	519	500	967	295	6.8	6.8	9.2	620	566	788	970	599
20	268	516	964	293	6.8	6.8	9.6	1,070	506	900	981	591
21	12.5	543	960	*290	6.8	7.2	9.6	1,150	468	950	974	583
22	13.5	562	953	288	6.8	7.2	9.6	998	424	1,010	970	573
23	11.5	363	939	286	6.8	7.2	9.6	946	424	1,090	936	568
24	11	20	950	284	6.8	7.6	9.6	950	468	1,050	884	560
25	11	340	960	283	6.8	7.6	9.6	950	457	1,050	860	550
26	11	540	960	279	6.8	8.0	9.6	950	390	1,050	827	545
27	240	543	960	277	6.8	8.0	9.6	953	379	1,050	797	535
28	521	545	960	275	6.8	7.6	9.6	950	357	1,050	797	*510
29	523	545	960	275	6.8	8.0	10	950	337	1,050	794	487
30	521	543	960	274	-------	*8.4	10	950	337	1,050	797	487
31	521	-------	960	272	-------	8.4	-------	663	-------	1,050	782	-------
Total	10,602.5	14,896	27,619	16,377	397.0	218.8	274.4	16,116.0	15,204	22,916	30.196	18,867
Mean	342	497	891	528	13.7	7.06	9.15	520	507	739	974	629
Ac-ft	21,030	29,550	54,780	32,480	787	434	544	31,970	30,160	45,450	59,890	37,420
(†)	+12,970	+26,490	-22,160	-25,120	+11,500	+15,120	+29,460	+14,180	+6,190	-37,000	-55.620	-32,810

Adjusted for change in contents in Keechelus Lake

Mean	553	942	531	120	214	253	504	751	611	137	69.4	77.5
Cfsm	9.91	16.9	9.52	2.15	3.84	4.53	9.03	13.5	10.9	2.46	1.24	1.39
In.	11.42	18.83	10.96	2.47	4.13	5.23	10.08	15.51	12.21	2.84	1.43	1.55
Ac-ft	34,000	56,040	32,620	7,360	12,290	15,550	30,000	46,150	36,350	8,450	4,270	4,610

Observed

Calendar year 1959: Max 1,290 Min 8.8 Mean 516 Ac-ft 373,300
Water year 1959-60: Max 1,150 Min 6.4 Mean 475 Ac-ft 344,500

Adjusted

Calendar year 1959: Mean 494 Cfsm 8.85 In. 120.22 Ac-ft 357,800
Water year 1959-60: Mean 396 Cfsm 7.10 In. 96.66 Ac-ft 287,700

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Keechelus Lake.

4760. Kachess River near Easton, Wash.

Location.--Lat 47°15'30", long 121°11'50", in NE¼ sec.3, T.20 N., R.13 E., on left bank three-quarters of a mile downstream from Kachess Lake and 2 miles northwest of Easton.
Drainage area.--63.6 sq mi.
Records available.--October 1903 to September 1960.
Gage.--Water-stage recorder. Datum of gage is 2,188.10 ft above mean sea level (Bureau of Reclamation bench mark). Prior to July 22, 1913, staff gage and July 22, 1913, to Aug. 14, 1916, water-stage recorder, at site a quarter of a mile upstream at different datum. Aug. 15, 1916, to Oct. 8, 1927, water-stage recorder at site half a mile downstream at different datum. Oct. 9, 1927, to Oct. 30, 1951, staff gage and water-stage recorder at present site at datum 1.33 ft higher.
Average discharge.--57 years, 290 cfs (210,000 acre-ft per year), adjusted for storage since October 1905.
Extremes.--Maximum discharge during year, 1,290 cfs Dec. 22 (gage height, 6.52 ft); minimum, 3.5 cfs Oct. 9, 10 (gage height, 1.60 ft).
1903-60: Maximum discharge, 2,530 cfs May 28, 1948 (gage height, 8.45 ft, present datum); no flow at times when gates in dam are closed.
Remarks.--Records excellent except those below 20 cfs, which are fair. No diversion. Flow regulated by Kachess Lake (see p. 362).
Cooperation.--Gage-height record, 10 discharge measurements, and records of daily discharge furnished by Bureau of Reclamation; reviewed by Geological Survey.
Revisions (water years).--WSP 369: 1904, 1907-8. WSP 1216: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 22				Dec. 23 to Sept. 30			
1.6	3.5	3.5	125	1.9	3.6	4.0	211
1.8	7.0	4.0	215	2.1	9.7	4.5	342
2.0	13	4.5	350	2.3	18	5.0	530
2.3	28	5.0	550	2.6	34	6.0	1,010
2.6	43	6.0	1,000	3.0	63	7.0	1,580
3.0	73	7.0	1,580	3.5	121		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	282	970	1,230	4.7	5.8	8.0	152	206	735	845	326
2	80	282	960	1,220	5.0	5.8	8.4	152	65	825	775	326
3	80	282	955	1,210	5.0	5.8	8.4	*199	65	850	775	326
4	80	285	945	1,210	4.7	5.8	8.0	326	100	890	696	326
5	80	285	945	1,200	5.0	5.8	7.7	382	250	900	620	326
6	80	282	945	1,190	5.6	5.8	7.4	406	330	880	602	326
7	80	285	945	1,180	7.1	5.8	7.4	422	403	870	598	323
8	80	282	945	1,180	6.7	5.8	7.1	422	403	850	598	323
9	42	*282	*950	1,180	6.1	5.8	6.4	422	406	845	670	323
10	3.5	285	950	1,170	6.4	5.6	6.1	422	*406	845	706	323
11	6.4	285	945	488	6.1	5.6	6.1	426	406	840	755	323
12	6.0	285	945	5.8	6.1	5.6	6.1	426	406	780	860	362
13	5.0	285	940	5.6	6.1	5.6	6.4	701	406	735	910	389
14	4.4	282	995	5.6	6.4	5.6	6.4	915	418	810	905	389
15	4.2	282	426	5.6	7.1	5.6	6.4	910	458	860	905	389
16	4.0	282	30	5.3	6.7	5.6	6.4	910	510	855	830	389
17	4.0	282	398	5.3	6.4	5.6	6.4	905	588	850	775	389
18	4.0	282	1,010	5.3	5.8	5.6	6.4	*895	598	*950	775	386
19	4.0	282	1,010	5.0	5.6	5.6	6.4	885	530	850	620	386
20	4.6	426	1,000	5.0	5.8	5.6	255	885	458	850	534	386
21	6.2	534	1,010	5.0	6.4	6.1	553	885	418	850	534	386
22	10.5	554	1,160	5.0	6.1	6.7	22	875	414	950	534	382
23	10	307	1,270	5.0	6.1	8.0	21	870	414	1,010	470	382
24	9.1	28	1,270	5.0	6.1	8.4	20	860	414	1,000	368	382
25	10	368	1,260	5.0	6.1	9.4	20	855	410	1,000	330	382
26	8.5	574	1,250	5.0	5.8	9.7	112	845	446	990	330	378
27	7.6	820	1,260	*5.0	5.8	8.7	113	545	557	990	330	378
28	181	995	1,250	4.7	5.8	8.4	112	365	634	990	330	*378
29	285	985	1,240	4.7	5.8	8.4	152	365	642	985	*330	378
30	285	980	1,240	4.7	--------	*8.7	152	365	674	980	326	378
31	282	--------	1,240	4.7	--------	8.0	--------	365	--------	975	326	--------
Total	1,827.0	11,950	30,659	12,560.3	172.4	204.3	1,663.9	18,358	12,435	27,490	18,962	10,840
Mean	58.9	398	989	405	5.94	6.59	55.5	592	414	887	612	361
Ac-ft	3,620	23,700	60,810	24,910	342	405	3,300	36,410	24,660	54,530	37,610	21,500
(†)	+25,180	+28,600	-30,960	-16,550	+10,610	+14,950	+26,880	+850	+6,730	-48,130	-35,200	-19,450

Adjusted for change in contents in Kachess Lake

Mean	468	879	485	136	190	250	507	606	528	104	39.2	34.5
Cfsm	7.36	13.8	7.63	2.14	2.99	3.93	7.97	9.53	8.30	1.64	0.616	0.542
In.	8.49	15.42	8.80	2.46	3.23	4.53	8.90	10.98	9.25	1.89	0.71	0.60
Ac-ft	28,800	52,300	29,850	8,360	10,950	15,360	30,180	37,260	31,390	6,400	2,410	2,050

Observed

Calendar year 1959: Max 1,320 Min 3.2 Mean 431 Ac-ft 312,100
Water year 1959-60: Max 1,270 Min 3.5 Mean 402 Ac-ft 291,800

Adjusted

Calendar year 1959: Mean 439 Cfsm 6.90 In. 93.76 Ac-ft 318,000
Water year 1959-60: Mean 352 Cfsm 5.53 In. 75.26 Ac-ft 255,300

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Kachess Lake.

4790. Cle Elum River near Roslyn, Wash.

Location.--Lat 47°14'30", long 121°03'50", in NW¼ sec.11, T 20 N., R.14 E., on left bank 1,000 ft downstream from dam at Cle Elum Lake and 4 miles northwest of Roslyn.
Drainage area.--203 sq mi.
Records available.--October 1903 to September 1960.
Gage.--Water-stage recorder. Datum of gage is 2,102.10 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Oct. 14, 1913, and Sept. 4, 1931, to Apr. 19, 1933, several staff gages and Oct. 14, 1913, to Sept. 3, 1931, water-stage recorder, at about same sites at same datum.
Average discharge.--57 years, 925 cfs (669,700 acre-ft per year), adjusted for storage since 1906.
Extremes.--Maximum discharge during year, 2,850 cfs June 16 (gage height, 8.69 ft); minimum, 2.6 cfs Feb. 3-24 (gage height, 3.81 ft).
1903-60: Maximum discharge, 18,700 cfs Nov. 15, 1906 (gage height, 14.05 ft); no flow at times when gates in dam are closed.
Remarks.--Records excellent except those below 100 cfs, which are good. No diversion above station. Flow regulated by Cle Elum Lake (see p. 362).
Cooperation.--Gage-height record, 12 discharge measurements, and records of daily discharge furnished by Bureau of Reclamation; reviewed by Geological Survey.
Revisions (water years).--WSP 369: 1906-8. WSP 1216: Drainage area. WSP 1286: 1908-9. WSP 1316: 1904. WSP 1396: 1943, 1954.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

3.8	2.4	5.0	265
3.9	7.5	5.5	470
4.0	16	6.0	720
4.1	27	7.0	1,360
4.3	60	9.0	3,200
4.6	135		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	704	33	2,160	2,190	276	27	30	770	1,120	2,050	2,300	1,920
2	488	33	2,170	2,210	272	26	30	780	1,150	2,160	2,280	1,900
3	412	33	2,160	2,230	92	26	30	780	1,200	2,300	2,260	*1,870
4	402	33	2,140	2,200	2.6	26	30	*780	1,230	2,270	2,230	1,880
5	402	33	2,120	2,200	2.6	26	30	786	1,270	2,240	2,200	1,850
6	398	33	2,120	2,190	2.6	26	30	786	1,010	2,130	2,180	1,800
7	394	33	2,110	2,200	2.6	26	30	792	814	2,180	2,160	1,820
8	398	33	2,100	2,190	2.6	26	32	797	792	2,160	2,130	1,810
9	398	34	2,080	2,190	*2.6	26	32	797	1,290	2,270	2,110	1,810
10	407	34	*2,070	2,170	2.6	27	34	802	1,670	2,430	2,080	1,780
11	412	33	2,070	2,150	2.6	27	36	808	1,810	2,440	2,060	1,750
12	151	*34	2,050	2,120	2.6	26	36	814	2,130	2,450	2,030	1,830
13	25	36	2,030	1,420	2.6	26	36	1,060	2,280	2,430	2,000	1,920
14	25	34	2,100	848	2.6	27	36	1,700	2,190	2,420	1,980	1,970
15	24	34	1,190	836	2.6	27	36	1,700	2,480	2,390	1,950	1,990
16	28	34	535	836	2.6	27	36	1,700	2,790	2,520	1,920	1,980
17	28	34	1,400	824	2.6	27	36	2,280	2,750	2,590	1,900	1,970
18	28	36	2,170	830	2.6	27	341	2,650	2,650	2,610	1,870	1,950
19	28	36	2,190	824	2.6	27	560	*2,610	2,240	*2,590	2,080	1,940
20	26	36	2,210	824	2.6	27	565	2,580	1,970	2,570	2,310	1,960
21	28	36	2,200	*814	2.6	27	565	2,660	1,780	2,550	2,290	1,960
22	30	40	2,200	814	2.6	27	565	2,690	1,760	2,530	2,270	1,960
23	28	40	2,220	808	2.6	27	565	2,620	*1,750	2,500	2,270	1,970
24	30	39	2,210	797	13	27	570	2,550	1,740	2,490	2,260	1,890
25	30	597	2,190	792	30	28	705	2,480	1,880	2,460	2,270	1,840
26	30	1,240	2,190	792	33	28	896	2,400	2,000	2,440	2,260	1,820
27	30	1,380	2,220	507	32	28	609	2,340	2,020	2,410	2,070	1,860
28	32	1,580	2,210	282	30	28	349	2,300	2,050	2,390	2,380	1,580
29	32	1,700	2,220	282	27	*30	667	2,260	2,020	2,360	2,110	*1,230
30	33	1,960	2,230	279	-------	30	764	2,230	2,050	2,330	*2,050	1,130
31	33	-------	2,210	276	-------	30	-------	1,640	-------	2,320	1,910	-------
Total	5,514	9,291	63,475	39,925	857.0	840	8,281	51,942	53,886	73,980	66,150	54,940
Mean	178	310	2,048	1,288	29.6	27.1	276	1,676	1,796	2,386	2,134	1,831
Ac-ft	10,940	18,430	125,900	79,190	1,700	1,670	16,430	103,000	106,900	146,700	131,200	109,000
(†)	+69,480	+113,400	-42,550	-59,780	+18,300	+35,020	+60,850	+17,020	+22,800	-98,330	-114,500	-98,970

Adjusted for change in contents in Cle Elum Lake

Mean	1,308	2,217	1,356	316	348	597	1,299	1,952	2,180	787	272	169
Cfsm	6.44	10.9	6.68	1.56	1.71	2.94	6.40	9.62	10.7	3.88	1.34	0.833
In.	7.43	12.18	7.70	1.79	1.85	3.39	7.14	11.08	11.98	4.47	1.55	0.93
Ac-ft	80,420	131,900	83,350	19,410	20,000	36,690	77,280	120,000	129,700	48,370	16,730	10,030

Observed

Calendar year 1959:	Max	3,570	Min	1.2	Mean	1,222	Ac-ft	884,500
Water year 1959-60:	Max	2,790	Min	2.6	Mean	1,172	Ac-ft	851,100

Adjusted

Calendar year 1959:	Mean	1,364	Cfsm	6.72	In.	91.22	Ac-ft	987,400
Water year 1959-60:	Mean	1,086	Cfsm	5.25	In.	71.49	Ac-ft	773,900

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Cle Elum Lake.
Note.--Discharge computed from twice-daily staff-gage readings Feb. 3-24.

4795. Yakima River at Cle Elum, Wash.

Location.--Lat 47°11'20", long 120°56'40", in sec.27, R.20 N., R.15 E., on left bank at highway bridge at Cle Elum just upstream from Roslyn Creek, 7 miles upstream from Teanaway River.

Drainage area.--500 sq mi, approximately.

Records available.--August 1906 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,902.27 ft above mean sea level (levels by Bureau of Reclamation). Prior to Aug. 12, 1910, chain gage on highway bridge at different datum. Aug. 12, 1910, to July 11, 1911, staff gage; July 12, 1911, to June 27, 1923, water-stage recorder; June 28, 1923, to Oct. 21, 1924, staff gages, all at various locations within vicinity of bridge at datum 2.0 ft higher.

Average discharge.--54 years, 2,004 cfs (1,451,000 acre-ft per year), adjusted for storage since October 1906 and Kittitas Canal diversion since 1930.

Extremes.--Maximum discharge during year, 14,000 cfs Nov. 23 (gage height, 11.68 ft); minimum, 233 cfs Feb. 5.

1906-60: Maximum discharge, 25,600 cfs Nov. 14, 1906 (gage height, 12.5 ft, from floodmarks); minimum, 46 cfs Nov. 17, 1953.

Remarks.--Records fair. Kittitas high-line canal diverts water from river at Easton for irrigation below station. Several smaller diversions for irrigation of several hundred acres above station. Considerable regulation by Keechelus, Kachess, and Cle Elum Lakes (see p. 362). Records of chemical analyses for the water year 1960 are given in WSP 1744.

Cooperation.--Gage-height record collected in cooperation with, and 15 discharge measurements furnished by Bureau of Reclamation.

Revisions (water years).--WSP 369: 1910-11. WSP 832: 1936.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 23 to Jan. 11)

Oct. 1 to Nov. 22		Nov. 23 to Sept. 30			
6.2	470	6.2	224	7.5	2,380
6.5	810	6.4	347	8.0	3,130
7.0	1,650	6.5	449	9.0	4,980
8.0	3,130	6.7	855	10.0	7,620
9.0	4,980	7.0	1,520	11.8	14,000

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,830	1,540	*4,530	4,960	901	309	901	1,220	2,150	2,320	3,230	2,280
2	1,600	1,510	4,810	4,960	715	282	878	1,220	1,890	2,190	3,070	2,260
3	1,410	1,540	4,790	4,940	449	282	993	1,180	1,850	2,600	3,050	2,240
4	1,310	1,650	4,710	4,940	253	282	1,110	*1,130	1,820	2,540	2,990	2,280
5	1,280	1,550	4,650	4,920	238	282	1,290	1,150	1,830	2,510	2,880	2,260
6	1,210	1,490	4,590	4,940	258	309	1,370	1,220	1,620	2,440	2,820	2,180
7	1,260	1,440	4,610	4,940	365	347	1,500	1,350	1,310	2,450	2,790	2,180
8	1,310	1,410	4,570	4,920	476	393	1,680	1,370	1,220	2,450	2,730	2,160
9	1,540	1,380	4,550	4,920	*462	365	1,620	1,330	1,560	2,640	2,800	2,130
10	1,410	1,350	*4,530	4,900	403	282	1,350	1,310	*2,010	2,960	2,880	2,190
11	2,000	1,310	4,510	4,570	403	264	1,150	1,400	2,150	3,020	2,860	2,040
12	2,010	1,310	4,550	3,080	374	253	1,040	1,660	2,610	2,990	2,910	2,140
13	*1,090	*1,280	4,490	2,560	383	258	1,040	2,060	2,700	2,900	3,020	*2,240
14	716	1,300	4,710	1,350	393	264	1,080	3,360	2,580	2,880	2,990	2,300
15	546	1,310	6,420	1,290	437	288	1,110	3,410	2,970	2,960	2,970	2,320
16	846	1,230	4,330	1,240	*449	282	667	3,380	3,490	3,160	2,900	2,300
17	689	1,190	*3,460	1,260	425	302	490	3,940	3,700	3,230	2,790	2,280
18	616	1,210	5,320	1,260	403	331	809	4,240	3,540	3,230	2,740	2,260
19	595	1,210	5,360	1,260	393	347	1,060	4,080	2,920	*3,190	*2,860	2,280
20	900	1,620	5,270	1,240	383	365	1,080	*4,370	2,540	3,210	2,970	2,280
21	972	2,700	5,160	1,260	393	449	1,080	4,980	2,260	3,290	2,990	2,280
22	1,430	3,340	5,130	1,240	383	643	1,150	4,810	2,170	3,360	2,920	2,300
23	1,630	11,400	5,290	1,220	347	832	1,260	4,530	*2,110	3,490	2,940	2,290
24	1,710	5,500	5,270	1,220	339	924	1,200	4,430	2,110	3,510	2,850	2,230
25	1,510	3,940	5,220	1,150	393	1,110	1,240	4,280	2,230	3,480	2,730	2,120
26	846	4,510	5,130	1,150	393	1,350	1,330	4,240	2,320	3,440	2,670	2,120
27	676	4,050	5,130	*1,150	323	1,350	1,260	4,080	2,300	3,430	2,510	2,170
28	*1,190	4,290	5,090	970	309	1,220	667	3,680	2,380	3,380	2,670	1,990
29	1,720	4,100	5,090	947	309	*1,080	1,080	3,670	2,320	3,360	2,550	*1,500
30	1,660	4,280	5,070	924	-------	1,020	1,260	3,680	2,300	3,340	2,450	1,420
31	1,600	-------	5,020	901	-------	947	-------	3,320	-------	3,310	2,240	-------
Total	39,112	75,940	151,360	80,582	11,752	17,012	33,745	90,080	68,960	93,460	87,770	65,020
Mean	1,262	2,531	4,883	2,599	405	549	1,125	2,906	2,299	3,015	2,831	2,167
Ac-ft	77,580	150,600	300,200	159,800	23,310	33,740	66,930	178,700	136,800	185,400	174,100	129,000
(†)	+107,600	+168,500	-95,670	-101,400	+40,410	+65,090	+117,200	+32,050	+35,720	-183,500	-205,300	-151,200
(‡)	1,050	0	0	0	0	0	3,290	45,500	59,390	75,390	68,040	51,330

Adjusted for change in lake contents and diversion

Mean	3,028	5,363	3,326	950	1,108	1,607	3,149	4,167	3,897	1,257	599	490
Cfsm	6.06	10.7	6.65	1.90	2.22	3.21	6.30	8.33	7.79	2.51	1.20	0.98
In.	6.98	11.97	7.67	2.19	2.39	3.71	7.03	9.61	8.70	2.90	1.38	1.09
Ac-ft	186,200	319,100	204,500	58,400	63,720	98,830	187,400	256,200	231,900	77,290	36,840	29,130

Observed

Calendar year 1959: Max 11,400 Min 546 Mean 2,441 Ac-ft 1,767,000
Water year 1959-60: Max 11,400 Min 238 Mean 2,226 Ac-ft 1,616,000

Adjusted

Calendar year 1959: Mean 2,977 Cfsm 5.95 In. 80.83 Ac-ft 2,155,000
Water year 1959-60: Mean 2,411 Cfsm 4.82 In. 65.62 Ac-ft 1,750,000

* Discharge measurement made on this day.
† Change in contents, in acre-feet, for Keechelus, Kachess, and Cle Elum Lakes.
‡ Diversion, in acre-feet, by Kittitas Canal.

4836. Wilson Creek near Ellensburg, Wash.

Location.--Lat 47°07'35", long 120°29'35", in NW¼ sec.20, T.19 N., R.19 E., on right bank at downstream side of Pope farm bridge, three-quarters of a mile above Naneum Creek and 9 miles north of Ellensburg.

Drainage area.--13.6 sq mi.

Records available.--March 1957 to May 1960 (flood seasons only), discontinued.

Gage.--Water-stage recorder. Altitude of gage is 2,650 ft (from topographic map).

Extremes.--Maximum discharge during period November 1959 to May 1960, 175 cfs May 11 (gage height, 2.80 ft); minimum daily, 2.0 cfs Nov. 13, 14.
1957-60: Maximum discharge, 244 cfs May 18, 1957 (gage height, 2.96 ft); minimum, 0.8 cfs Nov. 21, 1957.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. About 1 cfs is diverted above station for irrigation. No regulation.

Cooperation.--Gage-height record furnished by U. S. Soil Conservation Service.

Revisions.--WSP 1566: Drainage area.

Rating tables, Nov. 1, 1959, to May 31, 1960, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Nov. 1 to Jan. 3				Jan. 4 to May 31			
1.6	1.4	2.0	11.5	1.65	2.6	2.0	13
1.7	2.3	2.2	28	1.7	3.2	2.2	32
1.8	4.3	2.4	54	1.8	5.0	2.4	63
1.9	7.0			1.9	7.9	2.7	140

Discharge, in cubic feet per second, November 1959 to May 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		3.2	*9.8	4.0	2.8	2.1	12	32				
2		3.0	9.3	4.0	2.9	2.1	14.5	34				
3		3.4	8.1	3.8	2.8	2.2	19.5	32				
4		3.6	7.0	3.8	2.7	2.3	24	34				
5		2.8	6.7	4.0	3.6	2.5	31	48				
6		2.8	6.0	4.5	3.2	2.7	48	54				
7		2.8	6.3	5.0	4.0	3.0	63	67				
8		2.8	6.3	5.1	3.3	3.2	61	58				
9		2.8	6.0	5.2	3.3	3.3	58	60				
10		2.8	5.8	5.2	3.5	3.2	43	69				
11		2.6	5.8	5.2	3.2	3.2	39	g92				
12	†3.3	2.6	5.8	5.1	3.1	3.3	30	g119		†2.9		
13		2.0	5.0	5.0	3.1	3.5	26	g71				
14		2.0	5.5	*g4.8	3.1	3.5	24	*g53				
15		2.2	8.5	g4.4	3.1	3.5	24	53	†19			
16		2.5	7.4	g4.2	*2.9	4.2	20	45				
17		3.0	6.7	g4.2	2.8	5.0	19.5	*35				
18		3.5	6.3	g4.2	2.7	5.4	*17	31				
19		3.5	6.0	g4.2	2.6	6.6	16	30				
20		3.5	5.8	3.5	2.6	8.7	15	29				
21		g4.5	5.8	3.2	2.6	*13	14.5	26				
22		g4.7	5.5	2.9	2.5	16	13.5	22				
23		40	5.5	2.7	2.4	17	13.5	18.5				
24		35	5.5	2.6	2.7	19.5	12	18.5				
25		26	5.0	2.6	2.6	24	13	19.5				
26		21	4.5	2.7	2.1	28	15	26				
27		16.5	4.3	2.7	2.2	24	16	24				
28		14	4.2	2.7	2.2	20	19.5	24				
29		13	4.5	2.9	2.2	19.5	22	27				
30		11	4.3	2.9	-------	18	27	35				
31		-------	4.0	2.7	-------	14.5	-------	39	-------			-------
Total		243.1	187.2	120.0	82.8	287.0	770.5	1,325.5				
Mean		8.10	6.04	3.87	2.86	9.26	25.7	42.8				
Ac-ft		482	371	238	164	569	1,530	2,630				

Calendar year	: Max	Min	Mean	Ac-ft
Water year	: Max	Min	Mean	Ac-ft

* Discharge measurement made on this day.
† Result of discharge measurement.
g Computed from twice-daily staff-gage readings.
Note.--Stage-discharge relation affected by ice Nov. 13-17, Dec. 6, 13, Dec. 26 to Jan. 2, Feb. 22, 23, Feb. 26 to Mar. 7. No gage-height record Nov. 18-20, Jan. 3-13, 20-25; discharge estimated on basis of observer's notes, weather records, and records for nearby stations.

4838. Naneum Creek near Ellensburg, Wash.

Location.--Lat 47°07'30", long 120°28'40", in NE¼ sec.20, T.19 N., R.19 E., on right bank 10 ft upstream from intake of Ellensburg water-supply system and 9 miles north of Ellensburg.

Drainage area.--69.5 sq mi.

Records available.--March 1957 to September 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,500 ft (from topographic map).

Extremes.--Maximum discharge during year, 666 cfs May 12 (gage height, 3.22 ft); minimum observed, 7.9 cfs Nov. 13 (gage height, 0.10 ft), result of freezeup.
1957-60: Maximum discharge, 700 cfs May 18, 1957 (gage height, 3.36 ft); minimum observed, less than 5 cfs Nov. 29, 1957, result of freezeup.

Remarks.--Records good except those for periods of once-daily staff-gage readings, which are fair, and those for periods of no gage-height record, which are poor. No regulation. Small diversion above station for irrigation.

Revisions.--WSP 1566: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 28 to Dec. 4)

Oct. 1 to Mar. 7				Mar. 8 to Sept. 30			
0.0	6.0	1.0	87	0.2	14.5	1.5	193
.1	8.4	1.5	170	.4	25	2.0	305
.2	12.5	2.0	283	.7	56	3.1	624
.4	25	2.5	423	1.0	101		
.7	52						

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	22	47	27	22	19	84	149	236	73	31	22
2	23	22	47	27	22	18	90	165	293	72	30	21
3	22	22	47	27	22	18	110	158	312	69	32	21
4	22	23	45	28	23	19	132	154	283	66	31	22
5	21	22	45	30	25	20	164	177	260	63	30	22
6	21	22	44	31	27	20	204	201	247	61	29	21
7	21	22	42	31	29	21	234	270	212	59	28	21
8	22	22	40	30	28	21	245	232	191	58	28	21
9	24	22	40	30	28	21	232	218	181	54	28	20
10	23	21	40	25	27	21	189	267	177	52	27	19.5
11	35	20	40	23	26	21	169	371	175	50	27	19.5
12	*31	20	40	23	26	20	149	593	167	*48	27	19
13	27	7.9	40	24	25	20	134	392	164	46	26	19
14	26	17.5	44	*24	25	21	127	*291	160	44	26	19
15	24	22	67	24	24	21	115	258	*156	43	27	18.5
16	24	22	61	23	*24	21	104	243	158	42	*27	18.5
17	23	22	52	22	24	21	101	212	145	41	25	18.5
18	23	22	48	21	23	22	*93	189	134	40	24	18
19	22	22	44	20	23	24	90	179	125	38	24	17.5
20	22	22	46	20	23	32	88	177	120	37	23	17.5
21	22	25	40	20	23	*47	85	160	113	37	23	17.5
22	27	27	38	20	23	56	80	147	106	36	23	17.5
23	30	304	37	20	23	67	78	138	103	35	23	18
24	27	128	37	20	22	96	82	134	99	35	24	17.5
25	26	97	37	21	20	131	82	134	95	34	23	17.5
26	25	77	37	21	18	156	85	144	93	34	23	17.5
27	24	61	35	22	18	138	90	147	87	32	23	17
28	24	51	33	22	19	125	108	147	82	31	23	17
29	24	47	31	22	19	108	116	156	78	31	22	*17
30	22	*43	30	22	-------	113	131	189	76	31	22	17
31	22	-------	29	22	-------	95	-------	221	-------	32	21	-------
Total	752	1,277.4	1,303	742	681	1,553	3,791	6,613	4,828	1,424	800	569.0
Mean	24.3	42.6	42.0	23.9	23.5	50.1	126	213	161	45.9	25.8	19.0
Cfsm	0.350	0.613	0.604	0.344	0.338	0.721	1.81	3.06	2.32	0.660	0.371	0.273
In.	0.40	0.68	0.70	0.40	0.36	0.83	2.03	3.54	2.58	0.76	0.43	0.30
Ac-ft	1,490	2,530	2,580	1,470	1,350	3,080	7,520	13,120	9,580	2,820	1,590	1,130

Calendar year 1959: Max 304 Min 7.9 Mean 71.3 Cfsm 1.03 In. 13.93 Ac-ft 51,590
Water year 1959-60: Max 593 Min 7.9 Mean 66.5 Cfsm 0.957 In. 13.01 Ac-ft 48,260

Peak discharge (base, 150 cfs).--Nov. 23 (6:30 a.m.) 304 cfs (2.10 ft); Mar. 25 (12 p.m.) 165 cfs (1.36 ft); Apr. 7 (10 p.m.) 276 cfs (1.88 ft); May 12 (8:30 a.m.) 666 cfs (3.22 ft); June 3 (9 p.m.) 338 cfs (2.13 ft).

* Discharge measurement made on this day.

Note.--Discharge computed from once-daily staff-gage readings Nov. 13-23, Dec. 1-25, Mar. 19-23. No gage-height record Dec. 26 to Mar. 18; discharge estimated on basis of 2 discharge measurements, observer's notes, weather records, and records for nearby stations.

4843. Cooke Creek near Ellensburg, Wash.

Location.--Lat 47°05'40", long 120°22'40", in SE¼NW¼ sec.31, T.19 N., R.20 E., on left bank 4 miles upstream from mouth and 10 miles northeast of Ellensburg.

Drainage area.--19.3 sq mi.

Records available.--November 1957 to May 1960 (flood seasons only), discontinued.

Gage.--Water-stage recorder. Altitude of gage is 2,550 ft (from topographic map).

Extremes.--Maximum discharge during period November 1959 to May 1960, 267 cfs May 11 (gage height, 2.50 ft); minimum daily, 2.1 cfs Jan. 14.
1957-60: Maximum discharge, that of May 11, 1960; minimum, 1.2 cfs Dec. 30, 1957.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No regulation. Small diversion above station for irrigation.

Rating tables, Nov. 1, 1959, to May 31, 1960, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 9 to May 6)

Nov. 1 to Apr. 6				Apr. 7 to May 31	
0.5	2.0	1.1	22	1.1	17
.6	2.8	1.3	40	1.3	32
.7	4.2	1.5	64	1.6	69
.9	11	1.8	118	2.0	147

Discharge, in cubic feet per second, November 1959 to May 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		2.9	3.5	2.5	3.2	2.4	23	68				
2		2.9	3.2	2.4	3.4	2.5	31	75				
3		2.9	3.0	2.3	3.1	2.9	60	62				
4		2.9	2.9	2.5	3.0	2.9	78	56				
5		2.8	2.8	2.8	4.2	2.8	93	56				
6		2.8	2.5	3.2	3.8	2.8	104	63				
7		2.8	2.5	3.0	4.9	2.8	83	101				
8		2.8	2.5	3.1	4.2	2.8	75	83				
9		2.8	3.0	3.0	4.4	2.7	63	77				
10		2.8	3.2	2.9	4.2	2.6	45	99				
11		2.8	3.2	a2.5	3.8	2.7	48	131				
12	†2.8	2.8	3.1	a2.3	3.8	2.8	37	*80		†2.2		
13		2.4	2.5	a2.2	3.6	2.9	31	80				
14		2.5	3.4	*a2.1	3.6	2.9	26	68				
15		2.7	3.6	a2.3	3.6	2.9	24	56	†9.0			
16		3.0	3.6	a2.4	*3.6	3.1	19.5	44				
17		3.2	3.2	a2.3	3.4	3.6	19.5	*32				
18		3.4	3.1	a2.2	3.4	4.4	*17.5	26				
19		3.0	3.1	a2.2	3.4	5.5	17	25				
20		3.2	3.1	a2.3	3.5	8.2	19	26				
21		4.6	3.1	a2.4	3.5	*14	17.5	23				
22		4.6	3.1	a2.5	3.2	21	17	20				
23		16.5	3.1	2.7	3.4	27	17	17.5				
24		7.9	3.2	2.8	3.4	42	17.5	19				
25		5.5	2.7	2.7	3.2	75	17	21				
26		4.4	2.5	2.8	2.5	84	19.5	28				
27		4.0	2.5	2.7	2.6	87	24	26				
28		3.8	2.4	2.8	2.6	44	32	24				
29		3.6	2.4	3.4	2.5	39	44	24				
30		*3.6	2.5	3.1	-------	31	54	25				
31		-------	2.5	3.0	-------	25	-------	24	-------			-------
Total		115.9	91.0	81.4	101.0	535.2	1,173.0	1,559.5				
Mean		3.86	2.94	2.63	3.48	17.3	39.1	50.3				
Ac-ft		230	180	161	200	1,060	2,330	3,090				

Calendar year	: Max	Min	Mean	Ac-ft
Water year	: Max	Min	Mean	Ac-ft

* Discharge measurement made on this day.
† Result of discharge measurement.
a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations.
Note.--Stage-discharge relation affected by ice Nov. 13-17, Dec. 2-9, 13, Dec. 25 to Jan. 5, Feb. 26 to Mar. 2, Mar. 9, 10.

4845. Yakima River at Umtanum, Wash.

Location.--Lat 46°51'45", long 120°28'30", in NW¼ sec.20, T.16 N., R.19 E., on right bank at Umtanum, half a mile upstream from Umtanum Creek and 10 miles south of Ellensburg.

Drainage area.--1,590 sq mi, approximately.

Records available.--August 1906 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 1,300.00 ft above mean sea level, datum of 1929. Prior to Sept. 28, 1911, staff or chain gages at approximately same site at various datums. Sept. 28, 1911, to Nov. 23, 1936, water-stage recorder at site about 300 ft upstream at datum 26.70 ft higher.

Extremes.--Maximum discharge during year, 19,100 cfs Nov. 23 (gage height, 37.08 ft); minimum, 560 cfs Mar. 2 (gage height, 30.35 ft).
1906-60: Maximum discharge, 41,000 cfs Nov. 15 or 16, 1906 (gage height, 41.1 ft, from floodmarks, present datum); minimum recorded, 138 cfs Oct. 3, 1915 (gage height, 2.86 ft, datum then in use).

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. Flow partly regulated by Keechelus, Kachess, and Cle Elum Lakes (see p. 362). Water diverted above station for irrigation of about 105,000 acres.

Cooperation.--Seven discharge measurements furnished by Bureau of Reclamation.

Revisions (water years).--WSP 412: 1914. WSP 1216: Drainage area. WSP 1286: 1910.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

30.4	600	33.0	4,760
31.0	1,200	34.0	7,560
32.0	2,640	36.0	14,600

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,440	1,920	5,740	5,310	*1,250	b650	2,710	2,920	3,890	2,680	3,610	2,770
2	2,170	1,870	*5,790	5,230	1,280	b650	2,540	3,030	3,300	2,620	3,460	2,770
3	1,900	1,870	5,820	5,230	1,160	b600	2,900	2,860	3,280	2,880	3,480	2,770
4	1,810	2,080	5,660	5,200	930	b600	3,280	2,640	3,220	2,860	3,530	2,860
5	1,740	1,990	5,470	5,250	1,020	b650	3,860	2,500	3,030	2,840	3,420	2,880
6	1,700	1,920	5,390	5,310	991	753	4,440	2,500	3,010	2,800	3,360	2,820
7	1,640	1,870	5,420	5,250	1,080	735	4,890	2,970	2,350	2,660	3,320	2,710
8	1,690	1,830	5,280	5,230	1,380	744	5,180	3,180	2,110	2,640	3,240	2,690
9	1,870	1,770	5,230	5,120	1,330	717	5,050	2,990	1,960	2,680	3,200	2,610
10	1,960	1,740	5,200	5,050	1,250	690	4,250	2,780	2,610	3,030	3,260	2,590
11	2,220	1,710	*5,200	5,020	1,220	681	3,590	3,090	2,860	3,200	3,180	2,560
12	3,010	1,670	5,200	4,020	1,120	663	3,070	4,020	3,050	3,200	3,160	*2,570
13	2,190	1,650	5,070	3,360	1,100	672	2,730	4,200	3,550	3,100	3,260	2,640
14	*1,690	1,610	5,070	2,300	1,110	681	2,660	4,790	3,460	3,030	3,280	2,730
15	1,440	1,640	7,680	1,980	1,210	762	a2,600	5,050	3,760	*3,030	3,320	2,730
16	1,420	1,600	8,950	1,920	1,240	890	a2,350	4,990	4,460	3,120	3,300	2,730
17	1,440	1,530	5,630	1,870	1,120	1,190	a1,900	5,050	4,760	3,300	3,180	2,750
18	1,360	1,570	6,350	b1,700	1,070	*1,400	a2,100	5,580	4,710	3,300	3,120	2,710
19	1,370	1,610	6,730	b1,650	*1,000	1,380	a2,300	5,330	4,220	3,230	*3,050	2,680
20	1,380	1,740	6,410	b1,700	970	1,610	a2,350	5,500	3,780	3,220	3,280	2,680
21	1,400	3,380	6,160	b1,700	991	2,050	a2,300	6,300	3,220	3,300	3,280	2,690
22	1,650	4,090	5,960	b1,700	970	2,770	a2,400	6,440	3,030	3,300	3,300	2,750
23	2,620	12,400	6,020	1,710	910	3,200	a2,500	6,100	2,860	3,440	3,300	2,820
24	2,440	13,700	5,990	1,710	900	3,420	a2,400	5,850	2,730	3,550	3,280	2,840
25	2,320	*7,990	5,850	1,710	890	4,130	a2,500	5,900	2,710	3,570	3,120	2,800
26	1,940	7,320	5,680	1,700	840	4,890	a2,600	*5,770	2,920	3,530	3,090	2,690
27	1,580	6,380	5,630	1,640	771	4,760	a2,500	5,790	2,820	3,570	3,090	2,730
28	1,580	6,130	5,600	1,310	b700	4,090	a2,300	5,310	2,840	3,480	2,950	2,730
29	2,040	5,710	5,500	1,210	b650	3,500	a2,500	5,120	2,750	3,480	3,120	2,270
30	2,050	5,600	5,520	1,240	-------	3,320	2,800	5,180	2,660	3,570	2,860	2,080
31	1,990	-------	5,420	1,220	-------	3,030	-------	5,280	-------	3,630	2,710	-------
Total	58,050	107,890	180,620	94,550	30,453	55,878	89,550	139,010	95,910	97,930	100,110	80,650
Mean	1,873	3,596	5,826	3,050	1,050	1,803	2,985	4,484	3,197	3,159	3,229	2,688
Ac-ft	115,100	214,000	358,300	187,500	60,400	110,800	177,600	275,700	190,200	194,200	198,600	160,000

Calendar year 1959: Max 13,700 Min 1,360 Mean 3,455 Ac-ft 2,502,000
Water year 1959-60: Max 13,700 Min 600 Mean 3,089 Ac-ft 2,242,000

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage, weather records, and records for station at Cle Elum.
b Stage-discharge relation affected by ice.

4880. Bumping River near Nile, Wash.

Location.--Lat 46°52', long 121°18', in NE¼ sec.23, T.16 N., R.12 E., on left bank a quarter of a mile downstream from spillway of Bumping Lake Dam and 19 miles west of Nile.
Drainage area.--68.6 sq mi.
Records available.--June to July 1906, April 1909 to September 1960.
Gage.--Water-stage recorder. Datum of gage is 3,367.10 ft above mean sea level (Bureau of Reclamation bench mark). June 13 to July 31, 1906, staff gage at site half a mile upstream at different datum. Apr. 27 to Aug. 6, 1909, and June 24, 1912, to June 13, 1913, staff gage at site three-eighths of a mile upstream at different datum. Aug. 7, 1909, to June 23, 1912, staff gage at site 1,300 ft upstream at different datum.
Average discharge.--51 years (1909-60), 295 cfs (213,600 acre-ft per year), adjusted for storage.
Extremes.--Maximum discharge during year, 1,150 cfs June 17 (gage height, 4.17 ft); minimum, 5.8 cfs Nov. 17 (gage height, 1.02 ft).
1906, 1909-60: Maximum discharge, 5,180 cfs Dec. 29, 1917 (gage height, 9.33 ft); practically no flow when gates in outlet conduit are closed.
Remarks.--Records excellent. No diversion. Flow regulated by dam at Bumping Lake (see p. 362).
Cooperation.--Gage-height record, six discharge measurements, and records of daily discharge furnished by Bureau of Reclamation; reviewed by Geological Survey.
Revisions (water years).--WSP 369: 1911. WSP 1246: Drainage area. WSP 1286: 1911.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

1.0	5.3	2.0	111
1.1	7.6	2.5	239
1.3	15.5	3.0	445
1.5	30	4.0	1,010
1.7	55	5.0	1,900

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	186	338	470	450	200	54	84	205	625	684	200	158
2	288	322	630	415	239	55	84	205	635	684	200	156
3	386	306	711	364	224	55	86	208	*650	656	203	156
4	372	303	689	330	211	55	88	211	803	678	200	156
5	359	292	672	295	203	55	94	*208	968	694	200	154
6	273	280	650	277	200	55	98	214	1,070	689	197	151
7	334	266	282	263	253	57	107	224	1,040	684	197	151
8	235	256	27	253	280	57	115	224	968	678	194	149
9	338	249	22	236	288	57	120	227	894	672	194	147
10	334	236	13	224	292	57	122	230	755	667	192	144
11	359	227	24	214	284	57	120	239	744	656	189	144
12	257	214	49	203	273	57	230	256	803	650	189	142
13	*7.4	203	49	194	266	57	330	263	827	640	189	140
14	6.9	194	382	189	263	57	467	259	839	630	186	138
15	258	189	509	184	259	58	555	256	894	625	186	138
16	550	125	24	174	249	58	550	258	1,020	615	184	135
17	520	6.2	362	171	239	58	550	442	1,080	605	184	133
18	495	6.4	722	168	163	58	545	615	914	600	178	131
19	465	139	716	154	57	58	535	615	785	590	178	131
20	435	263	711	151	52	58	535	615	475	585	178	126
21	420	334	700	146	52	60	530	615	377	575	176	126
22	465	382	803	142	52	61	520	610	410	565	176	124
23	545	252	*869	138	52	63	515	610	435	550	176	122
24	545	25	839	135	54	66	510	605	480	545	174	120
25	535	256	797	133	54	71	505	600	515	*395	*171	118
26	515	445	767	129	54	77	500	600	515	208	168	115
27	485	445	722	126	54	80	495	600	510	208	168	111
28	460	440	678	126	54	82	203	595	505	205	166	109
29	430	440	630	147	54	84	200	600	620	205	166	107
30	400	435	575	192	-------	86	203	600	689	203	164	105
31	368	-------	515	194	-------	86	-------	615	-------	200	161	-------
Total	11,626.3	7,868.6	15,609	6,517	4,975	1,949	9,596	12,622	21,845	16,841	5,684	4,037
Mean	375	262	504	210	172	62.9	320	407	728	543	183	135
Ac-ft	23,060	15,610	30,960	12,930	9,870	3,870	19,030	25,040	43,330	33,400	11,270	8,010
(†)	-2,880	+10,240	-8,060	-4,270	+1,710	+6,930	+4,530	+12,080	+4,450	-18,960	-6,660	-4,880

Adjusted for change in contents in Bumping Lake

Mean	328	434	372	141	201	176	396	604	803	235	75.0	52.6
Cfsm	4.78	6.33	5.42	2.06	2.93	2.57	5.77	8.80	11.7	3.43	1.09	0.767
In.	5.52	7.07	6.26	2.37	3.17	2.95	6.44	10.15	13.06	3.95	1.26	0.86
Ac-ft	20,180	25,850	22,900	8,660	11,580	10,800	23,560	37,120	47,780	14,440	4,610	3,130

Observed

Calendar year 1959: Max 1,330 Min 6.2 Mean 355 Ac-ft 257,300
Water year 1959-60: Max 1,080 Min 6.2 Mean 326 Ac-ft 236,400

Adjusted

Calendar year 1959: Mean 350 Cfsm 5.10 In. 69.20 Ac-ft 253,200
Water year 1959-60: Mean 318 Cfsm 4.64 In. 63.06 Ac-ft 230,600

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Bumping Lake.

4885. American River near Nile, Wash.

Location.--Lat 46°58'30", long 121°10'10", in SW¼ sec.12, T.17 N., R.13 E., on right bank 300 ft upstream from Bumping Lake road crossing, three-quarters of a mile upstream from mouth, and 16 miles northwest of Nile.

Drainage area.--78.9 sq mi.

Records available.--April 1909 to March 1912, July to September 1913, June to September 1914, June to September 1915, October 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 2,700.0 ft above mean sea level (State Highway Department bench mark). Prior to Sept. 12, 1915, staff gage at site 300 ft downstream at different datum. Oct. 12 to Dec. 7, 1939, staff gage at present site and datum.

Average discharge.--23 years (1909-11, 1939-60), 246 cfs (178,100 acre-ft per year).

Extremes.--Maximum discharge during year, 1,080 cfs June 4 (gage height, 74.58 ft); minimum, 42 cfs Sept. 30 (gage height, 71.97 ft).
1909-12, 1913-15, 1939-60: Maximum discharge, 2,600 cfs May 27, 1948 (gage height, 76.6 ft, from high-water mark in well), from rating curve extended above 1,400 cfs; minimum, 20 cfs Nov. 22, 1940.

Remarks.--Records good except those for periods of ice effect, which are poor. No regulation or diversion.

Cooperation.--Gage-height record collected in cooperation with, and two discharge measurements furnished by Bureau of Reclamation.

Revisions (water years).--WSP 982: 1940-42. WSP 1216: Drainage area. WSP 1286: 1911.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

71.9	34	73.5	480
72.0	45	74.0	730
72.5	132	75.0	1,380
73.0	285		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	91	118	232	120	174	60	306	271	695	432	99	62
2	84	111	215	110	163	60	299	306	840	364	97	62
3	77	120	197	100	152	60	306	313	*984	344	99	62
4	74	140	182	120	144	55	332	306	1,020	348	93	60
5	70	120	*163	130	140	60	396	310	912	340	89	63
6	68	114	154	132	144	70	476	364	912	364	86	64
7	66	109	150	127	364	80	605	560	798	368	82	64
8	77	105	140	120	332	85	740	545	680	356	79	63
9	163	103	130	115	278	87	792	500	640	313	77	60
10	130	101	127	110	250	86	665	550	660	285	75	57
11	254	97	144	100	222	84	560	745	705	260	74	56
12	274	93	147	90	206	82	464	1,010	715	236	72	55
13	203	80	132	90	194	80	*412	*924	695	236	69	53
14	168	70	140	95	188	77	380	730	700	236	69	53
15	*144	65	558	93	182	77	336	615	700	215	68	52
16	130	65	755	91	171	75	302	565	*730	206	68	51
17	116	70	500	89	*157	75	282	500	690	197	68	51
18	107	89	408	80	152	82	260	448	530	191	*64	50
19	99	111	348	75	144	97	243	416	468	182	62	49
20	105	207	306	70	137	120	236	464	424	168	60	49
21	120	392	271	70	134	165	226	448	372	157	60	46
22	193	400	246	70	120	209	209	396	352	144	60	45
23	278	804	229	75	110	246	200	360	368	137	60	45
24	206	740	215	77	110	296	191	348	456	127	66	45
25	197	640	200	80	90	380	185	340	468	133	69	44
26	171	490	185	84	75	456	179	364	428	118	70	45
27	154	404	177	84	70	452	182	404	424	137	70	45
28	150	344	174	84	65	*420	197	400	428	120	69	45
29	137	299	168	160	60	392	222	428	432	114	66	44
30	130	264	160	257	------	388	246	510	448	109	63	43
31	123	------	152	194	------	340	------	670	------	135	62	------
Total	4,359	6,865	7,305	3,292	4,728	5,296	10,429	15,110	18,674	7,052	2,265	1,583
Mean	141	229	236	106	163	171	348	487	622	227	73.1	52.8
Cfsm	1.79	2.90	2.99	1.34	2.07	2.17	4.41	6.17	7.88	2.88	0.926	0.669
In.	2.05	3.24	3.44	1.55	2.23	2.50	4.92	7.12	8.80	3.31	1.07	0.75
Ac-ft	8,650	13,620	14,490	6,530	9,380	10,500	20,690	29,970	37,040	15,950	4,490	3,140

Calendar year 1959: Max 1,000 Min 56 Mean 274 Cfsm 3.47 In. 47.13 Ac-ft 198,300
Water year 1959-60: Max 1,020 Min 43 Mean 238 Cfsm 3.02 In. 40.98 Ac-ft 172,400

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 13-17, Jan. 1-5, 9-13, 18-23, Feb. 22 to Mar. 8.

4915. Tieton River at Tieton Dam, near Naches, Wash.

Location.--Lat 46°39'30", long 121°07'20", in sec.31, T.14 N., R.14 E. (unsurveyed), on left bank 900 ft upstream from Wildcat Creek, 1,200 ft downstream from Tieton Dam, 19 miles upstream from Oak Creek, and 22 miles southwest of Naches.
Drainage area.--187 sq mi.
Records available.--August 1908 to December 1912, June to September 1914, June 1918 to March 1921, April 1925 to September 1960. Monthly discharge only for some periods, published in WSP 1316. Published as "at McAllister Meadows" 1908-14 and as "at Rimrock" 1918-19.
Gage.--Water-stage recorder. Datum of gage is 2,680.99 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Oct. 1, 1914, staff gage at site a third of a mile upstream at different datum. Oct. 1, 1918, to Mar. 31, 1919, and Apr. 27 to Sept. 4, 1925, staff gage and reference point, and Sept. 5, 1925, to Apr. 23, 1933, water-stage recorder, at site about 800 ft downstream at different datum. Apr. 24, 1933, to Dec. 11, 1934, water-stage recorder at present site at datum 2.0 ft higher.
Average discharge.--41 years (1908-12, 1918-20, 1925-60), 496 cfs (359,100 acre-ft per year), adjusted for storage since October 1925.
Extremes.--Maximum discharge during year, 2,080 cfs June 16 (gage height, 5.82 ft); minimum, 7.2 cfs Dec. 7-22 (gage height, 1.52 ft).
1908-14, 1918-21, 1925-60: Maximum discharge, 8,450 cfs Dec. 22, 1933 (gage height, 9.24 ft); no flow Apr. 4-6, 10, 1930.
Remarks.--Records excellent except those for periods of discharge determined from staff-gage readings, which are good. No diversion above station. Flow regulated by Rimrock Lake (formerly Tieton Reservoir, see p. 362).
Cooperation.--Gage-height record, 14 discharge measurements, and records of daily discharge furnished by Bureau of Reclamation; records reviewed by Geological Survey.
Revisions (water years).--WSP 369: 1909-10. WSP 1286: 1910, 1928(M), 1935(M). WSP 1316: 1909.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	153	721	280	165	104	8.4	51	535	353	1,280	*1,510	1,360
2	153	721	280	165	104	8.4	36	535	283	1,320	1,450	1,150
3	101	716	*283	165	104	8.4	40	535	289	1,370	1,450	1,050
4	50	710	283	168	104	8.4	64	535	289	1,370	1,440	1,050
5	216	721	283	168	104	8.4	50	535	292	1,370	1,430	1,050
6	270	721	286	168	104	8.4	51	535	313	*1,360	1,430	1,040
7	*339	721	123	168	102	8.4	51	535	353	1,360	1,430	*1,030
8	255	721	7.2	168	*102	8.4	58	540	353	1,360	1,490	1,030
9	339	721	7.2	170	100	8.4	58	545	528	1,360	1,650	1,020
10	339	726	7.2	170	43	8.4	58	540	704	1,340	1,700	1,020
11	339	726	7.2	170	8.4	8.4	336	*540	988	1,330	1,700	1,020
12	216	726	7.2	170	8.4	8.4	535	545	1,130	1,330	1,700	1,060
13	11	726	7.2	170	8.4	8.4	535	935	1,280	1,320	1,700	1,160
14	11	726	7.2	*170	8.4	8.4	763	1,260	*1,180	1,320	1,700	1,160
15	344	726	7.2	170	8.4	8.4	958	1,260	1,360	1,360	1,700	1,160
16	704	726	7.2	170	8.4	8.4	952	1,260	1,810	1,430	1,700	1,160
17	704	721	7.2	170	8.4	8.4	940	1,260	1,820	1,420	1,700	1,140
18	704	571	7.2	170	8.4	8.4	*946	1,260	1,310	1,420	1,700	1,130
19	704	271	7.2	170	8.4	8.4	946	1,280	1,080	1,410	1,700	1,130
20	710	268	7.2	170	8.4	8.4	940	1,280	988	1,410	1,700	1,090
21	710	268	7.2	170	8.4	8.4	946	1,280	916	1,410	1,690	1,080
22	710	268	133	145	8.4	8.4	946	1,280	820	1,470	1,690	1,010
23	716	274	223	110	8.4	*11	940	1,280	704	1,530	1,600	820
24	716	274	223	108	8.4	14	940	1,290	770	1,530	1,530	638
25	716	277	223	108	8.4	17.5	1,120	1,280	862	1,530	1,450	572
26	721	277	223	108	8.4	14	1,250	1,280	892	1,520	*1,390	*567
27	*721	280	223	108	8.4	12.5	1,250	1,280	898	1,510	1,390	567
28	721	280	223	108	8.4	12.5	807	1,280	1,070	1,500	1,390	567
29	721	280	192	108	8.4	13	383	1,280	1,170	1,590	1,380	500
30	721	280	168	106	------	12.5	545	1,280	1,230	1,670	1,370	367
31	721	------	168	106	------	12.5	------	773	------	1,670	1,360	------
Total	14,556	16,144	3,917.8	4,660	1,130.6	304.3	17,495	29,833	26,035	44,170	48,220	28,698
Mean	470	538	126	150	39.0	9.82	583	962	868	1,425	1,555	957
Ac-ft	28,870	32,020	7,770	9,240	2,240	604	34,700	59,170	51,640	87,610	95,640	56,920
(†)	+9,050	+11,150	+21,630	+7,250	+18,430	+23,370	+11,200	-6,930	+15,400	-53,970	-75,080	-43,870

Adjusted for change in contents in Rimrock Lake

Mean	617	725	478	268	359	390	771	850	1,127	547	334	219
Cfsm	3.30	3.88	2.56	1.43	1.92	2.09	4.12	4.55	6.03	2.93	1.79	1.17
In.	3.80	4.33	2.95	1.65	2.07	2.40	4.60	5.24	6.72	3.37	2.06	1.31
Ac-ft	37,920	43,170	29,400	16,490	20,670	23,970	45,900	52,240	67,040	33,640	20,560	13,050

Observed

Calendar year 1959:	Max	1,600	Min	7.2	Mean	594	Ac-ft	429,800
Water year 1959-60:	Max	1,820	Min	7.2	Mean	643	Ac-ft	466,400

Adjusted

Calendar year 1959:	Mean	586	Cfsm	3.13	In.	42.51	Ac-ft	424,000
Water year 1959-60:	Mean	557	Cfsm	2.98	In.	40.50	Ac-ft	404,000

* Discharge measurement made on this day.
† Change in contents, in acre-feet, in Rimrock Lake.
Note.--Discharge computed from twice-daily staff-gage readings Oct. 12-15, Dec. 7-22, Feb. 10 to Apr. 1, Apr. 28, 29.

4925. Tieton River at headworks of Tieton Canal, near Naches, Wash.

Location.--Lat 46°40'10", long 121°00'20", in sec.30, T.14 N., R.15 E. (ur surveyed), on right bank 1,000 ft downstream from headworks of Tieton Canal, 7 miles downstream from Tieton Dam, 12 miles upstream from Oak Creek, and 16 miles southwest of Naches.
Drainage area.--239 sq mi.
Records available.--April 1906 to September 1960. Monthly discharge only for some periods, published in WSP 1316.
Gage.--Water-stage recorder. Datum of gage is 2,280.44 ft above mean sea level, unadjusted. Prior to July 28, 1909, staff gages at same site or sites within 1½ miles downstream referred to same datum.
Average discharge.--54 years, 561 cfs (406,100 acre-ft per year), adjusted for diversion since 1910 and for storage since October 1924.
Extremes.--Maximum discharge during year, 1,740 cfs June 16 (gage height, 4.50 ft); minimum, 27 cfs Mar. 11 (gage height, 1.67 ft).
1906-60: Maximum discharge, 8,910 cfs Dec. 22, 1933 (gage height, 9.70 ft); no flow at times in 1926, 1929, 1931-32, 1934, 1945.
Remarks.--Records good. Diversion for irrigation by Tieton Canal. Flow regulated by Rimrock Lake (formerly Tieton Reservoir, see p. 362).
Cooperation.--Gage-height record, 13 discharge measurements, and records of daily discharge furnished by Bureau of Reclamation; reviewed by Geological Survey.
Revisions (water years).--WSP 1216: Drainage area. WSP 1286: 1910(M), 1920.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

1.6	23	3.0	480
1.8	45	3.5	810
2.0	79	4.0	1,230
2.3	162	5.0	2,280
2.6	278		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	162	740	257	194	120	41	114	546	239	954	*1,150	978
2	162	740	261	194	93	44	98	540	91	9[illegible]	1,070	810
3	123	740	*261	194	73	37	123	534	91	1,0[illegible]	1,050	684
4	68	740	261	194	68	45	153	510	81	1,0[illegible]	1,040	691
5	207	733	292	194	68	40	172	510	70	1,020	1,030	691
6	278	740	324	194	64	37	197	510	77	*1,020	1,030	691
7	*358	740	195	194	114	35	224	516	106	1,010	1,030	*691
8	236	740	40	194	*89	35	220	510	101	1,010	1,100	691
9	348	740	39	190	79	31	201	498	224	1,010	1,190	684
10	358	740	38	201	71	28	153	486	394	1,000	1,300	677
11	394	740	39	197	44	28	379	*510	663	994	1,290	677
12	270	740	38	194	43	29	594	504	826	1,000	1,300	705
13	35	740	37	194	44	29	588	773	994	994	1,300	803
14	31	740	45	*186	44	30	752	1,140	*922	994	1,300	796
15	159	740	123	186	45	34	954	1,140	1,060	1,010	1,310	796
16	719	740	93	183	41	38	930	1,120	1,470	1,080	1,310	789
17	719	740	66	183	39	45	930	1,110	1,510	1,060	1,310	782
18	719	594	58	183	41	58	*946	1,100	1,070	1,060	1,310	782
19	719	296	52	183	37	79	978	1,090	826	1,060	1,310	775
20	726	310	51	183	39	111	978	1,090	719	1,060	1,310	754
21	733	334	48	186	39	153	954	1,050	635	1,060	1,300	740
22	768	436	150	176	34	190	922	1,030	552	1,120	1,300	712
23	754	570	265	128	40	*176	930	1,030	399	1,170	1,220	576
24	747	420	261	125	39	197	930	1,030	464	1,170	1,150	430
25	740	358	257	125	33	240	1,110	1,030	558	1,170	1,080	368
26	740	306	249	125	51	209	1,280	1,030	600	1,170	1,020	*373
27	*740	287	253	128	58	183	1,280	1,030	594	1,150	1,010	383
28	740	274	253	131	38	159	879	1,020	740	1,140	1,000	394
29	740	274	224	134	41	131	321	1,030	866	1,220	1,000	353
30	740	270	201	128	-------	106	552	1,040	914	1,280	994	287
31	740	-------	194	123	-------	89	-------	627	-------	1,280	986	-------
Total	14,973	17,302	4,925	5,324	1,629	2,687	18,842	25,684	17,856	33,320	36,100	19,563
Mean	483	577	159	172	56.2	86.7	628	829	595	1,075	1,165	652
Ac-ft	29,700	34,320	9,770	10,560	3,230	5,330	37,370	50,940	35,420	66,090	71,600	38,800
(†)	+9,050	+11,150	+21,630	+7,250	+18,430	+23,370	+11,200	-6,930	+15,400	-53,977	-75,080	-43,870
(‡)	0	601	589	0	1,060	196	2,820	12,780	19,560	21,020	20,810	17,170

Adjusted for change in lake contents and diversion

Mean	630	774	520	290	395	470	864	924	1,183	539	282	203
Cfsm	2.64	3.24	2.18	1.21	1.65	1.97	3.62	3.87	4.95	2.26	1.18	0.849
In.	3.04	3.61	2.51	1.40	1.78	2.27	4.03	4.46	5.52	2.60	1.36	0.95
Ac-ft	38,750	46,070	31,990	17,810	22,720	28,900	51,390	56,790	70,380	33,140	17,330	12,100

Observed

Calendar year 1959: Max 1,260 Min 20 Mean 506 Ac-ft 366,400
Water year 1959-60: Max 1,510 Min 28 Mean 542 Ac-ft 393,100

Adjusted

Calendar year 1959: Mean 632 Cfsm 2.64 In. 35.92 Ac-ft 457,800
Water year 1959-60: Mean 589 Cfsm 2.46 In. 33.53 Ac-ft 427,300

* Discharge measurement made on this day.
† Change in contents, in acre-feet, of Rimrock Lake.
‡ Diversion, in acre-feet, by Tieton Canal.

4940. Naches River below Tieton River, near Naches, Wash.

Location.--Lat 46°44'40", long 120°46'00", in SW¼NE¼ sec.36, T.15 N., R.16 E., on left bank half a mile downstream from Wapatox power canal, three quarters of a mile downstream from Tieton River, and 3½ miles northwest of Naches.
Drainage area.--941 sq mi.
Records available.--August to October 1905, October 1908 to September 1960. Monthly discharge only for some periods, published in WSP 1316.
Gage.--Water-stage recorder. Datum of gage is 1,549.67 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Dec. 7, 1916, staff gage and Dec. 7, 1916, to Sept. 9, 1936, water-stage recorder, at site five-eighths of a mile upstream at different datums. Sept. 10 to Oct. 30, 1936, staff gage at present site and datum.
Average discharge.--52 years (1908-60), 1,719 cfs (1,245,000 acre-ft per year), adjusted for diversions by Selah Valley and Tieton Canals since 1909, city of Yakima at Oak Flat since 1929, by Wapatox Canal since 1936, for change in contents in Bumping Lake since November 1910, and in Rimrock Lake (formerly Tieton Reservoir) since October 1924.
Extremes.--Maximum discharge during year, 9,120 cfs Nov. 23 (gage height, 16.34 ft); minimum, 18 cfs Mar. 11 (gage height, 10.24 ft).
1905, 1908-60: Maximum discharge, 32,200 cfs Dec. 22, 23, 1933 (gage height, 14.33 ft, site and datum then in use); minimum, 1 cfs Nov. 7, 1942, and for many days in winter of 1943-44, result of regulation and diversion.
Remarks.--Records good except those for periods of ice effect, which are fair. Flow regulated by Bumping Lake and Rimrock Lake (formerly Tieton Reservoir, see p. 362), by diversion at Oak Flat for municipal supply of city of Yakima below station, and by diversion of Selah Valley, Tieton, and Wapatox Canals. Small unmeasured diversions for irrigation of approximately 420 acres above station.
Cooperation.--Gage-height record collected in cooperation with, and 15 discharge measurements furnished by Bureau of Reclamation.
Revisions (water years).--WSP 1216: Drainage area. WSP 1286: 1910(M), 1911, 1929-30(M), 1932-33(M), 1935(M). WSP 1936: 1954.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22

10.7	128	12.0	850
11.0	240	13.0	2,000
11.5	490	14.0	3,600

Nov. 23 to Sept. 30

10.3	26	12.5	1,320
10.5	64	13.0	1,980
10.7	117	14.0	3,600
11.0	220	15.0	5,700
11.5	450	16.0	8,200
12.0	820		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	212	1,090	1,290	711	318	35	*1,160	2,040	2,590	2,010	991	703
2	148	1,020	1,280	711	300	35	1,030	2,180	2,890	1,950	910	573
3	244	1,020	1,340	648	236	30	1,200	2,180	3,280	1,910	928	439
4	216	1,060	1,280	640	194	30	1,470	2,080	3,370	1,870	*892	434
5	211	1,010	*1,240	812	202	35	1,980	2,040	3,200	1,870	883	434
6	321	960	1,210	538	205	45	2,490	2,000	3,200	1,850	847	422
7	330	931	1,090	462	479	50	*2,960	2,360	2,930	1,850	829	400
8	321	913	*390	450	829	55	3,300	2,340	2,560	1,810	874	400
9	524	877	340	400	663	*62	3,280	2,140	2,400	1,730	937	400
10	571	868	268	350	*595	66	2,690	*2,250	2,510	1,690	1,030	390
11	951	834	232	360	486	56	2,370	2,860	2,720	1,600	1,020	385
12	1,260	834	232	370	434	60	2,360	3,710	2,980	1,560	1,000	395
13	484	770	202	350	422	58	*2,220	3,560	3,110	1,520	1,010	510
14	*249	762	202	340	395	56	2,320	3,420	3,060	1,500	1,020	*492
15	229	842	1,810	*320	412	58	2,540	3,060	3,220	1,490	1,020	474
16	1,060	698	2,260	300	385	56	2,370	2,910	3,710	1,530	1,050	480
17	1,070	613	1,520	280	*350	*69	2,280	2,750	3,930	1,490	1,020	468
18	1,030	585	1,700	260	327	82	2,190	2,850	3,050	1,440	1,000	450
19	960	316	1,540	250	216	111	2,160	2,730	2,460	1,420	*982	444
20	950	550	1,360	220	166	224	2,160	2,890	2,060	1,370	982	428
21	980	1,270	1,220	470	152	517	2,120	2,880	1,570	1,330	964	417
22	1,260	1,620	1,210	390	132	973	1,970	2,720	1,430	1,370	973	390
23	2,130	7,350	1,450	210	103	*1,300	2,000	2,560	1,230	1,380	919	292
24	1,730	4,460	1,390	200	126	1,500	2,300	2,490	1,420	1,340	874	183
25	1,640	*3,280	1,310	190	114	2,010	2,560	2,450	1,640	1,330	812	145
26	1,500	2,650	1,180	187	45	2,450	2,700	2,460	1,580	1,090	752	142
27	*1,370	2,180	1,110	180	40	2,260	2,690	2,540	1,570	1,050	760	148
28	1,290	1,830	1,080	162	35	1,910	2,460	2,540	*1,640	1,020	744	152
29	1,230	1,580	937	*284	35	1,610	1,540	2,570	1,810	1,040	727	142
30	1,160	1,400	856	456	-------	1,530	1,980	2,850	2,000	1,110	711	117
31	1,140	-------	778	385	-------	1,310	-------	2,980	-------	1,110	703	-------
Total	26,771	44,173	33,307	11,866	8,666	18,643	66,850	81,390	75,120	46,630	28,164	11,249
Mean	864	1,472	1,074	383	299	601	2,228	2,625	2,504	1,504	909	375
Ac-ft	53,100	87,620	66,060	23,540	17,190	36,980	132,600	161,400	149,000	92,490	55,860	22,310
(†)	+6,170	+21,390	+13,570	+2,980	+20,140	+30,300	+15,730	+5,150	+19,850	-72,930	-81,740	-48,750
(‡)	36,100	31,690	30,690	23,880	26,860	24,810	31,770	46,820	59,440	62,450	61,770	53,710
Adjusted for change in lake contents and diversions												
Mean	1,551	2,365	1,794	820	1,116	1,498	3,027	3,471	3,837	1,334	584	458
Cfsm	1.65	2.51	1.91	0.871	1.19	1.59	3.22	3.69	4.08	1.42	0.621	0.487
In.	1.90	2.80	2.20	1.00	1.28	1.83	3.59	4.25	4.55	1.63	0.72	0.54
Ac-ft	95,370	140,700	110,300	50,400	64,190	92,090	180,100	213,400	228,300	82,010	35,890	27,270

Observed

Calendar year 1959: Max 7,350 Min 148 Mean 1,360 Ac-ft 984,800
Water year 1959-60: Max 7,350 Min 30 Mean 1,237 Ac-ft 898,200

Adjusted

Calendar year 1959: Mean 2,030 Cfsm 2.16 In. 29.29 Ac-ft 1,470,000
Water year 1959-60: Mean 1,818 Cfsm 1.93 In. 26.29 Ac-ft 1,320,000

* Discharge measurement made on this day. † Change in contents, in acre-feet, in Bumping and Rimrock Lakes. ‡ Diversion, in acre-feet, by Tieton, Selah Valley, and Wapatox Canals and city of Yakima. Note.--Stage-discharge relation affected by ice Jan. 9-25, Feb. 26 to Mar. 8.

5005. North Fork Ahtanum Creek near Tampico, Wash.

Location.--Lat 46°33'40", long 120°55'10", in NW¼ sec.2, T.12 N., R.15 E., on left bank 150 ft downstream from Nasty Creek, 3½ miles upstream from Tampico and confluence with South Fork, and 20 miles west of Yakima.

Drainage area.--68.9 sq mi.

Records available.--August 1907 to September 1960 (no winter records in water years 1808-9, 1916-30). Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Concrete control Nov. 11, 1915, to December 1933, and sharp-crested weir since September 1934. Altitude of gage is 2,450 ft (from topographic map). Prior to Sept. 20, 1934, staff gage or water-stage recorder at site 50 ft upstream at different datum.

Average discharge.--36 years (1909-15, 1930-60), 68.7 cfs (49,740 acre-ft per year).

Extremes.--Maximum discharge during year, 364 cfs May 12 (gage height, 1.85 ft); minimum, 4.3 cfs Nov. 13 (gage height, 0.13 ft), result of freezeup.
1907-60: Maximum discharge, 823 cfs May 20, 1956 (gage height, 3.00 ft); minimum, that of Nov. 13, 1959.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. No diversion of importance. No regulation.

Cooperation.--Gage-height record, 17 discharge measurements, and records of daily discharge furnished by Bureau of Indian Affairs; 12 discharge measurements made and records reviewed by Geological Survey.

Revisions (water years).--WSP 1216: Drainage area. WSP 1286: 1910(M), 1914-15.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.1	3.2	0.7	71
.2	9.7	1.0	123
.3	18.5	1.5	252
.5	42	2.0	415

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	26	29	15.5	27	16	97	115	225	74	27	21
2	20	26	28	13.5	25	15	102	119	280	70	*26	21
3	20	27	26	13	22	14	115	117	305	66	*29	21
4	20	25	20	16	21	14	136	112	277	64	27	20
5	19.5	21	*17	21	20	15	161	a110	243	60	26	20
6	19.5	22	16	22	21	16	194	a140	231	*58	25	*20
7	20	22	17	21	65	18	*216	a170	194	58	24	19.5
8	29	22	18.5	20	49	21	231	a160	173	53	24	19.5
9	42	22	20	19	35	20	222	151	168	49	*24	19.5
10	28	22	25	17	29	20	184	a180	168	48	24	18.5
11	53	22	28	16	27	19.5	161	255	173	*46	22	18.5
12	34	21	27	15	26	19.5	140	331	168	*45	22	18.5
13	29	8.9	20	15	25	19.5	129	*255	168	42	21	*18.5
14	27	10	28	16	25	20	*117	211	171	41	21	*17.5
15	*26	12	38	16	25	20	106	194	163	38	21	16.5
16	*26	14.5	35	16	22	21	97	181	*184	36	*21	16.5
17	25	15.5	29	15	21	25	94	158	149	35	*21	16.5
18	25	24	28	14	*24	*29	89	144	131	*34	21	15.5
19	25	29	28	14	21	38	85	138	121	33	21	15.5
20	26	33	27	13	21	53	84	149	110	33	21	*15.5
21	26	43	26	13	21	76	81	131	102	31	21	15.5
22	33	36	26	13	18.5	101	77	119	102	30	22	15.5
23	35	*90	26	13	18.5	115	81	112	104	29	24	15.5
24	29	65	26	15	22	125	77	110	104	29	*24	15.5
25	31	50	18.5	17	19.5	158	76	110	99	29	22	16.5
26	28	39	8.9	19	17	184	77	119	90	*29	22	15.5
27	28	34	18.5	21	16	171	79	119	87	29	22	14.5
28	28	34	22	21	16	144	85	121	85	28	21	14.5
29	27	30	17.5	35	16	134	96	134	82	28	21	14.5
30	26	29	18.5	43	------	123	104	173	*79	28	*21	14.5
31	26	------	16.5	29	------	108	------	211	------	28	21	------
Total	852.0	874.9	728.9	567.0	715.5	1,872.5	3,593	4,849	4,736	1,301	709	521.0
Mean	27.5	29.2	23.5	18.3	24.7	60.4	120	156	158	42.0	22.9	17.4
Cfsm	0.399	0.424	0.341	0.266	0.358	0.877	1.74	2.26	2.29	0.610	0.332	0.253
In.	0.46	0.47	0.39	0.31	0.39	1.01	1.94	2.62	2.56	0.70	0.38	0.28
Ac-ft	1,690	1,740	1,450	1,120	1,420	3,710	7,130	9,620	9,390	2,580	1,410	1,030

Calendar year 1959: Max 223 Min 8.9 Mean 67.3 Cfsm 0.977 In. 13.25 Ac-ft 48,740
Water year 1959-60: Max 331 Min 8.9 Mean 58.3 Cfsm 0.846 In. 11.51 Ac-ft 42,290

Peak discharge (base, 200 cfs).--Mar. 25 (9:30 p.m.) 200 cfs (1.32 ft); Apr. 8 (10:30 p.m.) 255 cfs (1.51 ft); May 12 (8 a.m.) 364 cfs (1.85 ft); June 3 (9:30 p.m.) 354 cfs (1.82 ft); June 16 (10:30 a.m.) 200 cfs (1.32 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for nearby stations.
Note.--Stage-discharge relation affected by ice Nov. 14, 15, Dec. 5-7, Jan. 3-26, Feb. 26 to Mar. 8.

5010. South Fork Ahtanum Creek at Conrad Ranch, near Tampico, Wash.

Location.--Lat 46°30'30", long 120°54'50", in SW¼ sec.23, T.12 N., R.15 E., on left bank at Conrad Ranch, 2½ miles upstream from confluence with North Fork, 2⅝ miles southwest of Tampico, and 20 miles southwest of Yakima.

Drainage area.--24.8 sq mi.

Records available.--March 1915 to September 1960 (no winter records prior to water year 1931). Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Concrete control effective Sept. 6, 1916, to December 1933. Altitude of gage is 2,400 ft (from topographic map). Prior to Aug. 9, 1918, staff gage at same site at datum 1.00 ft lower. Aug. 9, 1818, to Mar. 22, 1951, staff gage at present site and datum.

Average discharge.--30 years (1930-60), 19.1 cfs (13,830 acre-ft per year).

Extremes.--Maximum discharge during year, 85 cfs June 3 (gage height, 1.30 ft); maximum gage height, 1.96 ft Jan. 4 (backwater from ice); minimum daily discharge, 4.6 cfs Jan. 21, 22.

1915-60: Maximum discharge observed, 424 cfs Dec. 23, 1933 (gage height, 3.10 ft), from rating curve extended above 80 cfs; minimum observed, 2.6 cfs Aug. 23, 25, 1931 (gage height, 0.35 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversion for irrigation of about 55 acres above station. No regulation.

Cooperation.--Gage-height record, 18 discharge measurements, and records of daily discharge furnished by Bureau of Indian Affairs; 12 discharge measurements made and records reviewed by Geological Survey.

Revisions (water years).--WSP 312: 1910. WSP 902: 1939. WSP 1264: Drainage area. WSP 1316: 1943(M). WSP 1446: 1918(M).

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.4	5.4	1.0	52
.5	9.0	1.5	109
.6	14.5		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.8	7.0	8.6	5.6	9.0	5.5	33	30	55	22	10	8.2
2	7.8	7.0	8.6	5.3	8.5	5.3	32	32	63	20	*10	8.2
3	7.8	8.2	*8.2	5.0	8.0	5.0	33	31	72	19.5	*11	8.2
4	7.4	7.8	7.5	5.5	7.4	5.0	36	29	70	19.5	10.5	7.8
5	7.4	7.0	7.0	7.0	7.4	5.5	44	29	66	19.5	10	7.8
6	7.4	7.4	6.5	7.5	7.8	6.0	50	33	64	*19	9.5	*7.8
7	7.4	7.4	6.5	7.5	15	6.5	*55	40	54	18	9.5	7.4
8	9.5	7.4	7.0	7.0	11	7.0	58	37	48	18	9.0	7.4
9	11.5	7.4	7.8	6.5	10	6.6	56	36	46	16.5	*9.0	7.4
10	9.0	7.4	7.8	6.0	9.0	6.3	47	41	44	16	9.0	7.0
11	12.5	7.4	8.2	5.7	8.2	6.3	42	53	44	*16	8.6	7.0
12	9.5	7.4	8.2	5.4	8.2	6.3	36	74	44	*15	8.6	7.0
13	8.6	5.0	7.4	5.6	8.2	6.6	33	*62	42	14.5	8.6	*7.0
14	8.2	5.6	7.8	5.8	8.2	6.6	*30	54	43	14	8.6	*7.0
15	*8.2	6.4	9.5	5.8	8.2	7.0	28	50	41	14	8.6	7.0
16	*7.8	7.2	9.0	5.6	7.8	7.0	26	47	*40	13.5	*8.6	7.0
17	7.8	7.7	8.2	5.4	7.8	*7.8	24	43	37	12.5	*8.6	7.0
18	7.8	8.2	7.8	5.2	*7.8	9.5	24	39	35	*12	8.2	7.0
19	7.8	9.0	7.8	5.0	7.4	12	23	38	33	11.5	7.8	7.0
20	8.6	9.5	7.8	4.7	7.4	18	22	39	32	11.5	7.8	*7.0
21	8.6	11	7.8	4.6	7.4	25	21	36	31	11	8.2	7.0
22	9.5	9.0	7.8	4.6	6.5	31	20	33	30	11	8.2	7.0
23	9.0	*14	7.8	4.8	6.5	38	22	32	29	11	*8.6	7.0
24	8.6	11	7.8	5.5	7.5	43	20	31	27	11	8.2	7.4
25	8.6	10	7.8	6.5	7.4	52	21	31	26	11	8.2	7.4
26	8.6	9.0	6.0	7.5	6.5	61	21	33	25	*11	8.2	7.0
27	8.6	8.5	7.0	8.0	6.0	58	22	*33	25	11	8.2	7.0
28	7.8	8.0	8.0	8.0	5.5	49	25	32	24	10.5	8.2	6.6
29	7.8	8.0	7.0	9.0	5.5	45	27	35	*23	10.5	8.2	6.6
30	7.4	8.6	6.5	11	------	42	29	43	23	10.5	*7.8	6.6
31	7.4	------	6.0	10	------	36	------	51	------	10	8.2	------
Total	261.7	244.5	236.7	196.6	231.1	625.8	960	1,227	1,236	441.0	271.7	216.8
Mean	8.44	8.15	7.64	6.34	7.97	20.2	32.0	39.6	41.2	14.2	8.76	7.23
Cfsm	0.340	0.329	0.308	0.256	0.321	0.815	1.29	1.60	1.66	0.573	0.353	0.292
In.	0.39	0.37	0.35	0.29	0.35	0.94	1.44	1.84	1.85	0.66	0.41	0.33
Ac-ft	519	485	469	390	458	1,240	1,900	2,430	2,450	875	539	430

Calendar year 1959: Max 65 Min 5.0 Mean 19.6 Cfsm 0.790 In. 10.72 Ac-ft 14,200
Water year 1959-60: Max 74 Min 4.6 Mean 16.8 Cfsm 0.677 In. 9.22 Ac-ft 12,180

Peak discharge (base, 50 cfs).--Mar. 26 (9 p.m.) 65 cfs (1.12 ft); Apr. 8 (11:30 p.m.) 62 cfs (1.08 ft); May 12 (9 a.m.) 81 cfs (1.25 ft); June 3 (10 p.m.) 85 cfs (1.30 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-18, 27-29, Dec. 4-8, Dec. 26 to Jan. 26, Feb. 22-24, Feb. 26 to Mar. 7 (no gage-height record Nov. 17, 18, Jan. 5-26; discharge estimated on basis of weather records, field notes, and records for nearby stations). No gage-height record Jan. 27 to Feb. 3; discharge estimated on basis of weather records and records for nearby stations.

5020. Ahtanum Creek at The Narrows, near Tampico, Wash.

Location.--Lat 46°31'40", long 120°48'00", in NE¼ sec.15, T.12 N., R.16 E., on left bank at The Narrows, 3 miles downstream from confluence of North and South Forks, 3½ miles east of Tampico, and 18 miles southwest of Yakima.
Drainage area.--121 sq mi.
Records available.--June 1908 to September 1913. August to September 1960.
Gage.--Water-stage recorder. Altitude of gage is 1,830 ft (from topographic map). June 25, 1908, to Sept. 30, 1913, staff gage at different site and datum.
Average discharge.--5 years (1908-13), 95.8 cfs (69,360 acre-ft per year).
Extremes.--Maximum daily discharge during period, 35 cfs Aug. 3; minimum, 13.5 cfs Sept. 16 (gage height, 1.06 ft).
1908-13, 1960: Maximum discharge observed, 1,900 cfs Mar. 1, 1910 (gage height, 4.85 ft, from high-water mark, site and datum then in use), from rating curve extended above 600 cfs; minimum, that of Sept. 16, 1960.
Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation. Many small diversions. John Cox ditch diverts up to 8 cfs past gage during early irrigation seasons.
Revisions (water years).--WSP 1346: 1910-11.

Rating table, Aug. 1 to Sept. 30, 1960 (gage height, in feet, and discharge, in cubic feet per second)

1.0	10
1.2	24
1.4	44

Discharge, in cubic feet per second, August to September 1960

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	33	26	7	30	22	13	28	18	19	25	15	25	28	16
2	33	27	8	30	21	14	27	*19.5	20	26	15	26	27	15
3	35	25	9	29	20	15	27	16	21	26	15	27	27	15
4	33	24	10	29	20	16	28	14.5	22	27	15	28	26	14
5	32	24	11	28	19.5	17	*27	15	23	28	15	29	25	14
6	31	23	12	28	18.5	18	26	15	24	28	15	30	25	14
												31	25	-
Total													877	546.0
Mean													28.3	18.2
Runoff in acre-feet													1,740	1,080

* Discharge measurement made on this day.
Note.--No gage-height record Aug. 1-9, Sept. 21-30; discharge estimated on basis of recorded range in stage and records for stations on North and South Forks.

5025. Ahtanum Creek at Union Gap, Wash.

Location.--Lat 46°32'10", long 120°28'20" (revised), in SW¼ sec.8, T.12 N., R.19 E., on left bank just upstream from Union Pacific Railroad bridge, a quarter of a mile upstream from mouth and 1 mile south of Union Gap.
Drainage area.--171 sq mi.
Records available.--May to November 1904, August 1907 to July 1908, March to October 1910, April 1911 to September 1914, May 1951 to April 1953, August to September 1960. Published as "near Yakima" 1904, 1907-8, 1910-12. Records for water years 1913-14, published in WSP 1286.
Gage.--Water-stage recorder. Altitude of gage is 940 ft (from topographic map). Prior to Sept. 30, 1914, staff gages at approximately same site at various datums; May 12, 1951, to Apr. 23, 1953, water-stage recorder at same site and datum.
Extremes.--Maximum daily discharge during period, 25 cfs Sept. 30; minimum not determined. 1904, 1907-8, 1910-14, 1951-53, 1960: Maximum discharge observed, 1,530 cfs Mar. 3, 1910 (gage height, 8.9 ft, datum then in use); no flow for many days during September and October 1904.
Remarks.--Records excellent except those for period of no gage-height record, which are fair. No regulation. Water diverted for irrigation of about 9,000 acres above station.
Revisions.--WSP 1216: Drainage area.

Rating table, Aug. 1 to Sept. 30, 1960 (gage height, in feet, and discharge, in cubic feet per second)

0.5	11
.6	15.5
.7	21
.8	28

Discharge, in cubic feet per second, August to September 1960

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	a12	18	7	a12	20	13	13.5	20	19	18.5	19.5	25	19.5	22
2		19	8		21	14	13	*21	20	18.5	20	26	20	20
3		18.5	9		21	15	14	19.5	21	18.5	22	27	20	21
4		19	10	12.5	21	16	15	19.5	22	20	22	28	21	21
5		19.5	11	12.5	21	17	16	19.5	23	19.5	23	29	20	23
6		20	12	13.5	21	18	*18	19	24	19.5	24	30	18	25
												31	18	-
Total													487.0	620.0
Mean													15.7	20.7
Runoff in acre-feet													966	1,230

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records.

5050. Yakima River near Parker, Wash.

Location.--Lat 46°29'40", long 120°26'10", in sec.28, T.12 N., R.19 E., on left bank 700 ft downstream from Sunnyside diversion dam, 1½ miles east of Parker, and 3 miles downstream from Ahtanum Creek.

Drainage area.--3,650 sq mi, approximately.

Records available.--April 1908 to September 1960. Monthly discharge only for some periods, published in WSP 1316. Prior to October 1916, published as "near Wapato."

Gage.--Water-stage recorder. Datum of gage is 886.23 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Jan. 1, 1909, hook gage at site 25 ft above headgate of Sunnyside Canal at different datum. Jan. 1, 1909, to Dec. 31, 1913, chair gage at site 500 ft downstream from Sunnyside Canal at datum 1.82 ft higher than present datum. Jan. 1, 1914, to Aug. 16, 1915, chain or staff gage and Aug. 17, 1915, to Feb. 2, 1919, water-stage recorder, at site 500 ft downstream from headgate of Sunnyside Canal at datum 0.18 ft lower than present datum. Feb. 3, 1919, to Oct. 20, 1940, water-stage recorder at present site at datum 0.18 ft lower than present datum. Oct. 21, 1940, to Aug. 9, 1953, water-stage recorder at site 1,000 ft downstream from headgate of Sunnyside Canal at datum 0.18 ft lower than present datum.

Extremes.--Maximum discharge during year, 27,400 cfs Nov. 24 (gage height, 12.58 ft); minimum, 39 cfs Aug. 28 (gage height, 2.23 ft); minimum daily, 74 cfs Sept. 12. 1908-60: Maximum discharge, 65,000 cfs Dec. 23, 1933 (gage height, 15.0 ft, from high-water marks); minimum, less than 10 cfs for several days during latter part of irrigation season in most years prior to 1936.

Remarks.--Records excellent except those below 500 cfs, which are fair. Diversions above station for irrigation of about 200,000 acres above and 220,000 acres below station. During irrigation season when Sunnyside Canal is carrying water, as much as 18 cfs, depending upon the stage of the canal, is released ahead of the fish screens and passes river and canal gaging stations unmeasured. For combined flow of Yakima River and canals see following page. Some regulation by diversions and by Keechelus, Fachess, Cle Elum, and Bumping Lakes, and Tieton Reservoir (see p. 362). Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Cooperation.--Gage-height record collected in cooperation with, and 23 discharge measurements furnished by Bureau of Reclamation.

Revisions (water years).--WSP 982: 1942. WSP 1122: 1934. WSP 1216: 1949-50, drainage area. WSP 1516: 1955.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 8-14, 18-20, 26-31, Sept. 3-14, 26, 27)

Oct. 1 to Nov. 23		Nov. 24 to Sept. 30			
3.5	545	2.0	49	5.0	2,090
4.0	940	2.3	94	6.0	3,740
5.0	2,090	2.6	163	8.0	8,540
		3.0	301	10.0	15,000
Note.--Same as following table above 5.0 ft.		3.5	575	13.0	29,900
		4.0	950		

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,420	3,800	7,660	6,810	2,290	1,220	3,480	1,500	3,460	*531	647	372
2	1,220	3,700	7,660	6,430	2,460	1,180	2,950	1,670	2,460	453	459	467
3	949	3,630	7,860	6,460	2,220	1,170	3,230	1,610	2,740	488	431	80
4	690	3,820	7,660	6,300	1,870	1,120	3,740	1,210	3,000	569	500	140
5	594	3,780	7,390	6,400	*1,980	1,250	4,560	*857	2,610	550	436	235
6	730	3,660	*7,340	6,530	2,090	1,360	5,670	755	2,420	525	301	253
7	652	3,570	7,260	6,400	2,200	1,400	6,580	1,420	1,860	378	211	235
8	802	3,510	*6,660	6,400	3,100	*1,350	*7,180	2,260	933	253	*172	*238
9	794	3,440	6,130	6,200	3,070	1,350	7,340	*1,860	446	211	142	155
10	1,350	3,390	6,010	5,960	2,770	1,270	6,130	1,510	732	289	158	130
11	1,450	3,320	5,910	5,910	2,660	1,260	4,750	1,920	1,210	562	183	119
12	3,000	3,260	5,960	5,510	2,460	1,230	*4,050	3,510	1,740	*531	*123	74
13	*2,400	3,190	5,770	*4,690	2,360	1,200	3,390	4,560	2,240	431	180	174
14	901	3,020	5,630	3,930	2,320	1,200	3,100	4,520	2,470	338	272	276
15	609	3,090	7,890	3,140	2,410	1,230	3,240	4,750	2,690	293	324	324
16	*1,770	3,040	*12,700	3,000	2,520	*1,420	2,850	4,480	3,570	442	352	342
17	2,950	2,800	8,860	2,950	2,350	1,560	2,190	4,170	*4,670	482	372	372
18	3,350	2,790	8,250	2,720	*2,160	2,090	1,770	4,710	3,950	518	*253	352
19	3,230	2,640	9,060	2,560	1,980	2,230	1,790	4,520	2,970	420	132	357
20	3,170	2,660	8,630	2,520	1,830	2,320	1,770	4,500	2,060	383	256	398
21	3,320	4,330	8,250	2,590	1,720	2,870	*1,690	5,400	1,020	342	359	367
22	3,370	5,910	7,940	2,630	1,740	3,910	1,470	5,670	531	388	404	537
23	5,370	13,600	8,140	2,520	1,630	4,770	1,650	5,260	186	562	448	588
24	5,300	*24,500	8,250	2,530	1,570	*5,040	1,770	4,770	121	601	471	500
25	4,990	14,100	8,000	2,470	1,580	5,940	1,560	4,820	155	703	398	420
26	*4,620	11,300	7,750	2,440	1,500	7,200	1,870	4,580	202	588	235	264
27	3,990	9,930	7,530	2,380	1,330	7,340	1,980	4,710	272	448	235	*301
28	3,720	8,860	7,450	2,190	1,230	6,360	1,820	4,390	155	372	87	378
29	3,910	8,340	7,260	1,920	1,220	5,190	559	4,050	338	*310	254	629
30	4,090	7,860	7,100	2,200	-------	4,710	1,160	4,170	442	471	163	471
31	3,950	-------	6,990	2,300	-------	4,090	-------	*4,750	-------	582	248	-------
Total	78,661	174,840	234,950	126,990	60,620	85,830	95,269	108,862	51,653	14,014	9,206	9,548
Mean	2,537	5,828	7,579	4,098	2,090	2,769	3,176	3,512	1,722	452	297	318
Ac-ft	156,000	346,800	466,000	251,900	120,200	170,200	189,000	215,900	102,500	27,800	18,260	18,940

Calendar year 1959: Max 24,500 Min 55 Mean 3,456 Ac-ft 2,502,000
Water year 1959-60: Max 24,500 Min 74 Mean 2,870 Ac-ft 2,084,000

* Discharge measurement made on this day.

5050. Yakima River near Parker, Wash.--Continued

Monthly discharge of Yakima River and canals near Parker, Wash., water year October 1959 to September 1960

Month	Mean discharge, in cubic feet per second							Combined flow of Yakima River and canals (acre-feet)
	Yakima River near Parker	Roza Canal at mile 26.9	Union Gap Canal (estimated)	New Reservation Canal	Old Reservation Canal	Sunnyside Canal	Combined flow of Yakima River and canals	
October	2,537	266	2.2	330	1.7	396	3,533	217,200
November	5,828	0	0	0	11.2	0	5,839	347,400
December	7,579	0	0	0	15.3	0	7,594	466,900
Calendar year 1959	3,456	471	17.2	882	14.4	625	5,466	3,957,000
January	4,096	0	0	0	13.6	0	4,110	252,700
February	2,090	0	0	0	12.3	0	2,102	120,900
March	2,769	150	0	72.5	10.4	98.1	3,100	190,600
April	3,176	655	20.4	1,055	18.0	798	5,722	340,500
May	3,512	884	33.3	1,823	34.7	1,174	7,461	458,800
June	1,722	1,037	37.2	1,972	17.2	1,288	6,073	361,400
July	452	1,041	39.6	1,947	0	1,298	4,778	293,800
August	297	1,016	35.0	1,778	0	1,258	4,384	269,600
September	318	786	29.9	1,341	0	1,035	3,510	208,900
Water year 1959-60	2,870	487	16.5	862	11.2	614	4,861	3,529,000

Note.--New Reservation, Old Reservation, and Sunnyside Canals divert from river above station and below Union Gap. Roza and Union Gap Canals head above Union Gap, but records given herein show flow in these canals that reaches the valley below Union Gap. Records for Roza and Sunnyside Canals furnished by Bureau of Reclamation. Records for Union Gap Canal estimated on basis of discharge measurements and records of flow at canal headworks. Combined flow represents flow of Yakima River that reaches valley below Union Gap.

5105. Yakima River at Kiona, Wash.

Location.--Lat 46°15'10", long 119°28'50", in sec.19, T.9 N., R.27 E., on left bank just upstream from highway bridge at Kiona, 3½ miles downstream from intake of Kiona Canal and 25 miles upstream from mouth.

Drainage area.--5,600 sq mi, approximately.

Records available.--August to December 1895 (gage heights only, fragmentary), August 1896 to March 1915, February 1933 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 454.41 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 31, 1915, several staff or chain gages at approximately same site and datum. Feb. 6, 1933, to July 26, 1934, tape gage at present site and datum.

Extremes.--Maximum discharge during year, 18,700 cfs Nov. 25 (gage height, 12.47 ft); minimum, 914 cfs July 16 (gage height, 3.26 ft).
1896-1915, 1933-60: Maximum discharge, 67,000 cfs Dec. 23, 1933 (gage height, 21.57 ft, from high-water marks); minimum observed, 105 cfs Sept. 11, 1906 (gage height, 2.35 ft, datum then in use).

Remarks.--Records excellent except those for periods of no gage-height record, which are fair. Water diverted above station for irrigation of about 424,000 acres. Some regulation by diversions and by Keechelus, Kachess, Cle Elum, and Bumping Lakes, and Rimrock Lake (see following page). The Kiona Canal bypasses station with a mean flow of approximately 23 cfs for irrigation of about 1,100 acres below station. Diversion by the Kennewick Canal was 92,990 acre-ft in water year 1960. Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 214: 1905. WSP 1122: 1934(M). WSP 1216: 1949-50, drainage area. WSP 1286: 1907(M), 1909, 1936.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)

3.3	950	7.0	6,320
4.0	1,670	9.0	10,200
5.0	2,950	12.0	17,300

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,930	*5,030	8,640	7,690	3,160	2,130	6,300	2,500	6,470	1,230	1,350	1,860
2	3,500	4,890	8,500	7,480	3,120	2,100	5,710	2,910	5,170	1,340	1,530	*1,980
3	3,310	4,800	8,370	7,180	3,240	2,090	5,350	3,020	4,240	1,340	1,520	2,120
4	3,060	4,640	8,560	7,140	3,140	2,070	5,440	3,000	4,180	1,320	1,430	1,980
5	2,810	4,820	*8,390	7,060	2,820	2,060	5,710	2,710	4,310	1,420	1,450	1,900
6	2,680	4,800	8,140	7,140	2,870	2,080	6,340	2,390	4,010	1,480	1,490	1,920
7	2,680	4,670	8,010	7,210	3,020	2,200	7,100	2,280	3,740	1,440	1,440	2,010
8	2,660	4,570	7,940	7,180	3,610	2,280	7,730	2,800	3,280	1,280	1,350	2,010
9	2,710	4,520	7,380	7,080	4,190	2,270	8,390	3,670	2,540	1,010	1,260	1,950
10	2,740	4,450	6,980	*6,870	4,120	2,200	8,700	3,450	2,020	1,080	1,210	1,940
11	3,340	4,400	6,890	6,680	3,880	2,180	7,670	3,120	1,790	1,300	1,150	1,860
12	3,400	4,310	6,830	6,600	3,720	1,940	6,400	3,420	2,240	1,320	1,060	1,840
13	4,800	4,200	6,850	6,090	*3,480	2,090	5,650	4,920	2,750	1,320	1,070	1,800
14	4,350	4,100	6,780	5,330	3,370	2,060	5,100	5,730	3,220	1,280	1,090	1,700
15	3,340	4,000	6,620	4,580	3,320	2,070	4,740	5,910	3,580	1,140	1,140	1,760
16	3,140	3,900	8,560	3,940	3,450	2,040	4,690	6,050	3,860	1,010	1,300	1,820
17	3,750	3,900	11,900	3,750	3,510	2,190	4,410	5,850	4,530	1,110	1,410	1,840
18	4,750	3,800	9,920	3,640	3,320	2,350	3,830	5,640	5,560	1,230	1,440	1,860
19	4,840	3,800	9,040	3,420	3,140	*2,840	3,280	6,090	5,110	1,170	1,430	1,860
20	4,670	3,750	9,560	3,300	2,960	3,010	3,130	6,030	4,300	1,190	1,380	1,860
21	4,520	3,720	9,340	3,320	2,840	3,200	3,010	6,210	3,540	1,130	1,330	1,860
22	4,530	5,200	8,920	3,360	2,680	3,750	2,940	7,060	2,770	1,040	1,490	1,900
23	4,620	6,510	8,640	3,360	2,680	4,800	2,850	7,400	2,150	959	1,630	1,980
24	6,160	10,400	8,820	3,320	2,600	5,690	2,950	6,950	1,790	1,060	1,820	2,070
25	6,090	16,700	8,840	3,340	2,520	5,920	3,140	6,510	1,430	1,310	1,920	2,150
26	5,940	*16,700	8,680	3,280	2,500	7,230	3,070	*6,640	1,260	1,340	1,950	2,130
27	5,620	*12,500	8,370	3,240	2,440	8,450	3,260	6,570	1,360	1,410	1,880	2,040
28	5,110	10,800	8,160	3,200	2,280	8,680	3,560	6,620	1,450	1,250	2,000	2,000
29	4,870	9,740	8,110	3,000	2,140	7,900	*3,380	6,300	1,280	1,160	2,100	2,020
30	4,960	9,180	7,920	2,820	-------	7,310	2,400	6,090	1,210	*1,080	1,950	2,140
31	5,100	-------	7,820	3,020	-------	7,230	-------	6,210	-------	1,180	1,920	-------
Total	127,980	188,800	257,480	154,620	90,120	114,410	146,230	154,050	95,140	37,929	46,490	58,160
Mean	4,128	6,293	8,306	4,988	3,108	3,691	4,874	4,969	3,171	1,224	1,500	1,939
Ac-ft	253,800	374,500	510,700	306,700	178,800	226,900	290,000	305,600	188,700	75,230	92,210	115,400

Calendar year 1959: Max 16,700 Min 1,050 Mean 4,781 Ac-ft 3,461,000
Water year 1959-60: Max 16,700 Min 959 Mean 4,020 Ac-ft 2,919,000

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 12, Nov. 13-20; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations.

Reservoirs in Yakima River basin, Wash.

4740. Keechelus Lake.--Lat 47°19'20", long 121°20'20", in NE¼ sec.12, T.21 N., R.11 E., at dam on Yakima River at outlet of Keechelus Lake, 3½ miles northwest of Martin and 9½ miles northwest of Easton. Drainage area, 55.8 sq mi. Records available, January 1906 to September 1960. Staff gage read twice daily. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Maximum contents observed during year, 159,930 acre-ft June 17 (elevation, 2,517.84 ft); minimum observed, 33,560 acre-ft Sept. 30 (elevation, 2,450.97 ft). Maximum contents observed during period 1906-60, 160,570 acre-ft May 16, 1925 (elevation, 2,518.09 ft); minimum observed, 448 acre-ft Sept. 6, 12, 13, 1906 (original crib dam); minimum elevation observed, 2,428.30 ft Sept. 20, 1926.

Reservoir is formed on natural lake by earth- and gravel-fill dam completed in 1917; storage began above crib dam Jan. 12, 1906, above present dam Aug. 19, 1914. To aid in construction and clearing of reservoir site, the water surface was kept low and present reservoir was not filled until June 15, 1920. Capacity, 157,800 acre-ft between gate sill (elevation, 2,425.00 ft) and spillway crest (elevation, 2,517.00 ft). Spillway raised 2 ft, construction completed Sept. 12, 1952. Records given herein represent usable contents. Water used for irrigation.

4755. Kachess Lake.--Lat 47°15'50", long 121°12'00", in SW¼ sec.34, T.21 N., R.13 E., at dam on Kachess River at outlet of Kachess Lake, 2½ miles northwest of Easton. Drainage area, 63.6 sq mi. Records available, September 1905 to September 1960. Staff gage read twice daily. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Maximum contents observed during year, 242,850 acre-ft June 17 (elevation, 2,262.85 ft); minimum observed, 135,880 acre-ft Sept. 30 (elevation, 2,237.43 ft). Maximum contents observed during period 1905-60, 244,850 acre-ft May 9, 1957 (elevation, 2,263.29 ft); minimum observed, 525 acre-ft Sept. 14, 15, 1910 (original crib dam); minimum elevation observed, 2,197.73 ft Sept. 26, 27, 1915.

Reservoir is formed on natural lake by earth- and gravel-fill dam completed in 1912. Original crib dam, creating capacity of 21,000 acre-ft, used Sept. 20, 1905, to June 30, 1911. Storage above present dam began June 30, 1911. Capacity, 239,000 acre-ft between gate sill (elevation, 2,192.75 ft) and top of spillway gate (elevation, 2,262.00 ft). Records given herein represent usable contents. Water used for irrigation.

4785. Cle Elum Lake.--Lat 47°14'40", long 121°04'00", in NE¼ sec.10, T.20 N., R.14 E., at dam on Cle Elum River at outlet of Cle Elum Lake, 4 miles northwest of Roslyn. Drainage area, 203 sq mi. Records available, May 1906 to September 1960. Staff gage read twice daily. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Maximum contents observed during year, 441,920 acre-ft June 16 (elevation, 2,241.03 ft); minimum observed, 115,970 acre-ft Sept. 30 (elevation, 2,158.53 ft). Maximum contents observed during period 1906-60, 446,520 acre-ft May 8, 9, 1957 (elevation, 2,241.98 ft); minimum observed, 2,380 acre-ft Aug. 31, 1906; minimum elevation observed, 2,114.35 ft Oct. 14, 1932. Storage was uncontrolled Oct. 3, 1931, to Feb. 26, 1932.

Reservoir is formed on natural lake by earth- and gravel-fill dam completed in 1933; storage began above present dam Feb. 26, 1932. Capacity, 436,900 acre-ft between gate sill (elevation, 2,110.00 ft) and top of spillway gate (elevation, 2,240.00 ft). Records given herein represent usable contents. Water used for irrigation.

Revisions (water years).--WSP 1182: 1948-49.

4875. Bumping Lake.--Lat 46°52', long 121°18', in SW¼ sec.23 (unsurveyed), T.16 N., R.12 E., at dam on Bumping River at outlet of Bumping Lake, 11½ miles upstream from American River and 19 miles west of Nile. Drainage area, 68.6 sq mi. Records available, June to July 1906, April 1909 to September 1960. Staff gage read twice daily. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Maximum contents observed during year, 36,160 acre-ft June 16 (elevation, 3,427.85 ft); minimum observed, 4,980 acre-ft Sept. 30 (elevation, 3,396.67 ft). Maximum contents observed during period 1906, 1909-60, 39,840 acre-ft June 21, 22, 1925 (elevation, 3,430.55 ft); minimum observed, 1,130 acre-ft Feb. 5-9, 1949 (elevation, 3,390.80 ft).

Reservoir is formed on natural lake by earth-fill dam completed in 1910; storage began Nov. 3, 1910. Capacity, 33,700 acre-ft between gate sill (elevation, 3,389.00 ft) and spillway crest (elevation, 3,426.00 ft). Records given herein represent usable contents. Water used for irrigation.

4910. Rimrock Lake (formerly Tieton Reservoir).--Lat 46°39'10", long 121°07'30", in SW¼ sec.31 (unsurveyed), T.14 N., R.14 E., on face of dam on Tieton River, at spillway, at Rimrock, 2,000 ft upstream from Wildcat Creek, 7½ miles upstream from headworks of Tieton Canal, and 22½ miles southwest of Naches. Drainage area, 187 sq mi. Records available, April 1925 to September 1960. Prior to October 1959, published as Tieton Reservoir. Staff gage read twice daily. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Maximum contents observed during year, 200,860 acre-ft June 16 (elevation, 2,927.13 ft); minimum observed, 23,220 acre-ft Sept. 30 (elevation, 2,820.34 ft). Maximum contents observed during period 1925-60, 201,380 acre-ft June 21, 1937 (elevation, 2,927.33 ft); minimum observed, 89 acre-ft Oct. 12, 1926 (elevation, 2,766.77 ft).

Reservoir is formed by earth- and gravel-fill dam completed in 1925; storage began Apr. 27, 1925. Capacity, 198,000 acre-ft between sill of tunnel entrance (elevation, 2,766.00 ft) and crest of spillway gates (elevation, 2,926.00 ft). Records given herein represent usable contents. Water used for irrigation.

Cooperation.--Records furnished by Bureau of Reclamation and reviewed by Geological Survey.

Reservoirs in Yakima River basin, Wash.--Continued

Month-end elevation and contents, water year October 1959 to September 1960

	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
	Keechelus Lake			Kachess Lake		
Sept.30	2,486.95	90,120	-	2,246.60	172,150	-
Oct. 31	2,493.45	103,090	+12,970	2,252.57	197,330	+25,180
Nov. 30	2,505.50	129,580	+26,490	2,259.10	225,930	+28,600
Dec. 31	2,495.52	107,420	-22,160	2,252.02	194,970	-30,960
Calendar year 1959	-	-	-15,540	-	-	+5,890
Jan. 31	2,482.77	82,300	-25,120	2,248.11	178,420	-16,550
Feb. 29	2,488.84	93,800	+11,500	2,250.63	189,030	+10,610
Mar. 31	2,496.23	108,920	+15,120	2,254.11	205,980	+14,950
Apr. 30	2,509.21	138,380	+29,460	2,260.20	230,860	+26,880
May 31	2,514.95	152,560	+14,180	2,260.39	231,710	+850
June 30	2,517.38	158,750	+6,190	2,261.88	238,440	+6,730
July 31	2,502.09	121,750	-37,000	2,250.93	190,310	-48,130
Aug. 31	2,473.38	66,130	-55,620	2,242.39	155,110	-35,200
Sept.30	2,450.79	33,320	-32,810	2,237.37	135,660	-19,450
Water year 1959-60	-	-	-56,800	-	-	-77,180
	Cle Elum Lake			Bumping Lake		
Sept.30	2,181.55	192,540	-	3,404.42	10,700	-
Oct. 31	2,199.96	262,020	+69,480	3,400.70	7,820	-2,880
Nov. 30	2,226.81	375,470	+113,450	3,412.50	18,060	+10,240
Dec. 31	2,217.13	332,920	-42,550	3,403.55	10,000	-8,060
Calendar year 1959	-	-	+102,930	-	-	-4,110
Jan. 31	2,202.74	273,140	-59,780	3,397.77	5,730	-4,270
Feb. 29	2,207.24	291,440	+18,300	3,400.18	7,440	+1,710
Mar. 31	2,215.62	326,460	+35,020	3,408.68	14,370	+6,930
Apr. 30	2,229.42	387,310	+60,850	3,413.32	18,900	+4,530
May 31	2,233.11	404,330	+17,020	3,423.87	30,980	+12,080
June 30	2,237.95	427,130	+22,800	3,427.31	35,430	+4,450
July 31	2,216.17	328,800	-98,330	3,410.90	16,470	-18,960
Aug. 31	2,187.53	214,330	-114,470	3,403.30	9,810	-6,660
Sept.30	2,158.33	115,360	-98,970	3,396.60	4,930	-4,880
Water year 1959-60	-	-	-77,180	-	-	-5,770
	Rimrock Lake					
Sept.30	2,871.05	85,580	-			
Oct. 31	2,876.50	94,630	+9,050			
Nov. 30	2,882.86	105,780	+11,150			
Dec. 31	2,894.31	127,410	+21,630			
Calendar year 1959	-	-	-5,810			
Jan. 31	2,897.93	134,660	+7,250			
Feb. 28	2,906.73	153,090	+18,430			
Mar. 31	2,917.14	176,460	+23,370			
Apr. 30	2,921.83	187,660	+11,200			
May 31	2,918.95	180,730	-6,930			
June 30	2,925.26	196,130	+15,400			
July 31	2,901.58	142,160	-53,970			
Aug. 31	2,859.01	67,080	-75,080			
Sept.30	2,820.32	23,210	-43,870			
Water year 1959-60	-	-	-62,370			

† Elevation estimated at 12 p.m. from graph of twice-daily gage readings.

ESQUATZEL COULEE BASIN

5125. Providence Coulee at Cunningham, Wash.

Location.--Lat 46°49'20", long 118°48'30", near township line in NW¼ sec.4, T.15 N., R.32 E., on right bank on upstream side of Northern Pacific Railway bridge at Cunningham.
Drainage area.--27.8 sq mi.
Records available.--January 1953 to September 1960.
Gage.--Water-stage recorder. Altitude of gage is 1,160 ft (from topographic map).
Average discharge.--7 years, 0.38 cfs (275 acre-ft per year).
Extremes.--No flow during year.
1953-60: Maximum discharge, 2,160 cfs Feb. 21, 1956 (gage height, 10.04 ft); no flow for most of each year.
Remarks.--No flow since Jan. 25, 1959. No known regulation or diversion. Figures of discharge for calendar year 1959 are as follows: Maximum, 27 cfs; minimum, zero; mean, 0.074 cfs; cubic feet per second per square mile, 0.0027; runoff, 0.04 in; runoff, 54 acre-ft.

5130. Esquatzel Coulee at Connell, Wash.

Location.--Lat 46°39'30", long 118°52'10", in SE¼NW¼ sec.36, T.14 N., R.31 E., on right bank 400 ft below outlet of local sewage plant and half a mile southwest of Connell.
Drainage area.--240 sq mi.
Records available.--January 1953 to September 1960.
Gage.--Water-stage recorder. Concrete control since Aug. 7, 1959. Altitude of gage is 840 ft (from topographic map). Prior to Aug. 7, 1959, at site half a mile upstream at different datum.
Extremes.--Maximum daily discharge during year, 0.2 cfs Jan. 25-30, Feb. 1; maximum gage height, 2.20 ft Jan. 10, 12 (backwater from ice); no flow Oct. 25; Aug. 28 to Sept. 4.
1953-60: Maximum discharge, 5,560 cfs Feb. 21, 1956 (gage height, 12.68 ft); no flow for most of each year.
Remarks.--Records fair. No known regulation or diversion. Since August 1959, all of flow is discharge from local sewage plant. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0
2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	0
3	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	0
4	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	0
5	.1	.1	*.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
6	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
7	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
8	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
9	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
10	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
11	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
12	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
13	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
14	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
15	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
16	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
17	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
18	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
19	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
20	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
21	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	**.1
22	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
23	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
24	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
25	0	.1	.1	.2	.1	.1	.1	.1	.1	.1	.1	.1
26	.1	.1	.1	.2	.1	.1	.1	*.1	.1	.1	.1	.1
27	.1	.1	.1	.2	.1	.1	.1	.1	.1	.1	.1	.1
28	.1	.1	.1	.2	.1	.1	.1	.1	.1	.1	0	.1
29	.1	.1	.1	.2	.1	.1	.1	.1	.1	.1	0	.1
30	.1	.1	.1	.2	------	.1	.1	.1	.1	*.1	0	.1
31	.1	------	.1	.1	------	.1	------	.1	------	.1	0	------
Total	3.0	3.0	3.1	3.7	3.0	3.1	3.0	3.1	3.0	3.1	2.7	2.6
Mean	0.10	0.10	0.10	0.12	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09
Cfsm	0.00042	0.00042	0.00042	0.00050	0.00042	0.00042	0.00042	0.00042	0.00042	0.00042	0.00037	0.00037
In.	0.0005	0.0005	0.0005	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0004	0.0004
Ac-ft	6.0	6.0	6.1	7.3	6.0	6.1	6.0	6.1	6.0	6.1	5.4	5.2

Calendar year 1959: Max 5.5 Min 0 Mean 0.07 Cfsm 0.00029 In. 0.004 Ac-ft 50
Water year 1959-60: Max 0.2 Min 0 Mean 0.10 Cfsm 0.00042 In. 0.006 Ac-ft 72

* Discharge measurement made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Dec. 30 to Jan. 26 (no gage-height record Jan. 13, 14, 18-26). No gage-height record July 30 to Sept. 2; discharge estimated on basis of recorded range in stage and weather records.

5135. Esquatzel Coulee at Eltopia, Wash.

Location.--Lat 46°27'40", long 119°01'00", in SE¼ sec.2, T.11 N., R.30 E., on left bank on upstream side of Northern Pacific Railway bridge at Eltopia.
Drainage area.--394 sq mi.
Records available.--January 1953 to September 1960.
Gage.--Water-stage recorder. Altitude of gage is 580 ft (from topographic map).
Average discharge.--7 years, 1.07 cfs (775 acre-ft).
Extremes.--No flow during year.
1953-60: Maximum discharge, 3,740 cfs Feb. 22, 1956 (gage height, 18.23 ft); no flow for most of each year.
Remarks.--No flow since Feb. 27, 1956. Considerable regulation by natural pondage in Esquatzel Coulee near Mesa. No known diversion.

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reasen are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow, partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1960

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Spokane River basin				
4295	Little Spokane River at Chattaroy, Wash.	NE¼ sec.34 T.28 N., R.43 E., 200 ft below road crossing at Chattaroy and 200 ft above Deer Creek.	300	1948, 1952, 1955-58, 1960	9-14-60	95.2
4296	Deer Creek near Chattaroy, Wash.	On line between SW¼ and SE¼ sec.26, T.28 N., R.43 E., 1 mile above mouth near Chattaroy.	31.9	1948, 1952, 1955-58, 1960	9-14-60	.50
4301	Dragoon Creek at mouth, near Chattaroy, Wash.	NE¼ sec.4, T.27 N., R.43 E., at mouth, 1¼ miles southwest of Chattaroy.	177	1948, 1952, 1955-58, 1960	9-14-60	4.48
4301.5	Little Spokane River below Dragoon Creek, near Chattaroy, Wash.	On line between secs. 3 and 4, T.27 N., R.43 E., 500 ft below Dragoon Creek and 1 mile south of Chattaroy.	512	1952, 1955-58, 1960	9-14-60	105
4302	Little Spokane River at Buckeye, Wash.	NE¼ sec.16, T.27 N., R.43 E., 50 ft above road bridge at Buckeye.	518	1952, 1955-58, 1960	9-15-60	135
4302.5	Little Spokane River near Buckeye, Wash.	SE¼ sec.21, T.27 N., R.43 E., 50 ft below county road bridge and 1½ miles south of Buckeye.	523	1952, 1955-58, 1960	9-15-60	129
4303	Little Spokane River above Deadman Creek, near Dartford, Wash.	S½ sec.28, T.27 N., R.43 E., at county road bridge ½ mile above Deadman Creek and 2½ miles northeast of Dartford.	524	1952, 1955-58, 1960	9-15-60	130
4303.5	Deadman Creek near Mead, Wash.	E½ sec.3, T.26 N., R.43 E., 300 ft below highway bridge and 1 mile north of Mead.	80.3	1948, 1952, 1955-58, 1960	9-15-60	1.60
4304	Deadman Creek below U. S. Highway 195, near Mead, Wash.	SE¼NW¼ sec.3, T.26 N., R.43 E., 1,000 ft below U. S. Highway 195 and 1 mile northwest of Mead.	94.7	1953, 1955-58, 1960	9-16-60	8.72
4305	Deep Creek at Colbert, Wash.	SE¼ sec.22, T.27 N., R.43 E., at crossing on U. S. Highway 195, ½ mile south of Colbert.	32.8	1948‡, 1952-53, 1955-58, 1960	9-15-60	0
4306	Little Spokane River below Deadman Creek, near Dartford, Wash.	SW¼ sec.33, T.27 N., R.43 E., below Deadman Creek 1½ miles northeast of Dartford.	659	1957-58, 1960	9-16-60	142
4307	Little Spokane River above Wandermere Lake Creek, near Dartford, Wash.	NW¼ sec.5, T.26 N., R.43 E., 400 ft above Wandermere Lake Creek and ¾ mile east of Dartford.	660	1953, 1955-58, 1960	9-16-60	141

Discharge measurements made at low-flow partial-record stations during water year 1960--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Spokane River basin--Continued				
4308	Wandermere Lake Creek near Dartford, Wash.	SE¼NW¼ sec.5, T.26 N., R.43 E., 100 ft above mouth and ¾ mile east of Dartford.	4.65	1953, 1955-58, 1960	9-16-60	9.46
4312	Little Spokane River below Country Club, near Dartford, Wash.	NW¼NW¼ sec.12, T.26 N., R.42 E., 10 ft above bridge and 2 miles southwest of Dartford.	688	1953, 1955-58, 1960	9-16-60	331
4321	Little Spokane River near Spokane, Wash.	SE¼NW¼ sec.5, T.26 N., R.42 E., 50 ft below county road crossing, ¾ mile above mouth, and 12 miles northwest of Spokane.	701	1903-5, 1912, 1913-14‡, 1920-21, 1923-24, 1930-32, 1947-48, 1953, 1955-58, 1960	9-16-60	408

‡ Operated as a continuous-record gaging station.

Crest-stage partial-record stations

The following table contains annual maximum discharges for crest-stage stations A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained but is not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Naselle River basin					
106	Lane Creek near Naselle, Wash.	On line between secs.3 and 10, T.10 N., R.9 W., at U. S. Highway 830, 1.5 miles northeast of Naselle.	2.15	1950-60	11-22-59	a15.16	211
		Nemah River basin					
110	North Nemah River near South Bend, Wash.	SE¼ sec.30, T.12 N., R9 W., 500 ft below Finn Creek and 12 miles south of South Bend.	18.0	1947-54‡, 1955-58, 1960	2- 6-60	6.6	1,130
111	North Nemah River tributary near South Bend, Wash.	NW¼ sec.24, T.12 N., R.10 W., at Nemah Road 1¼ miles east of U. S. Highway 101 and 10¼ miles south of South Bend.	.46	1949-60	11-22-59	a9.84	61
		Willapa River basin					
122	Green Creek near Lebam, Wash.	NE¼ sec.30 T.13 N., R.7 W., at county road 2.5 miles northwest of Lebam.	1.79	1950-60	11-20-59	a17.51	67
		North River basin					
167	Joe Creek near Cosmopolis, Wash.	SE¼ sec.30, T.16 N., R.8 W., at U. S. Highway 101, 8½ miles southeast of Cosmopolis.	2.05	1949-60	11-20-59	a7.67	261
		Chehalis River basin					
196	Water Mill Creek near Pe Ell, Wash.	SE¼ sec.33, T.13 N., R.5 W., at State Highway 12, 1 mile southwest of Pe Ell.	b1.98	1950-60	11-21-59	a19.21	97
205	Elk Creek near Doty, Wash.	NE¼ sec.8, T.13 N., R.5 W., ½ mile above Nine Creek, 1 mile above Deer Creek, and 2½ miles west of Doty.	46.7	1945-50‡, 1952-60	12-15-59	8.16	2,430
210	South Fork Chehalis River at Boistfort, Wash.	NW¼NW¼ sec.12, T.12 N., R.4 W., ¼ mile south of Boistfort and 6 miles above mouth.	48.0	1945-50‡	11-22-59	8.67	3,770
263	Skookumchuck River tributary near Bucoda, Wash.	SE¼ sec.11, T.15 N., R.2 W., at State Highway 1 N., 1.5 miles west of Bucoda.	.58	1960	11-22-59	6.41	64
347	West Fork Satsop River tributary near Matlock, Wash.	NE¼ sec.17, T.21 N., R.7 W., at Simpson logging road, 3 miles south of Camp Grisdale, 10½ miles northwest of Matlock, and 24 miles north of Montesano.	.33	1958-60	11-20-59	a7.70	68
		Humptulips River basin					
390.5	Big Creek near Hoquiam, Wash.	SE¼ sec.11, T.19 N., R.10 W., at Larson Road, 300 ft east of U. S. Highway 101 and 11.4 miles north of Hoquiam.	0.56	1949-60	11-22-59	a11.72	93
391	Big Creek tributary near Hoquiam, Wash.	SE¼ sec.11, T.19 N., R.10 W., at U. S. Highway 101, 11.6 miles north of Hoquiam.	.15	1949-60	11-22-59	a6.01	24
		Quinault River basin					
394	Higley Creek near Amanda Park, Wash.	SW¼ sec.13, T.23 N., R.10 W., at North Shore Road, 1¼ miles north of Amanda Park and 1.6 miles east of U.S.Highway 101.	0.77	1955-60	12-14-59	a7.78	164
		Queets River basin					
400 •	Clearwater River near Clearwater, Wash.	In lot 4, NW¼ sec.18, T.24 N., R.12 W., 1½ miles north of Clearwater and 3 miles above mouth.	140	1932‡, 1935, 1938-49, 1950-60,	1-29-60	15.44	20,300
405	Queets River near Clearwater, Wash.	SW¼ sec.36, T.24 N., R.13 W., on Quinault Indian Reservation, 2 miles below Clearwater River and 2¾ miles southwest of Clearwater.	445	1931-49‡, 1950-60	1-29-60	19.92	60,500

‡ Operated as continuous-record gaging station.
a See note on page 374 for change in datum.
b Revised.

Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Quillayute River basin					
416	Soleduck River tributary near Fairholm, Wash.	SE¼SW¼ sec.35, T.30 N., R.10 W., at National Park road, 2.6 miles southwest of Fairholm.	0.42	1956-60	12-14-59	a9.15	17
427	May Creek near Forks, Wash.	SW¼ sec.35, T.28 N., R.13 W., at U. S. Highway 101, 5.0 miles south of Forks	2.03	1950-60	12-14-59	a26.77	582
429	Grader Creek near Forks, Wash.	SW¼ sec.17, T.28 N., R.13 W., at U. S. Highway 101, 2.0 miles southwest of Forks.	1.67	1950-60	12-14-59	a21.70	415
		Valley Creek basin					
468	East Valley Creek at Port Angeles, Wash.	SW¼ sec.15, T.30 N., R.6 W., at Hister Road, ¾ mile south of Port Angeles city limits.	0.69	1950-60	1-29-60	a30.26	38
		Lees Creek basin					
471	Lees Creek at Port Angeles, Wash.	SE¼ sec.12, T.30 N., R.6 W., at U. S. Highway 101, 1 mile east of Port Angeles city limits.	4.77	1949-60	1-29-60	a18.56	321
		Dean Creek basin					
494	Dean Creek at Blyn, Wash.	NW¼ sec.12, T.29 N., R.3 W., at old highway 50 ft east of U. S. 101 at west edge of Blyn.	b2.96	1949-60	1-29-60	a8.53	44
		Quilcene River basin					
527	Penny Creek near Quilcene, Wash.	SE¼ sec.22, T.27 N., R.2 W., 1,000 ft west of Big Quilcene River bridge at U. S. Highway 101 and 2 miles southwest of Quilcene.	6.78	1949-60	1-29-60	a21.17	277
		Dosewallips River basin					
530	Dosewallips River near Brinnon, Wash.	SW¼ sec.24, T.26 N., R.3 W., ½ mile west of Corrigenda ranger station, 5½ miles northwest of Brinnon, and 7½ miles above mouth.	93.5	1931-50‡, 1951-60	1-29-60	7.68	6,600
534	Dosewallips River tributary near Brinnon, Wash.	NW¼ sec.28, T.26 N., R.2 W., at Dosewallips River road, 2.9 miles from U. S. Highway 101 and 3¼ miles northwest of Brinnon.	.55	1951-60	1-29-60	a6.47	32
		Unnamed tributary to Hood Canal					
563	Annas Bay tributary near Potlatch, Wash.	SW¼ sec.35, T.22 N., R.4 W., at U. S. Highway 101, 2.5 miles south of Potlatch.	0.82	1950-60	11-20-59	a17.50	92
		Skokomish River basin					
612	Fir Creek tributary near Potlatch, Wash.	NE¼ sec.3, T.21 N., R.5 W., at private logging road, 8 miles southwest of Potlatch.	0.76	1955-60	11-20-59	a21.84	256
		Schneider Creek basin					
786	Schneider Creek tributary near Shelton, Wash.	SE¼ sec.32, T.19 N., R.3 W., at U. S. Highway 101, 8.5 miles south of Shelton.	1.12	1950-60	12-15-59	a19.66	86
		McCallister Creek basin					
813	Eaton Creek near Yelm, Wash.	S½ sec.7, T.17 N., R.1 E., at county road 6 miles northwest of Yelm.	1.91	1960	12-15-59	5.15	46
		Puyallup River basin					
930	Kapowsin Creek near Kapowsin, Wash.	NE¼ sec.5, T.17 N., R.5 E., ½ mile below Kapowsin Lake and 1½ miles east of Kapowsin.	c23	1928-32‡, 1942-57‡, 1958-60	11-22-59	4.40	377
968	Dry Creek near Greenwater, Wash.	NW¼ sec.34, T.18 N., R.10.E., (unsurveyed) at forest service road 200 ft above U. S. Highway 410, 10 miles north of Chinook Pass, and 12 miles southeast of Greenwater. (Prior to July 1959, gage was at U. S. Highway 410)	1.13	1957-60	10-22-59	d6.84	48
977	Cyclone Creek near Enumclaw, Wash.	SW¼ sec.34, T.20 N., R.8 E., at U. S. Highway 410, 10 miles east of Enumclaw.	2.35	1950-60	10-22-59	a24.22	d218
1022	Swan Creek near Tacoma, Wash.	Center of W½ sec.26, T.20 N., R.3 E., at South 72d Street, 1.8 miles east of Pacific Ave. and 4.8 miles southeast of Tacoma city center.	2.15	1951-60	2-6-60	a15.16	104

‡ Operated as continuous-record gaging station.
a See note on page 374 for change in datum.
b Revised.
c Approximately.
d Change in site and datum.

Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Hylebos Creek basin					
1028	South Fork Hylebos Creek near Puyallup, Wash.	SE¼ sec.33, T.21 N., R.4 E., at State Highway 5D, 5.0 miles north of Puyallup.	e0.48	1949-60	12-15-59	a3.76	4.6
		Joes Creek basin					
1032	Joes Creek at Tacoma, Wash.	NW¼ sec.14, T.21 N., R.3 E., at Dumas Road, 0.6 mile north of Tacoma city limits.	0.78	1958-60	1-29-60	a4.11	11
		Duwamish River basin					
1072	Deep Creek at Cumberland, Wash.	SE¼ sec.21, T.21 N., R.7 E., at the Northern Pacific RR. crossing, 0.6 mile northeast of Cumberland.	2.28	1950-60	10-22-59	a10.41	103
1132	Dolloff Lake Outlet near Auburn, Wash.	SW¼ sec.14, T.21 N., R.4 E., at private driveway, 50 ft south of State Highway 5 and 2 miles west of Auburn.	3.27	1950-60	12-15-59	a5.17	45
1133	Hill Creek tributary near Auburn, Wash.	SE¼ sec.2, T.21 N., R.4 E., at county road 2 miles northwest of Auburn.	.21	1959-60	11-20-59	a11.26	7.0
		Lake Washington basin					
1153	Green Point Creek near Cedar Falls, Wash.	SE¼ sec.17, T.22 N., R.9 E., at road crossing near mouth, 5 miles southeast of Cedar Falls.	0.73	1957-60	12-15-59	a15.11	113
1198	North Branch Mercer Creek near Bellevue, Wash.	NE¼ sec.27, T.25 N., R.5 E., on county road 0.2 mile north of Bellevue-Redmond highway and 2.5 miles northeast of Bellevue.	2.74	1949-60	2-15-60	a9.03	33
1233	Evans Creek tributary near Redmond, Wash.	NW¼ sec.16, T.25 N., R.6 E., at Redmond-Fall City highway, 3½ miles southeast of Redmond.	2.46	1949-60	12-16-59	a5.40	28
		Snohomish River basin					
1305	South Fork Skykomish River near Skykomish, Wash.	NW¼NE¼ sec.31, T.26 N., R.12 E., ¼ mile below confluence of Tye and Foss Rivers and 2½ miles east of Skykomish.	135	1930-31‡, 1947-50‡, 1951-60	11-22-59	12.74	20,000
1310	Beckler River near Skykomish, Wash.	SW¼ (revised) sec.18, T.26 N., R.12 E., ½ mile below Eagle Creek, 2½ miles above mouth, and 3 miles northeast of Skykomish.	96.5	1930-33‡, 1947-49‡, 1950-60	12-15-59	11.90	17,100
1327	South Fork Skykomish River tributary at Baring, Wash.	NE¼ sec.2, T.26 N., R.10 E., ¼ mile east of Baring Post Office, at Great Northern RR. crossing and 200 ft north of U. S. Highway 2.	1.25	1951-60	12-15-59	a16.26	196
1355	Olney Creek near Gold Bar, Wash.	SW¼ sec.6, T.28 N., R.9 E., 5½ miles north of Gold Bar and 7½ miles above mouth.	8.03	1947-50‡, 1951, 1953-60	11-12-58b 12-15-59	b4.94 4.46	b1,480 994
1420	North Fork Snoqualmie River near Snoqualmie Falls, Wash.	SW¼ sec.30, T.25 N., R.9 E., 1 mile above Calligan Creek, 7½ miles northeast of town of Snoqualmie Falls, and 8½ miles northeast of Snoqualmie.	c65	1930-50‡, 1951-54, 1956-57, 1959-60	11-22-59	16.47	13,700
1433	South Fork Snoqualmie River tributary near North Bend, Wash.	NW¼ sec.13, T.22 N., R.10 E., at U. S. Highway 10, 15 miles southeast of North Bend.	.15	1951-60	11-22-59	a14.52	44
1450	Tokul Creek near Snoqualmie, Wash.	SE¼NW¼ sec.19, T.24 N., R.8 E., 200 ft above fish hatchery diversion dam, 600 ft below highway bridge, and 1½ miles northwest of Snoqualmie. (1909-14 at site 1 mile upstream.)	b32.2	1909‡, 1912‡, 1914‡, 1930-31‡, 1959-60	1-24-59 12-15-59	d4.24 4.24	1,200 1,060
1455	Raging River near Fall City, Wash.	On west line of sec.27, T.24 N., R.7 E., at highway crossing 2 miles southwest of Fall City and 2½ miles above mouth.	30.6	1946-60‡, 1951, 1953-60	11-22-59	6.27	2,930
1481	South Fork Tolt River tributary near Carnation, Wash.	NW¼ sec.36, T.26 N., R.8 E., at Weyerhauser Timber Co. road, 9 miles northeast of Carnation and 12 miles southeast of Duvall.	2.08	1955-60	12-15-59	a19.06	221
1525	Pilchuck River near Granite Falls, Wash.	SE¼ sec.30, T.30 N., R.7 E., 200 ft above county road bridge and 2 miles southeast of Granite Falls.	53.5	1944-57‡	12-15-59	9.21	7,640
1564	Munson Creek near Marysville, Wash.	NW¼ sec.26, T.30 N., R.5 E., at south edge of Cedarcrest Golf Course, 2 miles northeast of Marysville.	.97	1949-60	11-21-59	a10.45	40

‡ Operated as continuous-record gaging station. a See note on page 374 for change in datum.
b Revised. c Approximately. d Change in site and datum. e Above gage there is some interchange of flow between 2 basins (drainage areas 0.29 and 0.19 sq mi). Total discharge shown here is the sum of the flow in the 2 basins. Prior to 1958, by-pass flow was not measured and peak discharges published in WSP 1566 represent the approximate discharge from the larger basin. The corresponding discharge for 1960 is 3.8 cfs.

Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Stillaguamish River basin					
1640	Jim Creek near Arlington, Wash.	W½ sec.17, T.31 N., R.6 E., at abandoned bridge 1¼ miles above mouth and 3 miles southeast of Arlington.	48.9	1938-57‡, 1958-60	11-22-59	9.12	4,530
1695	Fish Creek near Arlington, Wash.	NW¼ sec.18, T.31 N., R.5 E., 300 ft above former gaging station and 4½ miles west of Arlington.	c7.6	1951-53‡, 1955-60	1-29-60	a11.84	108
		Skagit River basin					
1894	Sauk River tributary near Darrington, Wash.	SE¼ sec.18, T.33 N., R.10 E., at Darrington-Concrete road, 6.5 miles northeast of Darrington.	1.11	1951-60	11-22-59	a76.63	128
1972	Skagit River tributary near Lyman, Wash.	SE¼ sec.25, T.35 N., R.5 E., at county road on south side of Skagit River, 3 miles southwest of Lyman.	1.82	1951-60	12-14-59	a18.58	117
2007	Skagit River tributary near Mount Vernon, Wash.	SE¼ sec.4, T.32 N., R.4 E., at U. S. Highway 99, ¾ mile south of Skagit County line and 9.5 miles south of Mount Vernon.	2.58	1949-60	1960	(a)	f70
		Samish River basin					
2008	Lake Creek near Bellingham, Wash.	NW¼ sec.23, T.37 N., R.3 E., 200 ft south of Samish Inn at U. S. highway 99 and 6.5 miles southeast of Bellingham.	2.35	1949-60	12-15-59	a10.76	108
		Nooksack River basin					
2044	Nooksack River tributary near Glacier, Wash.	SW¼ sec.32 (unsurveyed), T.40 N., R.8 E., 6.5 miles east of Glacier.	1.15	1956-60	11-23-59	a15.55	(†)
2127	Tenmile Creek tributary near Bellingham, Wash.	0.1 mile north from center of sec.27, T.39 N., R.3 E., at Starry Road, 2.7 miles northeast of Bellingham.	.74	1949-60	12-15-59	a8.74	18
2128	Tenmile Creek Tributary No. 2 near Bellingham, Wash.	0.2 mile north from center of sec 27, T.39 N., R.3 E., at Starry Road, 2.8 miles northwest of Noon and 7 miles northeast of Bellingham.	.24	1955-60	12-15-59	a6.70	20
		Kootenai River basin					
3005	Fortine Creek near Trego, Mont.	NE¼ sec.11, T.33 N., R.26 W., 5½ miles southwest of Trego.	112	1946-53‡, 1954, 1958-60	4- 8-60	9.7	700
3008	Deep Creek near Fortine, Mont.	SE¼ sec.30 T.35 N., R.25 W., at bridge on county road, 1¼ miles east of Fortine.	17.9	1959-60	6- 6-60	2.67	168
3017	Kootenai River tributary near Rexford, Mont.	SE¼ sec.11, T.35 N., R.29 W., at culvert on State Highway 37, 7 miles southwest of Rexford.	1.11	1959-60	4- 8-60	1.25	(†)
3018	Gold Creek near Rexford, Mont.	NW¼ sec.23, T.35 N., R.29 W., at culvert on State Highway 37, 8 miles southwest of Rexford.	6.04	1959-60	4- 8-60	.85	(†)
3021	Severn Gulch near Jennings, Mont.	SE¼ sec.14, T.30 N., R.30 W., at culvert on private road, 3 miles west of Jennings.	1.16	1960	4- -60	.03	f1
3022	Tub Gulch near Libby, Mont.	NE¼SE¼ sec.29, T.31 N., R.30 W., at culvert on State Highway 37, 4 miles northeast of Libby.	1.47	1960	6- 3-60	-.18	(†)
3024	Shaughnessy Creek near Libby, Mont.	W½ sec.5, T.29 N., R.31 W., at culvert on county road, 6½ miles southwest of Libby.	1.11	1959-60	1960	(g)	(†)
3025	Granite Creek near Libby, Mont.	NW¼SE¼ sec.5, T.29 N., R.31 W., 7 miles southwest of Libby.	23.6	1933-43‡, 1948, 1959-60	h1959 6- 3-60	4.49 4.53	769 793
3042.5	Whitetail Creek near Yaak, Mont.	NE¼ sec.1, T.35 N., R.33 W., 500 ft above mouth and 5 miles west of Yaak.	2.61	1960	h1960	.7	(†)
3043	Cyclone Creek near Yaak, Mont.	SE¼ sec.32, T.35 N., R.33 W., at bridge ¼ mile above mouth and 10½ miles southwest of Yaak.	5.66	1960	h1960	2.06	(†)
3044	Fourth of July Creek near Yaak, Mont.	NW¼ sec.22, T.34 N., R.33 W., at bridge 500 ft above mouth and 12 miles southwest of Yaak.	7.70	1960	h1960	2.5	(†)
		Pend Oreille River basin					
3233	Smith Gulch near Silverbow, Mont.	N½ sec.1, T.2 N., R.9 W., at culvert on Interstate Highway 15 and U. S. Highway 91, 4 miles south of Silverbow.	4.85	1959-60	3-21-60	1.97	43
3247	Clark Fork tributary near Drummond, Mont.	SW¼ sec.18, T.10 N., R.11 W., ½ mile above Interstate Highway 90 and U. S. Highways 10 & 12 and 6½ miles east of Drummond.	4.61	1958-60	3-18-60	1.62	84

† Discharge not determined. ‡ Operated as continuous-record gaging station. a See note on page 374 for change in datum. c Approximately. f Estimated. g Peak stage did not reach bottom of gage. h Peak flow occurred sometime during period May to June.

Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Pend Oreille River basin--Continued					
3248	Morris Creek near Drummond, Mont.	NW¼NW¼ sec.34, T.11 N., R.12 W., at culvert on county road, 2 miles east of Drummond.	12.6	1960	3-26-60	1.23	(†)
3317	Edwards Gulch at Drummond, Mont.	SW¼SW¼ sec.29, T.11 N., R.12 W., at culvert on private road, 0.4 miles north of Interstate Highway 90 and U. S. Highways 10 and 12 st Drummond.	4.69	1960	3-21-60	j1.14	(†)
3399	West Twin Creek near Bonner, Mont.	NW¼ sec.2, T.13 N., R.17 W., at bridge on State Highway 20, 8 miles east of Bonner.	7.47	1959-60	4- 6-60	.63	(†)
3402	Marshall Creek near Missoula, Mont.	NW¼ sec.18, T.13 N., R.18 W., at culvert on Interstate Highway 90 and U. S. Highways 10and 12, 3 miles east of Missoula.	5.47	1959-60	4- 7-60	.26	(†)
3443	Burke Gulch near Darby, Mont.	S½ sec.12, T.3 N., R.21 W., 1 mile above mouth and 1½ miles east of Darby.	6.28	1958-60	4- 7-60	.85	8
3458	Camas Creek near Hamilton, Mont.	SW¼ sec.34, T.5 N., R.21 W., 8 miles southwest of Hamilton.	6.01	1958-60	6- 4-60	2.65	265
3502	Gash Creek near Victor, Mont.	W½ sec.32, T.8 N., R.21 W., 5 miles west of Victor.	3.37	1958-60	6- 4-60	.75	80
3522	Hayes Creek near Missoula, Mont.	Center sec.10, T.12 N., R.20 W., at culvert on U. S. Highway 93, 2 miles southwest of Missoula.	4.16	1959-60	4- 5-60	3.77	(†)
3534	Nigger Gulch near Alberton, Mont.	NW¼ sec.33, T.15 N., R.23 W., at culvert on county road, 2.6 miles west of Alberton.	8.02	1959-60	4- 6-60	.80	(†)
3537	Flat Creek near Superior, Mont.	NW¼ sec.23, T.17 N., R.26 W., at culvert on county road, 2 miles north of Superior.	13.0	1960	4- 6-60	.31	(†)
3539	St. Regis River tributary near St. Regis, Mont.	NW¼ sec.19, T.18 N., R.28 W., at culvert on Interstate Highway 90 and U. S. Highway 10, 6 miles west of St. Regis.	1.16	1959-60	5- 9-60	.28	(†)
3541	North Fork Little Joe Creek near St. Regis, Mont.	SW¼SE¼ sec.34, T.18 N., R.28 W., at bridge on county road, 3 miles southwest of St. Regis.	14.7	1960	5-12-60	1.84	(†)
3560	Skyland Creek near Essex, Mont.	SE¼NW¼ sec.9, T.29 N., R.14 W., 10 miles northeast of Essex.	8.09	1946-52‡, 1959-60	6- 3-60	2.00	169
3573	Moccasin Creek near West Glacier, Mont.	SE¼ sec.35, T.32 N., R.18 W., at culvert on U. S. Highway 2, 6½ miles east of West Glacier.	1.97	1959-60	6- 3-60	1.29	(†)
3574	Middle Fork Flathead River tributary at West Glacier, Mont.	NE¼ sec.36, T.32 N., R.19 W., at culvert on U. S. Highway 2, 0.9 mile east of West Glacier.	.10	1960	4- 3-60	.27	(†)
3638	Spring Creek near Stryker, Mont.	N½ sec.15, T.33 N., R.24 W., at culvert on U. S. Highway 93, 5 miles southeast of Stryker.	3.86	1959-60	6- 3-60	-.08	8
3703	Teepee Creek near Polson, Mont.	SW¼ sec.22, T.24 N., R.19 W., at culvert on State Highway 35, 11 miles northeast of Polson.	2.55	1960	6- 3-60	.48	(†)
3705	Hell Roaring (Big) Creek near Polson, Mont.	NW¼ sec.4, T.22 N., R.19 W., at power house 5½ miles east of Polson.	6.41	1917-32‡, 1960	6- 3-60	.81	(†)
3713	Dayton Creek near Proctor, Mont.	NW¼ sec.20, T.25 N., R.21 W., at culvert on couty road, 2½ miles northwest of Proctor.	20.9	1959-60	5-12-60	1.74	(†)
3743	Mill Creek near Niarada, Mont.	NE¼ sec.20, T.24 N., R.24 W., at bridge on county road, 3½ miles northwest of Niarada.	28.0	1959-60	5-13-60	1.00	74
3747	Sullivan Creek tributary near Niarada, Mont.	N½ sec.33, T.25 N., R.23 W., at culvert on county road, 5 miles northeast of Niarada.	-	1960	3- -60	-	f1
3757	South Fork Garden Creek near Hot Springs, Mont.	SW¼ sec.20, T.22 N., R.24 W., at bridge on county road, 3 miles north of Hot Springs.	3.29	1959-60	4- -60	-	f5
3958	Deer Creek near Dalkena, Wash.	SE¼ sec.7, T.31 N., R.44 E., at State Highway 6B, 2.7 miles south of Davis Creek gage site and 4.5 miles southwest of Dalkena.	4.75	1954-80	3-29-60	a16.84	78
3959	Davis Creek near Dalkena, Wash.	NE¼ sec.31, T.32 N., R.44 E., at State Highway 6B at outlet of Davis Lake, 2.5 miles southwest of Dalkena.	16.8	1954-60	3-30-60	a9.64	175
3961	Winchester Creek near Cusick, Wash.	SW¼ sec.10, T.32 N., R.43 E., at county road around Calispell Lake, 4.8 miles southwest of Cusick.	16.8	1954-60	3- 9-60	a12.01	91

† Discharge not determined
‡ Operated as continuous-record gaging station.
a See note on page 374 for change in datum.
f Estimated.
j Backwater from ice.

Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Pend Oreille River basin--Continued					
3964.5	Little Muddy Creek at Ione, Wash.	SW¼ sec.6, T.37 N., R.43 E., at southwest edge of Ione.	11.0	1954-60	4- 9-60	a13.01	115
		Kettle River basin					
4037	Third Creek near Curlew, Wash.	NE¼ sec.19, T.39 N., R.35 E., at county road between Curlew and Orient, 8.0 miles east of Curlew.	1.18	1954-60	4- 9-60	a9.99	16
		Nancy Creek basin					
4054	Nancy Creek near Kettle Falls, Wash.	SE¼ sec.33, T.37 N., R.37 E., at U. S. Highway 395, 4.2 miles northwest of Kettle Falls.	11.9	1952, 1954-60	3-29-60	a18.40	79
		Colville River basin					
4076	Thomson Creek near Chewelah, Wash.	NW¼ sec.8 T.32 N., R.41 E., at private road 100 ft east of Flowery Trail Road (County Road 623) and 2.5 miles northeast of Chewelah.	4.22	1954-59	3-30-60	2.02	12.9
4082	Thomas Lake tributary near Tiger, Wash.	NW¼ sec.9, T.36 N., R.42 E., at State Highway 6A, 6.0 miles southwest of Tiger.	1.65	1954-60	4- 6-60	a9.50	13.1
4084	Narcisse Creek near Colville, Wash.	NE¼SW¼ sec.23, T.25 N., R.40 E., at State Highway 6A, 8.0 miles east of Colville.	10.6	1954-60	4- 6-60	a9.52	40
		Harvey Creek basin					
4106	South Fork Harvey Creek near Cedonia, Wash.	NE¼ sec.23, T.31 N., R.37 E., at county road up Harvey Creek, 3.0 miles northeast of Cedonia.	18.1	1954-60	3-30-60	7.48	31
4106.5	North Fork Harvey Creek near Cedonia, Wash.	SW¼ sec.6, T.31 N., R.38 E., at Cedonia-Addy County road, 5.6 miles northeast of Cedonia	6.96	1954-60	3-29-60	6.04	7.8
		Spokane River basin					
4239	Stevens Creek tributary near Moran, Wash.	NE¼ sec.22, T.24 N., R.43 E., at Palouse Highway, 2.8 miles south of Moran.	1.82	1954-60	3-29-60	7.26	27
4298	Mud Creek near Deer Park, Wash.	On line between secs.24 and 25, T.28 N., R.21 E., at Staley Road, 6.1 miles west of U. S. Highway 395 and 5.3 miles southwest of Deer Park.	1.83	1954-60	11-21-59 2- 8-60	9.07	18.9
4333	Spring Creek tributary near Reardan, Wash.	SW¼ sec.14, T.26 N., R.39 E., at side road 30 ft east of Reardan-Crescent road and 5.3 miles north of Reardan.	1.14	1954-60	2- 7-60	7.66	63
		Sanpoil River basin					
4338	Granite Creek near Republic, Wash.	W½ sec.31, T.37 N., R.32 E., at State Highway 4, 4¼ miles west of Republic.	4.25	1954-60	5-20-60	a6.83	5.2
		Foster Creek basin					
4379.5	East Fork Foster Creek tributary near Bridgeport, Wash.	SE¼ sec.1 T.28 N., R.25 E., at State Highway 10, 3½ miles southeast of Bridgeport.	4.75	1957-60	3-21-60	a4.79	22
		Okanogan River basin					
4392	Dry Creek tributary near Molson, Wash.	NE¼ sec.6, T.39 N., R.29 E., 4.5 miles south of Molson and 10 miles east of Oroville.	1.83	1958-60	1958 3-21-60	a8.29 8.89	29 43
4444	Siwash Creek tributary near Tonasket, Wash.	NE¼ sec.12, T.37 N., R.27 E., at county road 3.2 miles northeast of Tonasket.	.66	1957, 1959-60	1960	a7.79	9.0
4458	Omak Creek tributary near Disautel, Wash.	NE¼ sec.28, T.33 N., R.29 E., at State Highway 10A, about 3.5 miles southeast of Disautel.	4.23	1956-60	1960	a,j18.92	(†)
4471	Okanogan River tributary at Malott, Wash.	SW¼ sec.9, T.32 N., R.25 E., at new State Highway 10, ¼ mile southeast of Malott.	k2.59	1959-60	3- -60	a8.55	13
		Methow River basin					
4474	Doe Creek near Winthrop, Wash.	NE¼ sec.30, T.37 N., R.22 E., 14 miles north of Winthrop and 32 miles west of Tonasket.	4.19	1957-60	12-15-59	a,j6.68	(†)
4499	Methow River tributary near Methow, Wash.	NE¼ sec.30, T.30 N., R.23 E., at State Highway 16, 3.7 miles south of Methos and 4.8 miles west of Pateros.	1.17	1954-60	1960	(a)	(m)
		Unnamed Tributary to Columbia River					
4536	Columbia River tributary near Entiat, Wash.	SW¼ sec.24, T.24 N., R.20 E., at U. S. Highway 97, 7.5 miles south of Entiat and 9.3 miles east of Cashmere.	1.57	1954-60	1960	(a)	n<1

† Discharge not determined. a See note on page 374 for change in datum. j Backwater from ice. k Of which 0.48 sq mi appears to be noncontributing. m No evidence of any flow during the 1960 water year. n Flow too small to compute by indirect methods; discharge estimated as less than indicated figure.

Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Wenatchee River basin					
4573	Skinney Creek at Winton, Wash.	NW¼SW¼ sec.28, T.26 N., R.17 E., at U. S. Highway 2, 0.7 mile south of Winton.	2.48	1954-60	1960	p7.68	51
4589	Wenatchee River tributary near Leavenworth, Wash.	NW¼ sec.8, T.24 N., R.18 E., at county road just east of Wenatchee River, 1.8 miles east of Leavenworth.	1.86	1954-60	1960	(a)	n<3
4611	East Branch Mission Creek near Cashmere, Wash.	SW¼ sec.20, T.22 N., R.19 E., at U. S. Forest Service road, 9.7 miles south of Cashmere.	15.8	1955-60	5-12-60	a5.46	28
4612	East Branch Mission Creek tributary near Cashmere, Wash.	SW¼ sec.20, T.22 N., R.19 E., at U. S. Forest Service road, 9.7 miles south of Cashmere.	2.3	1955-60	5- 7-60	a11.28	8.3
4615	Sand Creek near Cashmere, Wash.	SE¼NW¼ sec.6, T.22 N., R.19 E., at U. S. Forest Service road, 100 ft above mouth and 6.5 miles south of Cashmere.	18.8	1954, 1955-56‡, 1957-60	11-22-59	a7.41	120
4620	Mission Creek at Cashmere, Wash.	NE¼NE¼ sec.8, T.23 N., R.19 E., 0.8 mile above mouth at Cashmere.	79.1	1954, 1955-58‡, 1959-60	4-18-54 g4- 1-59 11-22-59	12.50 12.85 13.15	168 141 235
		Douglas Creek basin					
4627	Moses Creek at Waterville, Wash.	Near center of E½ sec.22, T.25 N., R.22 E., at U. S. Highway 2, 0.8 mile east of Waterville.	5.11	1954-60	3-20-60	a13.05	117
4628	Moses Creek at Douglas, Wash.	SW¼ sec.31, T.25 N., R.23 E., at county road 0.3 mile southeast of Douglas.	18.4	1955, 1957-60	3-20-60	a15.44	193
4630	Douglas Creek near Alstown, Wash.	S½ sec.13, T.24 N., R.22 E., 1½ miles northwest of Alstown and 2.9 miles south of Douglas.	114	1950-55‡, 1956-60	3-20-60	4.7	710
		Schnebly Coulee basin					
4646	Schnebly Coulee tributary near Vantage, Wash.	NW¼SW¼ sec.13, T.17 N., R.21 E., at U. S. Highway 10, 8.5 miles west of Vantage.	0.82	1955-60	1960	(a)	(m)
		Crab Creek basin					
4646.5	South Fork Crab Creek tributary at Waukon, Wash.	SW¼SE¼ sec.26, T.24 N., R.39 E., at county road between Waukon and Edwall, 0.5 mile southwest of Waukon.	0.68	1954-60	5-21-60	a9.27	20
4651	Cannawai Creek tributary near Govan, Wash.	SW¼ sec.34, T.25 N., R.32 E., at county road ¼ mile north of State Highway 4B and 10 miles south of Govan.	r.25	1958-60	1960	a6.06	2.9
4653	Broadax Draw tributary near Wilbur, Wash.	NW¼ sec.16, T.27 N., R.32 E., at State Highway 4C, 7.5 miles northwest of Wilbur and 11 miles southeast of Grand Coulee.	1.12	1955-60	2- -60	a7.92	31
4674	Grand Coulee tributary near Coulee City, Wash.	SW¼ sec.19, T.25 N., R.28 E., at old road 200 ft east of State Highway 10, 1.5 miles northwest of Coulee City.	s2.7	1959-60	2- -60	a10.62	10
4703	Iron Springs Creek near Winchester, Wash.	At east line of sec.8, T.21 N., R.25 E., at county road 5½ miles north of Winchester and 7 miles east of Ephrata.	1.57	1959-60	3-18-60	a6.47	18
4713	Weber Coulee tributary near Ruff, Wash.	At west line of NW¼ sec.13, T.19 N., R.31 E., at county road 6 miles southeast of Ruff.	.95	1959-60	1960	(a)	(m)
		Scooteney Reservoir basin					
4737	Scooteney Reservoir tributary near Cunningham, Wash.	On line between sec.33, T.16 N., and sec.4, T.15 N., R.31 E., 5.6 miles west of Cunningham on road to Othello.	6.06	1955-60	1960	(a)	n<1
		Yakima River basin					
4807	Hovey Creek near Cle Elum, Wash.	S½ sec.10, T.21 N., R.17 E., at U. S. Highway 97, 2½ miles south of Blewett Pass and 14½ miles northeast of Cle Elum.	3.38	1955-60	11-22-59	a6.88	33
4833	South Fork Manastash Creek tributary near Ellensburg, Wash.	Near center of sec.18, T.17 N., R.17 E., at county road 10.5 miles west of Ellensburg.	2.28	1955-60	3-26-60	a8.16	32
4846	McPherson Canyon at Wymer, Wash.	Near center of sec.33, T.16 N., R.19 E., at U. S. Highway 97, 0.5 mile northeast of Wymer.	5.48	1952, 1955-60	1960	(a)	n<1
4857	Selah Creek tributary near Yakima, Wash.	NE¼ sec.25, T.14 N., R.19 E., at Yakima firing range road, 7 miles northeast of Yakima.	.75	1955-60	1960	(a)	(m)
4883	American River tributary near Nile, Wash.	N½ sec.18, T.17 N., R.13 E. (unsurveyed), at U. S. Highway 410, 19 miles northwest of Nile.	1.03	1955-60	4- 8-60	a7.71	11

‡ Operated as continuous-record gaging station. a See note on page 374 for charge in datum.
g Peak stage did not reach bottom of gage. m No evidence of any flow during the 1960 water year. n Flow too small to compute by indirect methods; discharge estimated as less than indicated figure. p Change in datum. r From U. S. Soil Conservation Service aerial photographs. s From county flat map.

Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Yakima River basin--Continued					
4917	Hause Creek near Rimrock, Wash.	NE¼ sec.28, T.14 N., R.14 E., at State Highway 5, 0.1 mile west of Tieton ranger station and 2.5 miles east of Rimrock.	2.50	1955-60	12-15-59	a6.03	16.5
5073	Toppenish Creek tributary near Toppenish, Wash.	SE¼ sec.6, T.9 N., R.20 E., at U. S. Highway 97, about 6 miles south of Toppenish.	1.24	1955-60	1960	(a)	n<.1
5076	Shenando Creek tributary near Goldendale, Wash.	SE¼ sec.14, T.6 N., R.17 E., at U. S. Highway 97, 2 miles northeast of Satus Pass and 14 miles northeast of Goldendale.	.28	1955-60	1960	a18.25	n<5
5088	Yakima River tributary near Sunnyside, Wash.	SE¼ sec.21, T.11 N., R.23 E., at Hanford Road, 7 miles northeast of Sunnyside.	1.91	1954-60	1960	(a)	(m)
5106	Webber Canyon near Kiona, Wash.	NE¼ sec.17 T.8 N., R.27 E., at county road 4½ miles south of Kiona.	3.33	1955-60	1960	(a)	n<1
5107	Yakima River tributary near Kiona, Wash.	W½ sec.13, T.9 N., R.27 E., at U. S. Highway 410, about 4.5 miles east of Kiona and 5 miles west of Richland.	3.35	1955-60	1960	(a)	(m)
		Esquatzel Coulee basin					
5127	Hatton Coulee tributary near Hatton, Wash.	NE¼ sec.28, T.15 N., R.32 E., 300 ft above mouth and 1½ miles southeast of Hatton.	3.82	1956-60	1960	(a)	(m)

a See note below for change in datum.
m No evidence of any flow during the 1960 water year.
n Flow too small to compute by indirect methods; discharge estimated as less than indicated figure.

Note.--To correct gage heights published in WSP 1566 and 1636 to datum used in this and subsequent reports, add figures shown in this table to previously published gage heights. Figures listed in this table are equal to the elevation of the upstream invert of culvert through which discharge is computed.

Station No.	Water year	Datum change (feet)	Station No.	Water year	Datum change (feet)
106	1950-59	10.66	2128	1955-59	4.62
111	1949-59	.88	3958	1954-59	9.96
122	1950-59	12.73	3959	1954-59	3.63
167	1949-59	3.5	3961	1954-59	7.94
196	1950-59	14.98	3964.5	1954-59	8.56
347	1958-59	4.29	4037	1954-59	7.70
390.5	1949-56	5.43	4054	1952, 1954-59	14.90
	1957-59	5.70	4082	1954-59	7.7
391	1949-58	3.03	4084	1954-59	7.20
	1959	2.80	4106	1954-59	5.14
394	1955-59	2.54	4106.5	1954-59	4.78
416	1956-59	7.16	4239	1954-59	4.98
427	1950-59	14.98	4298	1954-59	6.56
429	1950-59	16.13	4333	1954-59	4.10
468	1950-59	24.16	4338	1954-59	5.80
471	1949-59	7.54	4379.5	1957-59	3.02
494	1949-59	5.90	4392	1959	5.97
527	1949-58	Different site	4444	1959	6.41
	1959	14.44	4458	1956-59	16.67
534	1951-54	4.15	4471	1959	5.59
	1955-59	5.68	4474	1957-59	3.76
563	1950-59	14.62	4499	1956-57	10.76
612	1955-59	13.98	4589	1954-59	7.38
786	1950-59	16.06	4611	1955-56	5.23
977	1950-59	20.30		1957-59	4.01
1022	1951-59	12.62	4612	1955-59	9.80
1028	1949-59	2.85	4615	1954-59	4.58
1032	1958-59	2.23	4627	1954-59	6.98
1072	1950-59	5.13	4628	1955, 1957-59	9.06
1132	1950-57	Different site	4646	1955-59	7.93
	1958-59	2.92	4646.5	1954-59	7.60
1133	1959	9.94	4651	1958-59	5.27
1153	1957-59	8.38	4653	1955-59	5.62
1198	1949-59	6.24	4674	1959	9.26
1233	1949-59	a4.30	4703	1959	4.74
1327	1951-53	Different site	4737	1956	4.69
	1955-59	10.76	4807	1955-59	4.92
1433	1951-59	11.10	4833	1955-59	5.95
1481	1955-59	11.68	4846	1952, 1955-59	12.06
1564	1949-59	6.65	4857	1955-56	5.65
1695	1951-59	5.97	4883	1955-59	6.44
1894	1951-59	70.28	4917	1955-59	4.90
1972	1951-59	14.14	5073	1956	17.45
2007	1949-57b	3.42	5076	1955-59	17.27
	1959	5.18	5088	1954, 1956-57	5.15
2008	1949-59	6.47	5106	1956-57	6.89
2044	1956-59	12.93	5127	1956-57	8.36
2127	1949-59	6.66			

a Crest of weir.
b At site 200 ft downstream.

Measurements at miscellaneous sites

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table. Those that are measurements of base flow are designated by an asterisk (*); measurements of peak flow by a dagger (†).

Discharge measurements made at miscellaneous sites during water year 1960

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Chehalis River basin						
Wynoochee River.	Chehalis River.	NW¼NW¼ sec.35, T.18 N., R.8 W., 700 ft below Black Creek and 2½ miles northwest of Montesano, Wash.	178	1942-50‡, 1950-59	7-20-60 8-12-60	155 *61.0
Skokomish River basin						
North Fork Skokomish River.	Skokomish River.	SE¼NW¼ sec.7, T.21 N., R.4 W., 2,000 ft below recording gage, 0.6 mile above mouth, and 6 miles southwest of Potlatch, Wash.	-		3-21-60 4-25-60 5-31-60 7-31-60	98.6 150 30.0 *2.62
Nisqually River basin						
Tahoma Creek.	Nisqually River.	SE¼ sec.34, T.15 N., R.7 E., at highway bridge ½ mile above mouth and 1 mile east of Nisqually Entrance to Rainier National Park, Wash.	14.0		11-22-59	†3,130
Muck Creek...	....do.....	S½ sec.23, T.18 N., R.2 E., above Chambers Lake 2 miles northeast of Roy, Wash.	-		6-15-60	61.2
Do.....	....do.....	SE¼ sec.27, T.18 N., R.2 E., below Chambers Lake ¼ mile northeast of Roy, Wash.	-		6-15-60	31.6
Nisqually River.	Puget Sound..	SE¼ sec.5, T.18 N., R.1 W., at bridge crossing on U. S. Highway 99, 1 mile north of Nisqually, Wash.	-		11-24-59 11-24-59	†11,800 †11,900
Duwamish River basin						
Bear Creek...	Green River..	SE¼SE¼ sec.20, T.21 N., R.8 E., ¼ mile above mouth and 2½ miles northeast of Eagle Gorge, Wash.	-	1946-56‡	11-22-59	†710
Green River..	Duwamish River.	SE¼ sec.33, T.21 N., R.7 E., at city of Tacoma purification plant, 1 mile southeast of Palmer Junction, Wash.	-	1952	3-26-60 4-19-60 5-27-60	2,250 1,120 1,670
Lake Washington basin						
North Fork Cedar River tributary.	North Fork Cedar River.	NE¼ sec.7, T.21 N., R.11 E., at logging road crossing 1 mile above mouth and 7¾ miles north of Lester, Wash.	-		9-16-60	*0.29
Tinkam Creek.	....do.....	NE¼ sec.12, T.21 N., R.10 E., 80 ft below logging road bridge, 400 ft above mouth, and 8 miles north of Lester, Wash.	-		9-16-60	*3.48
North Fork Cedar River tributary No. 2.	....do.....	NE¼ sec.12, T.21 N., R.10 E., 500 ft below logging road bridge, 500 ft above mouth, and 7¾ miles north of Lester, Wash.	-		9-16-60	*.19
South Fork Cedar River tributary.	South Fork Cedar River.	NW¼ sec.25, T.21 N., R.10 E., 150 ft below culvert crossing on logging road, 2,000 ft above mouth, and 4¼ miles north of Lester, Wash.	-		9-16-60	*1.73
South Fork Cedar River tributary No. 2.	....do.....	SW¼ sec.24, T.21 N., R.10 E., 25 ft above mouth and 5¼ miles north of Lester, Wash.	-		9-16-60	*.44
South Fork Cedar River.	Cedar River..	SW¼ sec.24, T.21 N., R.10 E., 500 ft below tributary No. 2, 3 miles above confluence with North Fork, and 5¼ miles north of Lester, Wash.	-		9-16-60	*3.56
South Fork Cedar River tributary No. 3.	South Fork Cedar River.	SE¼ sec.15, T.21 N., R.10 E., 20 ft above logging road bridge, 2,000 ft above mouth, and 6½ miles northwest of Lester, Wash.	-		9-16-60	*.58

* Base flow.
† Peak flow.
‡ Operated as a continuous-record gaging station.

Discharge measurements made at miscellaneous sites during water year 1960--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Lake Washington basin--Continued						
Cedar River tributary.	Cedar River..	SE¼ sec.9, T.21 N., R.10 E., above falls at crossing on logging road bridge, 400 ft above mouth and 8 miles northwest of Lester, Wash.	-		9-16-60	*2.02
Cedar River tributary No. 2.	....do.....	NE¼ sec.9, T.21 N., R.10 E., 100 ft above mouth and 8¼ miles northwest of Lester, Wash.	-		9-16-60	*.27
Cedar River tributary No. 3.	....do.....	NE¼ sec.9, T.21 N., R.10 E., 100 ft below logging road bridge, 400 ft above mouth, and 8½ miles northwest of Lester, Wash.	-		9-16-60	*.21
Bear Creek...	Bear Creek...	NE¼ sec.4, T.21 N., R.10 E., 50 ft below crossing on logging road, 4,200 ft above mouth, and 9 miles northwest of Lester, Wash.	-		9-16-60	*.45
Bear Creek tributary No. 2.	....do.....	NE¼ sec.4, T.21 N., R.10 E., 400 ft below crossing on logging road, ½ mile above mouth, and 9 miles northwest of Lester, Wash.	-		9-16-60	*.08
Bear Creek...	Cedar River..	SW¼ sec.33, T.22 N., R.10 E., 100 ft above logging road bridge, ¾ mile above mouth, and 9½ miles northwest of Lester, Wash.	-		9-16-60	*4.22
Seattle Creek	....do.....	SE¼ sec.32, T.22 N., R.10 E., 50 ft above road bridge, 150 ft above mouth, and 12 miles southeast of Cedar Falls, Wash.	-		9-16-60	*3.90
Cedar River tributary No. 4.	....do.....	NE¼ sec.32, T.22 N., R.10 E., at road fork to Bear Creek cabin, 1,200 ft above mouth and 11½ miles southeast of Cedar Falls, Wash.	-		9-16-60	0
Cedar River tributary No. 5.	....do.....	N½ sec.32, T.22 N., R.10 E., 60 ft above road culvert, 1,000 ft above mouth, and 11½ miles southeast of Cedar Falls, Wash.	-		9-16-60	*.19
Cedar River tributary No. 6.	....do.....	NW¼ sec.32, T.22 N., R.10 E., at road culvert 1,000 ft above mouth and 11½ miles southeast of Cedar Falls, Wash.	-		9-16-60	*.23
Cedar River tributary No. 7.	....do.....	NE¼ sec.31, T.22 N., R.10 E., at road crossing 500 ft above mouth and 11 miles southeast of Cedar Falls, Wash.	-		9-16-60	*.47
Findley Creek.	....do.....	NE¼ sec.36, T.22 N., R.9 E., 250 ft above mouth and 10 miles southeast of Cedar Falls, Wash.	-		9-16-60	*2.70
Roaring Creek.	....do.....	SE¼ sec.25, T.22 N., R.9 E., at road culvert 500 ft above mouth and 10 miles southeast of Cedar Falls, Wash.	-		9-15-60	*.97
Cedar River tributary No. 8.	....do.....	Center of sec.25, T.22 N., R.9 E., at road culvert 10 miles southeast of Cedar Falls, Wash.	-		9-15-60	*.41
Cedar River tributary No. 9.	....do.....	NW¼ sec.25, T.22 N., R.9 E., at culvert crossing 9½ miles southeast of Cedar Falls, Wash.	-		9-15-60	*.08
Cedar River tributary No. 10.	....do.....	SE¼ sec.26, T.22 N., R.9 E., at road crossing 8¾ miles southeast of Cedar Falls, Wash.	-		9-15-60	*.04
Chester Morse Lake tributary.	Chester Morse Lake.	S½ sec.23, T.22 N., R.9 E., at road crossing 200 ft above mouth and 8¼ miles southeast of Cedar Falls, Wash.	-		9-15-60	a.01
Chester Morse Lake tributary No. 2.	....do.....	NE¼SW¼ sec.23, T.22 N., R.9 E., at road crossing 400 ft above mouth and 8 miles southeast of Cedar Falls, Wash.	-		9-15-60	0
Chester Morse Lake tributary No. 3.	....do.....	NW¼SW¼ sec.23, T.22 N., R.9 E., at road crossing 600 ft above mouth and 8 miles southeast of Cedar Falls, Wash.	-		9-15-60	0
Chester Morse Lake tributary No. 4.	....do.....	SE¼ sec.22, T.22 N., R.9 E., at road crossing 400 ft above mouth and 7½ miles southeast of Cedar Falls, Wash.	-		9-15-60	0
McClellan Creek.	....do.....	NE¼ sec.21, T.22 N., R.9 E., at culvert 6¼ miles southeast of Cedar Falls, Wash.	-	1953	9-15-60	*.79

* Base flow.
a Estimated.

Discharge measurements made at miscellaneous sites during water year 1960--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Lake Washington basin-Continued						
Green Point Creek.	Chester Morse Lake.	SE¼ sec.17, T.22 N., R.9 E., at road culvert 5½ miles southeast of Cedar Falls, Wash.	-	1953, 1957-60b	9-15-60	0
Rex River....	....do.....	SW¼SW¼ sec.11, T.21 N., R.9 E., at end of logging road, 1,500 ft below falls, 1 mile above Pine Creek, and 10 miles southeast of Cedar Falls, Wash.	-		9-14-60	*5.62
Pine Creek...	Rex River....	NW¼NE¼ sec.11, T.21 N., R.9 E., 250 ft above bridge, 1,000 ft above mouth, and 10 miles southeast of Cedar Falls, Wash.	-		9-14-60	*2.09
Rex River tributary.	....do.....	NW¼NW¼ sec.2, T.21 N., R.9 E., at road culvert 1,500 ft above mouth and 9 miles southeast of Cedar Falls, Wash.	-		9-14-60	*.04
Rex River tributary No. 2.	....do.....	SW¼SE¼ sec.4, T.21 N., R.9 E., at bridge about 1¾ miles above mouth and 8½ miles southeast of Cedar Falls, Wash.	-		9-14-60	*2.89
Rex River tributary No. 3.	....do.....	Center SE¼ sec.32, T.22 N., R.9 E., at road culvert ¾ mile above mouth and 7½ miles southeast of Cedar Falls, Wash.	-		9-14-60	*.45
Cabin Creek..	....do.....	NW¼ sec.29, T.22 N., R.9 E., at culvert 5¾ miles southeast of Cedar Falls, Wash.	-	1953	9-13-60	*.45
Boulder Creek.	Chester Morse Lake.	SE¼SW¼ sec.31, T.22 N., R.9 E., 150 ft above bridge and 6½ miles southeast of Cedar Falls, Wash.	-		9-14-60	*2.45
Do.....	....do.....	NW¼NW¼ sec.29, T.22 N., R.9 E., 300 ft above road crossing and 5¾ miles southeast of Cedar Falls, Wash.	-	1953	9-13-60	*2.80
Shotgun Creek.	....do.....	NE¼NW¼ sec.19, T.22 N., R.9 E., at road crossing 4½ miles southeast of Cedar Falls, Wash.	-	1953	9-13-60	*.15
Bridge Creek.	....do.....	NE¼NE¼ sec.18, T.22 N., R.9 E., at road crossing 4¼ miles southeast of Cedar Falls, Wash.	-	1953	9-15-60	*.09
Rock Creek...	....do.....	NE¼SE¼ sec.13, T.22 N., R.8 E., 150 ft below road culverts and 3½ miles southeast of Cedar Falls, Wash.	-	1953	9-13-60	*.75
Otter Creek..	....do.....	NW¼SE¼ sec.7, T.22 N., R.9 E., at road culverts 3¾ miles southeast of Cedar Falls, Wash.	-	1953	9-15-60	*.16
Chester Morse Lake tributary No. 5.	....do.....	NW¼NE¼ sec.13, T.22 N., R.8 E., at road crossing 4 miles southeast of Cedar Falls, Wash.	-		9-13-60	*.06
Chester Morse Lake tributary No. 6.	....do.....	SW¼SE¼ sec.12, T.22 N., R.8 E., at road crossing 4 miles southeast of Cedar Falls, Wash.	-		9-13-60	a.01
Dambyrat Creek.	....do.....	NW¼NW¼ sec.7, T.22 N., R.9 E., at road crossing 3 miles southeast of Cedar Falls, Wash.	-	1953	9-15-60	*.10
Lost Creek...	....do.....	NE¼SE¼ sec.11, T.22 N., R.8 E., at road culvert 2¼ miles southeast of Cedar Falls, Wash.	-		9-13-50	*1.44
Steele Creek.	Cedar River..	NW¼NW¼ sec.8, T.22 N., R.8 E., at road crossing at mouth, 2 miles southwest of Cedar Falls, Wash.	-	1945	9-13-60	*1.16
Williams Creek.	....do.....	NE¼SE¼ sec.13, T.22 N., R.7 E., at road crossing 4 miles southwest of Cedar Falls, Wash.	-	1945	9-13-60	*.42
Middle Fork Taylor Creek tributary (south branch).	Middle Fork Taylor Creek.	NE¼NE¼ sec.34, T.22 N., R.8 E., at road bridge 5 miles south of Cedar Falls, Wash.	-		9-12-60	*3.37

* Base flow.
a Estimated.
b Operated as a crest-stage gage.

Discharge measurements made at miscellaneous sites during water year 1960--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Lake Washington basin--Continued						
Middle Fork Taylor Creek tributary No. 2 (north branch).	Middle Fork Taylor Creek.	SW¼ sec.26, T.22 N., R.8 E., at road bridge 4½ miles south of Cedar Falls, Wash.	-		9-12-60	*2.50
Middle Fork Taylor Creek tributary No. 3	....do.....	NE¼ sec.32, T.22 N., R.8 E., 300 ft above mouth and 3½ miles southeast of Selleck, Wash.	-	1943, 1945	9-12-60	*.02
North Fork Taylor Creek.	Taylor Creek.	NE¼NW¼ sec.22, T.22 N., R.8 E., 150 ft above road crossing, 2¾ miles south of Cedar Falls, and 4¾ miles west of Selleck, Wash.	-		9-16-60	*1.20
North Fork Taylor Creek tributary.	North Fork Taylor Creek.	NW¼NW¼ sec.21, T.22 N., R.8 E., at road culvert 2¾ miles southwest of Cedar Falls and 3½ miles northeast of Selleck, Wash.	-		9-12-60	*.93
Seventeen Creek.	Taylor Creek.	NE¼NW¼ sec.19, T.22 N., R.8 E., at road crossing 1½ miles northeast of Selleck, Wash.	-	1943, 1945	9-16-60	*2.86
Rock Creek...	Cedar River..	NW¼NW¼ sec.11, T.22 N., R.7 E., at road bridge 2¾ miles northwest of Selleck, Wash.	-		9-13-60	*1.18
Streams tributary to Puget Sound						
Puget Sound tributary No. 7 (formerly unnamed tributary).	Puget Sound..	SW¼ sec.34, T.29 N., R.4 E., at highway crossing ¾ mile east of Mukilteo, Wash.	c16	1946, 1957, 1959	9-22-60	*0.30
Merrill and Ring Creek.	....do.....	NE¼ sec.35, T.29 N., R.4 E., at highway crossing 2 miles east of Mukilteo, Wash.	1.16	1946, 1957, 1959	9-22-60	*.63
Pigeon Creek.	....do.....	SE¼SW¼ sec.25, T.29 N., R.4 E., at railway crossing at mouth, 1 mile west of Everett, Wash.	1.42	1946, 1957, 1959	9-22-60	*1.75
Snohomish River basin						
Foss River...	South Fork Skykomish River.	NE¼ sec.31, T.26 N., R.12 E., at highway bridge 1 mile below old gage site and 2½ miles east of Skykomish, Wash.	54.8		11-22-59	†7,370
Olney Creek..	Snohomish River.	SE¼SW¼ sec.6, T.28 N., R.9 E., 5½ miles north of Gold Bar, Wash., and 7¼ miles above mouth.	d8.31	1946,50‡, 1951d, 1953-59e	9-14-60	*19.5
Do.....	....do.....	NE¼SE¼ sec.12, T.28 N., R.8 E., 5 miles northeast of Startup, Wash., and 6 miles above mouth.	d10.3	1923-27‡, 1929-34‡, 1946, 1948,49, 1957, 1959	9-14-60	*17.3
May Creek....	Wallace River.	NW¼SE¼ sec.6, T.27 N., R.9 E., at county road bridge at Gold Bar, Wash.	9.45	1946, 1957, 1959	9-14-60	*20.3
Bear Creek...	....do.....	SE¼NE¼ sec.26, T.28 N., R.8 E., at county road crossing 1½ miles north of Startup, Wash. (revised).	.86	1946, 1957, 1959	9-14-60	*8.45
Johnson Creek.	Skykomish River.	Center of south line of sec.3, T.27 N., R.8 E., at county road crossing 1½ miles southwest of Startup, Wash. (revised).	1.14	1946, 1957, 1959	9-14-60	*1.00
Sultan River.	....do.....	NE¼NE¼ sec.6, T.27 N., R.8 E., at mouth at State highway crossing at Sultan, Wash.	-	1911, 1915, 1957, 1959	9-15-60	*41.6
McCoy Creek..	....do.....	SE¼NE¼ sec.18, T.27 N., R.8 E., 1¼ miles above mouth and 2½ miles south of Sultan, Wash.	d5.87	1946-51‡, 1957, 1959	9-15-60	*5.08

* Base flow.
† Peak flow.
‡ Operated as a continuous-record gaging station.
c Approximately.
d Revised.
e Operated as a crest-stage gage; low-flow measurements made in 1957 and 1959.

Discharge measurements made at miscellaneous sites during water year 1960--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Snohomish River basin--Continued						
Elwell Creek.	Skykomish River.	SW¼SE¼ sec.12, T.27 N., R.7 E., 500 ft above mouth and 2⅔ miles southwest of Sultan, Wash.	d22.1	1946-47‡, 1957, 1959	9-15-60	*13.6
Roesiger Creek.	Woods Creek..	SE¼SW¼ sec.28, T.29 N., R.7 E., ½ mile below Roesinger Lake and 6½ miles southeast of Machias, Wash.	d3.73	1946-48‡, 1957, 1959	9-15-60	*.58
Woods Creek..	Skykomish River.	SE¼NW¼ sec.3, T.28 N., R.7 E., ¼ mile below Roesiger Creek and 7 miles northeast of Monroe, Wash.	d19.5	1946‡, 1957, 1959	9-15-60	*10.4
Carpenter Creek.	West Fork Woods Creek.	NE¼NE¼ sec.36, T.29 N., R.6 E., 40 ft above county road bridge and 4 miles southeast of Machias, Wash.	d10.8	1946-47‡, 1957, 1959	9-15-60	*3.03
West Fork Woods Creek.	Woods Creek..	SE¼NW¼ sec.33, T.28 N., R.7 E., 200 ft above county road bridge and 2½ miles northeast of Monroe, Wash.	26.7	1946, 1951, 1957, 1959	9-16-60	*15.1
Raging River.	Snoqualmie River.	West line of NW¼ sec.27, T.24 N., R.7 E., at highway crossing 2 miles southwest of Fall City, Wash., and 2½ miles above mouth.	30.6	1945-50‡, 1951f, 1953-59f	9-22-60	*16.2
Evans Creek..	Snohomish River.	SW¼NW¼ sec.7, T.27 N., R.6 E., 300 ft above county road bridge, ½ mile above mouth, and 5 miles south of Snohomish, Wash.	4.84	1946-47‡, 1957, 1959	9-22-60	*3.91
French Creek.	....do.....	SE¼SE¼ sec.22, T.28 N., R.6 E., at highway crossing 3 miles northwest of Monroe, Wash.	d5.53	1946-47‡, 1957, 1959	9-19-60	*.33
French Creek tributary (formerly unnamed tributary).	French Creek.	SW¼SE¼ sec.22, T.28 N., R.6 E., at county road crossing ¼ mile above mouth and 3½ miles east of Snohomish, Wash.	d1.53	1946, 1957, 1959	9-19-60	a.05
Pilchuck River.	Snohomish River.	NE¼SE¼ sec.3, T.29 N., R.7 E., ¾ mile below Worthy Creek and 5½ miles southeast of Granite Falls, Wash.	41.7	1945, 1946-47‡, 1957, 1959	9-19-60	*68.6
Do.....	....do.....	NW¼SE¼ sec.30, T.30 N., R.7 E., 200 ft above county road bridge and 2 miles southeast of Granite Falls, Wash.	53.5	1911‡, 1943-57‡, 1958-60g	9-16-60	*72.2
Stevens Creek.	Little Pilchuck Creek.	SE¼NE¼ sec.8, T.29 N., R.6 E., at county road bridge 1/3 mile east of town of Lake Stevens, Wash., and ¾ mile above mouth.	12.3	1946-50‡, 1951, 1957, 1959	9-22-60	*.89
Little Pilchuck Creek.	Pilchuck River.	SW¼SE¼ sec.16, T.29 N., R.6 E., at highway bridge crossing ¼ mile above mouth and 1 mile north of Machias, Wash.	-	1946, 1957, 1959	9-22-60	*1.15
Dubuque Creek.	....do.....	NW¼NW¼ sec.22, T.29 N., R.6 E., 300 ft above Panther Creek and 2½ miles southeast of town of Lake Stevens, Wash.	9.10	1946-51‡, 1957, 1959	9-23-60	*.91
Panther Creek.	Dubuque Creek.	NW¼NW¼ sec.22, T.29 N., R.6 E., 300 ft above mouth and 2½ miles southeast of town of Lake Stevens, Wash.	3.24	1946‡, 1957, 1959	9-23-60	*.45
Wood Creek...	Snohomish River.	SE¼SE¼ sec.8, T.28 N., R.5 E., 300 ft above county road crossing and 2 miles southeast of Everett, Wash.	1.88	1946-49‡, 1951, 1957, 1959	9-22-60	*5.25
Allen Creek..	Ebey Slough..	SE¼SE¼ sec.28, T.30 N., R.5 E., at highway crossing ½ mile east of Marysville, Wash., and 1 mile above mouth.	7.19	1946‡, 1947, 1949, 1957, 1959	9-23-60	*3.40

* Base flow.
‡ Operated as a continuous-record gaging station.
a Estimated.
d Revised.
f Operated as a crest-stage gage; low-flow measurements made in 1955 and 1957-59.
g Operated as a crest-stage gage; low-flow measurements made in 1959.

Discharge measurements made at miscellaneous sites during water year 1960--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Snohomish River basin--Continued						
Allen Creek tributary (formerly unnamed tributary).	Allen Creek..	NW¼NE¼ sec.34, T.30 N., R.5 E., at county road crossing 1 mile east of Marysville, Wash.	0.99	1946, 1957, 1959	9-23-60	*0.30
Middle Fork Quilceda Creek.	Quilceda Creek.	East line sec.4, T.30 N., R.5 E., at county road crossing ¾ mile above mouth and 4 miles north of Marysville, Wash.	7.45	1946, 1957, 1959	9-23-60	*2.06
Quilceda Creek.	Ebey Slough..	On west line sec.35, T.33 N., R.5 E., at county road crossing 5 miles north of Marysville, Wash.	3.29	1946-47, 1957, 1959	9-23-60	*2.04
West Fork Quilceda Creek.	Quilceda Creek.	E½ sec.8, T.30 N., R.5 E., at county road crossing 3 miles north of Marysville, Wash.	8.99	1946, 1957, 1959	9-23-60	*2.98
Mission Creek.	Puget Sound..	SW¼NW¼ sec.26, T.30 N., R.4 E., at highway crossing ¼ mile above mouth and 1 mile southeast of Tulalip, Wash.	7.79	1946, 1957, 1959	9-23-60	*1.98
Tulalip Creek.	....do.....	NE¼NE¼ sec.9, T.30 N., R.4 E., at wooden weir 200 ft east of road, ¾ mile below Weallup Lake, and 2¾ miles north of Tulalip, Wash.	9.01		9-13-60	*2.26
Do.....	....do.....	On north line sec.15, T.30 N., R.4 E., 0.4 mile above East Branch and 2 miles northeast of Tulalip, Wash.	10.9		9-13-60	*3.19
East Branch Tulalip Creek.	Tulalip Creek.	NE¼ sec.10, T.30 N., R.4 E., 1,000 ft above reservoirs and 2¾ miles northeast of Tulalip, Wash.	1.49		9-13-60	*.05
Do.....	....do.....	NW¼NE¼ sec.15, T.30 N., R.4 E., at road culvert 0.3 mile above mouth and 2 miles northeast of Tulalip, Wash.	1.74		9-13-60	*2.01
Tulalip Creek.	Puget Sound..	SW¼ sec.22, T.30 N., R.4 E., ¼ mile above mouth and ½ mile north of Tulalip, Wash.	15.5	1946, 1951, 1957	8-18-58 9-13-60	*4.84 *6.71
Stillaguamish River basin						
Stillaguamish River.	Skagit Bay...	Center of sec.2, T.31 N., R.5 E., at railroad-highway bridges at Arlington, Wash.	546		11-23-59	h59.600
Skagit River basin						
Ladder Creek.	Skagit River.	NE¼SE¼ sec.21, T.27 N., R.12 E., 250 ft above mouth at Newhalem, Wash.	-		9-16-60	*89.0
Newhalem Creek (minus diversion).	....do.....	SW¼SW¼ sec.21, T.37 N., R.12 E., 400 ft above mouth and ½ mile west of Newhalem, Wash.	-	1943-44	8- 9-60	123
Power-plant tailrace.	Newhalem Creek.	SW¼SW¼ sec.21, T.37 N., R.12 E., 400 ft above mouth and ½ mile west of Newhalem, Wash.	-	1944	8- 9-60	58.7
Goodell Creek.	Skagit River.	SE¼ sec.20, T.37 N., R.12 E., 500 ft above mouth and ¾ mile west of Newhalem, Wash.	38.7	1943-44‡	8- 9-60	*303
Thornton Creek.	....do.....	NE¼ sec.36, T.37 N., R.11 E., at old bridge 300 ft above mouth and 2¾ miles southwest of Newhalem, Wash.	-	1943-45	7-13-60 8- 9-60	46.3 *12.8
Damnation Creek.	....do.....	NW¼NE¼ sec.11, T.36 N., R.11 E., at highway bridge 200 ft above mouth and 5 miles southwest of Newhalem, Wash.	-	1943-44	8- 9-60	*5.27
Alma Creek...	....do.....	SE¼SW¼ sec.15, T.36 N., R.11 E., 150 ft above mouth and 6 miles northeast of Marblemount, Wash.	8.48	1943‡, 1944	8- 9-60	*40.4
Bacon Creek..	....do.....	E½SE¼ sec.20, T.36 N., R.11 E., ¼ mile above mouth and 4½ miles north of Marblemount, Wash.	50.9	1909, 1943-50‡, 1951, 1958	8-10-60	*258
Diobsud Creek.	....do.....	NW¼SW¼ sec.32, T.36 N., R.11 E., ¼ mile above mouth and 2½ miles north of Marblemount, Wash.	25.4	1943-44‡	7-13-60 8- 9-60	194 *85.6

* Base flow.
† Peak flow.
‡ Operated as a continuous-record gaging station.
h Elevation, 19.85 ft, U. S. Weather Bureau gage.

Discharge measurements made at miscellaneous sites during water year 1960--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Skagit River basin--Continued						
Boulder Creek.	Cascade River.	SE¼SW¼ sec.15, T.35 N., R.11 E., at logging bridge crossing ¼ mile above mouth and 3¼ miles southeast of Marblemount, Wash.	-	1943-44	8- 9-60	*34.5
Clark Creek..	....do.....	SE¼NE¼ sec.18, T.35 N., R.11 E., 500 ft above mouth and ¾ mile southeast of Marblemount, Wash.	-	1943, 1944-46‡	7-14-60 8- 9-60	14.0 *10.0
Jordan Creek.	....do.....	NE¼SE¼ sec.18, T.35 N., R.11 E., ½ mile above mouth and 1 mile southeast of Marblemount, Wash.	12.7	1943-48‡	7-14-60 8- 9-60	64.4 *22.6
Olson Creek..	Skagit River.	S½ sec.1, T.35 N., R.10 E., at Forest Service road crossing 1½ miles above mouth and 1½ miles northwest of Marblemount, Wash.	-	1943-44	7-14-60 8-10-60	1.20 *.56
Rocky Creek..	....do.....	NW¼SW¼ sec.22, T.35 N., R.10 E., ½ mile above mouth and 3½ miles southeast of Marblemount, Wash.	10.0	1943‡, 1944-45	7-14-60 8-10-60	36.1 *4.05
Illabot Creek.	....do.....	NW¼ sec.34, T.35 N., R.10 E., at Seattle City Light bridge (now destroyed) ¾ mile above mouth and 4½ miles east of Rockport, Wash.	-		7-15-60 8- 8-60	313 *144
Swift Creek..	....do.....	SE¼NE¼ sec.30, T.35 N., R.10 E., at highway bridge 300 ft above mouth and 2 miles east of Rockport, Wash.	-	1943-44, 1958	7-14-60 8-10-60	9.22 0
Tenas Creek..	Suiattle River.	SE¼SW¼ sec.19, T.33 N., R.11 E., at road bridge ¼ mile above mouth and 3½ miles northeast of Mansford, Wash.	-	1943-45	7-15-60 8- 8-60	55.2 *29.9
White Creek..	Sauk River...	SW¼SW¼ sec.29, T.34 N., R.10 E., 200 ft below old road bridge, ¼ mile above mouth, and 6½ miles southeast of Rockport, Wash.	-	1943-45	7-15-60 8- 8-60	18.5 *7.41
Jackman Creek.	Skagit River.	SE¼NW¼ sec.13, T.35 N., R.8 E., 1/8 mile above mouth and 2 miles southeast of Concrete, Wash.	23.9	1943-47‡, 1958	7-14-60 8- 2-60	76.6 *28.2
Sulphur Creek.	Lake Shannon.	SE¼NE¼ sec.36, T.37 N., R.8 E., at weir ¼ mile above mouth and 8¾ miles northeast of Concrete, Wash.	-	1959	7-13-60	*128
Bear Creek...	....do.....	NE¼SE¼ sec.10, T.36 N., R.8 E., ½ mile above North Fork and 5½ miles north of Concrete, Wash.	10.0	1943-45, 1953-54‡	7-14-60 8-10-60	*27.0 *7.16
Thunder Creek.	....do.....	NE¼SW¼ sec.18, T.36 N., R.9 E., ¼ mile above falls at road crossing, 1 mile above mouth, and 5¼ miles northeast of Concrete, Wash.	-	1943-45	8- 2-60	*30.6
Finney Creek.	Skagit River.	NW¼SE¼ sec.13, T.35 N., R.7 E., 400 ft above highway bridge, ½ mile above mouth, and 4 miles southwest of Concrete, Wash.	-	1958	7- 7-60 8- 2-60	109 *32.2
Pressentin Creek.	....do.....	SW¼SW¼ sec.13, T.35 N., R.7 E., 400 ft above highway bridge, 700 ft above mouth, and 4½ miles southwest of Concrete, Wash.	-		7- 7-60 8- 2-60	36.3 *11.7
Grandy Creek.	....do.....	NW¼SE¼ sec.10 T.35 N., R.7 E., 1 mile above mouth and 6 miles west of Concrete, Wash.	18.9	1943-44‡, 1958	7-12-60 8- 2-60	25.7 *13.0
Mill Creek...	....do.....	NE¼ sec.22, T.35 N., R.7 E., at highway bridge 300 ft above mouth and 5 miles east of Hamilton, Wash.	-	1943-45	7- 7-60 8- 2-60	7.34 *1.17
O'Toole Creek.	....do.....	NW¼ sec.21, T.35 N., R.7 E., 800 ft above mouth and 3 miles southeast of Hamilton, Wash.	5.69	1943-44‡	7- 7-60 8- 2-60	15.4 *4.87
Cary Creek...	....do.....	NW¼NW¼ sec.13, T.35 N., R.6 E., 100 ft below Cary Lake and ¾ mile northeast of Hamilton, Wash.	-	1943-45	7-12-60 8- 2-60	*5.09 *4.62
Muddy Creek..	....do.....	SE¼NW¼ sec.11, T.35 N., R.6 E., 1 mile northwest of Hamilton, Wash., and at county road crossing 1¼ miles above mouth.	-	1943-45	7-12-60 8- 2-60	*2.47 *2.03

* Base flow.
‡ Operated as a continuous-record gaging station.

Discharge measurements made at miscellaneous sites during water year 1960--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Skagit River basin--Continued						
Red Cabin Creek.	Etach Creek..	SW¼ sec.10, T.35 N., R.6 E., at county road culverts 1¾ miles northeast of Lyman, Wash.	-	1943-45	7- 8-60 8- 2-60	*0.68 0
Mannser Creek.	Skagit River.	SE¼ sec.9, T.35 N., R.6 E., at county road culverts 1½ miles northeast of Lyman, Wash.	-	1943-45	7- 8-60 8- 2-60	*3.97 *3.42
Jones Creek..	....do.....	SW¼ sec.9, T.35 N., R.6 E., 1 mile northeast of Lyman, Wash., and 1¼ miles above mouth.	7.80	1943-44‡, 1958	7- 8-60 8- 2-60	*5.32 *3.31
Childs Creek.	....do.....	On south line sec.7, T.35 N., R.6 E., 100 ft from end of gravel road, ¾ mile above Minkler Lake, and 1 mile northwest of Lyman, Wash.	-	1943-45	8- 2-60	*.37
Sorenson Creek.	....do.....	SW¼SE¼ sec.25, T.35 N., R.5 E., at highway culvert ½ mile above mouth and 3½ miles southwest of Lyman, Wash.	-	1943-44	7- 7-60 8- 2-60	.55 *.18
Anderson Creek.	....do.....	NW¼NE¼ sec.35, T.35 N., R.5 E., at highway bridge ½ mile above mouth and 4 miles southwest of Lyman, Wash.	-	1943-44	7- 7-60 8- 2-60	1.85 *.81
Gilligan Creek.	....do.....	NW¼NW¼ sec.35, T.35 N., R.5 E., 3/8 mile above mouth and 4½ miles southeast of Lyman, Wash.	6.31	1943‡	7- 7-60 8- 2-60	3.29 *.25
Powell Creek (formerly Wiseman Creek).	....do.....	SW¼SW¼ sec.11, T.35 N., R.5 E., 400 to 800 ft below falls, 500 ft above bridge on Highway 17-A, and 3½ miles west of Lyman, Wash.	-	1943-45	7- 8-60 8- 2-60	3.45 *1.64
Hansen Creek.	....do.....	NW¼ sec.20, T.35 N., R.5 E., ¾ mile above mouth and 1 mile east of Sedro Woolley, Wash.	10.3	1943-45‡, 1946, 1958	7- 8-60 8- 2-60	4.58 *2.28
Nookachamps Creek.	....do.....	SE¼SW¼ sec.25, T.34 N., R.4 E., ¼ mile below outlet of Big Lake and 4½ miles east of Mount Vernon, Wash.	22.2	1943-44‡	7- 6-60 8- 1-60	7.32 *.91
East Fork Nookachamps Creek.	Nookachamps Creek.	NW¼NE¼ sec.19, T.34 N., R.5 E., 3 miles southeast of Clear Lake, Wash., and 3½ miles above mouth.	20.5	1943-50‡, 1958	7- 6-60 8- 1-60	7.55 *1.82
Mundt Creek..	East Fork Nookachamps Creek.	NW¼NE¼ sec.19, T.34 N., R.5 E., at road crossing ¼ mile above mouth and 2½ miles southeast of town of Clear Lake, Wash.	-	1945	7-12-60 8- 1-60	1.19 *.59
Streams tributary to Georgia Strait						
Georgia Strait tributary.	Georgia Strait.	NE¼ sec.23, T.37 N., R.1 E., at damsite on Lummi Island, Wash.	-		8- 1-60	*0.06
Do.....	....do.....	NE¼ sec.23, T.37 N., R.1 E., ½ mile below damsite on Lummi Island, Wash.	-		8- 1-60	*.07
Kootenai River basin						
Kootenay River.	Columbia River.	Lat 49°29'40", long 117°20'04", at Grohman Narrows, 2 miles below Nelson, British Columbia; measurements referred to gage No. 10 at Nelson (station 8 N., J.9 of Water Resources Branch, Department of Northern Affairs and National Resources, Canada).	17,700	1932-59	10-24-59 4-20-60 5-21-60 7-21-60	25,700 39,500 63,600 57,200
Pend Oreille River basin						
Bitterroot River.	Clark Fork...	NW¼ sec.25, T.6 N., R.21 W., at Ravalli County bridge at Hamilton, Mont.	-	1940-42, 1959	7- 6-60 9- 9-60 9-29-60	1,380 345 206
Do.....	....do.....	E½ sec.12, T.11 N., R.20 W., 1¼ miles above Lolo Creek and 2⅝ miles southwest of Lolo, Mont.	-		2- 9-60	842
Lolo Creek...	Bitterroot River.	NW¼ sec.1, T.11 N., R.20 W., at mouth, 1.3 miles southeast of Lolo, Mont.	-		2-10-60	61.3
Bitterroot River.	Clark Fork...	On east line NE¼ sec.22, T.12 N., R.20 W., 2 miles north of Lolo, Mont., and 3¼ miles below Lolo Creek.	-		2-10-60	900

* Base flow.
‡ Operated as a continuous-record gaging station.

Discharge measurements made at miscellaneous sites during water year 1960--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
		Pend Oreille River basin--Continued				
Bitterroot River.	Clark Fork...	SE¼SE¼ sec.27, T.13 N., R.20 W., ½ mile above McClay Bridge and 4 miles west of Missoula, Mont.	-		2- 9-60	1,020
Aurora Creek.	South Fork Flathead River.	SE¼ sec.21, T.30 N., R.19 W., 1/8 mile above mouth and 1 mile northwest of Hungry Horse Dam, Mont.	-		6-29-60	67.2
Pack River...	Pend Oreille Lake.	Sec.14, T.59 N., R.2 W., at steel highway bridge above Caribou Creek, 5 miles north of Colburn, Idaho.	76.5	1956-59	10-30-59 12-10-59 1-24-60 3- 4-60 4-18-60 5-26-60 6-12-60 7-19-60 8-30-60	*164 *90.4 66.5 67.2 356 536 760 *96.0 43.9
Grouse Creek.	Pack River...	Sec.2, T.58 N., R.1 W., 2 miles above mouth and 4 miles east of Colburn, Idaho.	55.6	1956-59	10-29-59 12- 9-59 1-24-60 3- 4-60 4-18-60 5-25-60 6-12-60 7-19-60 8-30-60	*108 *109 63.9 63.1 290 319 290 *16.1 14.4
Rapid Lightning Creek.	....do.....	Sec.24, T.58 N., R.1 W., 0.3 mile above mouth and 6 miles southeast of Colburn, Idaho.	48.6	1958-59	10-27-59 12- 9-59 1-21-60 3- 4-60 4-18-60 5-25-60 6-12-60 7-19-60 8-30-60	53.9 *89.4 *37.5 54.4 255 191 168 *30.8 18.8
Sand Creek...	Pend Oreille River.	SE¼NE¼ sec.8, T.38 N., R.43 E., at road crossing 3½ miles south of Metaline Falls, Wash.	-		11- 3-59	a.5
Sweet Creek..	....do.....	NW¼SE¼ sec.5, T.38 N., R.43 E., 200 ft below State Highway 6 and 3 miles south of Metaline Falls, Wash.	10.7	1954, 1956	11- 2-59	*12.2
Wolf Creek...	....do.....	NE¼NW¼ sec.4, T.38 N., R.43 E., at county road crossing 2¼ miles south of Metaline Falls, Wash.	-		11- 3-59	a.25
Pocahontas Creek.	....do.....	NW¼SW¼ sec.33, T.39 N., R.43 E., at county road crossing 1½ miles south of Metaline Falls, Wash.	-		11- 3-59	a.25
Pend Oreille River.	Columbia River.	NW¼SW¼ sec.21, T.39 N., R.43 E., at highway bridge at Metaline Falls, Wash.	25,100	1909, 1913-28‡, 1959	6-30-60 6-30-60	5,770 6,050
Sullivan Creek.	Pend Oreille River.	SW¼SE¼ sec.30, T.39 N., R.44 E., 600 ft below mouth of Outlet Creek and 4 miles east of Metaline Falls, Wash.	122	1912-24‡, 1925	9- 2-60	*71.7
North Fork Sullivan Creek.	Sullivan Creek.	SE¼SE¼ sec.23, T.39 N., R.43 E., above highway crossing 2 miles east of Metaline Falls, Wash.	10.4	1959	11- 2-59 12- 3-59 1-12-60 3- 1-60 4- 5-60 9- 1-60	6.56 5.13 4.76 3.43 33.5 *4.96
Flume Creek..	Pend Oreille River.	SW¼SE¼ sec.16, T.39 N., R.43 E., 15 ft above county road crossing and 1 mile north of Metaline Falls, Wash.	-	1954	11- 4-59	16.6
Beaver Creek.	....do.....	NW¼NE¼ sec.9, T.39 N., R.43 E., at county road crossing 3 miles north of Metaline Falls, Wash.	-		11- 4-59	a.75
Slate Creek..	....do.....	SW¼NW¼ sec.36, T.40 N., R.43 E., ½ mile above mouth and 5 miles northeast of Metaline Falls, Wash.	c29	1952, 1954, 1956,	11- 6-59	19.3
Whiskey Creek.	....do.....	NW¼SE¼ sec.34, T.40 N., R.43 E., at county road crossing 4 miles north of Metaline Falls, Wash.	-		11- 4-59	a.25

* Base flow.
‡ Operated as a continuous-record gaging station.
a Estimated.
c Approximately.

Discharge measurements made at miscellaneous sites during water year 1960--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Pend Oreille River basin--Continued						
Everett Creek.	Pend Oreille River.	NW¼SE¼ sec.27, T.40 N., R.43 E., at county road crossing 5¼ miles north of Metaline Falls, Wash.	-		11- 4-59	a0.25
Lime Creek...	....do.....	SW¼NE¼ sec.13, T.40 N., R.43 E., at highway crossing 8 miles north of Metaline Falls, Wash.	-		11- 6-59	a.5
Peewee Creek.	....do.....	SE¼SE¼ sec.16, T.40 N., R.43 E., 500 ft above county road crossing and 7 miles north of Metaline Falls, Wash.	-		11- 5-59	3.42
Peewee Creek tributary.	Peewee Creek.	SE¼NW¼ sec.22, T.40 N., R.43 E., 200 ft below county road crossing and 6½ miles north of Metaline Falls, Wash.	-		11- 4-59	.44
Peewee Creek tributary No. 2.	....do.....	SW¼SW¼ sec.10, T.40 N., R.43 E., at county road crossing 7¾ miles north of Metaline Falls, Wash.	-		11- 4-59	a.75
Colville River basin						
Sheep Creek..	Colville River.	SW¼NE¼ sec.9, T.30 N., R.40 E., at county road bridge 3½ miles north of Springdale, Wash.	76.8		3-28-60 3-28-60 5- 9-60 8- 8-60 9-26-60	41.1 72.2 22.0 *12.9 *13.9
Grouse Creek.	Jumpoff Lake.	SW¼NW¼ sec.33, T.31 N., R.41 E., at road crossing 2 miles east of Jumpoff Lake and 4 miles southeast of Valley, Wash.	8.6	1959	10- 5-59 8- 8-60 9-26-60	*1.18 *1.59 *1.15
Jumpoff Creek.	Colville River.	SW¼SE¼ sec.26, T.31 N., R.40 E., at highway bridge 2 miles south of Valley, Wash.	17.2	1959	10- 5-59 3-28-60 5- 9-60 8- 8-60 9-26-60	*7.41 13.3 16.6 *6.39 *7.09
Colville River.	Columbia River.	NE¼NW¼ sec.23, T.31 N., R.40 E., at county road crossing at Valley, Wash.	161	1959	10- 6-59 3-28-60 3-29-60 5- 9-60 8- 8-60 9-26-60	*45.3 213 304 123 *31.8 *36.7
Huckleberry Creek.	Colville River.	NW¼NW¼ sec.9, T.31 N., R.40 E., at farm bridge 3½ miles northwest of Valley, Wash.	41.6	1959	10- 6-59 3-29-60 5-10-60 8- 9-60 9-27-60	*3.32 126 60.2 *2.73 *2.62
Cottonwood Creek.	....do.....	SE¼SW¼ sec.36, T.32 N., R.40 E., below county road crossing 3½ miles north of Valley, Wash.	34.7	1958-59	10- 6-59 3-29-60 5-10-60 8- 9-60 9-27-60	*9.03 134 38.8 *8.09 *6.64
Colville River.	Columbia River.	SE¼NE¼ sec.23, T.32 N., R.40 E., below highway bridge 1½ miles south of Chewelah, Wash.	295	1959	10- 6-59 3-29-60 5-10-60 8- 9-60 9-27-60	*64.3 398 289 *52.8 *58.7
North Fork Chewelah Creek.	Chewelah Creek.	SE¼NE¼ sec.11, T.32 N., R.40 E., below county road culvert 1 mile north of Chewelah, Wash.	60.9	1957-59	10- 6-59 3-29-60 5-10-60 8- 9-60 9-27-60	*12.8 105 103 *7.46 *9.07
Mill Creek...	Colville River.	NW¼NE¼ sec.23, T.33 N., R.39 E., above county road bridge 1 mile southwest of Addy, Wash.	56.0	1959	10- 7-59 3-30-60 3-31-60 5-11-60 8-10-60 9-28-60	*5.99 127 88.6 42.2 *1.81 *2.39
Stranger Creek.	....do.....	NE¼SW¼ sec.11, T.33 N., R.39 E., above county road culvert 1½ miles northwest of Addy, Wash.	42.9	1959	10- 7-59 3-30-60 3-31-60 5-11-60 8-10-60 9-28-60	*4.08 58.8 33.5 24.8 *1.78 *2.00

* Base flow.
a Estimated.

Discharge measurements made at miscellaneous sites during water year 1960--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Colville River basin--Continued						
Colville River.	Columbia River.	NW¼SW¼ sec.35, T.34 N., R.39 E., above county road bridge 2¾ miles northwest of Addy, Wash.	545		8-10-60	*64.9
					9-28-60	*79.9
Little Pend Oreille River.	Colville River.	SW¼SE¼ sec.16, T.35 N., R.41 E., below highway bridge at Park Rapids, Wash.	63.6	1959	10- 7-59	*15.7
					3-30-60	250
					3-31-60	224
					5-11-60	200
					8-10-60	*16.8
					9-28-60	*6.53
Do.....	....do.....	SW¼NE¼ sec.10, T.34 N., R. 39 E., above highway bridge at Arden, Wash.	185	1959	10- 7-59	*29.4
					3-30-60	462
					3-31-60	378
					5-11-60	292
					8-10-60	*28.8
					9-28-60	*20.3
Colville River.	Columbia River.	SW¼NW¼ sec.33, T.35 N., R.39 E., above highway bridge at Orin, Wash.	800	1959	10- 7-59	*144
					3-30-60	1,570
					5-12-60	851
					8-11-60	*98.3
					9-29-60	*106
Mill Creek...	Colville River.	NE¼SE¼ sec.16, T.36 N., R.40 E., ½ mile above North Fork and 8 miles northeast of Colville, Wash.	46.1	1959	10- 8-59	*5.35
					3-30-60	258
					3-31-60	204
					5-12-60	90.5
					8-11-60	*3.81
					9-29-60	*2.88
North Fork Mill Creek.	Mill Creek...	NW¼NW¼ sec.16, T.36 N., R.40 E., below highway bridge 8 miles northeast of Colville, Wash.	20.5	1959	10- 8-59	*5.56
					3-30-60	119
					3-31-60	93.4
					5-12-60	79.2
					8-11-60	*7.48
					8-12-60	*7.19
					9-29-60	*5.20
Mill Creek...	Colville River.	SW¼SW¼ sec.16, T.36 N., R.40 E., above road crossing, ½ mile below North Fork and 6½ miles northeast of Colville, Wash.	67.9	1959‡	10- 8-59	*10.4
					3-30-60	365
					3-31-60	310
					5-12-60	196
					8-11-60	*7.49
					8-12-60	*8.70
					9-29-60	*5.49
Wenatchee River basin						
Nason Creek..	Wenatchee River.	NW¼ sec.9, T.26 N., R.17 E., 2½ miles north of Winton, Wash., and 3 miles above mouth.	e86		11-22-59	†6,850
Wenatchee River.	Columbia River.	NE¼ sec.28, T.25 N., R.17 E., ½ mile above Drury Creek and 4½ miles northwest of Leavenworth, Wash.	-		12- 7-57	890
					5-21-58	11,600
					5-21-58	11,400
					5-22-58	12,500
					5-24-58	14,400
					6- 5-59	11,100
Peshastin Creek.	....do.....	SW¼NW¼ sec.12, T.22 N., R.17 E., above highway crossing at Blewett, Wash.	40.0	1911-12‡, 1948, 1958	11-22-59	†1,030
Mission Creek.	Wenatchee River.	NE¼NE¼ sec.8, T.23 N., R.19 E., 0.8 mile above mouth and 1 mile south of Cashmere, Wash.	79.1	1954-58b	5-13-60	120
Yakima River basin						
Gold Creek...	Keechelus Lake.	NE¼SE¼ sec.15, T.22 N., R.11 E., at highway crossing ½ mile southeast of Hyak and 13 miles northwest of Easton, Wash.	-		11-23-59	†5,000
North Fork Teanaway River.	Yakima River.	SW¼SE¼ sec.20, T.21 N., R.16 E., at county road crossing 1 mile below Middle Creek and 7 miles northeast of Cle Elum, Wash.	-		11-23-59	†3,180
John Cox ditch.	North Fork Ahtanum Creek.	NW¼SW¼ sec.7, T.12 N., R.16 E., 100 ft below headgate and 1 mile northwest of Tampico, Wash.	-		6- 9-60	12.4
					6- 9-60	8.34
					7-11-60	2.24
					8- 3-60	3.81

* Base flow.
† Peak flow.
‡ Operated as a continuous-record gaging station.
b Operated as a crest-stage gage.
c Approximately.

Discharge measurements made at miscellaneous sites during water year 1960--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Yakima River basin--Continued						
Main Ahtanum canal.	Ahtanum Creek.	NE¼SW¼ sec.14, T.12 N., R.16 E., at headworks 7 miles west of Wiley City, Wash.	-	1958-59	6- 9-60	71.2
					7-11-60	27.5
					8- 3-60	14.2
Hatton Creek.	....do.....	SW¼NW¼ sec.18, T.12 N., R.17 E., below headworks 5 miles west of Wiley City, Wash.	-	1958-59	6- 9-60	21.6
					6- 9-60	29.0
					7-11-60	19.0
					8- 3-60	15.9
Batchelor Creek.	....do.....	SE¼NE¼ sec.18, T.12 N., R.17 E., below headworks 4½ miles west of Wiley City, Wash.	-	1958-59	6- 8-60	17.3
					6- 8-60	11.3
					6- 8-60	8.68
					6- 8-60	5.65
					6- 8-60	8.24
					6- 8-60	12.7
					6- 8-60	18.9
					6- 8-60	10.5
					7-11-60	5.63
					8- 3-60	6.25

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