

# Surface Water Supply of the United States 1960

## Part 14. Pacific Slope Basins in Oregon and Lower Columbia River Basin

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

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GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1718

*Prepared in cooperation with the States  
of Oregon and Washington and with  
other agencies*



**UNITED STATES DEPARTMENT OF THE INTERIOR**

**STEWART L. UDALL, *Secretary***

**GEOLOGICAL SURVEY**

**Thomas B. Nolan, *Director***

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## PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Oregon 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:

K. N. Phillips.....	Portland, Oreg.
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

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13	14	15	16	17	18	19
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27	28	29	30	31		

## JANUARY 1960

S	M	T	W	T	F	S
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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
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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
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## APRIL 1960

S	M	T	W	T	F	S
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3	4	5	6	7	8	9
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## MAY 1960

S	M	T	W	T	F	S
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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
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5	6	7	8	9	10	11
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19	20	21	22	23	24	25
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## JULY 1960

S	M	T	W	T	F	S
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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 Oregon and lower 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:

Oregon: State of Oregon, L. A. Stanley, State engineer, and M. K. McIver, chairman, Oregon State Highway Commission; County Courts of Douglas and Morrow Counties; and the cities of Coos Bay-North Bend, Dallas, Eugene, McMinnville, Portland, The Dalles, and Toledo.

Washington: State Department of Conservation, Earl Coe, director, and M. 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; cities of Goldendale and Tacoma; Klickitat and Skamania County Public Utility Districts; and Klickitat County.

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 44 gaging stations in Oregon and 8 in Washington.

Assistance was also furnished by the Bureau of Reclamation and Bonneville Power Administration, United States Department of the Interior.

The following organizations aided in collecting records:

Oregon: Counties of Crook, Deschutes, Jackson, Jefferson, Josephine, Klamath, and Umatilla; city of Grants Pass; The California Oregon Power Co., Pacific Power & Light Co., Portland General Electric Co., and Coos-Curry Public Utility District.

Washington: Pacific Power & Light Co. and Washington Public Power Supply System.

## 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 date for stations in the several States were collected and prepared for publication in the district offices listed below.

<u>State</u>	<u>District office</u>	<u>Address</u>
Oregon.....	Portland.....	1002 N.E. Holladay Street.
Washington.....	Tacoma.....	207 Federal Building.

Information of a more detailed nature than that published for most of the gaging stations given in this report is on file in the district offices listed above. Provisional records of discharge prior to publication, and other unpublished data concerning the gaging-station records may 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 stream-flow 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 (cfs/m) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Runoff in inches (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 14-0110.00, the station number shown in this report is 110. The notation to the left of the hyphen is the part number; it is 14 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 1888. 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 those rating tables gives the daily mean discharge, from which the monthly and the yearly mean discharge are computed. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is essentially the shifting-control method.

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

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.	1895-96. 1897.

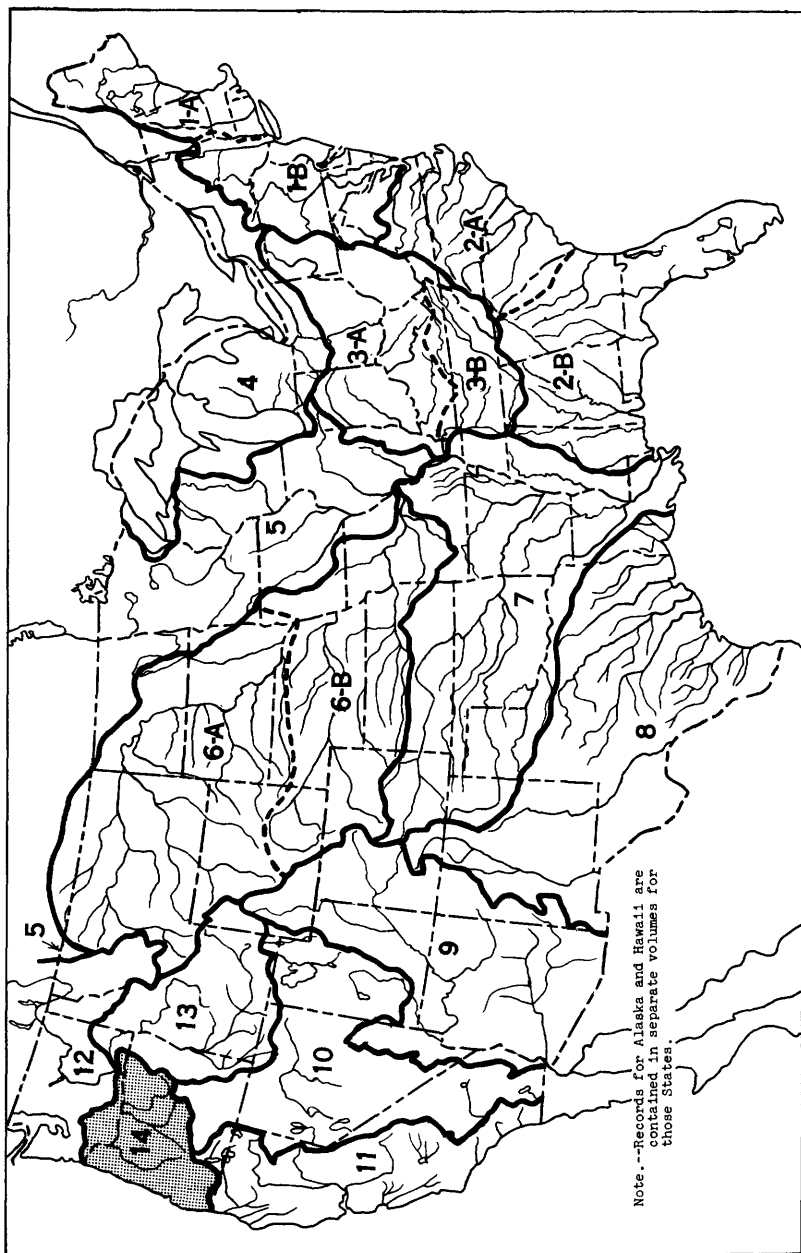


Figure 1.--Map of conterminous United States showing areas covered by 18 of the 20 volumes on surface water supply. The area covered by this report is shaded.

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

(A = Annual Report; B = Bulletin)

Report	Character of data	Year
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 76.....	Monthly discharge.....	1901.

Note.--Records for all stations in Oregon are contained in WSP 370, superseding all reports in this table for these stations.

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 Oregon and lower Columbia River basin, 1893-1960

Year	WSP	Year	WSP	Year	WSP	Year	WSP	Year	WSP
1899	38	1912	332-C	1925	614	1937	834	1949	1154
1900	51	1913	362-C	1926	634	1938	854	1950	1184
1901	66, 75	1914	394	1927	654	1939	884	1951	1218
1902	85	1915	414	1928	674	1940	904	1952	1248
1903	100	1916	444	1929	694	1941	934	1953	1288
1904	135	1917	464	1930	709	1942	954	1954	1348
1905	a177, 178	1918	484	1931	724	1943	984	1955	1398
1906	214	1919-20	514	1932	739	1944	1014	1956	1448
1907-8	252	1921	534	1933	754	1945	1044	1957	1518
1909	272	1922	554	1934	769	1946	1064	1958	1568
1910	292	1923	574	1935	794	1947	1094	1959	1658
1911	312	1924	594	1936	814	1948	1124	1960	1718

a Rogue, Umpqua, and Siletz Rivers only.

Note.--Records for all stations in Oregon through September 1910 are contained in WSP 370, superseding all earlier reports for these stations.

A compilation of records for the area covered by this report through September 1950 has been published as Water-Supply Paper 1318. 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 list gives the numbers and titles of these reports:

#### Report

- WSP 96: Destructive floods in the United States in 1903.  
WSP 771: Floods in the United States, magnitude and frequency.  
WSP 1080: Floods of May-June 1948 in Columbia River basin.  
WSP 1137-E: Floods of 1950 in Southwestern Oregon and Northwestern California.  
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-area characteristics.  
WSP 1320-D: Floods of January 1953 in western Oregon and northwestern California.  
WSP 1320-E: Summary of floods in the United States during 1953.

## 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 except as noted. The records on many canals and drainage ditches, not here listed, have been collected by the Oregon State engineer and the Bureau of Reclamation in connection with the water supply for irrigation projects.

Records of discharge collected by agencies other than the Geological Survey			
Stream	Location	Period	Collected by
Bear Creek.....	SW $\frac{1}{4}$ sec.33, T.38 S., R.1 E., at Oak Street Bridge, just below intake of Talent Lateral and 1 mile north of Ashland, Oreg.	1960	Oregon State engineer.
Big Butte Creek, South Fork (known locally as Rancheria Creek).	SE $\frac{1}{4}$ sec.17 (revised), T.35 S., R.3 E., 4 miles east of Butte Falls, Oreg.	1935-50, 1951-60	Do.
Blue River.....	T.15 S., R.5 E. (unsurveyed), $\frac{1}{2}$ miles upstream from Quentin Creek, 7 miles north of town of McKenzie Bridge, Oreg.	1955-60*	U. S. Forest Service.
Deschutes River.....	SW $\frac{1}{4}$ sec.23, T.21 S., R.9 E., $\frac{1}{2}$ mile upstream from bridge at Pringle Falls and 7 miles northwest of Lapine, Oreg.	1915-17, 1922-60*	Oregon State Engineer.
Fish Lake Dam, tunnel at.	SE $\frac{1}{4}$ sec.4, T.37 S., R.4 E., 14 miles east of Lakecreek, Oreg.	1929-60	Do.
Fivemile Creek.....	SW $\frac{1}{4}$ sec.27, T.4 S., R.29 E., 12 miles northwest of Ukiah, Oreg.	1928-30, 1932-33, 1935-44, 1946-47, 1949-52, 1953-60	Do.
Fourbit Creek.....	SE $\frac{1}{4}$ sec.22, T.35 S., R.3 E., 7 miles southeast of Butte Falls, Oreg.	1949-60	Do.
Little Butte Creek....	SE $\frac{1}{4}$ sec.19, T.36 S., R.2 E., at Lakecreek, Oreg.	1922-24, 1927-47, 1949-60	Do.
Little Butte Creek, North Fork.	SE $\frac{1}{4}$ sec.20, T.36 S., R.2 E., above Rogue River Valley Canal intake, near Lakecreek, Oreg.	1932-60*	Do.
Little Butte Creek, South Fork.	NE $\frac{1}{4}$ sec.21, T.37 S., R.4 E., 1 mile south of Big Elk Ranger station, near Lakecreek, Oreg.	1932-60*	Do.
Little Walla Walla River.	NE $\frac{1}{4}$ sec.12, T.5 N., R.35 E., near George St., in Milton, Oreg.	1932-60*	Do.
Lookout Creek.....	T.15 or 16 S., R.5 E. (unsurveyed), 0.4 mile upstream from mouth and 6 miles northeast of town of Blue River, Oreg.	1955-60*	U. S. Forest Service.
Lookout Creek tributary, a/	NE $\frac{1}{4}$ sec.31, T.15 S., R.5 E., 600 ft above mouth and 6.8 miles northeast of town of Blue River, Oreg.	1952-60	Do.
Do.....	SE $\frac{1}{4}$ sec.31, T.15 S., R.5 E., 0.5 mile above mouth and 6.5 miles northeast of town of Blue River, Oreg.	1952-60	Do.
Do.....	NW $\frac{1}{4}$ sec.6, T.16 S., R.5 E., 0.3 mile above mouth and 6 miles northeast of town of Blue River, Oreg.	1952-60	Do.
Ochoco Creek.....	NE $\frac{1}{4}$ sec.6, T.15 S., R.17 E., below Ochoco Reservoir, 6 miles east of Prineville, Oreg.	1920-60	Oregon State engineer.
Ochoco Reservoir.....	NW $\frac{1}{4}$ sec.5, T.15 S., R.17 E., 6 miles east of Prineville, Oreg.	1918-60	Do.
Willow Creek.....	Sec.34, T.35 S., R.3 E., 6 miles southeast of Butte Falls, Oreg.	1949-60	Do.
Willow Creek (known locally as Big Butte Springs).	NE $\frac{1}{4}$ sec.20, T.35 S., R.3 E., 4 miles east of Butte Falls, Oreg.	1930-60	Do.

\* Records for some earlier years contained in water-supply papers published by the Geological Survey either in annual reports or in WSP 1318 "Compilation of Surface Water records through 1950."

a Also operated as a crest-stage partial-record station by the Geological Survey (see p.

Note.--Records through 1941 collected by the Oregon State engineer (some in cooperation with the Bureau of Reclamation of the U. S. Department of the Interior) are contained in bulletins published by that officer.

## HYDROLOGIC CONDITIONS

Streamflow was near median for the water year. During December and January streamflow was generally well below median throughout the area. No outstanding floods occurred during the water year.

Figure 2, below, 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 for the period 1931-60.

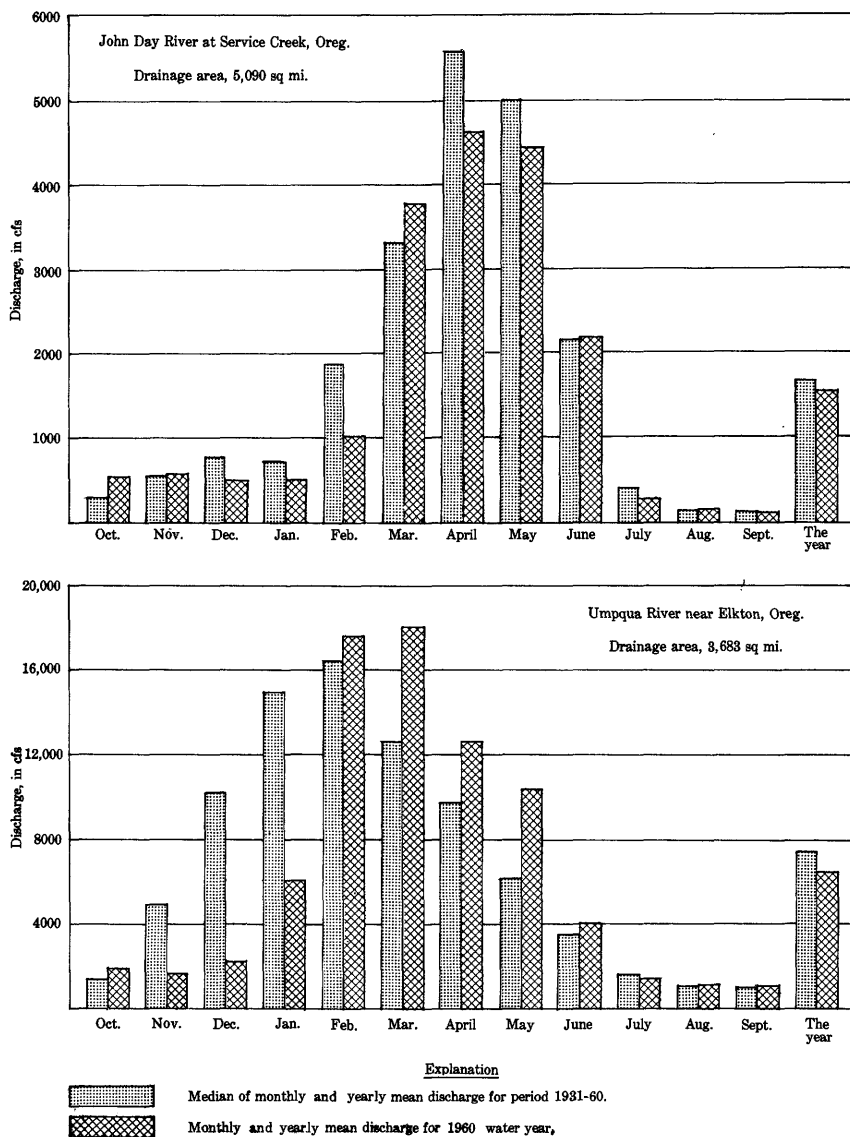


Figure 2. Comparison of discharge at three long-term representative gaging stations during 1960 water year with median discharge for period 1931-60.

## LOWER COLUMBIA RIVER BASIN

## WALLA WALLA RIVER BASIN

100. South Fork Walla Walla River near Milton, Oreg.

Location.--Lat 45°50', long 118°10', in NE 1/4 sec. 15, T.4 N., R. 37 E., on right bank 1 mile downstream from Elbow Creek and 13 miles southeast of Milton.

Drainage area.--63 sq mi, approximately.

Records available.--February to October 1903, August 1906 to November 1917, May 1931 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Published as "12 miles above Milton" 1903 and as "above Pacific Power & Light Co.'s intake, near Milton" 1907-10.

Gage.--Water-stage recorder. Altitude of gage is 2,050 ft (from river-profile map). Prior to Mar. 23, 1934, water-stage recorder or staff gage at several sites within 1 1/2 miles of present site at various datums.

Average discharge.--39 years (1907-17, 1931-60), 176 cfs (127,400 acre-ft per year).

Extremes.--Maximum discharge during year, 465 cfs Nov. 23 (gage height, 2.43 ft); minimum, 105 cfs for several days in August and September.

1903, 1906-17, 1931-60: Maximum discharge recorded, 2,430 cfs Dec. 12, 1946 (gage height, 4.20 ft), from rating curve extended above 240 cfs; minimum, 72 cfs Feb. 14, 1932.

Maximum stage known, about 6 ft Mar. 31, 1931, present site and datum.

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

Revisions (water years).--WSP 964: Drainage area. WSP 1398: 1912, 1940, drainage area at former site.

Discharge, in cubic 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	166	182	146	*188	140	342	251	267	137	129	108
2	166	163	182	143	185	140	306	251	271	137	118	108
3	157	182	179	143	173	140	316	*247	271	134	115	108
4	152	176	170	140	167	140	342	243	263	132	112	120
5	149	166	167	140	179	146	365	235	251	129	112	112
6	146	163	164	149	182	155	a380	243	239	126	112	112
7	149	160	164	146	298	207	a370	302	228	126	112	110
8	149	157	161	146	334	*247	a360	298	218	123	112	108
9	157	154	161	143	316	228	a350	306	204	123	112	108
10	149	152	158	143	275	200	342	334	197	120	110	108
11	221	152	161	146	243	185	320	356	194	120	110	108
12	218	152	158	140	214	179	*280	352	191	*120	110	108
13	185	144	155	140	194	176	316	185	120	110	*110	108
14	182	144	155	140	185	173	275	284	194	120	110	108
15	169	144	158	137	182	176	251	275	232	120	112	108
16	160	135	167	140	173	170	235	311	197	120	112	108
17	154	141	167	134	167	176	235	280	185	120	112	108
18	149	141	164	134	164	194	239	275	176	*118	*110	108
19	146	144	161	134	155	228	247	271	167	120	110	108
20	154	149	161	134	146	275	288	306	167	118	108	108
21	157	210	158	134	149	347	316	320	167	118	110	108
22	277	273	155	134	143	*383	293	311	158	115	112	108
23	301	430	155	132	140	a370	275	288	155	112	118	110
24	245	388	161	134	a140	a360	271	271	152	112	120	*112
25	218	320	164	140	a140	a340	267	255	149	112	112	112
26	195	a260	155	155	143	a320	259	263	146	112	112	110
27	182	a240	158	158	140	a300	255	263	143	112	112	110
28	182	a220	155	161	140	a320	263	255	140	110	110	110
29	176	a200	149	194	140	a400	*251	255	137	110	110	110
30	172	a190	152	204	-----	450	251	263	137	112	108	110
31	169	-----	149	197	-----	392	-----	*271	-----	112	108	-----
Total	5,578	5,816	5,003	4,561	5,395	7,657	8,815	8,751	5,781	3,720	3,480	3,284
Mean	180	194	161	147	186	247	294	282	193	120	112	109
Cfs/m	2.86	3.08	2.56	2.33	2.95	3.92	4.47	4.48	3.08	1.90	1.78	1.73
In.	3.29	3.43	2.95	2.69	3.18	4.52	5.20	5.17	3.41	2.20	2.05	1.94
Ac-ft	11,060	11,540	9,820	9,050	10,700	15,190	17,480	17,360	11,470	7,580	6,900	6,510

Calendar year 1959: Max 460 Min 117 Mean 198 Cfs/m 3.14 In. 42.72 Ac-ft 143,500  
 Water year 1959-60: Max 450 Min 108 Mean 185 Cfs/m 2.94 In. 40.03 Ac-ft 134,600

Peak discharge (base 600 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Umatilla River above Meacham Creek, near Gibsons, and North Fork Walla Walla River near Milton.

## 110. North Fork Walla Walla River near Milton, Oreg.

Location.--Lat 45°54', long 118°17', in NW $\frac{1}{4}$  sec.23, T.5 N., R.36 E., on right bank  $\frac{1}{4}$  miles upstream from confluence with South Fork and 5 miles southeast of Milton.

Drainage area.--42 sq mi, approximately.

Records available.--January 1930 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Altitude of gage is 1,470 ft (from river-profile map). Prior to Oct. 23, 1948, at several sites 0.7 mile downstream at various datums.

Average discharge.--30 years, 49.3 cfs (35,690 acre-ft per year).

Extremes.--Maximum discharge during year, 238 cfs Mar. 30 (gage height, 3.76 ft); minimum, 3.0 cfs Aug. 19, 20.

1930-60: Maximum discharge observed, 1,980 cfs Dec. 12, 1946 (gage height, 6.97 ft, site and datum then in use), from rating curve extended above 220 cfs; minimum, 0.9 cfs Aug. 17, 1955.

Remarks.--Records good. No regulation. Diversions above station for irrigation of about 150 acres, of which 20 acres is below station.

Revisions (water years).--WSP 1398: 1942, 1947, drainage area (present and former sites).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Feb. 9-11)

Oct. 1 to Feb. 8

Feb. 9 to Sept. 30

2.4	16	3.0	84	2.1	3.0	2.7	36
2.5	22	3.5	210	2.3	7.5	3.0	70
2.7	41			2.4	12	3.3	120
				2.5	19	3.7	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	51	40	39	21	*68	24	170	76	53	7.5	4.6	5.0
2	41	38	37	21	65	23	142	76	50	5.3	6.0	4.8
3	33	38	*39	19	56	22	134	*73	47	5.5	5.5	4.0
4	28	41	34	17	49	21	134	70	43	5.2	4.8	5.0
5	24	36	32	18	54	22	152	63	36	5.0	4.8	7.0
6	23	36	30	21	57	32	165	63	32	4.6	4.4	6.5
7	23	33	30	22	110	60	165	90	32	4.6	4.0	6.2
8	21	32	28	24	163	90	158	86	29	4.4	4.0	5.8
9	21	30	28	23	193	85	142	82	27	5.0	3.8	5.0
10	20	28	26	22	188	70	120	80	25	5.0	3.8	4.4
11	36	26	26	24	148	62	102	80	23	4.4	4.0	4.2
12	42	25	28	22	114	57	*86	78	17	4.2	4.2	4.4
13	39	21	28	21	90	54	79	70	12	4.4	4.2	*4.6
14	36	21	26	21	80	50	82	62	17	*4.6	4.4	4.6
15	32	20	29	19	84	*48	70	54	38	5.5	4.4	4.6
16	28	19	34	19	79	45	62	63	25	5.2	4.4	4.4
17	26	19	37	18	68	46	59	56	23	4.8	4.6	4.2
18	24	18	36	17	62	57	68	58	20	4.4	*4.0	4.2
19	21	18	33	17	51	70	78	60	18	4.2	3.4	4.0
20	22	21	32	17	44	91	92	82	16	4.6	3.4	4.4
21	24	39	30	17	40	122	108	130	16	4.6	3.8	4.8
22	54	82	28	17	38	*152	104	122	14	4.8	4.2	5.0
23	90	156	27	16	33	165	102	110	12	4.8	4.4	5.2
24	79	140	27	16	32	160	108	98	12	4.4	5.2	5.2
25	67	110	31	25	32	148	110	91	9.8	4.8	5.2	5.5
26	54	86	28	60	30	155	100	84	11	4.2	5.0	5.8
27	45	71	25	68	28	145	96	80	10	4.0	5.2	5.8
28	41	61	24	64	27	152	90	74	9.8	4.8	5.2	5.5
29	44	51	23	79	25	138	82	68	9.3	4.2	4.6	5.2
30	42	45	24	84	-----	214	78	63	9.3	4.0	4.6	5.2
31	41	-----	23	76	-----	214	-----	58	-----	4.0	4.8	-----
Total	1,172	1,401	922	925	2,128	2,794	3,238	2,400	696.2	147.2	138.9	150.5
Mean	37.8	46.7	29.7	29.8	73.4	90.1	108	77.4	23.2	4.75	4.48	5.02
Ac-ft	2,320	2,780	1,830	1,850	4,220	5,540	6,420	4,760	1,380	292	276	299
Calendar year 1959: Max	296			Min 2.0		Mean 57.9		Ac-ft 41,890				
Water year 1959-60: Max	214			Min 3.4		Mean 44.0		Ac-ft 31,950				

Peak discharge (base, 300 cfs).--No peak above base.

\* Discharge measurement made on this day.

## 130. Mill Creek near Walla Walla, Wash.

Location.--Lat 46°00'30", long 118°07'00", in SE<sup>1</sup>/<sub>4</sub> sec.12, T.6 N., R.37 E., on left bank 4 miles downstream from city of Walla Walla diversion dam, 4½ miles upstream from Blue Creek, and 1½ miles southeast of Walla Walla.

Drainage area.--60 sq mi, approximately.

Records available.--August 1913 to September 1917, April to September 1938, October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,000 ft above mean sea level, unadjusted. Prior to Oct. 1, 1938, staff gages at about same site at different datums.

Average discharge.--25 years (1913-17, 1939-60), 98.4 cfs (71,240 acre-ft per year).

Extremes.--Maximum discharge during year, 386 cfs Mar. 30 (gage height, 16.28 ft); minimum, 27 cfs July 28 (gage height, 15.01 ft).  
1913-17, 1938, 1939-60: Maximum discharge, 2,610 cfs Dec. 28, 1945 (gage height, 17.85 ft), from rating curve extended above 620 cfs by logarithmic plotting; minimum observed, 16 cfs Oct. 11-15, 1939.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. No regulation. City of Walla Walla diverts about 22 cfs 4 miles above station for municipal use.

Cooperation.--Gage-height record and 11 discharge measurements furnished by Corps of Engineers.

Revisions (water years).--WSP 1288: Drainage area. WSP 1398: 1946-48(M), 1950(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 Jan. 25

Jan. 26 to Sept. 30

15.0	28	16.0	230	14.9	23	15.7	175
15.2	52	16.5	410	15.1	47	16.0	270
15.5	103			15.4	100	16.5	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	*62	69	86	62	124	58	*238	100	98	.40	47	39
2	56	66	82	60	137	56	193	98	94	39	44	39
3	52	99	86	56	*124	55	181	94	92	39	44	39
4	49	*118	79	56	112	60	181	92	88	39	44	48
5	47	116	76	55	127	70	193	84	82	39	43	43
6	49	112	74	61	142	90	198	84	80	39	42	42
7	51	105	74	68	256	120	187	106	75	38	42	42
8	52	99	*70	60	306	*172	181	104	*71	38	*40	42
9	67	94	67	56	282	157	163	104	66	38	40	40
10	62	90	66	58	238	139	144	*110	62	36	40	40
11	105	84	66	61	199	129	132	110	59	36	39	40
12	114	82	67	58	170	119	117	106	58	*36	39	*40
13	95	76	66	56	180	114	108	104	58	36	38	*40
14	81	76	64	56	150	108	119	94	60	35	39	40
15	69	74	70	55	170	106	108	90	76	35	40	40
16	62	69	88	60	155	102	102	110	67	35	40	39
17	58	69	90	55	140	104	104	110	62	34	39	39
18	55	69	90	45	130	*122	117	139	58	34	39	39
19	52	78	84	35	120	147	137	149	56	34	38	39
20	61	84	81	40	110	172	184	184	54	33	38	39
21	62	198	76	37	105	211	223	246	53	32	38	39
22	92	245	72	45	100	232	202	217	50	30	39	40
23	97	292	69	55	95	232	178	181	48	30	42	40
24	90	230	74	65	85	217	160	152	47	30	44	43
25	81	180	81	70	80	202	147	134	46	29	42	44
26	72	148	76	84	75	199	134	127	46	29	42	43
27	67	125	72	100	70	184	122	127	44	29	42	42
28	78	112	70	102	65	184	117	122	43	29	40	42
29	79	101	67	134	80	190	110	119	42	29	40	42
30	*78	92	67	160	-----	342	104	112	40	32	39	39
31	70	-----	66	144	-----	330	-----	106	-----	33	39	-----
Total	2,165	3,452	2,316	2,099	4,087	4,723	4,582	3,815	1,875	1,065	1,262	1,223
Mean	69.8	115	74.7	67.7	141	152	153	123	62.5	34.4	40.7	40.8
Ac-ft	4,290	6,850	4,590	4,180	8,110	9,370	9,090	7,570	3,720	2,110	2,500	2,430
Calendar year 1959: Max	708			Min 32		Mean 108		Ac-ft 78,090				
Water year 1959-60: Max	342			Min 29		Mean 89.2		Ac-ft 64,790				

Peak discharge (base, 700 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--No gage-height record Jan. 15-25, Feb. 12 to Mar. 7 (stage-discharge relation affected by ice Jan. 15-25, Feb. 27 to Mar. 5); discharge estimated on basis of weather records and records for nearby stations.

## 135. Blue Creek near Walla Walla, Wash.

Location.--Lat 46°03'30", long 118°08'10", in SW 1/4 sec. 25, T. 7 N., R. 37 E., on right bank 1 mile upstream from mouth and 10 miles east of Walla Walla.

Drainage area.--17.0 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Concrete control since July 25, 1948. Datum of gage is 1,700 ft above mean sea level, unadjusted. Prior to Oct. 1, 1950, at datum 1,700 ft lower.

Average discharge.--21 years, 15.7 cfs (11,370 acre-ft per year).

Extremes.--Maximum discharge during year, 90 cfs Feb. 8 (gage height, 41.47 ft); maximum gage height, 41.68 ft Jan. 14 (backwater from ice); minimum discharge, 0.4 cfs July 29 (gage height, 40.27 ft).  
1939-60: Maximum discharge, 725 cfs Dec. 28, 1945 (gage height, 43.35 ft, present datum), from rating curve extended above 400 cfs; minimum observed, 0.1 cfs Oct. 14, 1939, but may have been less during periods of no gage-height record Oct. 1-11, 15, 1939.

Remarks.--Records good except those below 5 cfs, which are fair, and those for periods of ice effect or no gage-height record, which are poor. No known regulation or diversion.

Cooperation.--Gage-height record and 10 discharge measurements furnished by Corps of Engineers.

Revisions (water years).--WSP 984: 1942. WSP 1348: 1941, 1942(M), 1945.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

40.28	0.5	40.6	8.8
40.3	.8	40.8	19
40.4	2.6	41.1	43
40.5	5.3	41.5	95

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.8	6.3	6.6	4.0	30	4.0	*59	17	12	2.6	2.4	0.6
2	4.1	5.9	6.3	2.5	32	3.5	48	15.5	11.5	2.4	1.6	.6
3	3.8	9.6	7.7	3.0	*32	4.0	38	14	11	2.4	1.3	.6
4	3.6	*12	6.6	3.5	29	6.0	33	12.5	11	2.2	1.1	1.1
5	3.3	12	6.3	5.0	32	10.5	31	11	10.5	2.2	.9	1.1
6	3.3	12	6.3	5.6	35	14	28	10.5	10	2.0	.8	1.3
7	3.6	10.5	*6.3	5.9	65	*30	24	13.5	9.6	1.6	.6	1.1
8	3.6	8.8	6.0	6.3	79	39	20	10.5	9.2	1.4	*.8	1.1
9	3.6	8.0	5.5	5.3	75	35	17.5	10.5	*8.8	1.4	.8	.9
10	3.8	7.0	5.5	3.0	65	30	15.5	*10.5	8.0	1.3	.6	.9
11	4.7	5.9	5.5	3.5	48	28	14.5	10.5	7.7	1.3	.6	.9
12	6.6	5.6	6.0	4.0	39	25	12.5	10.5	7.3	*.9	.5	*.8
13	8.0	3.5	6.5	3.5	31	24	12.5	11	6.6	.8	.6	.8
14	8.4	3.0	6.0	3.0	28	24	16.5	10.5	6.3	.9	.6	.8
15	8.0	2.5	6.5	3.5	33	23	13.5	10.5	5.9	.9	.8	.8
16	7.0	2.0	7.5	4.5	32	22	12	12.5	5.6	.8	.8	.8
17	6.3	2.5	8.5	4.5	28	23	12.5	13.5	5.3	.6	.7	.8
18	5.6	3.8	9.0	4.0	25	*28	17	25	5.0	.6	.7	.8
19	5.3	4.7	8.5	3.5	23	37	24	29	5.0	.6	.6	.8
20	5.0	5.3	8.0	3.0	18.5	41	36	46	4.7	.6	.6	.6
21	5.3	17	7.0	2.5	16	47	49	75	4.4	.6	.7	.6
22	6.3	28	7.0	2.0	14	46	46	69	4.1	.6	.8	.8
23	7.0	26	7.0	2.5	11.5	45	45	54	3.8	.5	.9	.6
24	7.0	19.5	7.0	4.0	11	38	44	43	3.8	.5	1.0	.8
25	6.3	14.5	7.5	7.5	11	31	39	35	3.6	.5	.9	.9
26	5.6	12	7.0	18	11	29	34	29	3.3	.5	.9	.9
27	5.3	11	6.5	26	7.0	28	31	25	3.3	.6	.9	.9
28	6.6	10	6.5	28	6.0	28	28	22	3.1	.6	.9	.9
29	6.3	8.8	6.0	39	5.0	29	23	19.5	2.6	.5	.8	.8
30	*6.6	7.7	6.0	38	-----	59	19	17	2.8	.6	.7	.9
31	6.6	-----	6.0	35	-----	68	-----	15	-----	.8	.6	-----
Total	170.3	285.4	208.6	283.6	872.0	899.0	843.0	706.0	196.0	33.8	26.5	25.3
Mean	5.49	9.51	6.73	9.15	30.1	29.0	28.1	22.8	6.53	1.09	0.85	0.84
Cfs/m	0.323	0.559	0.396	0.538	1.77	1.71	1.65	1.34	0.384	0.064	0.050	0.049
In.	0.37	0.62	0.46	0.62	1.91	1.97	1.84	1.54	0.43	0.07	0.06	0.06
Ac-ft	338	566	414	563	1,730	1,780	1,670	1,400	389	67	53	50

Calendar year 1959: Max 149 Min 0.7 Mean 18.3 Cfs/m 1.08 In. 14.65 Ac-ft 13,280  
Water year 1959-60: Max 79 Min 0.5 Mean 12.4 Cfs/m 0.729 In. 9.95 Ac-ft 9,020

Peak discharge (base, 200 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-17, Jan. 1-4, 10-26, Feb. 27 to Mar. 4. No gage-height record Dec. 8-30, Aug. 16-31; discharge estimated on basis of weather records and records for nearby stations.

## 150. Mill Creek at Walla Walla, Wash.

Location.--Lat 46°04'40", long 118°16'10", in NE¼NW¼ sec.23, T.7 N., R.36 E., on left bank 400 ft downstream from diversion dam and 1.5 miles east of Walla Walla.

Drainage area.--96 sq mi, approximately.

Records available.--April 1941 to September 1960.

Gage.--Water-stage recorder and artificial control. Datum of gage is 1,165.49 ft above mean sea level (Corps of Engineers bench mark). April 1941 to June 11, 1941, staff gage and June 11, 1941, to Jan. 22, 1957, water-stage recorder, at sites 0.8 mile downstream at different datum.

Extremes.--Maximum discharge during year, 444 cfs Feb. 8 (gage height, 3.10 ft); minimum, 1.2 cfs Oct. 8; minimum gage height, 1.75 ft June 22.

1941-60: Maximum discharge, 2,760 cfs Dec. 28, 1945 (gage height, 4.0 ft, site and datum then in use); no flow Nov. 2, 1954, Oct. 3-5, 1957, and part of each day Oct. 15, 18-20, Oct. 29 to Nov. 1, Nov. 3, 1954, Feb. 19, 20, 1958.

Remarks.--Records fair except those below 20 cfs or those for periods of ice effect, which are poor. Some regulation at diversion dam 400 ft above station where water is diverted into Yellowhawk and Garrison Creeks for stock and irrigation. Water is diverted 1 mile upstream into Mill Creek Reservoir for flood control with release of stored waters after flood into Russell Creek and is also diverted as required to replenish losses from seepage and evaporation from small recreation pool maintained in the reservoir. City of Walla Walla diverts about 22 cfs for municipal supply several miles upstream. Other small diversions above station for irrigation.

Cooperation.--Gage-height record, 7 discharge measurements, and 2 field estimates furnished by Corps of Engineers.

Revisions (water years).--WSP 1288: Drainage area. WSP 1348: 1943, 1945-46.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	0.4	2.2	78
1.8	4.1	2.5	175
1.9	15	3.0	400
2.0	32	3.5	710

Discharge, in cubic 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	19.5	42	34	132	40	320	78	66	2.4	6.5	2.9
2	12.5	18	42	30	128	40	247	76	40	2.4	5.6	2.9
3	8.6	26	47	30	*122	40	219	73	30	2.9	4.8	2.9
4	8.6	*38	42	30	95	42	158	70	32	2.9	4.1	4.1
5	3.5	36	40	30	106	45	171	47	21	2.9	4.1	4.1
6	*2.0	34	40	34	119	51	175	21	19.5	2.9	3.5	3.5
7	2.0	32	40	32	264	86	160	63	23	2.9	3.5	2.9
8	1.6	28	36	34	400	*149	145	63	16.5	2.9	3.5	2.9
9	2.0	24	36	32	370	125	138	56	15	2.9	3.5	2.4
10	2.0	23	35	30	300	132	122	*53	13.5	2.9	2.9	2.4
11	30	21	35	30	286	119	109	53	9.8	*2.9	2.9	2.4
12	63	21	38	28	219	89	89	53	3.5	*2.9	2.9	2.4
13	49	16.5	40	26	191	109	73	53	2.9	2.4	2.9	2.4
14	38	16.5	*36	25	171	100	92	42	2.4	2.9	2.9	2.4
15	30	18	38	24	183	98	76	36	24	2.9	3.5	2.4
16	24	16	45	23	183	92	70	53	23	2.9	4.1	2.4
17	21	15	53	22	160	92	70	53	13.5	2.9	4.1	2.4
18	13.5	16.5	53	21	142	*108	84	89	5.6	2.9	3.5	2.4
19	11	18	51	20	122	128	109	112	2.4	2.9	2.9	2.4
20	12.5	19.5	47	20	98	160	132	179	2.4	2.9	2.9	2.4
21	13.5	78	45	20	92	231	247	291	2.4	3.5	3.5	2.4
22	32	195	42	21	84	282	231	247	2.4	3.5	4.8	2.4
23	53	227	40	23	70	278	219	207	2.4	3.5	4.8	2.4
24	49	199	45	26	53	255	203	171	2.4	3.5	5.6	2.4
25	45	153	49	32	53	227	175	135	2.4	3.5	5.6	2.9
26	28	119	47	56	51	223	153	119	2.4	3.5	4.8	2.9
27	18	92	45	81	45	203	138	116	2.4	2.9	4.8	2.4
28	21	63	42	86	42	211	128	106	2.4	3.5	4.8	2.4
29	23	53	40	132	40	203	100	100	2.4	2.9	4.1	2.4
30	21	49	40	183	-----	380	81	86	2.4	2.9	3.5	2.4
31	*21	-----	38	168	-----	411	-----	70	-----	4.1	2.9	-----
Total	677.3	1,684.5	1,309	1,383	4,321	4,767	4,434	2,971	390.0	93.8	123.8	80.0
Mean	21.8	56.2	42.2	44.6	149	154	148	95.8	13.0	3.03	3.99	2.67
Ac-ft	1,340	3,340	2,600	2,740	8,570	9,460	8,790	5,890	774	186	246	159

Calendar year 1959: Max 773

Min 0.7

Mean 84.8

Ac-ft 61,380

Water year 1959-60: Max 411

Min 1.6

Mean 60.7

Ac-ft 44,100

\* Discharge measurement made on this day.

\*\* Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16, 17, Jan. 2-4, 10-24, Feb. 27 to Mar. 4.

## 160. Dry Creek near Walla Walla, Wash.

Location.--Lat 46°07'20", long 118°14'10", on south line of SW $\frac{1}{4}$  sec.31, T.8 N., R.37 E., on right bank 1 mile downstream from Spring Creek and 6 miles northeast of Walla Walla.

Drainage area.--48.4 sq mi.

Records available.--January 1949 to September 1960.

Gage.--Water-stage recorder. Concrete control since July 25, 1949. Altitude of gage is 1,200 ft (from topographic map).

Average discharge.--11 years, 23.4 cfs (16,940 acre-ft per year).

Extremes.--Maximum discharge during year, 113 cfs May 20 (gage height, 4.40 ft); maximum gage height, 5.46 ft Jan. 29 (backwater from ice); minimum discharge, 0.8 cfs July 27, Aug. 12 (gage height, 3.06 ft).  
1949-60: Maximum discharge, 3,340 cfs Feb. 22, 1949 (gage height, 11.6 ft, from high-water mark in well); from rating curve extended above 310 cfs on basis of slope-area and contracted-opening measurements of peak flows at gage heights 9.0 and 11.6 ft; minimum, 0.2 cfs Aug. 4, 1949.

Remarks.--Records good except those below 10 cfs, which are fair, and those for periods of ice effect, which are poor. No regulation. Several 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)

3.0	0.3	3.6	22
3.1	1.3	3.8	38
3.2	3.2	4.1	70
3.3	6.2	4.5	134
3.4	10		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.5	10	11.5	6.0	37	4.0	51	24	17	3.7	3.7	1.6
2	4.3	9.8	11	4.0	42	3.0	44	22	14.5	3.4	3.2	1.6
3	4.0	13.5	13.5	5.0	36	5.0	40	20	13	3.2	2.3	1.6
4	3.7	16.5	*11.5	7.0	32	10	36	19.5	12	3.0	2.3	4.3
5	3.2	14.5	11	9.0	36	15	34	17	11	3.0	2.0	3.7
6	3.2	14	11	10	38	20	35	15.5	9.6	2.7	2.0	2.7
7	3.2	13.5	11	11.5	70	47	35	24	9.2	2.3	1.6	2.3
8	3.2	12	10	*11.5	80	49	32	19.5	8.8	2.3	1.5	2.3
9	3.7	11.5	9.6	9.6	74	44	28	17.5	8.4	2.3	1.5	2.1
10	4.0	11	9.6	5.0	67	38	25	16.5	7.6	2.3	1.3	2.1
11	5.2	10	10	6.0	56	35	24	14.5	6.9	2.1	1.1	2.0
12	8.0	9.6	11	6.5	*50	33	21	14	6.9	2.0	1.1	2.1
13	8.0	6.0	11.5	6.0	46	33	19.5	15.5	5.8	1.6	1.2	2.1
14	7.6	4.0	11	5.0	44	31	27	14	7.6	1.8	1.3	2.1
15	6.6	3.5	12	5.5	49	30	21	13	13.5	2.0	1.8	1.8
16	5.8	3.0	15	6.5	45	28	19.5	19.5	9.6	1.6	1.8	1.8
17	5.2	3.5	17	7.0	40	28	19.5	19.5	8.4	1.5	1.6	2.0
18	5.2	5.0	16.5	6.0	36	*34	32	7.2	7.2	1.5	1.5	2.0
19	4.9	7.0	15.5	5.0	32	41	32	36	6.6	1.5	1.2	1.8
20	4.6	11.5	14	4.0	27	48	42	63	6.6	1.3	1.2	1.8
21	5.5	21	13.5	4.0	26	56	47	86	6.2	1.3	1.5	2.0
22	6.2	29	12	3.5	24	59	44	67	5.5	1.3	1.6	2.0
23	7.6	35	12	4.0	21	59	45	55	5.2	1.2	2.0	2.1
24	7.6	31	12	6.0	21	54	42	45	4.6	1.3	2.3	2.1
25	7.6	25	14	10	21	47	39	*38	4.5	1.3	2.1	2.5
26	7.2	20	12	30	8.0	44	35	34	4.3	1.3	2.0	2.3
27	6.9	17.5	11	40	5.0	39	31	31	4.0	1.1	2.1	2.3
28	6.6	15	11.5	50	4.0	42	*29	27	3.7	1.2	2.0	2.1
29	8.8	13.5	9.6	59	4.0	40	27	25	*3.4	*1.1	2.0	2.1
30	*11	12.5	10.5	56	-----	74	24	22	3.7	1.1	1.6	2.1
31	10	-----	10.5	45	-----	67	-----	19.5	-----	1.8	*1.5	-----
Total	184.4	408.7	371.8	443.6	1,071.0	1,157.0	974.5	886.0	235.1	59.1	55.9	65.4
Mean	5.95	13.6	12.0	14.3	36.9	37.3	32.5	28.6	7.84	1.91	1.80	2.18
Ac-ft	366	811	737	880	2,120	2,290	1,930	1,760	466	117	111	130
Calendar year 1959: Max	292			Min	1.8	Mean	24.7	Ac-ft	17,890			
water year 1959-60: Max	86			Min	1.1	Mean	16.2	Ac-ft	11,720			

Peak discharge (base, 400 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-19, Jan. 1-6, 10-28, Feb. 26 to Mar. 6.

## 165. East Fork Touchet River near Dayton, Wash.

Location.--Lat 46°16'45", long 117°54'05", in NW¼NW¼ sec.11, T.9 N., R.39 E., 50 ft upstream from Dayton water-supply headworks, three-quarters of a mile downstream from mouth of Wolf Creek, 3 miles upstream from confluence with South Fork, and 4 miles southeast of Dayton.

Drainage area.--102 sq mi.

Records available.--April 1941 to September 1951, September 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,868.3 ft above mean sea level (river-profile survey). April 1941 to September 1951 at site 200 ft upstream at same datum.

Average discharge.--14 years, 124 cfs (89,770 acre-ft per year).

Extremes.--Maximum discharge during year, 330 cfs Mar. 30 (gage height, 1.70 ft); maximum gage height, 2.46 ft Jan. 4 (backwater from ice); minimum discharge, 15.5 cfs Jan. 9 (gage height, 0.92 ft), result of freezeup.  
1941-51, 1956-60: Maximum discharge, 1,530 cfs about Jan. 7, 1948 (gage height, 5.28 ft, from recorded range in stage); minimum, that of Jan. 4, 1960.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. No regulation. Small diversions above station for irrigation during summer months. City of Dayton diverts about 1.2 mgd in summer and 0.4 mgd in winter for municipal water supply at 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 Mar. 30		Mar. 31 to June 24		June 24 to Sept. 30	
0.9	13	1.2	60	1.1	38
1.0	30	1.4	165	1.2	55
1.1	61	1.7	330	1.3	73
1.3	150				
1.7	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	53	96	87	50	136	50	283	183	159	62	64	50
2	53	96	87	55	141	40	258	183	153	60	57	50
3	53	114	*96	60	136	50	258	177	153	60	57	50
4	49	118	92	60	128	70	*263	177	147	59	53	57
5	49	110	87	69	132	96	274	171	136	57	52	57
6	49	110	82	74	136	114	280	159	131	55	52	52
7	53	100	82	*74	200	105	274	171	120	53	50	50
8	53	100	82	74	222	100	263	165	105	53	50	48
9	69	96	82	57	245	110	247	165	84	52	48	48
10	61	96	82	25	244	110	219	165	83	53	48	48
11	78	96	82	30	*236	114	201	177	78	52	46	48
12	69	96	82	30	218	118	183	171	73	52	46	48
13	61	82	82	30	200	123	171	159	68	53	46	48
14	61	92	78	40	190	118	177	147	78	52	46	46
15	57	92	78	69	195	123	165	136	94	50	48	46
16	57	70	92	69	186	123	153	177	78	48	50	48
17	53	60	92	65	177	*132	147	171	68	48	48	48
18	53	78	87	30	172	136	171	171	64	48	46	46
19	53	82	87	25	168	146	183	159	64	48	45	45
20	53	92	87	20	164	172	a200	171	68	48	46	46
21	57	136	82	25	159	200	a240	189	68	48	46	46
22	61	146	78	30	154	231	a220	189	68	48	50	46
23	61	169	78	50	150	258	a210	195	64	48	50	46
24	57	146	82	92	150	258	201	195	64	48	52	48
25	57	123	82	96	146	244	201	*195	66	46	50	50
26	57	105	78	105	128	244	201	189	64	46	50	46
27	57	100	74	110	30	236	*230	183	64	46	52	46
28	65	96	74	110	40	226	213	171	64	*46	52	46
29	*92	92	69	136	40	218	195	165	*64	48	52	46
30	96	87	69	150	---	303	189	165	64	50	50	45
31	96	---	69	146	---	290	---	165	---	50	*48	---
Total	1,893	3,075	2,541	2,056	4,627	4,858	6,450	5,356	2,664	1,587	1,554	1,444
Mean	61.1	102	82.0	66.3	160	157	215	173	88.8	51.2	50.1	48.1
Cfs/m	0.599	1.00	0.804	0.650	1.57	1.54	2.11	1.70	0.871	0.502	0.491	0.472
In.	0.69	1.12	0.93	0.75	1.69	1.77	2.35	1.95	0.97	0.58	0.57	0.53
Ac-ft	3,750	6,100	5,040	4,080	9,180	9,640	12,790	10,620	5,280	3,150	3,080	2,860

Calendar year 1959: Max 390 Min 46 Mean 122 Cfs/m 1.20 In. 16.21 Ac-ft 88,190  
Water year 1959-60: Max 303 Min 20 Mean 104 Cfs/m 1.02 In. 13.90 Ac-ft 75,570

Peak discharge (base, 700 cfs).--No peak above base.

\* 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. 16, 17, Jan. 1-4, 10-14, 18-23, Feb. 27 to Mar. 4.

## 170. Touchet River at Bolles, Wash.

Location.--Lat 46°16'30", long 118°13'15", on line between secs.7 and 8, T.9 N., R.37 E., on right bank just downstream from bridge on State Highway 3 E, a quarter of a mile southeast of Bolles and 3 miles west of Waitsburg.

Drainage area.--372 sq mi.

Records available.--February 1924 to October 1929, April 1951 to September 1960. Monthly discharge only for February and March 1929, published in WSP 1318.

Average discharge.--14 years (1924-29, 1951-60), 220 cfs (159,300 acre-ft per year).

Gage.--Water-stage recorder. Altitude of gage is 1,150 ft (from topographic map). Prior to Oct. 5, 1929, water-stage recorder at site half a mile upstream at different datum. Apr. 1 to May 6, 1951, staff gage at present site and datum.

Extremes.--Maximum discharge during year, 1,220 cfs Mar. 30 (gage height, 6.69 ft); minimum, 27 cfs Sept. 19 (gage height, 4.07 ft).  
1924-29, 1951-60: Maximum discharge, 4,470 cfs Jan. 13, 1928 (gage height, 7.04 ft, site and datum then in use); minimum, 1.4 cfs July 30, 1926 (gage height, 0.42 ft, site and datum then in use).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diurnal fluctuation and some regulation at low flow caused by operation of flour mill at Waitsburg. Numerous small diversions for municipal and domestic use and for irrigation.

Revisions (water years).--WSP 1448: 1952-53(M), 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 Jan. 5

Jan. 6 to Sept. 30

4.2	53	5.0	280	4.0	18	5.0	295
4.4	96	5.5	490	4.1	31	5.5	525
4.7	177			4.3	69	6.0	800
				4.6	152	6.5	1,100

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	82	104	143	80	310	80	740	327	248	61	52	36
2	78	104	134	70	300	70	602	311	233	61	63	36
3	73	118	*165	70	280	100	550	303	225	56	45	36
4	69	154	134	80	260	114	*515	291	211	56	46	48
5	67	140	118	100	250	137	520	271	194	54	43	52
6	69	137	118	120	300	296	525	251	178	48	41	45
7	78	129	124	120	400	424	510	299	168	48	38	45
8	71	121	*116	116	500	562	485	287	158	46	38	43
9	96	116	111	100	700	331	460	267	143	45	36	41
10	96	111	108	60	600	307	412	267	134	45	34	40
11	148	106	114	65	*540	287	371	279	122	45	34	41
12	148	104	126	70	460	279	335	291	114	43	33	38
13	118	70	126	70	412	291	307	295	105	40	33	38
14	104	70	116	65	376	275	384	263	114	41	31	38
15	98	80	132	90	425	267	327	240	187	41	34	36
16	96	60	151	100	376	263	291	319	155	43	40	31
17	87	70	162	100	344	*299	279	327	149	41	38	33
18	84	80	162	80	315	344	327	358	125	41	36	31
19	80	100	154	60	283	376	420	353	114	38	34	30
20	82	114	145	50	255	435	540	475	116	40	34	30
21	98	264	140	60	233	515	636	580	111	38	36	31
22	118	398	132	70	208	608	602	505	100	40	40	33
23	121	454	129	85	178	668	580	450	92	38	40	33
24	111	400	132	100	184	652	535	402	84	41	46	34
25	106	336	151	110	178	592	490	*366	76	41	45	43
26	101	250	126	100	120	586	445	335	74	40	41	41
27	96	219	114	80	70	555	412	323	69	38	43	40
28	111	290	121	100	60	565	*402	303	65	38	41	38
29	*124	171	108	287	70	515	362	285	*65	*36	40	38
30	114	154	100	330	-----	1,060	340	267	61	26	38	38
31	106	-----	90	320	-----	938	-----	263	-----	41	*34	-----
Total	3,030	5,014	4,000	3,308	8,987	12,591	13,704	10,151	3,990	1,360	1,227	1,137
Mean	97.7	167	129	107	310	406	457	327	133	43.9	39.6	37.9
Ac-ft	6,010	9,950	7,930	6,560	17,830	24,970	27,180	20,130	7,910	2,700	2,430	2,260

Calendar year 1959: Max 1,490 Min 34 Mean 221 Ac-ft 159,700  
Water year 1959-60: Max 1,060 Min 30 Mean 187 Ac-ft 135,900

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

\* Discharge measurement made on this day.  
Note.--No gage-height record Jan. 6, 7, Jan. 30 to Feb. 11; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations. Stage-discharge relation affected by ice Nov. 13-19, Dec. 30 to Jan. 5, Jan. 9-28, Feb. 26 to Mar. 2 (no gage-height record Jan. 4, 5, 13-25; discharge estimated on basis of weather records and records for nearby stations).

## 185. Walla Walla River near Touchet, Wash.

Location.--Lat 46°01'45", long 118°43'40", in NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec.6, T.6 N., R.33 E., on left bank  $\frac{2}{3}$  miles southwest of Touchet and 3 miles downstream from Touchet River.

Drainage area.--1,660 sq mi, approximately.

Records available.--October 1951 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 405 ft (from topographic map). Prior to Nov. 27, 1951, staff gage at same site and datum.

Average discharge.--8 years, 596 cfs (431,500 acre-ft per year).

Extremes.--Maximum discharge during year, 3,010 cfs Jan. 30 (gage height, 6.96 ft); minimum, 2.1 cfs Aug. 15 (gage height, 1.63 ft).

1951-60: Maximum discharge, 16,300 cfs Feb. 2, 1952 (gage height, 12.10 ft), from rating curve extended above 8,000 cfs on basis of contracted-opening measurement at gage height 13.81 ft; minimum, that of Aug. 15, 1960.

Maximum stage known, 13.81 ft in February 1949, from floodmarks (discharge, 23,800 cfs).

Remarks.--Records good except those below 25 cfs or those for periods of ice effect, which are fair. Many diversions above station for irrigation. Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.6	1.5	2.2	43	4.0	590
1.7	3.5	2.5	90	5.0	1,220
1.8	7.0	3.0	200	6.0	2,060
2.0	21	3.5	360	7.0	3,050

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	418	332	530	450	1,040	390	2,140	696	540	22	7.0	*18.5
2	364	320	495	350	975	380	1,760	680	472	17	12	19.5
3	324	324	505	330	975	400	1,480	620	400	17	31	19.5
4	288	432	*505	350	852	450	1,360	585	356	20	14.5	20
5	267	432	463	392	816	500	1,330	545	296	20	12	32
6	252	404	450	468	1,000	575	1,390	481	237	20	10	49
7	246	392	463	490	1,320	1,210	1,330	580	192	14	7.6	44
8	252	368	458	486	2,080	1,500	1,280	690	170	11	7.0	42
9	249	348	445	*454	2,380	1,240	1,210	615	146	10.5	6.0	39
10	270	336	432	409	2,100	1,110	1,070	590	128	10	7.8	37
11	296	328	427	390	1,870	1,020	926	610	120	10	6.3	37
12	486	340	432	370	*1,500	947	816	610	104	11	6.6	42
13	445	302	450	350	1,280	926	696	600	88	8.8	7.0	42
14	384	282	427	330	1,160	898	738	575	87	8.8	6.3	46
15	336	260	440	330	1,200	816	714	463	182	8.2	7.0	43
16	306	250	505	340	1,180	810	630	472	225	8.2	8.8	33
17	292	280	560	350	1,090	798	555	605	182	7.0	8.2	32
18	273	348	570	340	1,010	898	575	610	155	6.6	10	30
19	258	388	560	320	940	*996	738	702	112	5.2	8.2	28
20	240	427	545	300	846	1,140	822	828	92	4.6	6.6	24
21	255	476	535	300	786	1,380	1,320	1,640	90	4.2	6.6	22
22	292	961	520	300	738	1,680	1,300	1,520	92	4.6	6.3	24
23	540	1,310	495	310	670	1,790	1,260	1,340	83	4.9	8.2	32
24	500	1,510	495	330	625	1,780	1,210	1,150	67	5.2	10.5	33
25	432	1,200	545	388	645	1,640	1,150	1,050	51	6.3	14	43
26	388	940	540	463	595	1,580	1,050	*933	43	6.6	18	47
27	352	774	490	615	490	1,480	940	940	39	8.2	18.5	44
28	328	675	481	690	450	1,480	912	834	36	6.6	18	43
29	376	820	481	905	400	1,380	*828	750	33	*5.2	22	44
30	364	575	472	1,510	-----	2,060	750	690	*28	4.6	20	45
31	*344	-----	468	1,170	-----	2,620	-----	605	-----	4.9	20	-----
Total	10,417	15,934	15,184	14,580	31,013	35,874	32,280	23,589	4,846	301.2	351.8	1,052.5
Mean	336	531	490	470	1,069	1,157	1,076	761	162	9.72	11.3	35.1
Ac-ft	20,660	31,600	30,120	28,920	61,510	71,160	64,030	46,790	9,610	597	698	2,090

Calendar year 1959: Max 4,620 Min 5.8 Mean 679 Ac-ft 491,500

Water year 1959-60: Max 2,620 Min 4.2 Mean 507 Ac-ft 367,800

Peak discharge (base, 3,000 cfs).--Jan. 30 (4:30 a.m.) 3,010 cfs (6.96 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 15-17, Jan. 2-4, 11-24, Feb. 27 to Mar. 4.

## Springs in the Walla Walla River basin, Oreg.-Wash.

Ground-water overflow through many springs on the alluvial fan of the Walla Walla River near Milton-Freewater, Oreg., amounts to about 50,000 acre-ft a year. During irrigation season practically all the overflow is used to water crops on land not served by diversion from the river. A survey made in 1933 listed 57 springs or spring groups in the area, arranged in "inner," "intermediate," and "outer" zones concentric about the apex of the alluvial fan.<sup>1</sup>

The inner zone is 3 to 3½ miles below Milton-Freewater and extends from the vicinity of Nicholas Spring, which is about half a mile east of the Walla Walla River at McCoy Bridge, to springs in the vicinity of Dugger Creek. Within this zone are fully three-fourths of the springs in the Walla Walla River basin. The intermediate and outer zones, each of which contains only a few springs, are about 2 miles and 4 miles, respectively, beyond the inner zone.

In order to bring about a more effective use of the available water supply through a better understanding of the relation between surface- and ground-water supplies in the basin, discharge measurements of each of the principal springs and measurements of ground-water levels in representative wells have been made and the results published periodically since 1932.

Discharge measurements, in cubic feet per second, of springs in Walla Walla River basin, Oreg.-Wash., during water year October 1959 to September 1960†

Springs of the inner zone			
Date	Spring	Location	Discharge (cfs)
Nov. 24	Big Spring Branch (west prong), Oreg.	SE¼NW¼ sec.24, T.6 N., R.35 E., at Ballou residence 75 ft above bridge on county road.	7.48
Apr. 4	.....do.....	.....do.....	6.59
June 7	.....do.....	.....do.....	8.04
Aug. 15	.....do.....	.....do.....	5.92
Nov. 24	Big Spring Branch (east prong), Oreg.	NE¼SW¼ sec.24, T.6 N., R.35 E., above flow line of small reservoir supplying two diversion pumps.	3.03
Apr. 4	.....do.....	.....do.....	2.98
June 7	.....do.....	.....do.....	2.93
Aug. 17	.....do.....	.....do.....	2.08
Nov. 24	Engle Spring, Oreg.	NW¼SE¼ sec.23, T.6 N., R.35 E., total flow at diversion dam.	3.48
Apr. 4	.....do.....	.....do.....	3.29
June 9	.....do.....	.....do.....	3.73
Aug. 15	.....do.....	.....do.....	3.35
Nov. 24	Downing Spring, Oreg.	SE¼SW¼ sec.23, T.6 N., R.35 E., at weir 200 ft below spring orifice.	1.66
Apr. 4	.....do.....	.....do.....	.48
June 7	.....do.....	.....do.....	1.70
Aug. 15	.....do.....	.....do.....	2.28
Nov. 24	Haun Spring, Oreg.	NW¼SE¼ sec.23, T.6 N., R.35 E., at Haun farm 200 ft above highway crossing.	1.59
Apr. 4	.....do.....	.....do.....	1.10
June 7	.....do.....	.....do.....	1.51
Aug. 15	.....do.....	.....do.....	1.74
Springs of the intermediate and outer zones			
Nov. 25	McEvoy Spring, Wash.	SE¼NW¼ sec.10, T.6 N., R.35 E., at McEvoy farm 200 ft above Walla Walla Railway.	3.24
Apr. 4	.....do.....	.....do.....	2.14
June 7	.....do.....	.....do.....	2.41
Aug. 16	.....do.....	.....do.....	3.32
Nov. 24	Lewis Spring, Oreg.	NW¼NW¼ sec.23, T.6 N., R.35 E., below road crossing.	2.31
Apr. 4	.....do.....	.....do.....	1.87
June 7	.....do.....	.....do.....	1.95
Aug. 15	.....do.....	.....do.....	2.20
Nov. 25	Unnamed Spring, Wash.	NW¼NE¼ sec.16, T.6 N., R.35 E., at small diversion structure.	2.24
Apr. 4	.....do.....	.....do.....	2.41
June 7	.....do.....	.....do.....	2.50
Aug. 16	.....do.....	.....do.....	2.04
Nov. 25	East Mud Creek (west prong), Oreg.	SW¼SW¼ sec.22, T.6 N., R.35 E., at two weirs.	1.21
Apr. 4	.....do.....	.....do.....	.64
June 11	.....do.....	.....do.....	1.35
Aug. 17	.....do.....	.....do.....	1.88

† Measurements by Umatilla County deputy watermaster.

<sup>1</sup>Piper, A. M., Robinson, T. W., and Thomas, H. E., Ground Water in the Walla Walla River Basin, Oreg.-Wash.: Supreme Court of the United States, October term 1935, State of Washington vs. State of Oregon, transcript of record, p. 132A, October 14, 1935.

## Springs in the Walla Walla River basin, Oreg.-Wash.--Continued

Discharge measurements, in cubic feet per second, of springs in Walla Walla River basin, Oreg.-Wash., during water year October 1959 to September 1960†--Continued

## Springs of the intermediate and outer zones--Continued

Date	Spring	Location	Discharge (cfs)
Nov. 25	East Mud Creek (east prong), Oreg.	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.22, T.6 N., R.35 E., in diversion ditch 150 ft below diversion dam.	0.90
Apr. 4	...do.....	...do.....	.53
June 11	...do.....	...do.....	.70
Aug. 17	...do.....	...do.....	.68
Nov. 25	East Mud Creek (branch or), Oreg.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.16, T.6 N., R.35 E., near Lockwood dwelling.	2.66
Apr. 4	...do.....	...do.....	.84
June 8	...do.....	...do.....	1.51
Aug. 16	...do.....	...do.....	.62
Apr. 4	South Mud Creek, Oreg..	SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.28, T.6 N., R.35 E., at Von Der Ahe farm.	1.52
June 8	...do.....	...do.....	3.57
Aug. 17	...do.....	...do.....	1.62
Nov. 25	Johnson Creek, Oreg....	SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.29, T.6 N., R.35 E., at two weirs.....	2.34
Apr. 5	...do.....	...do.....	1.09
June 8	...do.....	...do.....	2.11
Aug. 16	...do.....	...do.....	1.52
Nov. 27	Dugger Creek, Oreg.....	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.32, T.6 N., R.35 E., at two weirs.....	5.55
Apr. 5	...do.....	...do.....	2.02
June 8	...do.....	...do.....	6.42
Aug. 16	...do.....	...do.....	2.87
Nov. 25	Schwartz Spring Branch (south prong), Oreg.	SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.23, T.6 N., R.34 E., at weirs.....	3.28
Apr. 5	...do.....	...do.....	1.26
June 9	...do.....	...do.....	2.63
Aug. 16	...do.....	...do.....	1.33
Nov. 25	Schwartz Spring Branch (north prong), Oreg.	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.23, T.6 N., R.34 E., in ditch diverting from spring.	3.81
Apr. 5	...do.....	...do.....	3.02
June 9	...do.....	...do.....	3.07
Aug. 16	...do.....	...do.....	2.68
Nov. 25	South Mud Creek, Oreg..	SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.13, T.6 N., R.34 E., at Krumbaugh farm...	4.72
Apr. 5	...do.....	...do.....	3.79
June 9	...do.....	...do.....	5.13
Aug. 16	...do.....	...do.....	1.56

† Measurements by Umatilla County deputy watermaster.

## 192. Columbia River below McNary Dam, near Umatilla, Oreg.

Location.--Lat 45°56', long 119°20', in NW¼ sec.9, T.5 N., R.28 E., on right bank 1.2 miles downstream from McNary Dam, 2 miles northeast of Umatilla, 2.3 miles upstream from Umatilla River, and at mile 290.8.

Drainage area.--214,000 sq mi, approximately.

Records available.--October 1950 to September 1960. Gage-height records collected at Umatilla since 1876 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 240.04 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (Corps of Engineers bench mark).

Average discharge.--10 years, 192,300 cfs (139,200,000 acre-ft per year).

Extremes.--Maximum discharge during year, 446,000 cfs June 6 (gage height, 27.79 ft); minimum, 84,400 cfs Sept. 7 (gage height, 11.35 ft).

1950-60: Maximum discharge, 818,000 cfs June 2, 1956 (gage height, 36.97 ft); minimum, 50,600 cfs Jan. 29, 1957 (gage height, 8.74 ft).

Flood of June 5, 1894, reached a stage of 44.2 ft, and that of May 31, 1948, reached a stage of about 40 ft, from information by Corps of Engineers.

Remarks.--Records excellent. Some regulation by Franklin D. Roosevelt Lake and by reservoirs in Kootenai, Flathead, Pend Oreille, Spokane, Chelan, Yakima, and Snake River basins. Diurnal fluctuation caused by powerplant and gates at McNary Dam since April 1953. Many diversions for irrigation above station. Records of chemical analyses for the water year 1960 are given in WSP 1744.

Cooperation.--Gage-height record and 13 discharge measurements furnished by Corps of Engineers.

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

11.4	85,100
13.0	108,000
20.0	240,000
28.0	453,000

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	174,000	172,000	188,000	108,000	142,000	90,700	220,000	184,000	347,000	330,000	176,000	103,000
2	169,000	168,000	184,000	108,000	131,000	93,600	204,000	193,000	356,000	341,000	180,000	102,000
3	161,000	169,000	180,000	105,000	128,000	105,000	195,000	195,000	373,000	346,000	183,000	91,400
4	155,000	171,000	181,000	102,000	129,000	106,000	210,000	199,000	396,000	341,000	189,000	89,200
5	152,000	169,000	179,000	104,000	125,000	102,000	220,000	*204,000	432,000	341,000	189,000	86,500
6	143,000	167,000	167,000	106,000	122,000	96,000	241,000	203,000	427,000	343,000	188,000	85,200
7	146,000	160,000	164,000	104,000	122,000	94,800	258,000	199,000	413,000	*341,000	183,000	85,100
8	142,000	161,000	147,000	102,000	127,000	111,000	269,000	208,000	418,000	345,000	180,000	95,300
9	145,000	154,000	136,000	99,500	130,000	115,000	280,000	234,000	415,000	336,000	162,000	98,000
10	143,000	154,000	124,000	99,500	125,000	105,000	292,000	233,000	403,000	312,000	167,000	101,000
11	145,000	146,000	125,000	102,000	*135,000	96,200	289,000	237,000	397,000	312,000	*168,000	100,000
12	151,000	150,000	117,000	101,000	127,000	99,500	235,000	256,000	396,000	306,000	172,000	100,000
13	167,000	136,000	120,000	107,000	126,000	97,200	300,000	304,000	398,000	292,000	160,000	104,000
14	178,000	132,000	116,000	117,000	127,000	98,000	295,000	356,000	397,000	*287,000	151,000	98,000
15	169,000	126,000	118,000	96,800	129,000	100,000	291,000	360,000	400,000	283,000	150,000	99,200
16	167,000	124,000	133,000	112,000	127,000	95,000	287,000	348,000	404,000	275,000	143,000	96,200
17	169,000	122,000	145,000	112,000	108,000	99,600	269,000	340,000	412,000	267,000	145,000	96,500
18	171,000	124,000	134,000	119,000	112,000	104,000	262,000	356,000	405,000	275,000	*143,000	101,000
19	172,000	*119,000	130,000	121,000	106,000	99,600	249,000	339,000	403,000	*267,000	147,000	107,000
20	165,000	120,000	128,000	120,000	104,000	102,000	260,000	341,000	397,000	265,000	130,000	88,500
21	170,000	128,000	127,000	116,000	107,000	*108,000	262,000	350,000	383,000	261,000	125,000	90,300
22	174,000	130,000	*125,000	117,000	105,000	117,000	255,000	352,000	372,000	256,000	128,000	96,400
23	175,000	141,000	124,000	119,000	104,000	129,000	252,000	363,000	361,000	254,000	122,000	97,800
24	186,000	163,000	124,000	119,000	102,000	136,000	243,000	*347,000	349,000	245,000	111,000	107,000
25	202,000	198,000	117,000	116,000	100,000	155,000	238,000	343,000	332,000	238,000	119,000	103,000
26	196,000	205,000	121,000	122,000	97,800	171,000	229,000	330,000	312,000	218,000	116,000	113,000
27	*196,000	211,000	121,000	121,000	103,000	187,000	216,000	330,000	315,000	*224,000	106,000	106,000
28	190,000	206,000	117,000	124,000	97,200	193,000	202,000	328,000	306,000	214,000	105,000	105,000
29	188,000	192,000	115,000	120,000	92,800	197,000	186,000	330,000	304,000	198,000	104,000	*105,000
30	195,000	190,000	109,000	123,000	-----	211,000	177,000	331,000	*317,000	183,000	98,200	108,000
31	185,000	-----	111,000	135,000	-----	214,000	-----	340,000	-----	192,000	97,700	-----
Total	*5,251	*4,708	*4,227	*3,477.8	*3,390.8	*3,828.2	*7,456	*9,033	*11,340	*8,694	*4,537.9	*2,958.6
Mean	169,400	156,900	136,400	112,200	116,900	123,500	248,500	291,400	378,000	280,500	146,400	98,620
Ac-ft	*10,420	*9,338	*8,384	*6,898	*6,726	*7,593	*14,790	*17,920	*22,490	*17,240	*9,001	*5,868
Calendar year 1959:	Max 540,000	Min 97,100	Mean 214,300	Ac-ft 155,200,000								
Water year 1959-60:	Max 432,000	Min 85,100	Mean 188,300	Ac-ft 136,700,000								

\* Discharge measurement made on this day.

† Expressed in thousands.

## 200. Umatilla River above Meacham Creek, near Gibbon, Oreg.

Location.--Lat 45°43', long 118°20', in SW $\frac{1}{4}$  sec. 21, T.3 N., R.36 E., on right bank 0.8 mile downstream from Ryan Creek,  $2\frac{1}{4}$  miles upstream from Meacham Creek, and  $2\frac{1}{2}$  miles northeast of Gibbon.

Drainage area.--125 sq mi.

Records available.--April 1933 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,854.81 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to June 27, 1939, at site 1 mile downstream at datum 43.94 ft lower.

Average discharge.--27 years, 226 cfs (163,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,060 cfs Nov 23 (gage height, 4.51 ft); minimum, 42 cfs July 23.

1933-60: Maximum discharge, 6,660 cfs Dec. 12, 1946 (gage height, 8.84 ft), from rating curve extended above 2,000 cfs by logarithmic plotting; minimum, 28 cfs Sept. 27, 1935, Jan. 9, 1937.

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

Revisions (water years).--WSP 1398: 1933, drainage area at former site.

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

2.4	84	3.5	440	2.1	40	3.0	230
2.5	102	4.0	700	2.3	62	3.5	460
2.7	150	4.5	1,050	2.5	95	4.0	730
3.0	235			2.7	140	4.5	1,050

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	142	142	*174	86	266	a110	652	415	a340	74	70	47
2	120	*140	160	a80	246	a100	580	405	a300	71	58	47
3	107	155	152	a75	216	a100	590	*390	a280	68	52	47
4	98	172	140	a70	*186	a100	658	385	a260	66	51	58
5	89	162	130	a75	192	a150	760	356	a240	65	50	58
6	89	160	122	81	206	a300	778	346	a220	64	49	50
7	93	155	120	82	580	440	760	475	a200	61	48	49
8	89	142	115	88	766	570	718	505	a180	60	48	47
9	128	135	111	84	730	450	658	485	a170	60	48	47
10	132	128	109	84	652	351	550	485	a160	58	47	46
11	187	120	109	90	495	302	490	480	a150	57	47	46
12	217	118	109	84	370	258	*425	460	a140	56	46	45
13	196	102	105	79	302	250	370	420	a130	*56	46	46
14	168	102	99	77	262	234	385	365	a120	56	46	46
15	148	a95	101	74	274	230	338	333	a150	55	50	46
16	132	a90	107	76	250	216	297	410	a140	54	51	45
17	120	a90	109	72	223	226	279	395	a130	52	49	46
18	111	a90	109	a70	206	328	315	440	a120	52	47	45
19	102	a95	107	a70	186	440	400	475	a120	51	46	45
20	104	97	107	a65	171	595	520	610	a110	50	45	45
21	104	205	105	a65	165	808	658	802	*109	50	45	46
22	222	502	103	a65	152	917	590	694	a100	*50	49	46
23	364	956	101	a65	142	931	530	605	a95	48	*52	46
24	298	736	105	a70	142	886	495	530	a90	47	60	49
25	235	525	109	a80	142	832	450	470	a85	48	54	50
26	199	380	99	a120	130	832	405	480	a80	48	51	*49
27	170	297	95	160	a130	736	380	a550	a80	47	49	48
28	162	242	93	168	a120	700	425	a480	a80	47	48	47
29	158	212	90	346	a110	*622	420	a440	76	46	48	47
30	150	189	93	380		790	410	a400	76	48	48	47
31	145	-----	91	320	-----	766	-----	a360	-----	50	48	-----
Total	4,779	6,734	3,479	3,401	8,012	14,570	15,286	14,446	4,531	1,715	1,546	1,424
Mean	154	224	112	110	276	470	510	466	151	55.3	49.9	47.5
Cfsm	1.23	1.79	0.896	0.880	2.21	3.76	4.08	3.73	1.21	0.442	0.399	0.380
In.	1.42	2.00	1.04	1.01	2.38	4.33	4.55	4.30	1.35	0.51	0.46	0.42
Ac-ft	9,480	13,360	6,900	6,750	15,890	28,900	30,320	28,650	8,990	3,400	3,070	2,820

Calendar year 1959: Max 1,190 Min 43 Mean 227 Cfsm 1.82 In. 24.66 Ac-ft 164,400  
 Water year 1959-60: Max 956 Min 45 Mean 218 Cfsm 1.74 In. 23.77 Ac-ft 158,500

Peak discharge (base, 1,400 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for station at Pendleton and North Fork Walla Walla River near Milton.

## 210. Umatilla River at Pendleton, Oreg.

Location.--Lat 45°40'30", long 118°46'50", in SW $\frac{1}{4}$  sec.2, T.2 N., R.32 E., on left bank at downstream side of SR 8th Street bridge at Pendleton, 7/8 mile downstream from Wild-horse Creek and 3 $\frac{1}{2}$  miles upstream from McKay Creek.

Drainage area.--637 sq mi.

Records available.--February 1891 to July 1892, May 1903 to June 1905 (gage heights and discharge measurements only June to December 1904), October 1934 to September 1960. Monthly discharge only February 1891 to July 1892, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 1,067.01 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. February 1891 to July 1892 and May 22, 1903, to June 11, 1905, staff gage; May 16 to July 2, 1958, and Dec. 12, 1958, to Apr. 23, 1959, wire-weight gage; all at Main Street bridge half a mile downstream at different datums. Oct. 1, 1934, to May 15, 1958, water-stage recorder at site 1,500 ft downstream at datum 4.62 ft lower. Supplementary water-stage recorder at site 900 ft downstream at different datum used for some low-water periods August 1942 to January 1953 and July 3 to Dec. 11, 1958.

Average discharge.--26 years (1934-60), 503 cfs (364,200 acre-ft per year).

Extremes.--Maximum discharge during year, 3,000 cfs Mar. 22 (gage height, 4.86 ft); minimum, 15 cfs Aug. 10.

1891-92, 1903-5, 1934-60: Maximum discharge, 15,400 cfs Feb. 22, 1949 (gage height, 9.01 ft); minimum, 10 cfs July 13-16, 1940.

Maximum flood known, 17,000 cfs Dec. 14, 1882 (date and discharge from data furnished by Corps of Engineers). Flood of May 30-31, 1906, reached a stage of 11.0 ft, 1934-58 site and datum, but before channel was improved (discharge, 15,500 cfs, estimated by Corps of Engineers).

Remarks.--Records good except those for periods of no gage-height record, which are poor. No regulation. Many diversions for irrigation above station.

Revisions (water years).--WSP 1398: 1904, 1937.

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

Oct. 1 to Mar. 22

Mar. 23 to Sept. 30

1.8	118	3.5	900	1.2	21	3.5	900
2.0	160	4.0	1,370	1.5	55	4.0	1,450
2.5	320	4.5	2,100	2.0	148	4.5	2,250
3.0	560	5.0	3,120	2.5	290	4.9	3,090
				3.0	530		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	206	a255	376	153	608	250	1,490	860	736	85	42	36
2	180	a250	344	a140	560	236	1,350	820	644	*84	61	*38
3	158	240	320	a130	500	a230	1,350	768	584	84	47	45
4	140	288	296	a120	430	226	1,480	752	530	77	48	56
5	130	285	268	a130	405	226	*1,680	706	460	70	45	62
6	126	288	250	142	405	341	1,730	*657	415	72	42	56
7	130	285	236	148	740	1,050	820	375	67	43	51	42
8	124	278	226	158	1,380	1,490	1,540	1,020	330	61	*38	42
9	142	257	215	a155	1,630	1,250	1,390	1,020	*298	62	35	42
10	180	246	206	a150	1,610	1,000	1,180	1,000	270	60	33	46
11	212	229	200	a150	1,260	860	1,000	970	241	54	32	43
12	288	215	203	a150	980	750	850	920	232	46	32	38
13	296	203	206	a145	*906	694	720	850	212	47	29	41
14	274	185	188	a140	701	662	728	713	202	48	33	40
15	243	182	182	a140	729	626	*671	632	254	*52	39	42
16	215	178	182	a140	715	602	602	692	*226	50	41	42
17	197	170	188	a135	650	572	554	736	208	43	40	41
18	178	165	*191	a135	596	694	578	850	185	45	35	40
19	*165	162	188	a130	530	956	728	1,020	172	42	36	39
20	158	172	185	a130	465	1,360	920	1,250	161	40	36	36
21	156	212	182	a130	420	2,100	1,440	2,100	150	36	36	39
22	182	592	180	a130	392	2,740	1,480	2,040	144	*38	36	36
23	471	1,630	178	a135	360	2,720	1,350	*1,750	*133	39	42	45
24	608	*1,780	178	a140	336	2,560	1,280	1,480	123	45	52	42
25	508	1,190	191	a150	344	2,210	1,150	1,330	119	38	55	50
26	*420	884	182	a200	316	2,230	1,030	1,240	113	36	48	50
27	360	701	172	a300	278	1,920	950	1,480	105	36	48	42
28	316	579	165	360	271	1,760	950	1,370	101	35	46	45
29	310	485	162	671	268	1,520	930	1,200	93	31	43	43
30	278	425	160	*792	-----	1,620	880	1,010	89	29	40	43
31	264	-----	160	694	-----	1,680	-----	860	-----	40	39	-----
Total	7,613	13,010	6,560	6,524	18,685	37,135	33,561	32,896	7,903	1,592	1,269	1,311
Mean	246	434	212	210	644	1,198	1,119	1,081	263	51.4	40.9	43.7
Ac-ft	15,100	25,800	13,010	12,940	37,060	73,660	66,570	65,250	15,680	3,160	2,520	2,600

Calendar year 1959: Max 5,100 Min 20 Mean 513 Ac-ft 371,700  
 Water year 1959-60: Max 2,740 Min 28 Mean 459 Ac-ft 333,400

Peak discharge (base, 3,500 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records at Pendleton and records for stations above Meacham Creek and at Yakum.

## 225. McKay Creek near Pilot Rock, Oreg.

Location.--Lat 45°33'10", long 118°46'20", in NE¼ sec.23, T.1 N., R.32 E., on left bank 400 ft downstream from county road bridge, three-quarters of a mile upstream from maximum flow line (altitude, 1,322 ft) of McKay Reservoir, 6 miles northeast of Pilot Rock, and 8 miles south of Pendleton.

Drainage area.--178 sq mi.

Records available.--May to August 1921, October 1926 to June 1928, December 1928 to July 1929, October 1929 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 1,335.68 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. May 7 to Aug. 14, 1921, staff gage near present site at different datum. Nov. 19, 1926, to Sept. 15, 1932, and Sept. 16, 1932, to Apr. 8, 1941, water-stage recorder at site 400 ft upstream at datums 1.4 and 4.4 ft higher, respectively.

Average discharge.--32 years (1926-27, 1929-60), 100 cfs (72,400 acre-ft per year).

Extremes.--Maximum discharge during year, 670 cfs Mar. 7 (gage height, 3.76 ft); minimum, 0.1 cfs Aug. 19-23.

1921, 1926-60: Maximum discharge, 6,000 cfs Apr. 1, 1931 (gage height, 10.4 ft, site and datum then in use), from rating curve extended above 1,000 cfs by logarithmic plotting; no flow at times.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No regulation. Many small diversions for irrigation above station.

Revisions (water years).--WSP 1398: 1928-29, 1933, 1940.

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 Sept. 17-30)

Oct. 1 to Mar. 7

Mar. 8 to Sept. 30

1.5	8.5	1.0	0.1	2.0	40
1.7	19	1.1	.3	2.2	55
2.0	45	1.2	.9	2.5	120
2.2	71	1.3	2.0	3.0	270
2.5	125	1.4	3.5	3.5	495
3.0	270	1.5	6.0	4.0	850
3.5	520	1.7	15		

Discharge, in cubic 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	34	50	b25	190	a65	274	152	152	4.5	0.3	0.5
2	16	*32	43	b24	160	a60	260	135	125	4.0	.2	.5
3	14	31	41	b24	135	a60	263	122	106	4.0	.2	.7
4	12	33	38	22	113	a65	266	116	87	3.8	.3	.9
5	11	32	34	22	105	a60	270	112	72	3.4	.3	.8
6	11	31	32	b23	103	109	260	*98	*62	3.4	.4	*.8
7	11	30	30	b24	181	411	235	148	53	3.4	.3	.8
8	11	30	29	b25	260	522	214	263	46	3.0	.3	.8
9	*11	29	27	b25	314	400	188	235	40	2.9	.3	.8
10	11	27	25	b25	454	322	162	200	35	2.8	.3	.8
11	12	26	25	b25	355	266	148	170	29	2.4	.2	.8
12	13	25	25	b25	*270	228	130	152	22	*2.3	.2	.8
13	12	24	28	a25	223	214	114	140	17	2.2	.2	.9
14	12	22	25	b25	199	194	125	122	11	2.0	.2	.9
15	11	22	25	a24	229	182	*114	106	19	2.0	.2	.8
16	11	21	27	a23	229	165	102	125	18	1.6	.2	.9
17	11	20	29	a22	205	160	96	128	16	1.4	.2	.8
18	11	19	30	a22	*181	191	104	158	14	1.3	.2	.9
19	11	19	30	a21	160	242	135	162	12	1.0	.1	.8
20	10	19	30	a20	138	326	145	250	10	.9	.1	.9
21	11	24	29	a20	125	435	191	592	*10	.7	.1	.9
22	14	76	29	b20	113	470	210	574	10	.5	.1	1.0
23	80	211	28	a20	98	455	235	*475	10	.4	.1	1.0
24	98	175	27	a25	92	430	268	386	9.2	*.4	.4	.9
25	82	150	30	a40	92	386	256	330	6.8	.3	.4	1.1
26	68	100	30	103	79	377	238	326	6.8	.3	.4	1.3
27	58	82	27	162	b75	358	214	386	*6.4	.2	.4	1.4
28	49	73	26	*162	a72	358	200	342	5.5	.2	.4	1.1
29	64	64	b26	278	a70	280	182	262	5.0	.2	.4	1.1
30	42	57	b25	270	279	318	165	235	*.2	.2	.4	1.0
31	38	-----	b25	229	-----	310	-----	188	-----	.2	.4	-----
Total	824	1,518	925	1,803	5,020	8,409	5,762	7,210	1,019.9	55.9	8.3	26.7
Mean	26.6	50.6	29.8	58.2	173	271	192	233	34.0	1.80	0.27	0.89
Ac-ft	1,630	3,010	1,830	3,580	9,960	16,680	11,430	14,300	2,020	111	16	53

Calendar year 1959: Max 964 Min 0.4 Mean 103 Ac-ft 74,780  
Water year 1959-60: Max 592 Min 0.1 Mean 89.0 Ac-ft 64,620

Peak discharge (base, 840 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records at Pendleton and records for Umatilla River above Meacham Creek and Birch Creek at Rieth.

b Stage-discharge relation affected by ice.

## UMATILLA RIVER BASIN

## 230. McKay Reservoir near Pendleton, Oreg.

Location.--Lat 45°36'30", long 118°47'40", in SE $\frac{1}{4}$  sec.34, T.2 N., R.32 E., near right end of McKay Dam on McKay Creek, 4 miles south of Pendleton and 5 miles upstream from mouth.

Drainage area.--186 sq mi.

Records available.--December 1927 to September 1960.

Gage.--Staff gage. Datum of gage is 0.16 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Extremes.--Maximum contents observed during year, 68,780 acre-ft June 8 (gage height, 1,317.9 ft); minimum observed, 3,430 acre-ft Sept. 15, 30 (gage height, 1,219.0 ft). 1927-60: Maximum contents observed, 73,840 acre-ft June 9, 1950 (gage height, 1,322.0 ft); minimum observed, 3,050 acre-ft Oct. 1, Nov. 1, Dec. 1, 1935 (gage height, 1,217.6 ft).

Remarks.--Reservoir is formed by gravel-fill dam with concrete facing, completed in 1926; storage began in 1927. Usable capacity, 73,830 acre-ft, between gage heights 1,182.0 (floor of trashrack structure) and 1,322.0 ft (top of spillway gates). Dead storage, about 6 acre-ft, included in records. Water is used for irrigation of lands along Umatilla River near Echo, Stanfield, and Hermiston.

Cooperation.--Gage heights and capacity table furnished by Bureau of Reclamation.

Revisions.--WSP 1154: Drainage area.

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.....	1,224.6	5,190	-
Oct. 31.....	1,228.7	6,640	+1,450
Nov. 30.....	1,236.8	9,740	+3,100
Dec. 31.....	1,242.0	11,920	+2,180
Calendar year 1959.....	-	-	-13,180
Jan. 31.....	1,250.5	15,850	+3,930
Feb. 29.....	1,268.7	26,020	+10,170
Mar. 31.....	1,292.4	43,100	+17,080
Apr. 30.....	1,304.7	54,360	+11,260
May 31.....	1,317.0	67,700	+13,340
June 30.....	1,308.4	58,140	-9,560
July 31.....	1,279.3	35,050	-25,090
Aug. 31.....	1,242.5	12,120	-20,930
Sept. 30.....	1,219.0	3,430	-8,690
Water year 1959-60.....	-	-	-1,760

† Gage height usually read at 4 p.m.

235. McKay Creek near Pendleton, Oreg.

Location.--Lat 45°36'40", long 118°48'00", in SE<sup>1</sup>/<sub>4</sub> sec.34, T.2 N., R.34 E., on right bank 35 ft upstream from irrigation diversion dam, a quarter of a mile downstream from McKay Dam, and 4 miles south of Pendleton.

Drainage area.--186 sq mi.

Records available.--November 1918 to May 1919, October 1919 to September 1923, October 1924 to September 1927, November 1927 to September 1943, April 1944 to October 1947 (irrigation seasons only), March 1948 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder and, since Mar. 23, 1928, concrete control. Datum of gage is 1,163.71 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Apr. 16, 1919, staff gage at site 2 miles upstream at different datum. Apr. 16, 1919, to Sept. 30, 1923, staff gage at site a quarter of a mile upstream at different datum. Oct. 1, 1924, to Jan. 14, 1927, staff gage and Jan. 15, 1927, to Nov. 15, 1948, water-stage recorder, at several sites within 220 ft of present site at various datums.

Average discharge.--23 years (1932-43, 1948-60), 94.9 cfs (68,700 acre-ft per year).

Extremes.--Maximum discharge during year, 440 cfs July 17 (gage height, 1.68 ft); no flow Oct. 1 to Jan. 15, Sept. 17-30. 1918-23, 1924-60: Maximum discharge observed, 3,250 cfs Feb. 10, 1921 (gage height, 4.4 ft, site and datum then in use), from rating curve extended above 1,200 cfs; no flow at times in each year.

Remarks.--Records good above 1.0 cfs and poor below. Flow completely regulated since 1927 by McKay Reservoir (see preceding page). Many diversions for irrigation above station. Since 1932, records have excluded flow in Elder ditch which, since 1953, has diverted not over 3 cfs at station for irrigation during season and up to 1 cfs (seepage from reservoir) for stock water at other times.

Revisions (water years).--WSP 1154: Drainage area. WSP 1398: 1923.

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

-0.1	0	0.5	55
0.0	.3	.7	93
.1	4.7	1.0	170
.2	14	1.5	350
.3	25	2.0	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							2.2	8.0	9.0	370	410	310
2							2.7	8.0	9.0	322	410	318
3							3.3	7.0	8.0	328	375	326
4						1	3.3	8.0	8.0	342	360	322
5							2.7	9.0	8.0	346	350	286
6							3.3	*9.0	8.0	360	*338	*266
7							3.3	9.0	9.0	370	314	249
8				0		1.0	3.3	9.0	49	375	306	260
9						1.0	3.3	9.0	*114	385	314	294
10						*1.0	3.3	9.0	155	365	350	286
11						1.3	3.3	10	173	342	370	278
12						1.3	3.3	10	200	385	385	274
13						1.0	4.7	10	207	415	395	270
14						1.0	7.0	10	228	415	385	274
15						1.0	*7.0	10	167	410	370	96
16					0.5	1.3	8.0	9.0	*158	410	370	.6
17						1.3	7.0	9.0	167	420	365	0
18						1.3	8.0	8.0	140	435	360	0
19						1.3	8.0	8.0	138	*435	360	0
20						1.3	8.0	8.0	176	450	355	0
21						*1.7	9.0	8.0	214	430	334	0
22						1.7	9.0	7.0	290	430	330	0
23				.2		1.3	9.0	7.0	*350	415	260	0
24						1.7	10	8.0	350	405	194	0
25						1.3	10	8.0	350	400	170	0
26						1.7	11	8.0	350	400	253	0
27						1.7	11	*9.0	350	395	294	0
28						1.7	10	9.0	360	395	290	0
29						2.2	11	9.0	360	390	260	0
30						2.2	10	10	365	390	246	0
31						2.7	-----	10	-----	390	266	-----
Total	0	0	0	3.2	14.5	42.0	195.0	270.0	5,470.0	12,098	10,139	4,109.6
Mean	0	0	0	0.10	0.50	1.55	6.50	8.71	182	390	327	137
Ac-ft	0	0	0	6.3	29	85	387	536	10,850	24,000	20,110	8,150
Calendar year 1959: Max	450			Min	0	Mean	117	Ac-ft	85,030			
Water year 1959-60: Max	435			Min	0	Mean	88.4	Ac-ft	64,150			

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 1 to Mar. 7; discharge estimated on basis of records for McKay Reservoir.

## UMATILLA RIVER BASIN

## 250. Birch Creek at Rieth, Oreg.

Location.--Lat 45°39'10", long 118°52'45", in SE $\frac{1}{4}$  sec.13, T.2 N., R.31 E., on right bank 600 ft downstream from highway bridge, a quarter of a mile upstream from mouth, and half a mile southwest of Rieth.

Drainage area.--291 sq mi.

Records available.--May to August 1921, March to July 1922, April to September 1923, April to September 1927, January to June 1928, November 1928 to August 1929, October 1929 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 951.04 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Apr. 4, 1927, staff gage at several sites within 1,400 ft upstream at various datums. Apr. 4, 1927, to Jan. 29, 1928, water-stage recorder and Feb. 3, 1928, to Dec. 16, 1931, staff gage, at site 600 ft upstream at different datum. Dec. 17, 1931, to Dec. 29, 1939, water-stage recorder at site 300 ft upstream at datum 1.64 ft higher and Dec. 30, 1939, to July 24, 1957, at datum 0.78 ft higher.

Average discharge.--31 years (1929-60), 48.1 cfs (34,820 acre-ft per year).

Extremes.--Maximum discharge during year, 351 cfs Mar. 26 (gage height, 2.37 ft); no flow many days in September. 1921-23, 1927-60: Maximum discharge, 1,860 cfs June 17, 1950 (gage height, 7.2 ft, from floodmark, site and datum then in use), from rating curve extended above 570 cfs by logarithmic plotting; no flow at times.

Remarks.--Records good except those below 0.3 cfs and those for periods of ice effect or no gage-height record, which are poor. No regulation. Many diversions for irrigation of 4,000 acres above station.

Revisions (water years).--WSP 984: 1939. WSP 1398: 1929, 1932-33, 1938-39, 1940(M).

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.1	0	1.0	58
.2	.6	1.2	85
.3	3.5	1.5	133
.5	14	2.0	245
.7	28	2.5	390

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	24	26	b18	68	a24	157	131	89	0.4	0.1	0
2	0.6	*23	26	b15	62	22	139	133	76	.4	.1	0
3	.8	22	24	b15	56	24	145	126	66	.4	.1	0
4	.9	22	25	16	51	26	160	124	58	.4	.1	0
5	2.7	24	24	20	49	30	211	115	50	.4	.2	0
6	2.7	24	24	22	48	44	215	*103	36	.2	.1	0
7	3.1	24	24	22	52	115	202	151	27	.2	.1	0
8	*4.2	23	23	b20	*70	202	182	235	19	.2	.1	0
9	6.5	22	22	b15	89	186	173	218	9.0	.1	.1	0
10					95	143	117	197	2.0	.2	.1	0
11	8.5	23	22	b15	89	122	117	171	1.1	.1	.1	0
12	8.5	23	22	b15	80	101	103	151	.9	.1	.1	.1
13	8.5	23	23	b15	74	84	84	141	.8	.1	.1	.1
14	8.5	22	22	a15	69	89	82	117	.8	.1	.1	0
15	8.0	b20	22	a15	66	86	*70	90	1.1	.1	.1	.1
16	*8.5	b19	22	a15	63	80	65	98	.9	.1	.1	.1
17	8.5	18	22	a15	59	74	58	94	.9	.1	.1	.1
18	10	b19	22	a15	58	79	60	100	.9	.1	.1	.1
19	12	b21	22	a15	54	88	76	83	.9	.1	.1	0
20	12	23	22	a15	49	112	78	114	.9	.1	.1	0
21	13	24	22	a15	47	166	80	218	.8	.1	.1	0
22	14	24	21	b15	44	*222	94	225	.8	.1	.1	.1
23	16	24	22	a15	36	240	100	*225	.8	.1	.2	0
24	25	24	22	a16	33	252	101	211	.6	.1	.1	0
25	25	25	23	a18	35	242	106	204	.4	.1	.1	0
26	26	27	22	a25	34	273	106	188	.4	.1	*.1	0
27	25	27	21	50	30	248	108	204	*.4	.1	.1	0
28	25	26	22	*50	a28	242	119	186	.6	.1	.1	0
29	25	26	21	71	a25	193	126	166	.4	.1	.1	0
30	26	21	76	-----	-----	195	120	151	.4	.1	.1	0
31	24	-----	b20	73	-----	179	-----	105	-----	.1	.1	0
Total	360.8	696	698	755	1,613	4,169	3,554	4,755	446.8	5.0	3.3	0.6
Mean	11.6	23.2	22.5	24.4	55.6	134	118	153	14.9	0.16	0.11	0.02
Ac-ft	716	1,380	1,380	1,500	3,200	8,270	7,050	9,430	886	9.9	6.5	1.2

Calendar year 1959: Max 279 Min 0.1 Mean 56.4 Ac-ft 40,870  
 Water year 1959-60: Max 273 Min 0 Mean 46.6 Ac-ft 33,830

Peak discharge (base, 300 cfs).--Mar. 26 (6:30 a.m.) 351 cfs (2.37 ft).

\* Discharge measurement made on this day.  
 a No gage-height record; discharge estimated on basis of weather records at Pendleton and records for McKay Creek near Pilot Rock and Butter Creek near Pine City.  
 b Stage-discharge relation affected by ice.

## 260. Umatilla River at Yoakum, Oreg.

Location.--Lat 45°40'40", long 119°02'00", in SW $\frac{1}{4}$  sec. 2, T. 2 N., R. 30 E., at left bank on downstream side of highway bridge, half a mile northeast of Yoakum,  $\frac{2}{3}$  miles downstream from abandoned Furnish Reservoir, and 11 miles downstream from Birch Creek.

Drainage area.--1,280 sq mi, approximately.

Records available.--May 1903 to September 1960. Published as "above Furnish Reservoir, near Yoakum" October 1916 to September 1934.

Gage.--Water-stage recorder. Datum of gage is 768.21 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. May 5, 1903, to Sept. 30, 1916, staff gage at site 500 ft upstream at different datum. Oct. 1, 1916, to Sept. 30, 1934, water-stage recorder at site 5 miles upstream at different datum. Oct. 1, 1934, to Oct. 20, 1948, water-stage recorder at present site at datum 2.0 ft higher.

Average discharge.--57 years, 677 cfs (490,100 acre-ft per year).

Extremes.--Maximum discharge during year, 3,050 cfs Mar. 23 (gage height, 5.71 ft); minimum, 39 cfs Sept. 19.

1903-60: Maximum discharge, 20,000 cfs May 30, 1906 (gage height, about 15.0 ft, site and datum then in use from floodmarks), from rating curve extended above 6,600 cfs; minimum, 12 cfs Aug. 10-12, 1908, Aug. 4, 1910.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Slight regulation by Furnish Reservoir 1910-34 (capacity, 3,900 acre-ft prior to filling with silt). Flow regulated to some extent since 1927 by McKay Reservoir (see p. 28). Many small diversions for irrigation above station.

Revisions (water years).--WSP 794: 1906(M). WSP 1398: 1904-6, 1908-9, 1922-23, 1926, 1936.

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

Oct. 1 to Mar. 23				Mar. 24 to Sept. 30			
1.5	115	4.0	1,400	1.1	44	3.0	700
2.0	285	5.0	2,300	1.3	71	4.0	1,400
2.5	475	6.0	3,400	1.5	107	5.0	2,300
3.0	720			2.0	230	6.0	3,400
				2.5	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	243	285	414	180	690	a300	*1,750	1,030	901	470	475	329
2	212	271	380	a175	640	282	1,540	1,010	796	430	480	363
3	184	274	358	a170	585	a260	1,540	957	712	400	450	376
4	159	302	338	159	520	a255	1,660	901	646	430	415	405
5	142	320	306	a150	484	a250	1,940	*868	575	425	410	372
6	130	316	288	159	470	352	2,020	808	510	440	400	341
7	127	320	274	162	698	1,130	1,910	950	450	460	363	317
8	124	313	260	173	1,420	1,740	1,810	1,300	395	455	341	297
9	124	299	246	a170	1,760	1,580	1,670	1,300	420	460	329	350
10	152	285	236	a170	*1,820	1,260	1,400	1,260	455	485	363	345
11	212	278	232	a170	1,500	1,040	1,210	1,180	455	*390	400	350
12	288	264	229	a170	1,150	988	1,050	1,100	465	430	420	337
13	320	254	236	173	930	798	894	1,020	450	475	440	337
14	302	232	218	a170	792	780	868	894	470	475	425	317
15	274	a220	*208	a165	792	726	a800	766	485	*480	410	254
16	243	a210	204	a160	798	700	*748	796	425	480	415	80
17	222	a205	204	a155	720	655	a700	856	420	470	410	68
18	201	201	212	a155	660	732	a660	936	363	495	410	60
19	187	a190	208	a155	610	1,020	a700	1,110	305	490	400	55
20	173	a190	212	a150	550	1,430	1,010	1,260	341	485	400	46
21	170	218	204	a150	502	2,110	1,530	2,240	350	480	390	45
22	187	480	208	a150	470	2,730	1,670	2,310	415	480	376	*45
23	394	1,480	201	a150	422	2,860	1,540	2,040	495	465	341	52
24	645	*1,870	204	a160	386	2,800	1,460	1,760	500	460	251	52
25	570	1,320	226	a170	383	2,540	1,340	1,580	490	455	227	56
26	470	954	218	a200	a370	2,540	1,210	1,460	465	445	254	60
27	410	738	201	a300	a340	2,270	1,100	1,710	460	445	341	59
28	358	615	190	410	a320	2,080	1,080	1,630	465	450	341	54
29	341	530	187	670	a310	1,820	1,100	1,450	475	450	317	58
30	310	466	180	900	-----	1,860	1,040	1,230	455	445	277	58
31	296	-----	154	786	-----	1,950	-----	1,050	-----	440	293	-----
Total	8,170	13,900	7,466	7,337	21,092	41,738	38,950	38,762	14,609	14,140	11,564	5,938
Mean	264	463	241	237	727	1,346	1,298	1,250	487	456	373	198
Ac-ft	16,200	27,570	14,810	14,550	41,840	82,790	77,260	76,880	28,990	28,050	22,940	11,780

Calendar year 1959: Max 4,320 Min 75 Mean 678 Ac-ft 491,100  
 Water year 1959-60: Max 2,860 Min 45 Mean 611 Ac-ft 443,600

Peak discharge (base, 3,600 cfs).--No peak above base.

\* Discharge measurement made on this day.  
 a No gage-height record; discharge estimated on basis of weather records at Pendleton and records for stations at Pendleton and near Umatilla.

## UMATILLA RIVER BASIN

320 (corrected). Butter Creek near Pine City, Oreg.  
(Called North Fork Butter Creek on some maps)

Location.--Lat 45°32'40", long 119°18'40", in SW<sup>1</sup>/<sub>4</sub> sec.22, T.1 N., R.28 E., on right bank half a mile downstream from Mattlock Canyon, 6 miles southeast of settlement of Pine City, and 20 miles south of Hermiston.

Drainage area.--291 sq mi.

Records available.--April to June 1928, November 1928 to June 1929, October 1929 to September 1930, January 1931 to September 1932, February to June 1933, October 1933 to September 1941, January to June 1942, October 1942 to September 1960. Prior to October 1945 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Altitude of gage is 1,400 ft (by barometer). Prior to Oct. 1, 1944, at datum 1.1 ft higher and Oct. 1, 1944, to Sept. 6, 1949, at datum 1.0 ft higher.

Average discharge.--28 years (1929-30, 1931-32, 1933-41, 1942-60), 24.2 cfs (17,520 acre-ft per year).

Extremes.--Maximum discharge during year, 350 cfs Mar. 8 (gage height, 3.72 ft); minimum, 0.1 cfs for many days in July and August.  
1928-60: Maximum gage height, 12.4 ft, present datum, Feb. 21, 1949 (discharge not determined); no flow at times.

Remarks.--Records good except those for periods of ice effect, which are poor. No regulation. A few small diversions for irrigation above station. Water is diverted into headwaters of Butter Creek from Pivemile Creek, a tributary of Camas Creek in John Day River basin, for irrigation of 345 acres below station; at times almost 40 cfs is diverted.

Revisions (water years).--WSP 1218: 1950(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 Jan. 1

Jan. 2 to Sept. 30

1.1	3.5	0.8	0.1	1.7	33
1.3	9.5	.9	.4	2.0	58
1.5	18	1.0	1.5	2.5	117
2.0	60	1.1	3.5	3.0	200
		1.3	10	3.5	300
		1.5	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	4.1	6.2	7.7	b6	18	b10	71	32	37	2.3	0.2	0.3
2	4.4	6.2	7.7	b6	16	b10	67	41	30	2.3	.2	.3
3	4.7	6.2	7.7	6.6	16	b10	68	44	*25	2.1	.2	.3
4	4.4	5.9	7.4	7.7	15	b11	71	45	23	1.7	.2	.4
5	4.1	5.9	b6.5	8.0	14	b14	75	*41	20	1.9	.3	.5
6	4.1	5.9	b6	9.1	15	16	75	36	16	1.5	.3	.5
7	4.4	5.9	b6.5	9.4	16	68	74	39	15	1.0	.2	.6
8	4.7	6.5	b6.5	b9	32	202	70	58	13	.6	.2	.6
9	4.7	7.1	7.1	b8	*55	*95	66	51	11	.5	.2	.7
10	4.4	7.1	7.4	b7	48	74	59	44	10	.3	.1	.7
11	5.0	6.6	7.4	b7.5	38	61	54	43	10	.3	.1	.7
12	*5.0	6.8	7.7	b8	32	53	48	39	9.1	.3	.1	.6
13	5.0	6.2	7.7	b7.5	28	51	44	44	8.8	.2	.1	.6
14	5.0	5.9	7.4	7.0	26	51	*43	40	7.7	.2	.1	.7
15	4.7	b5.5	*7.4	b7.5	25	50	40	35	9.1	.2	.1	.8
16	4.4	b5	7.7	b8	23	44	35	34	9.4	.2	.2	.6
17	4.4	b5.5	7.7	b7.5	21	44	31	32	6.6	.2	.2	.6
18	4.7	7.1	7.7	b6.5	20	74	32	33	6.0	.1	.2	.6
19	5.0	7.7	7.7	6.0	20	99	36	30	7.4	.1	.2	.6
20	5.0	8.0	7.7	b6.5	18	107	39	33	7.0	.1	.1	.7
21	5.0	8.0	7.7	b7	18	114	46	86	6.3	.1	.1	.8
22	5.6	8.0	7.4	8.0	18	123	47	80	5.6	.1	.2	1.0
23	5.6	8.3	7.4	8.4	15	118	47	70	3.8	.1	.2	1.0
24	6.8	8.0	8.0	8.8	14	117	47	64	3.8	.1	*.3	1.2
25	6.5	8.0	8.6	9.4	b12	*105	47	60	3.8	.1	.3	1.3
26	5.9	8.0	8.3	11	b10	103	45	56	3.8	.1	.2	1.4
27	6.2	7.4	8.0	14	8.0	94	46	64	3.8	.1	.2	1.3
28	5.9	7.4	7.7	16	9.1	91	42	58	3.3	.1	.2	1.2
29	5.9	7.7	b7.5	*22	b10	71	37	51	2.7	.1	.3	1.2
30	6.2	7.7	7.4	20	-----	91	33	46	2.5	.1	.3	1.4
31	6.2	-----	b7	18	-----	85	-----	42	-----	.2	.4	-----
Total	158.0	205.9	232.5	291.4	610.1	2,257	1,531	1,471	320.5	17.3	6.3	23.2
Mean	5.10	6.86	7.50	9.40	21.0	72.8	51.0	47.5	10.7	0.56	0.20	0.77
Ac-ft	313	408	461	578	1,210	4,480	3,040	2,920	636	34	12	46

Calendar year 1959: Max 196 Min 0.2 Mean 28.7 Ac-ft 20,760  
Water year 1959-60: Max 202 Min 0.1 Mean 19.5 Ac-ft 14,140

Peak discharge (base, 200 cfs).--Mar. 8 (4 a.m.) 350 cfs (3.72 ft).

\* Discharge measurement made on this day.  
b Stage-discharge relation affected by ice.

Principal diversions from Umatilla River between Yoakum  
and Umatilla gaging stations, Oreg.

The following canals divert water from Umatilla River between Yoakum and Umatilla:

270. Furnish Canal, from right bank of Umatilla River in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.31, T.3 N., R.30 E.

290. Umatilla project feed canal, from right bank of Umatilla River in SW $\frac{1}{4}$  sec.22, T.3 N., R.29 E., to feed Cold Springs Reservoir of Bureau of Reclamation.

300 (revised). Allen Canal, from right bank of Western Land Canal, half a mile downstream from headgate of that canal.

305 (revised). Western Land Canal, from left bank of Umatilla River in NE $\frac{1}{4}$  sec.21, T.3 N., R.29 E.; gage is 1 mile downstream from intake.

315 (revised). Maxwell Canal, from right bank of Umatilla River in SW $\frac{1}{4}$  sec.28 T.4 N., R.28 E.; at times it receives water from Cold Springs Reservoir.

325. West Division main canal, from left bank of Umatilla River in SW $\frac{1}{4}$  sec.28, T.5 N., R.28 E.

Water diverted by all of these canals is used for irrigation of lands on both sides of Umatilla River near and below Echo, except that diverted by West Division main canal which is applied to land along Columbia River in vicinity of Irrigon.

Several smaller canals also divert water between Yoakum and Umatilla, but no records for them were obtained.

Records available for 1921-60 water years (incomplete). Monthly discharge only for some periods, published in WSP 1318. Revised figures of discharge for Maxwell Canal (water year 1921) and West Division main canal (water year 1923) published in WSP 1398.

Diversions, in acre-feet, water year October 1959 to September 1960

Month	Furnish Canal	Umatilla project feed canal	Allen Canal	Western Land Canal	Maxwell Canal	West Division main canal
October.....	0	1,910	404	500	0	3,430
November.....	0	10,450	-	0	0	0
December.....	0	11,260	-	0	0	0
January.....	0	2,400	-	0	0	0
February.....	0	12,600	-	0	0	0
March.....	0	11,170	-	2,480	1,150	2,940
April.....	5,560	10,980	919	14,660	4,420	11,350
May.....	6,000	12,780	383	13,220	5,090	11,790
June.....	8,150	2,080	782	15,150	3,370	10,880
July.....	8,930	0	745	15,520	2,110	11,610
August.....	6,700	0	759	13,060	2,210	11,990
September.....	3,500	0	673	6,490	1,370	10,690
Water year 1959-60.....	38,840	75,830	-	81,080	19,720	74,680

Note.--No gage-height record for months of little or no flow and for short periods at other times. Discharge for some periods interpolated or computed on basis of information furnished by watermaster.

## 335. Umatilla River near Umatilla, Oreg.

Location.--Lat 45°54'20", long 119°19'40", in NW $\frac{1}{4}$  sec. 21, T.5 N., R.28 E., on left bank  $\frac{1}{4}$  miles downstream from West Division main canal of Umatilla project,  $\frac{1}{4}$  miles south-east of Umatilla, and 2 miles upstream from mouth.

Drainage area.--2,290 sq mi, approximately.

Records available.--October 1903 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 330.47 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Jan. 26, 1931, staff gage at same site and datum.

Average discharge.--33 years (1927-60), 449 cfs (325,100 acre-ft per year). Years prior to 1927 not included in computation of average discharge owing to increased diversion since 1927.

Extremes.--Maximum discharge during year, 2,770 cfs Mar. 22 (gage height, 4.98 ft); minimum, 0.9 cfs Apr. 19, 20.

1903-60: Maximum discharge, 19,600 cfs May 31, 1906 (gage height, 11.0 ft), from rating curve extended above 11,000 cfs by logarithmic plotting; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Regulation since 1927 by McKay Reservoir (see p. 28). Many diversions above station for irrigation of lands above and below station; Brownell Canal diverts below station. Diversions since 1908 to Cold Springs Reservoir, an off-channel reservoir (capacity, 50,000 acre-ft).

Revisions (water years).--WSP 794: Drainage area. WSP 1398: 1909, 1911, 1914, 1928, 1935.

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

1.5	0.7	2.0	16	3.5	630
1.6	1.6	2.2	34	4.0	1,140
1.7	3.3	2.4	67	5.0	2,810
1.8	6.0	2.6	115		
1.9	10	3.0	290		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	225	210	414	158	820	190	1,360	550	414	3.1	42	76
2	190	190	376	178	590	170	1,180	414	220	5.2	38	72
3	182	174	335	240	534	162	1,070	310	100	4.6	65	69
4	205	158	315	250	470	a180	1,090	*245	31	5.2	56	69
5	182	188	285	245	428	a200	1,210	210	2.8	4.9	46	78
6	*170	205	265	255	376	a400	1,320	150	1.4	11	43	78
7	166	205	245	186	582	a700	1,210	170	*1.4	17	43	76
8	166	205	225	178	1,020	a1,600	1,010	566	1.2	9.6	43	65
9	154	225	215	170	1,600	1,540	840	711	5.9	15	33	65
10	a160	260	210	162	1,680	1,260	657	630	9.2	21	30	74
11	a170	245	200	240	*1,530	1,020	456	566	9.6	34	28	90
12	a300	230	200	330	1,160	860	435	494	12	26	27	90
13	a450	210	200	320	890	738	315	494	13	*6.4	42	74
14	502	205	200	300	747	702	*240	376	14	8.1	49	63
15	478	200	190	310	675	648	225	245	15	23	63	60
16	442	195	186	325	702	622	108	166	14	20	78	60
17	421	205	178	315	657	582	53	275	15	16	290	54
18	400	330	174	305	590	582	15	295	15	15	225	48
19	388	352	170	*290	526	774	1.4	382	14	14	38	34
20	382	250	170	270	463	1,100	82	630	14	14	34	20
21	330	245	170	280	394	1,590	436	1,480	14	14	51	*11
22	305	255	170	290	364	2,280	860	2,050	15	11	49	8.4
23	364	773	170	305	*325	2,480	860	1,820	15	18	58	8.0
24	630	1,730	166	300	290	2,460	810	1,530	14	25	78	6.4
25	693	*1,400	166	300	270	2,240	756	1,350	16	33	78	5.5
26	*606	1,030	162	320	265	2,100	622	1,220	12	25	69	4.6
27	456	792	162	394	255	1,960	534	1,200	10	22	67	4.1
28	358	630	162	510	190	1,640	470	1,270	7.8	20	62	3.8
29	300	542	158	590	182	*1,460	510	1,130	5.0	30	69	3.3
30	255	463	158	900	-----	1,360	478	932	1.9	22	63	3.1
31	225	-----	158	900	-----	1,490	-----	630	-----	26	78	-----
Total	10,255	12,300	6,549	10,096	18,375	35,090	19,213.4	22,491	1,033.0	519.1	2,055	1,373.2
Mean	331	410	211	326	634	1,132	640	726	34.4	16.7	66.3	45.8
Ac-ft	20,340	24,400	12,990	20,030	36,450	69,600	38,110	44,610	2,050	1,030	4,080	2,720
Calendar year 1959: Max	4,510				Min 3.6		Mean 474	Ac-ft 342,800				
Water year 1959-60: Max	2,480				Min 1.2		Mean 381	Ac-ft 276,400				

Peak discharge (base, 3,100 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for station at Toakum.

## 345. Willow Creek at Heppner, Oreg.

Location.--Lat 45°21', long 119°32', in SE $\frac{1}{4}$  sec.35, T.2 S., R.26 E., on right bank at Heppner, 100 ft upstream from Court Street bridge, 800 ft southeast of Morrow County Court-house, and 0.3 mile (revised) downstream from Balm Fork.

Drainage area.--87 sq mi, approximately.

Records available.--May 1951 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,952.73 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--9 years, 21.0 cfs (15,200 acre-ft per year).

Extremes.--Maximum discharge during year, 73 cfs May 21 (gage height, 2.13 ft); no flow for many days July to September.

1951-60: Maximum discharge, 812 cfs May 10, 1957 (gage height, 6.15 ft), from rating curve extended above 230 cfs by logarithmic plotting; no flow at times.

Maximum discharge known, about 36,000 cfs June 14, 1903, by slope-area method.

Remarks.--Records excellent except those for periods of ice effect or doubtful gage-height record, which are good. Many diversions for irrigation of about 500 acres above station. Part of flow of Ditch Creek (John Day River basin) is diverted to Willow Creek above station.

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

Oct. 1 to Mar. 2

Mar. 3 to Sept. 30

0.9	1.9	1.2	12	0.7	0	1.1	6.5
1.0	4.2	1.4	22	.8	.3	1.4	18
1.1	7.4			.9	1.6	1.7	36
				1.0	3.7	2.1	70

Discharge, in cubic 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	3.5	6.7	6.0	12	b9.0	43	25	27	3.2	0.1	0.1
2	4.8	3.5	6.7	b5.0	13	b8.5	41	31	24	2.8	.1	.1
3	4.8	3.7	6.7	b5.0	12	b8.5	42	31	21	2.6	.1	0
4	4.2	3.7	6.0	b5.5	11	9.3	44	*28	18	1.6	.1	0
5	*3.7	4.5	4.5	6.0	9.4	7.9	45	25	16	.9	.1	0
6	3.0	5.7	6.0	6.7	9.0	13	46	23	d12	.7	0	0
7	2.3	6.0	6.7	6.7	13	41	44	39	d9.0	.4	0	0
8	2.1	5.7	5.1	6.4	15	52	42	46	d7.0	.2	0	0
9	2.6	5.7	5.4	b5.5	17	42	40	47	*5.8	.2	0	0
10	2.8	*5.7	5.7	b5.0	20	35	35	47	7.2	.3	0	0
11	3.0	5.7	6.7	b5.5	20	31	32	42	6.5	.2	0	0
12	3.2	5.7	6.7	b6.0	18	28	29	40	3.2	.1	0	0
13	3.2	4.8	6.4	b5.0	17	29	25	41	2.6	*.1	0	0
14	3.0	4.8	*5.4	b4.8	16	29	23	35	3.4	.1	0	0
15	3.0	7.0	6.7	b6.0	16	28	20	32	6.8	.2	0	0
16	2.8	b5.0	6.4	6.7	14	25	17	31	7.6	.1	*0	0
17	2.8	b6.0	6.4	6.4	12	24	17	26	9.0	.2	0	0
18	2.8	6.7	6.4	b6.0	15	27	19	24	8.6	.1	0	0
19	2.8	7.4	6.0	*b6.0	13	32	22	21	7.9	.2	0	0
20	2.8	7.4	6.0	b5.5	12	40	22	36	6.8	.1	0	0
21	2.6	7.8	5.4	b6.0	12	47	24	66	6.2	.1	.1	0
22	3.0	7.8	5.1	b6.0	11	52	24	66	5.8	.1	.1	0
23	5.7	7.8	5.7	b6.0	8.6	52	26	64	5.8	.1	.1	0
24	5.7	8.2	6.7	6.7	9.9	51	29	58	4.2	.1	.2	0
25	5.1	7.4	8.6	7.4	*12	47	29	54	3.4	.1	.1	0
26	4.5	6.7	6.4	9.9	b9.0	46	30	51	3.4	.1	0	0
27	6.4	5.7	5.1	9.0	b8.0	43	29	53	3.7	.1	0	0
28	5.7	7.0	6.0	14	b8.5	45	28	49	4.2	.1	0	0
29	5.7	6.7	b5.0	16	b8.5	38	24	43	4.0	.1	0	0
30	5.7	6.7	6.0	16	-----	53	23	39	3.4	0	0	0
31	4.2	-----	6.7	14	-----	*47	-----	34	-----	.1	0	-----
Total	119.1	180.0	189.3	226.7	371.9	1,040.2	913	1,247	253.5	15.3	1.1	0.2
Mean	3.84	6.00	6.11	7.31	12.8	33.6	30.4	40.2	8.45	0.49	0.04	0.007
Ac-ft	236	357	375	450	738	2,060	1,810	2,470	503	30	2.2	0.4
Calendar year 1959: Max	127				Min 0.1		Mean 20.0		Ac-ft 14,490			
Water year 1959-60: Max	66				Min 0		Mean 12.5		Ac-ft 9,030			

Peak discharge (base, 170 cfs).--No peak above base.

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record; discharge interpolated.

## 348. Rhea Creek near Heppner, Oreg.

Location.--Lat 45°15'30", long 119°38'10", in SW $\frac{1}{4}$  sec.31, T.3 S., R.26 E., on right bank 1.5 miles downstream from Sanford Canyon and 8 miles southwest of Heppner.

Drainage area.--120 sq mi, approximately.

Records available.--August to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,250 ft (from topographic map).

Extremes.--Maximum discharge during period, 2.1 cfs Aug. 26 (gage height, 1.20 ft); minimum, 0.8 cfs Sept. 19.

Remarks.--Records good.

Discharge, in cubic feet per second, 1960														
Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	-	1.9	7	-	1.4	13	-	1.3	19	-	1.2	25	-	1.8
2	-	1.9	8	-	1.4	14	-	1.3	20	-	1.5	26	*2.1	1.9
3	-	1.8	9	-	1.4	15	-	1.2	21	-	1.6	27	2.0	1.8
4	-	1.8	10	-	1.3	16	†2.0	1.2	22	-	*1.5	28	2.0	1.6
5	-	1.8	11	-	1.2	17	-	1.2	23	-	1.5	29	2.0	1.6
6	-	1.5	12	-	1.4	18	-	1.0	24	-	1.6	30	1.9	1.6
												31	1.9	-
Total.....													-	45.2
Mean.....													-	1.51
Runoff in acre-feet.....													-	90

\* Discharge measurement made on this day.

† Result of discharge measurement.

Note.--Result of discharge measurement, 12 cfs June 9, 0.7 cfs July 14.

## 360. Willow Creek near Arlington, Oreg.

Location.--Lat 45°45'00", long 120°00'30", in SW $\frac{1}{4}$  sec.12, T.3 N., R.22 E., on right bank 500 ft downstream from bridge on State Highway 74, 2.9 miles downstream from Eightmile Canyon, 3.6 miles upstream from mouth, and 10 miles east of Arlington.

Drainage area.--850 sq mi, approximately.

Records available.--March to July 1906, August, September 1960. Records for March to August 1905, at site just upstream from Eightmile Canyon, not equivalent owing to difference in inflow.

Gage.--Water-stage recorder and, since Aug. 24, 1960, concrete control. Datum of gage is 291.28 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Mar. 1 to July 21, 1906, staff gage at site 2.6 miles upstream at different datum.

Extremes.--Maximum discharge during period August to September, 0.8 cfs Sept. 28 (gage height, 2.98 ft); no flow Aug. 24 to Sept. 13. 1906, 1960: Maximum discharge observed, 2,100 cfs May 30, 1906 (gage height, 7.8 ft, site and datum then in use), from rating curve extended above 370 cfs by logarithmic plotting; no flow Aug. 24 to Sept. 13, 1960.

Remarks.--Records good. No regulation. Many diversions for irrigation above station. Records given herein do not include water diverted for irrigation in canal just below gage, in which canal the following discharge measurements, in cubic feet per second, were made in the water year 1960:

June 8..... 7.99  
 Aug. 16..... .29  
 Sept. 21..... e.05

e Estimated.

Revisions (water years).--WSP 1518: 1906, drainage area (former site).

Discharge, in cubic feet per second, 1960														
Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	-	0	7	-	0	13	-	0	19	-	0.3	25	0	0.4
2	-	0	8	-	0	14	-	.3	20	-	.3	26	0	.5
3	-	0	9	-	0	15	-	.5	21	-	*.3	27	0	.5
4	-	0	10	-	0	16	-	.5	22	-	.4	28	0	.6
5	-	0	11	-	0	17	-	.4	23	-	.4	29	0	.6
6	-	0	12	-	0	18	-	.4	24	0	.4	30	0	.6
												31	0	-
Total.....													-	7.4
Mean.....													-	0.25
Runoff in acre-feet.....													-	15

\* Discharge measurement made on this day.

Note.--Result of discharge measurement, 6.1 cfs June 8.

375. Strawberry Creek above Slide Creek, near Prairie City, Oreg.

Location.--Lat 44°20', long 118°39', in SW<sup>1</sup>/<sub>4</sub> sec.20, T.14 S., R.34 E., on left bank 100 ft upstream from Slide Creek and 8<sup>1</sup>/<sub>2</sub> miles south of Prairie City.

Drainage area.--7.2 sq mi, approximately.

Records available.--October 1930 to September 1960. Prior to October 1944, published as "above South Fork, near Prairie City."

Gage.--Water-stage recorder and, since Nov. 3, 1948, log control. Datum of gage is 4,909.57 ft above mean sea level, datum of 1929.

Average discharge.--30 years, 12.8 cfs (9,270 acre-ft per year).

Extremes.--Maximum discharge during year, 100 cfs June 6 (gage height, 2.10 ft); minimum, 1.9 cfs Mar. 2, 5.

1930-60: Maximum discharge, 172 cfs June 8, 1948, maximum gage height, 3.23 ft  
May 24, 1956 (backwater from logs); minimum discharge, 1.0 cfs Mar. 20, 1955.

Remarks.--Records good. Some natural regulation by Strawberry Lake. No diversion above station.

Revisions (water years).--WSP 1488: 1932-33.

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

Oct. 1-28		Oct. 29 to Sept. 30	
1.2	4.7	1.1	1.9
1.3	8.5	1.2	4.6
		1.3	8.7
		1.4	14
			2.1
			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	5.7	6.0	4.2	3.0	2.8	3.0	6.5	11	48	25	8.7	4.2
2	5.7	5.0	4.2	3.0	2.8	2.3	5.5	12	68	24	*8.7	4.2
3	5.7	6.0	*4.2	3.0	2.8	2.1	6.5	12	80	22	8.7	4.2
4	5.7	6.0	3.9	3.0	2.8	2.1	7.3	12	78	21	8.2	4.2
5	5.7	5.5	3.9	3.0	2.8	2.1	10	12	74	20	7.7	4.2
6	5.7	5.5	3.9	*3.0	3.0	2.3	13	12	85	20	7.7	3.9
7	5.7	5.5	3.9	3.0	3.0	2.3	16	14	88	*19	7.3	*3.9
8	6.1	5.5	3.9	3.0	3.0	2.1	19	15	80	18	7.3	3.9
9	7.7	5.5	3.9	3.0	2.8	2.1	20	18	70	17	6.9	3.9
10	7.3	5.5	3.6	3.0	2.8	2.1	20	24	64	17	6.5	3.6
11	7.3	5.5	3.6	3.0	*2.8	2.1	18	30	61	16	6.5	3.6
12	7.3	5.0	3.6	3.0	2.8	2.1	17	33	61	15	6.5	3.6
13	7.3	5.0	3.6	2.8	2.8	2.3	17	32	62	15	6.5	3.6
14	7.3	5.0	3.6	2.8	2.8	2.3	16	31	64	14	6.5	3.6
15	7.3	5.0	3.6	2.8	2.8	2.3	15	31	67	14	6.5	3.3
16	7.3	5.0	3.6	2.8	3.0	*2.3	14	31	65	14	6.1	3.3
17	7.3	5.0	3.6	2.8	2.8	2.3	14	31	62	13	6.1	3.3
18	7.3	4.6	3.6	2.8	2.8	2.3	14	31	57	13	5.7	3.3
19	7.3	4.6	3.6	2.8	2.8	2.5	14	31	53	12	5.3	3.3
20	7.0	4.6	3.3	2.8	2.8	2.5	14	31	48	12	5.0	3.3
21	7.0	4.6	3.3	2.8	2.8	3.0	*14	31	42	12	5.0	3.3
22	7.0	4.6	3.3	2.8	2.8	3.6	14	30	38	11	5.0	3.0
23	7.0	5.0	3.3	2.8	2.8	5.0	14	29	35	11	5.0	3.0
24	7.0	4.6	3.3	2.8	3.0	5.7	13	*28	33	11	5.0	3.0
25	7.0	4.6	3.3	2.8	3.0	6.5	13	28	31	11	5.0	3.0
26	7.0	4.6	3.3	2.8	3.0	7.7	12	28	30	10	4.6	3.0
27	7.0	4.6	3.3	2.8	3.0	8.2	12	29	29	9.7	4.6	3.0
28	7.0	4.6	3.0	2.8	3.2	8.2	12	30	28	9.2	4.6	3.0
29	*6.9	4.6	3.0	2.8	3.6	7.7	11	31	27	9.2	4.2	3.0
30	6.5	4.6	3.0	2.8	-----	7.3	11	34	26	9.2	4.2	3.0
31	6.0	-----	3.0	2.8	-----	6.5	-----	40	-----	8.7	4.2	-----
Total	209.1	152.7	110.4	89.2	84.0	114.9	403.8	792	1,654	453.0	189.8	104.7
Mean	6.75	5.09	3.56	2.88	2.90	3.71	13.5	25.5	55.1	14.6	6.12	3.49
Cfsm	0.938	0.707	0.494	0.400	0.403	0.515	1.88	3.54	7.65	2.03	0.850	0.485
In.	1.08	0.79	0.57	0.46	0.43	0.59	2.08	4.09	8.54	2.34	0.98	0.54
Ac-ft	415	303	219	177	167	228	801	1,570	3,280	899	376	208

Calendar year 1959: Max 78 Min 3.0 Mean 11.3 Cfsm 1.57 In. 21.37 Ac-ft 8,200  
Water year 1959-60: Max 88 Min 2.1 Mean 11.9 Cfsm 1.65 In. 22.50 Ac-ft 8,640

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 20-28, Oct. 30 to Nov. 17; discharge estimated on basis of recorded range in stage, weather records, and records for John Day River at Prairie City.

## 385. John Day River at Prairie City, Oreg.

Location.--Lat 44°27', long 118°43', in NE $\frac{1}{4}$  sec.10, T.13 S., R.33 E., on right bank 600 ft upstream from outlet of Prairie power canal, 0.3 mile downstream from Dixie Creek, and 0.8 mile southwest of Prairie City.

Drainage area.--231 sq mi.

Records available.--October 1916 to September 1917 (gage heights only), March 1925 to September 1960. Monthly discharge only March 1925, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 3,496.66 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 30, 1926, staff gage at site 600 ft downstream, just below outlet of Prairie power canal, at different datum. Mar. 30, 1926, to Aug. 23, 1943, staff gages at various sites and datums just above outlet of Prairie power canal.

Average discharge.--28 years (1925-53), 113 cfs, including flow of Prairie power canal (81,810 acre-ft per year).

Extremes.--Maximum discharge during year, 366 cfs Apr. 10 (gage height, 2.22 ft); minimum, 12 cfs July 11.

1925-60: Maximum discharge, 2,100 cfs Mar. 25, 1952 (gage height, 6.27 ft, from floodmark), from rating curve extended above 450 cfs; minimum, 2 cfs Dec. 8, 21, 22, 1932, Aug. 10, 1934.

Remarks.--Records excellent except those for periods of no gage-height record, which are good. No regulation. Many diversions for irrigation above station. Prairie power canal (not used for power since February 1952) diverts water above station in SE $\frac{1}{4}$  sec.7, T.13 S., R.34 E.; water is used for irrigation below former canal gaging station in sec.11, T.13 S., R.33 E., where the following discharge measurements, in cubic feet per second, were made in the 1960 water year:

Oct. 29.....	10.3	July 6.....	2.28
Apr. 21.....	7.44	Aug. 2.....	7.57
May 24.....	24.0		

Revisions (water years).--WSP 1448: 1926-27, 1929-32, 1944, 1950.

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

Oct. 1 to Feb. 26			Feb. 27 to Sept. 30		
1.0	50		0.6	13	1.5 153
1.5	140		.8	29	2.0 300
2.0	270		1.1	68	2.5 455

Discharge, in cubic 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	70	62	62	89	77	180	104	216	45	75	28
2	84	70	62	67	87	84	172	117	189	45	*59	25
3	79	70	*62	64	79	88	180	108	216	44	53	23
4	77	65	59	58	80	94	210	130	261	43	46	27
5	75	65	56	65	86	104	249	115	288	40	38	27
6	75	65	60	*82	86	115	294	113	273	40	34	30
7	77	65	60	72	121	189	315	143	264	*41	33	*30
8	82	65	60	72	162	166	324	161	243	41	29	27
9	91	65	60	68	155	140	330	166	219	43	26	28
10	80	65	60	70	147	119	324	180	189	33	24	29
11	79	60	62	68	*123	117	285	192	169	25	20	31
12	79	60	64	68	111	138	255	207	156	30	16	31
13	77	55	62	62	108	153	228	222	140	32	15	32
14	77	55	62	67	102	149	219	222	136	26	15	33
15	75	60	64	68	104	136	204	201	172	24	19	25
16	75	60	64	70	100	*119	186	210	153	30	23	19
17	74	60	62	67	93	130	175	183	140	31	24	18
18	72	62	62	58	95	148	169	172	133	30	24	19
19	72	62	60	65	91	156	166	166	119	31	23	24
20	72	62	62	75	87	186	164	205	108	29	23	25
21	74	68	60	86	86	219	*166	234	100	26	24	32
22	75	67	60	87	80	243	161	201	96	26	25	38
23	75	72	62	74	70	261	153	201	75	25	28	37
24	74	70	67	72	80	270	146	*198	65	28	65	37
25	74	67	68	72	87	270	138	195	60	37	53	38
26	75	64	62	74	74	279	130	213	60	33	48	41
27	75	64	58	72	70	270	126	252	58	27	46	43
28	80	64	64	75	77	249	113	234	50	33	48	44
29	*79	62	62	119	84	222	110	225	50	39	46	46
30	75	62	70	115	-----	210	104	219	46	48	39	45
31	70	-----	65	95	-----	189	-----	207	-----	56	30	-----
Total	2,382	1,921	1,923	2,289	2,814	5,319	5,976	5,696	4,444	1,081	1,069	932
Mean	76.8	64.0	62.0	73.8	97.0	172	199	184	148	34.9	34.5	31.1
Ac-ft	4,720	3,810	3,810	4,540	5,580	10,550	11,850	11,300	8,610	2,140	2,120	1,850

Calendar year 1959: Max 264

Min 14

Mean 93.8

Ac-ft 67,900

Water year 1959-60: Max 330

Min 15

Mean 97.9

Ac-ft 71,080

Peak discharge (base, 240 cfs).--Mar. 7 (8 p.m.) 267 cfs (1.89 ft); Mar. 26 (1 a.m.) 288 cfs (1.96 ft); Apr. 10 (12:30 a.m.) 366 cfs (2.22 ft); June 5 (10 a.m.) 306 cfs (2.02 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 26-28, Oct. 30 to Nov. 17; discharge estimated on basis of recorded range in stage, weather records, and records for station at Picture Gorge, near Dayville.

405. John Day River at Picture Gorge, near Dayville, Oreg.

Location.--Lat 44°31'15", long 119°37'30" in SW $\frac{1}{4}$  sec.17, T.12 S., R.26 E., on right bank 0.7 mile upstream from Rock Creek and  $\frac{5}{8}$  miles northwest of Dayville.

Drainage area.--1,680 sq mi, approximately.

Records available.--April 1926 to September 1960. Monthly discharge only for April 1926, published in WSP 1318.

Gage.--Water-stage recorder. Concrete control since Sept. 1, 1934. Datum of gage is 2,231.84 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 11, 1926, staff gage and Oct. 11, 1926, to Sept. 30, 1930, water-stage recorder, at same site at datum 0.50 ft higher.

Average discharge.--34 years, 459 cfs (332,300 acre-ft per year).

Extremes.--Maximum discharge during year, 2,090 cfs Mar. 24 (gage height, 7.65 ft); minimum, 6.5 cfs July 18, 19, 29.

1926-60: Maximum discharge, 6,800 cfs Mar. 19, 1932 (gage height, 14.0 ft); minimum, 1 cfs for several days in August and September 1930, Aug. 8, 9, 1936.

Remarks.--Records excellent except those for periods of ice effect, no gage-height record, or shifting control, which are good. No regulation. Many diversions for irrigation above station.

Revisions (water years).--WSP 1218: 1950. WSP 1348: Drainage area. WSP 1448: 1926, 1928, 1932(M), 1936.

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

Oct. 1 to Feb. 8			Feb. 9 to Sept. 30		
2.1	133		1.0	6.0	3.0
3.0	310		1.2	17	4.0
4.0	570		1.5	46	6.0
			2.0	113	8.0
			2.5	194	

Discharge, in cubic 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	208	190	b180	310	220	1,100	427	948	95	33	28
2	236	208	*192	b150	300	240	1,100	452	852	91	*71	31
3	230	208	192	151	280	240	1,140	454	812	92	82	31
4	220	210	186	159	280	260	1,260	496	908	91	77	28
5	206	206	180	160	290	360	1,460	511	815	78	61	30
6		198	174	*196	290	440	1,640	493	804	*71	51	30
7	208	202	190	220	310	700	1,690	532	742	64	43	*27
8	214	204	200	226	400	1,000	1,700	615	686	58	35	24
9	230	202	190	212	850	1,000	1,650	631	616	52	32	27
10	248	202	200	190	752	800	1,700	640	574	45	27	27
11	250	196	200	180	*586	650	1,500	696	517	40	23	28
12	248	194	206	170	481	550	1,350	762	484	33	19	26
13	242	194	202	b160	427	500	1,200	888	460	26	17	25
14	236	182	206	b170	401	650	1,120	846	432	24	17	23
15	232	188	200	176	377	600	1,050	759	446	22	13	21
16	226	196	190	172	354	550	986	756	440	12	12	24
17	220	196	204	b170	322	*481	920	714	401	10	12	25
18	214	188	206	b160	326	640	892	734	380	9.0	12	27
19	212	188	202	153	299	815	885	686	362	7.0	11	30
20	210	192	194	160	300	1,060	*818	696	332	9.5	12	33
21	214	198	188	*b170	320	1,380	784	972	299	9.0	12	31
22	226	212	190	b220	280	1,680	773	902	269	18	12	29
23	228	212	206	230	240	1,940	734	840	240	23	11	27
24	230	216	226	220	240	1,940	696	*801	209	24	13	32
25	222	212	240	210	260	1,900	644	794	176	25	17	28
26	214	206	230	226	220	1,940	595	948	159	21	23	27
27	210	190	188	220	180	1,860	559	1,350	148	22	27	33
28	*212	188	190	248	160	1,680	535	1,260	138	18	29	35
29	212	190	172	320	170	1,450	514	1,150	151	13	28	35
30	212	190	190	342	-----	1,300	452	1,080	109	10	28	35
31	208	-----	b180	292	-----	1,190	-----	1,010	-----	20	28	-----
Total	6,922	5,974	6,104	6,213	10,005	29,896	31,447	23,896	13,819	1,132.5	890	857
Mean	223	199	197	200	345	964	1,048	771	461	36.5	28.7	28.6
Ac-ft	13,750	11,850	12,110	12,320	19,840	59,300	62,370	47,400	27,410	2,250	1,770	1,700

Calendar year 1959: Max 1,160 Min 7.0 Mean 305 Ac-ft 220,500  
 Water year 1959-60: Max 1,940 Min 7.0 Mean 375 Ac-ft 272,000

Peak discharge (base, 1,300 cfs).--Mar. 24 (2:30 a.m.) 2,090 cfs (7.65 ft); Apr. 10 (10 to 11 a.m.) 1,760 cfs (7.01 ft); May 27 (11 a.m.) 1,400 cfs (6.25 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Jan. 29, Feb. 2, 8, 9, Feb. 20 to Mar. 16; discharge estimated on basis of recorded range in stage, weather records, and records for stations at Prairie City and Service Creek. Shifting-control method used Oct. 30 to Dec. 5.

## JOHN DAY RIVER BASIN

420. Camas Creek near Lehman, Oreg.

Location.--Lat 45°10', long 118°44', in SW $\frac{1}{4}$  sec.33, T.4 S., R.33 E., on left bank 2 miles downstream from Bowman Creek and  $3\frac{1}{2}$  miles northwest of Lehman.

Drainage area.--61 sq mi, approximately.

Records available.--October 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 3,969.53 ft above mean sea level (levels by State Highway Department).

Average discharge.--10 years, 49.7 cfs (35,980 acre-ft per year).

Extremes.--Maximum discharge during year, 760 cfs Mar. 25 (gage height, 3.00 ft); minimum, 0.6 cfs Aug. 12-14.

1950-60: Maximum discharge, 1,880 cfs Dec. 21, 1955 (gage height, 4.56 ft), from rating curve extended above 900 cfs by logarithmic plotting; minimum, 0.4 cfs Sept. 1, 2, 5-8, 1955.

Revisions.--The figure of maximum discharge for the water year 1952 has been revised to 1,030 cfs Mar. 8, 1952 (gage height, 3.40 ft), superseding that published in WSP 1248.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. No regulation. A few small diversions for irrigation above station.

Revisions.--Revised figures of discharge, for some peak discharges in the water year 1952, superseding those published in WSP 1248, are given herewith:

Revised peak discharge.--1952: Apr. 5 (9 p.m.) 844 cfs (3.09 ft); Apr. 14 (2:30 a.m.) 712 cfs (2.87 ft); May 8 (6:30 p.m.) 1,030 cfs (3.40 ft).

Rating table, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.1	0.4	0.6	11	1.7	180
.2	1.1	.7	16	2.2	350
.3	2.4	.9	31	2.6	530
.4	4.4	1.1	53		
.5	7.0	1.3	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	5.2	12	*b14	7	5.6	9	192	84	74	4.6	2.9	1.1
2	4.4	11	b14	4.0	5.6	9	222	92	60	4.4	1.6	1.0
3	4.2	12	14	4.4	b5	13	244	84	52	3.9	1.4	3.9
4	3.9	12	12	4.2	5.6	30	250	98	45	3.7	*1.4	3.1
5	3.7	b8	b11	*b4.2	5.6	50	247	96	39	*3.3	1.3	2.2
6	3.7	b9	13	4.9	5.6	120	234	90	33	3.1	1.2	2.0
7	3.9	10	11	5.2	12	180	207	155	29	2.6	1.1	1.3
8	3.9	10	10	5.2	36	220	180	160	27	2.4	1.0	*1.2
9	3.9	9.5	12	b5	39	200	160	144	23	2.2	.9	1.2
10	4.2	9.1	15	b4.6	*b30	220	137	127	21	2.1	.9	1.1
11	11	8.7	28	4.9	b26	240	120	113	22	2.1	.8	1.1
12	14	9.1	22	4.9	23	200	104	111	16	2.1	.7	1.0
13	10	b7	17	b4.6	20	150	92	118	14	2.0	.6	1.3
14	8.3	7.9	13	4.9	18	90	102	106	14	1.7	.7	1.4
15	7.3	7.6	16	4.8	18	50	92	92	20	1.7	1.0	1.2
16	7.0	b7	18	4.8	13	32	88	137	14	1.6	1.4	1.1
17	6.4	7.3	14	4.8	b11	40	66	174	14	1.6	1.2	1.0
18	6.2	7.0	11	4.4	b13	60	136	192	11	1.4	1.0	1.0
19	5.6	7.6	9	4.2	b11	100	*192	160	10	1.4	.9	.9
20	5.6	7.3	10	4.4	b12	180	192	210	9.1	1.3	.9	.9
21	5.9	9.5	10	*4.4	12	*289	183	268	8.7	1.2	.8	.9
22	14	21	10	4.4	b11	384	160	240	8.3	1.1	1.1	.9
23	46	77	12	4.4	b9	468	150	*195	7.6	1.1	1.1	1.0
24	32	69	14	4.4	b10	445	137	165	7.0	1.0	1.4	1.1
25	25	52	12	4.4	b10	493	122	140	6.7	1.3	2.0	1.2
26	20	40	10	4.6	b10	394	116	134	5.9	.9	1.7	1.2
27	17	b30	9	4.4	b8	362	106	174	5.6	.9	1.7	1.2
28	15	b24	9	b4.0	b6	306	106	152	4.9	1.0	1.6	1.1
29	14	b20	9	4.6	7	264	96	127	4.9	.9	1.3	1.0
30	*14	b16	10	4.9	-----	275	90	106	4.6	1.1	1.2	1.0
31	12	-----	10	4.6	-----	216	-----	90	-----	1.3	1.1	-----
Total	339.3	537.6	399	144.5	398.0	6,079	4,543	4,332	611.3	61.0	38.1	36.6
Mean	10.9	17.9	12.9	4.66	13.7	196	151	140	20.4	1.97	1.23	1.22
Ac-ft	673	1,070	791	287	759	12,060	9,010	8,590	1,210	121	76	73
Calendar year 1959: Max	244			Min	0.6	Mean	35.0	Ac-ft	25,340			
Water year 1959-60: Max	483			Min	0.6	Mean	47.9	Ac-ft	34,750			

Peak discharge (base, 420 cfs).--Mar. 25 (6:30 p.m.) 760 cfs (3.00 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Dec. 8 to Jan. 4, Jan. 15-20, Feb. 29 to Mar. 20; discharge estimated on basis of weather records, recorded range in stage, and records for station near Ukiah.

## 425. Camas Creek near Ukiah, Oreg.

Location.--Lat 45°09', long 118°49', in SE $\frac{1}{4}$  sec.3, T.5 S., R.32 E., on right bank 1.2 miles upstream from Cable Creek and 6 miles east of Ukiah.

Drainage area.--121 sq mi.

Records available.--May 1914 to September 1917, November 1919 to July 1920, November 1920 to June 1924, March 1932 to June 1940 (fragmentary), November 1940 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Published as "above Cable Creek, near Ukiah" 1914-17, 1919-24.

Gage.--Water-stage recorder. Datum of gage is 3,588.61 ft above mean sea level (levels by State Highway Department). May 1, 1914, to June 30, 1924, staff gage and Mar. 1, 1932, to July 2, 1940, water-stage recorder, at site 1.2 miles downstream at different datum.

Average discharge.--24 years (1914-17, 1921-23, 1941-60), 103 cfs (74,570 acre-ft per year).

Extremes.--Maximum discharge during year, 1,130 cfs Mar. 25 (gage height, 3.78 ft); minimum, 2.5 cfs Aug. 12, 13, 14, 15, 20, 21.  
1914-17, 1919-24, 1932, 60: Maximum discharge, 2,600 cfs Mar. 18, 1932 (gage height, 5.20 ft, from floodmark), from rating curve extended above 740 cfs; minimum recorded, 1 cfs Aug. 9, 1932, June 24 to July 2, 1940.

Remarks.--Records excellent except those for periods of ice effect, which are fair. No regulation. Diversions for irrigation of 80 acres above station.

Revisions (water years).--WSP 1448: 1916, 1920, 1922(M), 1924.

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. 6

Feb. 7 to Sept. 30

1.5	10	1.3	1.6	2.2	100
1.7	25	1.4	4.5	2.6	225
1.9	47	1.5	9.5	3.0	420
2.1	80	1.6	16	3.5	850
2.3	125	1.9	47		

Discharge, in cubic 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	25	*b36	b18	b16	b24	340	162	214	12	10	4.1
2	14	24	b34	b10	b17	b22	378	169	186	11	8.9	3.7
3	13	24	b30	b11	b15	b40	441	162	162	11	6.3	3.4
4	12	25	b28	b11	b17	69	485	180	137	10	*5.3	7.5
5	11	b20	b26	*b11	b17	77	558	180	115	*9.5	4.5	8.9
6	10	b22	b28	b14	b20	172	546	169	98	11	4.1	6.3
7	11	23	b24	b15	b40	278	498	296	86	8.9	3.7	4.9
8	11	24	b22	b15	b90	384	462	335	73	8.3	3.4	*4.5
9	11	22	b24	b13	b100	350	408	310	60	8.3	3.1	4.5
10	11	21	b32	b11	*b70	372	340	301	53	7.8	3.1	4.1
11	21	21	b60	b12	60	396	283	296	48	7.3	2.8	4.1
12	22	20	48	b12	48	355	237	278	43	7.3	2.8	3.7
13	23	b17	36	b11	43	283	208	261	40	6.8	2.5	4.5
14	21	b20	b28	b11	40	155	218	225	41	6.8	2.8	4.5
15	19	b20	b34	b12	37	75	197	194	50	6.3	4.1	4.1
16	17	b14	37	b13	37	48	172	245	41	5.8	6.3	3.7
17	15	*b15	29	b12	b28	54	169	283	37	5.3	5.8	3.4
18	15	b19	23	b11	b32	109	211	320	32	5.3	4.5	3.1
19	14	b20	b18	b11	b26	199	*283	278	29	4.9	3.7	3.4
20	14	19	b20	b12	b28	325	283	386	27	4.9	2.6	3.4
21	15	19	b20	*b13	29	*525	278	506	25	5.3	2.8	3.4
22	25	28	b20	b13	b24	687	249	489	23	4.5	3.4	3.4
23	98	110	b24	14	b20	850	233	*402	21	4.1	3.7	3.4
24	76	122	b28	13	b26	810	214	350	19	4.1	5.8	3.7
25	54	94	b24	13	b28	824	197	301	17	4.5	7.3	4.1
26	43	80	b20	13	b22	750	190	301	16	4.5	6.3	4.5
27	37	b70	b18	13	b16	669	176	408	15	4.1	5.8	4.5
28	34	b50	b16	b12	b13	588	186	366	14	4.1	5.3	4.1
29	31	b42	b16	14	b14	462	172	320	13	3.7	4.5	3.7
30	*28	b38	b20	15	-----	490	162	278	12	3.7	4.1	3.7
31	26	-----	b20	b14	-----	384	-----	249	-----	4.9	4.1	-----
Total	777	1,068	843	393	971	10,826	8,752	8,980	1,747	206.0	143.6	128.1
Mean	25.1	35.6	27.2	12.7	33.5	349	292	290	58.2	6.65	4.63	4.27
Ac-ft	1,540	2,120	1,670	780	1,930	21,470	17,360	17,810	3,470	409	285	254
Calendar year 1959: Max	410			Min	3.0	Mean	77.4	Ac-ft	56,060			
Water year 1959-60: Max	850			Min	2.5	Mean	95.2	Ac-ft	69,100			

Peak discharge (base, 550 cfs).--Mar. 25 (9 p.m.) 1,130 cfs (3.78 ft); Apr. 5 (9 to 11 p.m.) 624 cfs (3.28 ft); May 21 (10 p.m.) 570 cfs (3.20 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## 440. Middle Fork John Day River at Ritter, Oreg.

Location.--Lat 44°53'20", long 119°08'25", in SW1/4 sec.8, T.8 S., R.30 E., on left bank a quarter of a mile south of Ritter and three-quarters of a mile downstream from Twelvemile Creek.

Drainage area.--515 sq mi.

Records available.--October 1929 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,544.56 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--31 years, 240 cfs (173,800 acre-ft per year).

Extremes.--Maximum discharge during year, 1,380 cfs Mar. 26 (gage height, 5.25 ft); minimum, 12 cfs Dec. 28, result of freezeup.

1929-60: Maximum discharge, 4,000 cfs Mar. 19, 1932 (gage height, 7.78 ft), from rating curve extended above 2,200 cfs; maximum gage height, 8.50 ft Feb. 18, 1949 (ice jam); minimum discharge, 1.0 cfs Dec. 10, 1932, result of freezeup; minimum daily, 2 cfs Dec. 10, 11, 1932.

Remarks.--Records excellent except those for periods of ice effect, which are fair. No regulation. Many small diversions for irrigation of 2,700 acres above station.

Revisions (water years).--WSP 739: 1931. WSP 1218: 1950. WSP 1448: 1930-32, 1937, 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 May 20

May 21 to Sept. 30

2.0	29	4.0	500	1.8	22	3.5	300
2.2	46	4.5	790	2.1	34	4.0	550
2.5	81	5.0	1,180	2.5	71	5.0	1,160
3.0	175	5.5	1,580	3.0	155		
3.5	315						

Discharge, in cubic 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	96	*b80	57	99	b65	660	336	740	76	42	28
2	78	94	b85	b38	93	b75	654	378	740	74	47	28
3	73	93	82	b40	81	b80	741	392	722	69	*40	27
4	69	108	77	b42	78	b100	900	444	698	66	36	28
5	67	88	53	*b50	78	153	1,060	440	644	*66	33	34
6	66	b75	38	b60	86	200	1,160	416	596	62	31	34
7	71	b80	b55	b65	155	336	1,150	525	542	58	28	32
8	77	b85	57	b65	255	332	1,160	666	465	53	26	*30
9	84	84	62	b60	234	270	1,100	606	425	49	26	29
10	88	81	63	48	*212	212	1,100	642	376	47	25	27
11	92	78	b90	b65	157	192	948	702	348	46	24	29
12	101	80	86	b65	132	180	804	714	320	43	23	30
13	93	64	74	58	117	212	696	696	293	40	23	31
14	84	35	58	b55	113	198	666	624	272	38	23	30
15	80	b60	78	b60	115	*188	612	555	320	38	24	29
16	76	b55	76	b60	117	175	555	600	286	34	29	29
17	72	b60	72	b55	90	198	505	575	253	34	34	28
18	69	b70	b65	46	101	332	476	580	214	34	32	28
19	68	b75	b55	b48	101	468	*492	530	192	31	28	28
20	68	73	b55	b50	93	720	464	580	175	30	26	29
21	71	78	50	b55	93	972	476	900	158	30	25	27
22	84	90	49	b60	88	1,140	468	844	143	29	25	27
23	182	108	72	b60	67	1,170	444	*758	133	27	27	27
24	171	142	80	b65	72	1,210	416	704	122	27	32	28
25	136	124	78	b65	b90	1,200	385	662	113	26	51	29
26	117	103	66	b65	81	1,270	368	692	108	27	40	29
27	110	81	39	b70	b70	1,190	354	865	96	28	35	29
28	103	b85	31	93	b50	1,000	346	788	88	32	35	28
29	106	b85	b38	101	b55	804	332	740	86	32	33	27
30	*103	b80	b46	98	-----	860	329	740	81	32	32	27
31	104	-----	b60	99	-----	783	-----	740	-----	32	30	-----
Total	2,853	2,510	1,970	1,918	3,173	16,285	19,821	19,434	9,749	1,310	965	866
Mean	92.0	83.7	63.5	61.9	109	525	681	827	325	42.3	31.1	28.9
Ac-ft	5,660	4,980	3,910	3,800	6,290	32,300	39,310	38,550	19,340	2,600	1,910	1,720
Calendar year 1959: Max	900			Min	16	Mean	198	Ac-ft	143,100			
Water year 1959-60: Max	1,270			Min	23	Mean	221	Ac-ft	160,400			

Peak discharge (base, 760 cfs).--Mar. 26 (6:30 a.m.) 1,380 cfs (5.25 ft); Apr. 8 (7:30 a.m.) 1,240 cfs (5.07 ft); May 21 (1 a.m.) 991 cfs (4.73 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## 460. North Fork John Day River at Monument, Oreg.

Location.--Lat 44°48'50", long 119°25'50", in SE $\frac{1}{4}$  sec.2, T.9 S., R.27 E., on right bank just downstream from entrance to canyon, 0.7 mile downstream from Cottonwood Creek and 0.8 mile west of Monument.

Drainage area.--2,520 sq mi, approximately.

Records available.--March 1925 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 1,959.64 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Nov. 24, 1925, staff gage and Nov. 24, 1925, to Oct. 16, 1928, water-stage recorder, at datum 1.10 ft higher. Oct. 17, 1928, to Sept. 30, 1930, water-stage recorder at datum 1.00 ft higher.

Average discharge.--35 years, 1,208 cfs (874,600 acre-ft per year).

Extremes.--Maximum discharge during year, 7,540 cfs Mar. 24 (gage height, 8.62 ft); minimum, 86 cfs Aug. 15, Sept. 20, 21, 24.

1925-60: Maximum discharge, 22,000 cfs Mar. 18, 1932 (gage height, 14.8 ft), from rating curve extended above 12,000 cfs by logarithmic plotting; minimum, 6 cfs sometime during period Nov. 2-13, 1936 (result of freezeup); minimum daily, 17 cfs Dec. 12, 1932.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are good. Very slight regulation by small reservoirs upstream. Many small diversions for irrigation above station.

Revisions (water years).--WSP 754: 1932(M). WSP 1448: 1927, 1931(M), 1949.

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. 7

Mar. 8 to Sept. 30

3.2	137	5.0	1,360	2.9	70	5.0	1,450
3.6	285	5.5	1,960	3.2	141	6.0	2,800
4.2	635			3.7	335	9.0	8,300
				4.2	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	308	340	b300	240	370	b260	3,490	1,900	3,770	421	147	104
2	290	330	*b320	180	350	b280	3,440	2,090	3,610	397	179	97
3	268	330	326	200	316	303	3,840	2,290	3,480	370	*186	90
4	243	340	281	200	308	326	4,340	2,300	3,310	350	163	88
5	235	360	243	220	321	416	5,060	2,290	2,980	335	141	102
6	224	277	169	260	370	710	5,670	2,220	2,720	*322	130	130
7	220	321	137	*b280	642	1,700	5,780	2,800	2,490	308	119	117
8	243	321	b190	b280	1,670	2,700	5,940	3,980	2,190	290	114	*107
9	247	294	204	281	1,720	1,660	5,730	3,700	1,970	256	107	109
10	285	290	239	256	1,280	1,200	5,240	3,850	1,820	247	97	104
11	326	285	268	216	933	1,030	4,590	4,250	1,710	239	95	95
12	340	281	380	272	*742	940	3,770	4,320	1,640	228	90	95
13	350	272	340	277	658	1,060	3,240	4,180	1,510	216	88	104
14	321	200	280	260	600	1,110	3,140	3,610	1,430	208	88	97
15	294	166	300	231	565	980	2,860	3,090	1,610	204	90	97
16	277	b220	320	247	546	901	2,520	3,310	1,570	201	100	95
17	260	204	320	256	482	*930	2,320	3,310	1,330	186	117	92
18	247	204	300	243	452	1,530	2,280	3,290	1,180	176	133	90
19	239	277	260	235	464	2,140	2,540	2,960	1,050	166	114	88
20	239	303	240	208	428	3,070	*2,460	3,040	950	153	102	88
21	239	298	260	b220	428	4,520	2,650	5,130	865	141	92	88
22	256	308	220	b240	398	5,650	2,520	4,720	784	136	90	88
23	355	326	260	b260	350	6,030	2,430	4,230	730	133	90	88
24	635	532	320	b280	285	6,360	2,320	3,800	682	122	109	88
25	513	628	320	b300	375	6,050	2,130	*3,530	620	117	130	92
26	428	520	260	b300	355	6,280	2,010	3,750	575	109	176	92
27	380	365	160	b300	b200	5,600	1,950	5,370	533	109	150	92
28	*365	316	140	294	b150	5,370	1,920	4,720	496	112	133	92
29	365	b320	150	330	b200	4,230	1,860	4,230	457	125	128	92
30	360	b320	180	532	-----	4,860	1,830	4,000	439	133	117	90
31	345	-----	240	392	-----	4,020	-----	3,850	-----	144	109	-----
Total	9,697	9,548	7,927	8,290	15,968	82,216	99,850	110,110	48,498	6,654	3,724	2,891
Mean	313	318	256	267	551	2,652	3,328	3,552	1,617	215	120	96.4
Ac-ft	19,230	18,940	15,720	16,440	31,670	163,100	198,000	218,400	96,190	13,200	7,390	5,730

Calendar year 1959: Max 4,260 Min 78 Mean 1,012 Ac-ft 732,500  
 Water year 1959-60: Max 6,360 Min 88 Mean 1,208 Ac-ft 804,000

Peak discharge (base, 5,300 cfs).--Mar. 24 (3:30 a.m.) 7,540 cfs (8.62 ft); Apr. 8 (9 a.m.) 6,270 cfs (7.97 ft); May 21 (5 a.m.) 5,830 cfs (7.73 ft); May 27 (10:30 a.m.) 5,780 cfs (7.70 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Dec. 13 to Jan. 6; discharge estimated on basis of weather records and records for John Day River at Service Creek and at Picture Gorge, near Dayville.

## 465. John Day River at Service Creek, Oreg.

Location.--Lat 44°47'40", long 120°00'30", in N $\frac{1}{2}$  sec.18, T.9 S., R.23 E., on left bank 0.2 mile downstream from bridge on State Highway 207, half a mile downstream from Service Creek, and three-quarters of a mile southwest of town of Service Creek.

Drainage area.--5,090 sq mi, approximately.

Records available.--March 1925 to September 1926, October 1929 to September 1960. Monthly discharge only March 1925 to September 1926, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 1,632.42 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Nov. 6, 1929, staff gage at site 12 miles downstream at different datum. Nov. 6-22, 1929, staff gage and Nov. 23, 1929, to Sept. 25, 1930, water-stage recorder, at site 1,000 ft upstream at datum 4.01 ft higher. Sept. 26, 1930, to Feb. 6, 1956, water-stage recorder at site 1,000 ft upstream at datum 3.21 ft higher. Feb. 7, 1956, to Feb. 23, 1957, wire-weight gage at site 500 ft upstream at datum 0.76 ft higher.

Average discharge.--32 years, 1,809 cfs (1,310,000 acre-ft per year).

Extremes.--Maximum discharge during year, 10,300 cfs Mar. 24 (gage height, 8.73 ft); minimum, 93 cfs Aug. 14. 1925-26, 1929-60: Maximum discharge, 28,900 cfs Mar. 19, 1932 (gage height, 16.75 ft, site and datum then in use), from rating curve extended above 11,000 cfs; minimum, 20 cfs Sept. 6, 1931.

Remarks.--Records good. Very slight regulation by several small reservoirs above station. Many 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. 1-25		Oct. 26 to Sept. 30	
3.5	380	2.9	98
3.7	530	3.2	213
4.0	850	3.5	395
		4.0	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	530	595	b600	b440	792	b440	5,080	2,350	4,980	585	168	138
2	506	585	*b550	b460	781	b500	4,880	2,490	4,720	556	177	130
3	482	575	605	b420	770	625	5,180	*2,800	4,520	529	*213	127
4	458	575	556	b380	708	645	5,700	2,820	4,340	493	260	130
5	429	605	484	b380	696	708	6,600	2,890	4,020	467	234	127
6	415	605	459	381	708	1,100	7,420	2,800	3,720	*427	208	124
7	408	529	411	*481	847	1,920	7,850	2,910	3,420	395	190	138
8	415	585	595	585	1,690	4,380	8,080	4,600	3,040	374	172	*141
9	456	575	435	b600	3,300	2,870	7,880	4,560	*2,740	346	157	130
10	450	556	435	b500	2,350	2,140	7,320	4,540	2,480	319	158	130
11	522	*556	484	467	1,840	1,760	6,660	4,900	2,300	307	130	130
12	522	547	529	493	*1,500	1,620	5,740	5,140	2,150	289	111	124
13	*557	558	625	b480	1,290	1,640	4,940	5,380	2,020	271	104	124
14	557	493	575	459	1,180	1,950	4,520	4,880	1,920	*255	98	127
15	522	427	511	427	1,100	1,700	4,580	4,120	1,890	239	101	130
16	490	403	529	467	1,060	1,580	3,920	3,960	2,120	229	108	127
17	474	*475	547	484	976	1,480	3,520	4,380	1,860	218	108	124
18	466	443	547	b460	880	1,900	3,340	4,200	1,690	208	117	120
19	458	467	529	b400	880	2,760	3,480	3,680	1,530	190	134	117
20	450	547	451	*b360	869	3,900	*3,480	3,680	1,400	177	127	111
21	443	556	419	b400	803	5,700	3,560	5,820	1,270	164	111	114
22	458	565	427	b440	792	7,320	3,560	5,920	1,200	145	104	117
23	482	595	381	b500	753	8,100	3,560	5,480	1,100	138	101	*120
24	640	635	459	b550	*869	8,950	3,200	4,880	1,010	134	104	117
25	819	928	635	565	645	8,650	2,950	*4,600	916	138	108	120
26	792	869	585	565	b700	8,920	2,760	4,600	858	134	124	124
27	718	738	502	b550	b600	8,150	2,620	6,480	781	130	172	127
28	665	595	427	556	b460	7,620	2,530	6,600	728	127	168	127
29	645	565	381	595	b400	6,320	2,510	5,860	676	134	157	130
30	645	625	581	696	-----	*6,320	2,570	5,460	825	141	153	130
31	655	-----	467	892	-----	5,920	-----	5,200	-----	177	149	-----
Total	16,489	17,352	15,321	15,436	30,000	117,588	139,390	138,160	66,024	8,456	4,506	3,775
Mean	532	578	494	498	1,054	3,793	4,646	4,457	2,201	272	145	126
Ac-ft	32,710	34,420	30,390	30,620	59,500	233,200	276,500	274,000	131,000	16,730	8,940	7,490

Calendar year 1959: Max 5,780 Min 71 Mean 1,434 Ac-ft 1,038,000  
 Water year 1959-60: Max 6,950 Min 98 Mean 1,564 Ac-ft 1,136,000

Peak discharge (base, 7,300 cfs).--Mar. 24 (11 a.m.) 10,300 cfs (8.73 ft); Apr. 8 (2 p.m.) 8,480 cfs (7.99 ft); May 27 (6 p.m.) 7,460 cfs (7.58 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## 480. John Day River at McDonald Ferry, Oreg.

Location.--Lat 45°35'20", long 120°24'30", in NW¼ sec.11, T.1 N., R.19 E., on left bank at McDonald Ferry, 0.8 mile downstream from Rock Creek and 10 miles east of Klondike.

Drainage area.--7,580 sq mi, approximately.

Records available.--December 1904 to September 1960. Prior to Oct. 1, 1930, published as "at McDonald."

Gage.--Water-stage recorder. Datum of gage is 392.27 ft above mean sea level, datum of 1929. Prior to Aug. 30, 1930, staff gage at same site and datum.

Average discharge.--55 years (1905-60), 2,014 cfs (1,458,000 acre-ft per year).

Extremes.--Maximum discharge during year, 10,100 cfs Mar. 25 (gage height, 6.53 ft); minimum, 66 cfs Aug. 18, 19.

1904-60: Maximum discharge, 27,800 cfs Feb. 6, 1907 (gage height, 10.8 ft); maximum gage height, 13.2 ft Feb. 8, 1950, from floodmark (ice jam); minimum discharge, 4 cfs Aug. 31, 1931.

Maximum discharge known, 39,100 cfs, from rating curve extended above 22,000 cfs, probably occurred in 1894 (gage height, 12.8 ft, from floodmarks).

Remarks.--Records excellent except those for periods of ice effect, which are good. No appreciable regulation. Many diversions for irrigation above station.

Revisions (water years).--WSP 1094: 1894(M), 1932(M). WSP 1448: 1908-9, 1912, 1916, 1920(M), 1922, 1932.

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 Aug. 19 to Sept. 4)

1.0	64	3.0	1,630
1.3	148	4.0	3,200
1.6	275	5.0	5,300
2.0	540	7.0	11,600
2.5	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	764	647	580	b400	773	572	6,020	2,500	5,130	665	126	132
2	692	638	647	508	b900	484	5,250	2,420	4,930	629	122	122
3	647	629	656	439	880	508	5,040	*2,490	4,660	580	155	122
4	612	612	820	478	820	665	5,230	2,780	4,470	564	159	122
5	580	604	620	b420	791	737	5,780	2,870	4,270	524	155	116
6	*564	596	604	372	737	810	6,690	2,940	4,060	492	148	110
7	540	629	508	404	728	880	7,560	2,900	3,740	453	189	105
8	500	647	476	411	791	2,420	7,950	2,920	*3,460	425	181	108
9	492	564	439	492	1,090	4,390	8,070	4,120	3,180	384	159	110
10	500	598	397	540	3,130	3,500	7,920	4,470	2,870	366	148	110
11	548	*620	372	564	2,650	2,750	7,410	4,400	2,580	348	135	116
12	556	580	425	b500	2,240	2,210	6,720	4,710	2,410	324	119	119
13	596	564	508	b460	1,810	2,080	5,820	4,970	2,260	302	108	110
14	638	556	524	468	1,530	1,980	4,950	5,180	2,160	*266	96	108
15	656	556	*612	468	1,370	2,180	4,600	4,820	2,040	270	96	110
16	647	b500	588	b460	1,260	2,180	4,470	4,220	1,940	246	86	108
17	629	b440	540	b420	1,170	1,960	4,040	3,940	2,120	223	*63	102
18	572	478	532	b440	1,130	1,870	3,660	4,290	2,020	210	78	102
19	564	556	556	404	1,080	1,920	3,460	4,080	1,810	202	72	110
20	564	524	556	*b420	990	3,090	3,500	4,000	1,660	198	78	108
21	548	476	556	b420	980	4,080	3,600	3,780	1,500	178	83	108
22	548	548	508	b400	950	5,750	3,600	5,450	1,400	159	81	*110
23	540	572	468	b440	910	7,590	3,700	5,920	1,280	148	94	108
24	540	580	468	b500	*900	8,380	3,500	5,480	1,170	142	96	105
25	556	604	425	b550	830	3,080	3,330	4,950	1,040	135	94	105
26	728	629	425	b600	755	8,980	3,110	4,690	970	132	94	105
27	870	900	572	b600	728	3,040	2,880	4,690	910	129	94	110
28	773	870	620	b600	b650	8,420	2,750	6,360	840	119	99	122
29	701	773	b550	612	b600	7,890	2,630	6,540	764	122	105	122
30	656	629	b460	b550	-----	*6,600	2,580	5,850	719	119	108	126
31	638	-----	b400	b600	-----	6,510	-----	5,400	-----	126	138	-----
Total	18,959	18,115	16,212	14,938	33,173	119,506	145,820	134,130	72,363	9,200	3,579	3,371
Mean	612	604	523	482	1,144	3,855	4,861	4,327	2,412	297	115	112
Ac-ft	37,600	35,930	32,160	29,630	65,800	237,000	289,200	266,000	143,500	18,250	7,100	6,690

Calendar year 1959: Max 5,680 Min 64 Mean 1,515 Ac-ft 1,097,000  
Water year 1959-60: Max 9,080 Min 72 Mean 1,610 Ac-ft 1,169,000

Peak discharge (base, 6,900 cfs).--Mar. 25 (9 a.m.) 10,100 cfs (6.53 ft); Apr. 9 (1 p.m.) 8,380 cfs (6.03 ft); May 28 (6 p.m.) 7,550 cfs (5.73 ft).

\* Discharge measurement made on this day.  
b Stage-discharge relation affected by ice.

## 500. Deschutes River below Snow Creek, near Lapine, Oreg.

Location.--Lat 45°48'50", long 121°46'40", in NW<sup>1</sup> sec.28, T.20 S., R.8 E., on left bank just upstream from Crane Prairie Reservoir, 50 ft downstream from Snow Creek, 300 ft upstream from road bridge, and 17 miles northwest of Lapine.

Drainage area.--132 sq mi including Sparks, Elk, and Mud Lake basins, which have no surface outflow to Deschutes River; hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available.--October 1937 to September 1960. Monthly discharge only October 1937, published in WSP 1318.

Gage.--Water-stage recorder. Altitude of gage is 4,445 ft (from elevation of Crane Prairie Reservoir when slack water extended to gage). Prior to Sept. 10, 1938, at site 450 ft downstream at different datum.

Average discharge.--23 years, 154 cfs (111,500 acre-ft per year).

Extremes.--Maximum discharge during year, 230 cfs Sept. 11 (gage height, 1.75 ft); minimum, 40 cfs sometime during period Dec. 22 to Mar. 2, result of freezeup; minimum daily, 74 cfs Mar. 14-20, Apr. 1.

1937-60: Maximum discharge, 444 cfs July 13, 1956 (gage height, 3.13 ft); maximum gage height, 4.12 ft Jan. 21, 1943 (ice jam); minimum discharge, 40 cfs sometime during period Dec. 22, 1959, to Mar. 2, 1960, result of freezeup; minimum daily, 55 cfs for many days April to June 1941.

Remarks.--Records good except those for period of no gage-height record, which are poor. No regulation. Crater Creek Canal diverts water to Tumalo Creek basin from tributaries of Soda Creek. Stream is spring fed and peak discharge may occur several months after the precipitation which caused it.

Revisions (water years).--WSP 1248: 1951.

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

1.1	56
1.3	112
1.5	165
1.7	215

Discharge, in cubic 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	100	95	80	80	82	74	88	120	142	185	208
2	132	100	95	80	80	*82	77	85	*120	145	185	210
3	129	100	82	80	80	85	77	85	120	148	188	212
4	129	100	82	80	80	85	79	88	118	148	190	210
5	129	97	82	80	80	85	79	88	118	150	190	210
6	126	97	82	80	80	82	79	88	118	150	192	208
7	126	97	82	80	80	88	91	94	118	*150	195	208
8	132	94	82	80	80	85	85	97	118	148	198	208
9	129	81	85	80	80	82	82	97	118	148	200	208
10	126	91	85	80	80	77	82	97	120	148	202	208
11	123	91	85	80	80	77	85	97	120	148	202	210
12	123	*91	88	80	80	77	82	103	118	150	202	210
13	*120	94	88	80	80	77	82	103	115	150	205	*208
14	120	91	88	80	80	74	85	103	115	152	205	205
15	118	91	88	80	80	74	82	100	115	152	205	202
16	115	91	*88	80	80	74	79	103	118	150	*212	200
17	115	88	88	80	80	74	79	106	118	152	212	200
18	112	88	85	80	80	74	79	109	118	152	212	198
19	112	88	85	80	80	74	79	109	120	155	212	195
20	112	85	82	80	80	74	85	123	123	158	210	192
21	112	91	82	80	82	77	85	120	126	158	210	190
22	112	91	82	80	82	77	82	120	126	160	210	190
23	112	91	82	80	82	77	79	120	129	160	212	190
24	112	88	82	80	82	77	79	120	132	162	212	188
25	109	88	82	80	82	77	79	126	134	165	210	188
26	109	88	82	80	82	79	79	126	134	168	210	185
27	109	85	82	80	82	79	82	123	137	170	208	182
28	109	85	82	80	82	79	88	123	140	172	205	180
29	109	85	82	80	82	79	*88	123	140	175	205	178
30	106	85	82	80	-----	77	85	120	140	182	205	178
31	103	-----	82	80	-----	77	-----	120	-----	182	205	-----
Total	3,662	2,742	2,596	2,480	2,338	2,437	2,448	3,304	3,706	4,850	6,294	5,959
Mean	118	91.4	83.7	80.0	80.6	78.6	81.6	107	124	156	203	199
Ac-ft	7,260	5,440	5,150	4,920	4,640	4,830	4,860	6,550	7,350	9,620	12,480	11,820
Calendar year 1959: Max 165 Min 82 Mean 124 Ac-ft 90,030												
Water year 1959-60: Max 212 Min 74 Mean 117 Ac-ft 84,920												

\* Discharge measurement made on this day.

Note.--No gage-height record Dec. 23 to Mar. 1; discharge estimated on basis of weather records at Wickiup Dam.

## 505. Cultus River above Cultus Creek, near Lapine, Oreg.

Location.--Lat 43°49'10", long 121°47'50", near line between secs.20 and 29, T.20 S., R.8 E., on left bank at road crossing, 2 miles upstream from Cultus Creek and 18 miles northwest of Lapine.

Drainage area.--16.5 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available.--October 1922 to September 1925, October 1937 to September 1960. Monthly discharge only for October 1937, published in WSP 1318.

Gage.--Water-stage recorder. Altitude of gage is 4,450 ft (by barometer). Oct. 1, 1922, to Sept. 30, 1925, staff gage at site half a mile upstream at different datum.

Average discharge.--26 years, 64.9 cfs (46,990 acre-ft per year).

Extremes.--Maximum discharge during year, 74 cfs May 14, 15, July 22 to Aug. 7; maximum gage height, 0.74 ft Oct. 1-3; minimum discharge, 26 cfs Nov. 23 to Dec. 4. 1922-25, 1937-60: Maximum discharge, 178 cfs May 31, 1956 (gage height, 1.04 ft); maximum gage height, 1.23 ft Oct. 30, 1952 (backwater from culvert installation); minimum discharge, 26 cfs May 26-31, Nov. 23 to Dec. 4, 1959.

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

Revisions (water years).--WSP 1448: 1923-25, 1947.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1 to Nov. 24)

Oct. 1 to Mar. 1		Mar. 2 to Sept. 30	
0.4	8.0	0.4	32
.5	33	.5	44
.6	64	.6	68
		.7	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	61	30	26	34	38	40	56	46	71	64	74	63
2	61	33	26	34	38	*40	54	46	*71	66	74	63
3	61	36	26	34	38	40	51	46	71	66	74	63
4	61	36	26	34	38	42	46	46	68	66	74	63
5	61	36	28	34	38	40	43	49	63	66	74	63
6	61	36	30	34	38	37	42	49	58	68	74	63
7	61	39	30	34	38	36	42	49	54	*68	74	63
8	58	39	33	34	38	34	40	49	49	68	72	63
9	58	43	36	34	38	33	38	49	44	68	72	63
10	58	46	36	34	38	32	37	61	42	68	72	63
11	55	46	39	36	38	32	37	68	39	68	70	63
12	52	*46	39	38	38	32	37	68	37	68	70	63
13	*52	46	43	36	38	32	37	66	37	68	70	*63
14	49	43	43	36	38	32	37	66	36	68	68	63
15	49	39	46	36	38	32	37	71	37	68	68	63
16	46	39	*46	36	38	32	37	71	37	68	*68	63
17	43	36	43	36	38	33	37	71	38	68	66	63
18	39	33	43	36	38	34	37	68	39	68	66	63
19	39	33	39	36	38	36	39	68	42	71	68	63
20	36	33	36	36	38	37	39	68	44	71	63	63
21	33	30	36	36	40	38	39	68	46	71	63	63
22	33	28	33	36	40	39	39	68	49	74	63	63
23	33	26	33	36	40	42	39	68	54	74	63	63
24	33	26	33	36	40	44	40	68	58	74	63	63
25	30	26	36	36	40	46	42	68	61	74	63	63
26	30	26	36	36	40	49	43	68	63	74	63	63
27	28	26	36	36	40	51	43	68	63	74	63	63
28	28	26	36	36	40	54	46	68	64	74	63	63
29	28	26	33	36	40	54	*46	71	64	74	63	63
30	28	26	33	36	-----	56	46	71	64	74	63	63
31	28	-----	33	36	-----	56	-----	71	-----	74	63	-----
Total	1,393	1,034	1,092	1,096	1,120	1,235	1,246	1,932	1,563	2,165	2,102	1,890
Mean	44.9	34.5	35.2	35.4	38.6	39.8	41.5	62.3	52.1	69.8	67.8	63.0
Ac-ft	2,760	2,050	2,170	2,170	2,220	2,450	2,470	3,830	3,100	4,290	4,170	3,750
Calendar year 1959:	Max	75		Min	26	Mean	50.2	Ac-ft	36,320			
Water year 1959-60:	Max	74		Min	26	Mean	48.8	Ac-ft	35,430			

\* Discharge measurement made on this day.

Note.--No gage-height record Jan. 1 to Mar. 1, June 27 to July 6, Aug. 6-15; discharge interpolated.

510. Cultus Creek above Crane Prairie Reservoir, near Lapine, Oreg.

Location--Lat 43°49'30", long 121°49'30", in SW $\frac{1}{4}$  sec.19, T.20 S., R.8 E., on left bank 1,000 ft upstream from road bridge, three-quarters of a mile downstream from Cultus Lake, and 19 miles northwest of Lapine.

Drainage area--32.2 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available--March to September 1924 (published as "above Crane Prairie, near Lapine"), October 1937 to September 1960. Monthly discharge only October 1937 to September 1949, published in WSP 1318. Records for October 1923 to February 1924, published in WSP 594, have been found to be unreliable and should not be used.

Gage--Water-stage recorder. Altitude of gage is 4,545 ft (by barometer). Mar. 1 to Sept. 30, 1924, staff gage at site 100 ft upstream at different datum.

Average discharge--23 years (1937-60), 23.2 cfs (16,800 acre-ft per year).

Extremes--Maximum discharge during year, 101 cfs June 8 (gage height, 1.94 ft); minimum not determined; minimum daily, 0.1 cfs for many days in October and November.

1924, 1937-60: Maximum discharge, 219 cfs May 26, 1958 (gage height, 2.67 ft); maximum gage height, 2.76 ft June 15, 1950 (backwater from trees); no flow at times.

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

Revisions (water years)--WSP 1568: 1957. 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)

0.3	0	0.8	7.5
.4	.2	1.0	17
.5	.8	1.2	30
.6	2.0	1.5	52
.7	4.0	2.0	109

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.1	0.6	0.6	1.0	6	22	31	76	46	8.3	0.8
2			.6	.6	1.0	*7	25	31	*81	43	7.3	.8
3	.1	.1	.6	.5	1.5	8.5	23	31	84	42	7.5	.8
4	.1	.1	.5	.5	2	11	22	31	90	39	6.8	.9
5	.1	.1	.4	.5	2	12	22	31	94	38	6.4	.9
6	.1	.1	.4	.5	1.5	13	23	31	97	37	6.1	.8
7	.1	.1	.4	.6	1.5	15	24	33	100	*36	5.8	.7
8	.2	.1	.3	.7	2	16	25	34	100	35	5.4	.6
9	.2	.1	.3	.7	4	18	27	35	96	33	4.7	.6
10	.2	.1	.3	.7	8	18	29	37	95	30	4.4	.7
11	.2	.1	.4	.7	10	17	30	39	92	29	4.0	.8
12	.1	**1	.4	.6	9.5	17	31	43	90	26	3.8	.8
13	.1	.1	.4	.5	9	17	31	49	91	25	3.6	.8
14	.1	.1	.4	.5	8.5	16	32	52	89	24	3.2	.8
15	.1	.1	.3	.5	8	16	31	56	91	22	2.8	.7
16	.1	.1	*.3	.5	7	16	34	60	92	21	*2.6	.6
17	.1	.1	.3	.5	6.5	15	32	62	88	19	2.4	.6
18	.1	.1	.3	.5	6	15	32	64	84	16	2.2	.5
19	.1	.2	.3	.5	6	14	32	65	80	15	2.0	.5
20	.1	.2	.3	.5	6	14	32	65	75	14	1.9	.5
21	.2	.2	.4	.5	5.5	13	32	69	71	13	1.6	.4
22	.2	.3	.5	.5	5	13	32	69	68	12	1.6	.4
23	.2	.3	.6	.5	5	13	32	68	64	11	1.6	.3
24	.2	.4	.8	.6	5	13	32	65	62	9.9	1.6	.3
25	.1	.6	1.3	.7	6	12	32	65	60	9.5	1.5	.3
26	.1	.6	1.4	.8	6	12	32	65	57	9.1	1.4	.2
27	.1	.6	1.4	1.0	5.5	12	32	65	54	8.7	1.2	.2
28	.1	.7	1.2	1.0	5	13	32	66	51	8.7	.9	.2
29	.1	.8	1.0	1.0	5	14	*31	66	50	8.7	.9	.2
30	.1	.6	.9	1.0	5	17	31	68	47	9.1	.9	.2
31	.1	-----	.7	1.0	-----	20	-----	72	-----	9.1	.9	-----
Total	4.0	7.1	18.0	19.8	149.0	433.5	876	1,618	2,369	698.8	105.9	16.9
Mean	0.13	0.24	0.58	0.64	5.14	14.0	29.2	52.2	79.0	22.5	3.42	0.56
Ac-ft	7.9	14	36	39	296	860	1,740	3,210	4,700	1,390	210	34

Calendar year 1959: Max 43

Min 0

Mean 11.8

Ac-ft 8,530

Water year 1959-60: Max 100

Min 0.1

Mean 17.3

Ac-ft 12,540

\* Discharge measurement made on this day.

\*\* Field estimate made on this day.

Note.--No gage-height record Oct. 1-12, Oct. 14 to Nov. 11, Feb. 25 to Mar. 1; discharge estimated on basis of weather records at Wickup Dam and records for Deer Creek above Crane Prairie Reservoir, near Lapine and Odell Creek near Crescent. Stage-discharge relation affected by ice Nov. 27, 29, Dec. 3-10, 12-22, Dec. 29 to Feb. 24, Mar. 1, 2.

520. Deer Creek above Crane Prairie Reservoir, near Lapine, Oreg.

Location.--Lat 43°48'20", long 121°50'20", in NW $\frac{1}{4}$  NW $\frac{1}{4}$  sec.36, T.20 S., R.7 E., on right bank 150 ft downstream from road bridge, 1 $\frac{1}{4}$  miles downstream from Little Cultus Lake, and 19 miles northwest of Lapine.

Drainage area.--21.5 sq mi.

Records available.--February to September 1924 (published as "above Crane Prairie, near Lapine"), October 1937 to September 1960. Monthly discharge only October 1937 to September 1949, published in WSP 1318. Records for October 1923 to January 1924, published in WSP 594, have been found to unreliable and should not be used.

Gage.--Water-stage recorder and, since Oct. 11, 1938, log control. Altitude of gage is 4,520 ft (by barometer). Feb. 1 to Sept. 30, 1924, staff gage at site 75 ft upstream at various datums. Oct. 1, 1937, to Sept. 30, 1938, water-stage recorder at road bridge 150 ft upstream at different datum.

Average discharge.--23 years (1937-60), 7.75 cfs (5,610 acre-ft per year).

Extremes.--Maximum discharge during year, 44 cfs June 3-5 (gage height, 1.50 ft); minimum, 0.1 cfs Nov. 5, 9-20.  
1924, 1937-60: Maximum discharge, 97 cfs Nov. 30, 1942 (gage height, 1.95 ft); maximum gage height, 3.14 ft sometime during period Jan. 25 to Apr. 2, 1956 (ice jam); no flow at times.

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

Revisions.--See Records available.

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. 29				Mar. 1 to Sept. 30			
0.2	0	0.5	3.1	0.2	0	0.7	7.0
.3	.3	.6	5.3	.3	.3	1.0	17
.4	1.4			.4	1.2	1.2	26
				.5	2.7	1.5	44

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.3	0.6	1.8	1.5	0.9	6.5	13	36	5.0	0.7	0.2
2	.2	.3	.6	1.6	1.6	.9	6.5	14	*40	4.5	.6	.2
3	.2	.4	.4	1.5	2.0	1.0	6.2	15	44	4.3	.6	.2
4	.2	.3	.4	1.5	2.5	1.2	6.5	15	44	4.0	.6	.2
5	.2	.3	.4	1.5	2.5	1.5	6.8	16	43	3.8	.5	.2
6	.2	.2	.4	1.5	2.4	2	7.3	17	40	3.6	.4	.2
7	.2	.2	.4	1.5	2.2	3	9.1	19	39	*3.4	.4	.2
8	.6	.2	.4	1.5	3	4.1	11	22	37	3.1	.4	.2
9	.4	.2	.4	1.5	4	5.0	13	24	35	2.6	.4	.2
10	.4	.2	.5	1.5	5	4.5	16	26	32	2.4	.4	.2
11	.3	**2	.5	1.5	5	4.1	19	30	29	2.2	.3	.2
12	.3	.5	.5	1.5	4	3.8	19	36	28	2.0	.2	.2
13	**3	.4	.3	1.4	3	3.6	19	40	26	1.8	.2	.2
14	.3	.1	.6	1.2	2.5	3.6	20	40	24	1.6	.2	.2
15	.3	.1	.6	1.0	2	2.9	21	38	22	1.5	.2	.2
16	.3	.1	.6	1.0	1.6	3.1	19	*35	21	1.4	**2	.2
17	.3	.1	.7	1.0	1.7	2.7	17	36	20	1.2	.2	.2
18	.3	.1	.8	1.0	1.6	2.7	17	35	19	1.0	.2	.2
19	.4	.1	.9	1.0	1.5	2.7	16	33	17	.9	.2	.2
20	.4	.1	1.0	1.0	1.4	2.6	16	33	15	.8	.2	.2
21	.4	.2	1.1	1.0	1.4	2.6	17	33	14	.7	.2	.2
22	.5	.4	1.4	1.0	1.3	2.4	16	31	13	.6	.2	.2
23	.4	.4	1.8	1.0	1.2	2.6	15	30	12	.6	.2	.2
24	.4	.5	2.4	1.2	1.2	2.7	15	28	11	.5	.3	.2
25	.3	.6	2.7	1.4	1.1	2.7	14	28	9.4	.5	.3	.2
26	.3	.7	2.7	1.5	1.1	2.7	13	27	8.5	.5	.2	.2
27	.3	1.0	2.5	1.5	1.0	3.1	13	26	7.9	.5	.2	.3
28	.3	.9	2.4	1.5	1.0	3.6	12	26	7.0	.4	.2	.2
29	.3	.9	2.2	1.5	1.0	4.0	13	26	6.2	.4	.2	.2
30	.3	.8	2.0	1.5	-----	5.2	13	28	5.8	.7	.2	.2
31	.3	-----	1.9	1.5	-----	6.0	-----	32	-----	.7	.2	-----
Total	9.8	10.2	34.4	41.6	61.5	93.5	412.9	852	705.8	57.2	9.5	6.1
Mean	0.32	0.34	1.11	1.34	2.12	3.02	13.8	27.5	23.5	1.65	0.31	0.20
Ac-ft	19	20	68	83	125	165	619	1,690	1,400	113	19	12
Calendar year 1959: Max	21				Min 0.1		Mean 4.42		Ac-ft 3,200			
Water year 1959-60: Max	44				Min 0.1		Mean 6.27		Ac-ft 4,550			

\* Discharge measurement made on this day.

\*\* Field estimate made on this day.

Note.--No gage-height record Jan. 1 to Feb. 15, Feb. 28 to Mar. 1; discharge estimated on basis of weather records at Wickiup and records for Cultus Creek above Crane Prairie Reservoir, near Lapine and Odell Creek near Crescent. Stage-discharge relation affected by ice Dec. 4-14, 16, 17, 20-23, 29-31, Feb. 16-27, Mar. 2-7.

## 525. Quinn River near Lapine, Oreg.

Location.--Lat 43°47'10", long 121°50'10", in NW¼ sec.1, T.21 S., R.7 E., on left bank just upstream from Crane Prairie Reservoir, 150 ft downstream from springs at head of river and 18 miles northwest of Lapine.

Records available.--June 1922 to September 1925 (published as "above Crane Prairie, near Lapine"), October 1937 to September 1960. Monthly discharge only October 1937, published in WSP 1318.

Gage.--Water-stage recorder and, since Sept. 13, 1938, log control. Datum of gage is 4,442.1 ft above mean sea level, based on elevation of Crane Prairie Reservoir when slack water reached station. June 1, 1922, to Sept. 30, 1925, staff gage at site 150 ft downstream at different datum.

Average discharge.--26 years, 24.4 cfs (17,660 acre-ft per year).

Extremes.--Maximum discharge during year, 30 cfs July 6-31; maximum gage height, 1.82 ft July 16-31; minimum discharge, 8.3 cfs Mar. 9-15.  
1922-25, 1937-60: Maximum discharge, 59 cfs July 4, 1949 (gage height, 1.97 ft); maximum gage height, 3.92 ft June 25, 1943 (backwater from reservoir); practically no flow Nov. 14, 1941.

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

Revisions (water years).--WSP 1448: 1939, 1941.

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

Oct. 1 to Feb. 29

Mar. 1 to Sept. 30

1.6	8.0	1.5	2.0
1.7	16	1.6	9.0
1.8	27	1.7	18
		1.8	29
		1.9	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	16	16	16	16	16	a12	14	14	24	28	29	28
2	16	16	16	16	15	*12	14	14	*24	28	29	27
3	16	16	16	16	15	12	14	14	24	29	29	27
4	16	16	16	16	15	11	14	14	24	29	29	27
5	17	16	16	16	15	11	14	14	24	29	29	27
6	17	16	16	16	15	9.9	14	15	24	30	29	27
7	18	16	16	17	15	9.0	14	15	25	*30	29	27
8	18	16	16	17	16	9.0	14	15	25	30	29	27
9	18	16	16	17	15	8.3	14	16	25	30	29	27
10	18	16	16	17	15	8.3	14	16	26	30	29	27
11	18	16	16	17	15	8.3	14	17	27	30	29	27
12	18	*16	16	17	15	8.3	14	18	28	30	29	27
13	*18	16	16	17	15	8.3	14	18	28	30	29	*27
14	17	16	16	17	15	8.3	14	18	28	30	29	27
15	16	16	16	17	15	9.0	14	18	28	30	29	27
16	16	16	*16	17	15	9.0	14	*18	28	30	*29	27
17	16	16	15	16	15	9.0	14	18	28	30	29	26
18	16	16	14	16	15	9.0	14	18	28	30	29	26
19	15	16	14	16	15	9.9	14	18	28	30	29	26
20	15	16	14	16	15	9.9	14	19	28	30	29	25
21	15	15	14	16	15	11	14	20	28	30	29	25
22	14	15	14	16	15	11	14	21	28	30	28	25
23	14	16	14	16	a15	12	14	22	28	30	28	25
24	14	16	14	16	a14	13	14	24	28	30	28	24
25	14	16	14	16	a14	13	14	24	28	30	28	24
26	14	16	14	16	a14	14	14	24	28	30	28	24
27	14	16	14	16	a13	14	14	24	28	30	28	22
28	14	16	15	16	a13	14	14	24	28	30	28	22
29	14	16	15	16	a13	14	14	24	28	30	28	22
30	14	16	15	16	-----	14	14	24	28	30	28	22
31	15	-----	16	16	-----	14	-----	24	-----	30	28	-----
Total	491	478	472	506	428	335.5	420	582	804	923	889	771
Mean	15.8	15.9	15.2	16.3	14.8	10.8	14.0	18.8	26.8	29.8	28.7	25.7
Ac-ft	974	948	936	1,000	849	665	833	1,150	1,590	1,830	1,760	1,530

Calendar year 1959: Max 29 Min 14 Mean 23.2 Ac-ft 16,800  
Water year 1959-60: Max 30 Min 8.3 Mean 19.4 Ac-ft 14,060

\* Discharge measurement made on this day.

a No gage-height record; discharge interpolated.

530. Charlton Creek above Crane Prairie Reservoir, near Lapine, Oreg.

Location.--Lat 43°47'00", long 121°50'00", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.1, T.21 S., R.7 E., on left bank 3 miles northwest of Crane Prairie Dam and 18 miles northwest of Lapine.

Drainage area.--15.6 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available.--May and June 1923, October 1937 to September 1951, May to September 1952, May to September 1953, May 1954 to September 1955, May 1956 to September 1960. Monthly discharge only prior to October 1949, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 4,458.70 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. May 1 to June 30, 1923, staff gage at about same site at different datum.

Average discharge.--19 years (1937-51, 1954-55, 1956-60), 1.46 cfs (1,060 acre-ft per year).

Extremes.--Maximum discharge during year, 20 cfs June 6, 7 (gage height, 1.21 ft); no flow for most of year.

1923, 1937-60: Maximum discharge, 54 cfs June 12, 1950 (gage height, 1.53 ft), from rating curve extended above 22 cfs; maximum gage height, 2.39 ft Mar. 9, 1957 (ice jam); no flow for many months in each year.

Remarks.--Records good May 16 to June 27, others poor. No regulation or diversion above station.

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

0.4	0	0.8	1.2
.5	.1	.9	3.3
.6	.2	1.0	7.0
.7	.4	1.2	19

Discharge, in cubic 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	3	12			
2							0	3	*14			
3							0	3.5	15			
4							0	3.5	16			
5							0	3.5	18			
6							0	3.5	18			
7							0	4	18			
8							0	4.5	14			
9							0	5	12			
10							0	5.5	12			
11							1	6	12			
12							2	7	12			
13							3	8	12			
14							4	9	12			
15							4	9.5	16			
16							4	*9.8	15			
17							4	9.2	13			
18							4	7.0	10			
19							4	6.6	9.2			
20							3.5	9.8	7.6			
21							3.5	8.6	7.0	(*)		
22							3.5	7.0	6.6			
23							3.5	5.9	5.9			
24							3.5	5.9	5.2			
25							3.5	5.5	4.8			
26							3	6.3	4.0			
27							3	9.2	3.1			
28							3	9.8	1.1			
29							3	11	0			
30							3	11	0			
31		-----			-----			12	-----			-----
Total	0	0	0	0	0	0	66.0	213.1	305.5	0	0	0
Mean	0	0	0	0	0	0	2.20	6.87	10.2	0	0	0
Ac-ft	0	0	0	0	0	0	151	423	606	0	0	0

Calendar year 1959: Max 6.3

Min 0

Mean 0.39

Ac-ft

281

Water year 1959-60: Max 18

Min 0

Mean 1.60

Ac-ft

1,160

\* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Oct. 1 to May 15, July 22 to Sept. 30; discharge estimated on basis of weather records and records for Deer Creek above Crane Prairie Reservoir, near Lapine.

## 540. Deschutes River below Crane Prairie Reservoir, near Lapine, Oreg.

Location.--Lat 43°45'10", long 121°46'50", in NW $\frac{1}{4}$  sec.16, T.21 S., R.8 E., on left bank 800 ft downstream from Crane Prairie Dam and 15 miles northwest of Lapine.

Drainage area.--254 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available.--August 1907 to November 1908 and August 1912 to September 1913 (fragmentary), October 1913 to September 1917, February 1922 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Prior to October 1949, published as "at Crane Prairie, near Lapine."

Gage.--Water-stage recorder. Datum of gage is 4,419.78 ft above mean sea level (Pacific Power & Light Co. bench mark). Aug. 15, 1907, to Sept. 30, 1917, and Feb. 23 to June 8, 1922, staff gages at site half a mile upstream at different datums. June 9, 1922, to May 9, 1932, staff gage or water-stage recorder at present site and datum.

Average discharge.--42 years (1913-17, 1922-60), 211 cfs (152,800 acre-ft per year).

Extremes.--Maximum discharge during year, 511 cfs Feb. 28 (gage height, 2.21 ft); minimum, 39 cfs Dec. 14 to Jan. 28.  
1913-17, 1922-60: Maximum discharge, 1,170 cfs July 28, 1947 (gage height, 3.34 ft); minimum, 1.4 cfs Oct. 14, 1958.

Remarks.--Records good. Flow regulated since 1922 by Crane Prairie Reservoir (see p. 59). No diversion above station.

Revisions (water years).--WSP 1218: Drainage area. WSP 1318: 1929(M).

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

0.6	36	1.5	242
.8	66	2.0	422
1.0	106	2.5	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	118	50	40	39	40	506	52	202	275	342	286	303
2	118	50	40	39	40	502	52	202	306	339	286	303
3	118	50	40	39	40	497	52	202	332	339	286	303
4	118	52	40	39	40	497	52	202	335	339	286	303
5	118	52	40	39	40	493	52	202	339	339	286	303
6	118	52	40	39	40	489	52	202	339	339	286	303
7	118	52	40	39	40	302	52	202	342	*339	286	303
8	120	52	40	39	40	50	52	202	342	339	286	303
9	120	52	40	39	40	50	53	202	342	339	286	303
10	111	52	40	39	40	50	74	205	342	339	289	303
11	104	52	40	39	40	50	104	205	346	339	289	303
12	104	*52	40	39	40	50	104	205	350	339	289	303
13	104	52	40	39	40	50	106	205	350	339	292	*363
14	104	52	39	39	40	50	106	205	350	339	296	463
15	104	52	39	39	40	50	106	205	350	339	296	463
16	104	52	39	39	40	50	209	205	350	339	*330	463
17	106	52	39	39	40	50	364	220	350	335	303	459
18	106	52	39	39	40	50	361	236	350	335	303	459
19	106	52	39	39	42	50	361	236	350	335	303	459
20	106	52	39	39	42	50	361	242	350	342	303	459
21	106	52	39	39	217	50	361	249	346	350	303	459
22	106	52	39	39	497	52	357	249	346	350	303	455
23	106	52	39	39	493	52	357	252	346	350	303	455
24	70	52	39	39	489	52	357	252	346	350	303	451
25	50	52	39	39	489	52	357	252	346	300	303	451
26	50	52	39	39	484	52	357	*252	346	275	303	447
27	50	46	39	39	480	52	353	262	346	272	303	442
28	50	40	39	39	489	52	353	258	342	272	303	410
29	50	40	39	40	506	52	282	275	342	272	303	353
30	50	40	39	40	-----	*52	205	275	342	278	303	353
31	50	-----	39	40	-----	52	-----	275	-----	286	303	-----
Total	2,963	1,512	1,222	1,212	4,948	4,506	6,064	7,028	10,238	10,129	9,170	11,500
Mean	95.6	50.4	39.4	39.1	171	145	202	227	341	327	298	393
Ac-Ft	5,880	3,000	2,420	2,400	9,810	8,940	12,030	13,940	20,310	20,090	18,190	22,810

Calendar year 1959: Max 422 Min 30 Mean 168 Ac-ft 121,500  
Water year 1959-60: Max 506 Min 39 Mean 193 Ac-ft 193,800

\* Discharge measurement made on this day.

## 545. Brown Creek near Lapine, Oreg.

Location.--Lat 43°43'30", long 121°48'40", in SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec.30, T.21 S., R.8 E., on left bank  $\frac{1}{2}$  miles upstream from mouth and 16 miles northwest of Lapine.

Drainage area.--19.7 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available.--May 1922 to September 1925, July 1938 to September 1960. Monthly discharge only July 1938 to September 1949, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 4,372.94 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. May 24, 1922, to Sept. 30, 1925, staff gage and July 1, 1938, to Nov. 1, 1945, water-stage recorder, at site  $1\frac{1}{2}$  miles downstream at different datums.

Average discharge.--25 years, 40.0 cfs (28,960 acre-ft per year).

Extremes.--Maximum discharge during year, 40 cfs Oct. 1-3 (gage height, 0.99 ft); minimum, 29 cfs Mar. 2-25, June 1 to July 9.

1922-25, 1938-60: Maximum discharge, 104 cfs Aug. 4, 1956 (gage height, 1.64 ft); minimum, 16 cfs July 22-25, 1941, and at times December 1941 to March 1942.

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

Revisions (water years).--WSP 1448: 1922-24.

Discharge, in cubic 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	35	32	31	30	30	31	30	29	29	32	34
2	40	35	32	31	30	30	31	30	29	29	32	34
3	40	35	32	30	30	29	32	30	29	29	32	34
4	39	35	32	30	30	29	32	30	29	29	32	35
5	39	35	32	30	30	29	32	30	29	29	33	35
6	38	35	32	30	30	29	33	30	29	29	33	35
7	38	35	32	30	30	29	34	30	29	*29	33	35
8	38	35	32	30	30	29	34	30	29	29	33	35
9	38	35	32	30	30	29	35	*30	29	29	33	36
10	38	34	32	30	30	29	32	30	29	30	33	36
11	38	34	32	30	30	29	32	30	29	30	33	36
12	37	*34	32	30	30	29	32	30	29	30	33	36
13	37	34	32	30	30	29	32	30	29	30	33	*36
14	37	34	31	30	*30	29	32	30	29	30	33	36
15	37	34	31	30	30	29	32	30	29	30	33	36
16	37	34	*31	30	30	29	32	30	29	30	*33	36
17	37	34	31	30	30	29	32	30	29	30	33	36
18	37	34	31	30	30	29	32	30	29	30	33	36
19	37	33	31	30	30	29	32	30	29	30	33	36
20	37	33	31	30	30	29	31	30	29	30	33	36
21	37	33	31	30	30	29	31	30	29	31	33	36
22	37	33	31	30	30	29	31	30	29	31	33	36
23	37	33	31	30	30	29	31	30	29	31	33	36
24	37	33	31	30	30	29	31	30	29	31	33	36
25	37	33	31	30	30	29	31	30	29	31	34	36
26	37	33	31	30	30	30	31	30	29	31	34	36
27	37	33	31	30	30	30	31	30	29	32	34	36
28	36	33	31	30	30	30	31	30	29	32	34	36
29	36	32	31	30	30	30	30	30	29	32	34	36
30	36	32	31	30	-----	30	30	30	29	32	34	36
31	35	-----	31	30	-----	30	-----	30	-----	32	34	-----
Total	1,161	1,015	974	932	870	907	951	930	870	937	1,026	1,069
Mean	37.5	33.8	31.4	30.1	30.0	29.3	31.7	30.0	29.0	30.2	33.1	35.6
Ac-ft	2,300	2,010	1,930	1,850	1,730	1,800	1,890	1,840	1,730	1,860	2,040	2,120
Calendar year 1959: Max	47			Min	31		Mean	39.1	Ac-ft	28,320		
Water year 1959-60: Max	40			Min	29		Mean	31.8	Ac-ft	23,100		

\* Discharge measurement made on this day.

## 555. Odell Creek near Crescent, Oreg.

Location.--Lat 43°32'50", long 121°57'40", in SW $\frac{1}{4}$  sec.25, T.23 S., R.6 E., on left bank 1,000 ft downstream from Odell Lake, 3 miles north of town of Crescent Lake, and 14 miles northwest of Crescent.

Drainage area.--39.0 sq mi.

Records available.--August and September 1911, August and September 1912, January and February, May to November 1913, April to August 1914, December 1923 to June 1924, May, 1933 to September 1960. Gage heights and discharge measurements only August and September 1911, January 1913. Published as Odell Lake outlet near Crescent 1911-12. Records for January to July 1912, published in WSP 332, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 4,779.05 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Aug. 5 to Sept. 18, 1911, Aug. 14, 1912, to Aug. 12, 1914, and Nov. 18, 1923, to June 7, 1924, staff gages at several sites within 700 ft of present site at various datums.

Average discharge.--27 years (1933-60), 82.0 cfs (59,370 acre-ft per year).

Extremes.--Maximum discharge during year, 166 cfs June 6, 7, 16 (gage height, 0.79 ft); minimum, 30 cfs Aug. 21, 22.

1912-14, 1923-24, 1933-60: Maximum discharge, 416 cfs Nov. 24, 1953 (gage height, 1.44 ft); maximum gage height, 2.03 ft Jan. 5, 1947 (ice jam); minimum discharge, 9 cfs sometime during period Sept. 7-30, 1934.

Remarks.--Records good. Flow affected occasionally in winter by ice jams at outlet of Odell Lake, and slightly affected at times by seiches in Odell Lake. No diversion above station.

Revisions (water years).--WSP 754: Drainage area. WSP 794: 1933-34. WSP 1448: 1924, 1934(m). See also Records available.

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

Oct. 1 to Mar. 11

Mar. 12 to Sept. 30

0.3	28	0.3	28
.4	44	.4	47
.5	66	.6	98
.7	122	.8	170

Discharge, in cubic 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	42	55	51	44	55	114	76	131	98	57	38
2	55	42	55	48	48	55	111	*76	139	95	54	38
3	53	57	55	48	48	55	105	74	143	93	52	38
4	51	48	51	46	53	62	101	76	154	87	49	38
5	51	46	48	44	55	79	98	74	158	84	47	38
6	51	44	48	42	57	84	98	76	162	84	47	38
7	46	42	46	48	66	98	98	79	162	84	47	36
8	59	42	44	51	92	104	98	79	158	82	45	36
9	74	42	44	46	101	119	98	82	154	*76	45	36
10	66	42	42	46	101	122	98	84	150	71	43	36
11	69	41	46	53	92	122	101	90	150	69	43	38
12	62	41	51	57	84	108	101	98	147	69	41	38
13	59	39	51	46	82	98	101	111	147	66	41	38
14	59	38	48	46	82	98	111	114	150	64	39	38
15	57	38	48	42	87	98	121	118	154	61	38	38
16	53	38	46	44	79	101	114	124	158	61	34	38
17	53	38	46	51	74	105	108	128	158	61	32	38
18	51	38	48	48	68	95	105	128	154	59	34	36
19	48	38	44	48	66	90	101	124	147	59	34	36
20	53	38	44	48	64	84	108	131	135	57	34	36
21	55	55	44	46	71	79	111	139	*131	54	32	34
22	59	55	44	44	59	76	105	135	124	52	34	34
23	57	64	44	44	55	74	98	131	121	49	36	34
24	57	64	53	42	57	74	93	128	121	47	38	34
25	55	64	57	44	57	71	90	128	118	45	39	36
26	53	62	55	44	55	71	87	131	114	45	*39	36
27	51	59	53	44	55	74	84	131	108	43	38	36
28	48	59	51	48	55	79	82	131	108	43	38	38
29	46	57	48	46	*55	84	79	128	105	43	38	38
30	44	57	53	46	-----	98	79	128	101	47	38	*38
31	42	-----	53	44	-----	108	-----	128	-----	57	38	-----
Total	1,694	1,430	1,513	1,440	1,963	2,720	2,998	3,380	4,162	2,005	1,264	1,102
Mean	54.6	47.7	48.8	46.5	67.7	87.7	99.9	109	139	64.7	40.8	36.7
Cfs/m	1.40	1.22	1.25	1.19	1.74	2.25	2.56	2.79	3.56	1.66	1.05	0.941
In.	1.62	1.36	1.44	1.37	1.87	2.59	2.86	3.22	3.97	1.91	1.21	1.05
Ac-ft	3,360	2,840	3,000	2,860	3,890	5,400	5,950	6,700	8,260	3,980	2,510	2,190

Calendar year 1958: Max 122 Min 27 Mean 66.3 Cfs/m 1.70 In. 23.08 Ac-ft 47,990  
 Water year 1959-60: Max 162 Min 32 Mean 70.1 Cfs/m 1.80 In. 24.47 Ac-ft 50,940

\* Discharge measurement made on this day.

565. Deschutes River below Wickiup Reservoir, near Lapine, Oreg.

Location.--Lat 43°41'20", long 121°41'00", near line between secs.7 and 8, T.22 S., R.9 E., on left bank 2,000 ft downstream from Wickiup Dam and 9 miles west of Lapine.

Drainage area.--483 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available.--June 1938 to September 1960. Monthly discharge only June 1938, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 4,857.41 ft above mean sea level (levels by Bureau of Reclamation).

Average discharge.--22 years, 758 cfs (548,800 acre-ft per year).

Extremes.--Maximum discharge during year, 2,100 cfs July 8-18; maximum gage height, 7.11 ft July 9, 10, 13, 17, 18; minimum discharge, 9 cfs Oct. 31.  
1938-60: Maximum discharge, 2,280 cfs July 28 to Aug. 1, 1956 (gage height, 7.92 ft); minimum, 6 cfs Oct. 20, 1948, when gate was closed for outlet inspection and repair; minimum daily, 10 cfs Jan. 17, 1952.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Flow regulated by Crane Prairie Reservoir and, since Dec. 24, 1942, by Wickiup Reservoir (see p. 59). Some leakage from Crane Prairie and Wickiup Reservoirs does not pass station. Some spill bypassed station in 1955.

Revisions (water years).--WSP 1448: 1944(m), 1947-51(m).

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

Oct. 1-29			Oct. 30 to Sept. 30		
2.0	155		1.0	10	3.0 430
3.0	430		1.1	16	4.0 770
4.0	730		1.2	27	6.0 1,560
			1.5	64	7.1 2,100
			2.0	158	

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	676	14	a16	a17	a21	a22	27	956	1,100	1,780	1,640	1,260
2	679	14	a16	a17	a21	a22	27	956	1,400	1,810	1,620	1,240
3	679	14	a16	a17	a21	a23	28	952	1,590	1,830	1,600	1,240
4	679	12	a16	a17	a21	a23	29	952	1,660	1,910	1,580	1,240
5	682	12	a16	a17	a21	a23	28	972	1,740	1,960	1,550	1,280
6	682	12	16	17	a21	a23	29	1,100	a1,850	*2,020	1,540	1,450
7	631	a12	16	18	a21	a23	31	1,120	*1,830	2,090	1,540	1,500
8	604	a13	16	19	a21	a24	31	1,130	1,820	2,100	1,570	1,500
9	604	a14	16	a19	a21	a24	34	996	a1,820	2,100	1,600	1,490
10	607	15	a16	a20	a21	a25	42	1,030	a1,820	2,100	1,610	1,440
11	610	15	a16	20	a21	a25	310	1,180	a1,800	2,100	1,630	1,440
12	610	14	a16	20	a21	a25	255	1,180	1,780	2,100	1,630	1,450
13	607	a13	a16	a20	a21	a26	330	1,200	1,770	2,100	1,630	1,360
14	*607	a14	a16	a20	a21	a26	588	1,260	1,780	2,100	1,630	*1,270
15	610	14	a16	20	a21	a27	724	1,250	1,780	2,100	1,630	1,250
16	610	a14	a16	a20	a21	a27	728	1,250	1,830	2,100	1,630	1,250
17	601	a15	16	a20	a21	27	724	1,250	1,790	2,100	1,630	1,240
18	598	15	a16	a20	a21	*28	732	1,260	1,760	2,000	1,620	1,240
19	598	*15	a16	a16	a21	28	732	*1,240	1,760	1,880	1,620	1,190
20	589	a15	a16	16	a21	28	742	1,160	1,770	1,880	1,620	1,160
21	547	a15	a16	16	a21	28	794	1,130	1,800	1,880	1,620	1,170
22	547	a15	a16	16	a21	28	*900	1,100	1,880	1,900	1,620	1,160
23	550	a15	a16	17	a21	28	904	1,070	1,870	1,920	1,620	1,150
24	351	a15	16	a18	a21	28	900	968	1,900	1,910	1,610	1,120
25	212	a15	a16	a18	a21	28	896	944	1,900	1,880	1,540	1,120
26	212	a16	a16	a19	a22	28	896	833	1,880	1,860	1,520	1,120
27	182	a16	a16	a20	a22	28	932	840	1,880	1,860	1,490	1,130
28	162	a16	a16	*a21	a22	28	960	840	1,880	1,790	1,460	1,130
29	165	a16	a16	a21	a22	27	960	848	1,830	1,760	1,430	1,120
30	*101	a16	a16	a21	-----	27	960	900	1,760	1,740	1,420	984
31	25	-----	a16	a21	-----	27	-----	1,030	-----	1,740	1,360	-----
Total	15,617	431	496	578	613	804	15,273	32,877	53,030	60,400	48,810	37,694
Mean	504	14.4	16.0	18.6	21.1	25.9	509	1,061	1,768	1,948	1,575	1,256
Ac-ft	30,980	855	984	1,150	1,220	1,590	30,290	65,210	106,200	119,800	96,810	74,760
Calendar year 1959: Max			2,090		Min 12	Mean	830	Ac-ft	601,100			
Water year 1959-60: Max			2,100		Min 12	Mean	728	Ac-ft	528,800			

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of unpublished records for station at Pringle Falls.

## 575. Fall River near Lapine, Oreg.

Location.--Lat 43°47'50", long 121°34'20", in SE $\frac{1}{4}$  sec.31, T.20 S., R.10 E., on left bank 50 ft downstream from pond spillway at State fish hatchery and 9 miles northwest of Lapine.

Drainage area.--45.1 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available.--July 1938 to September 1960. Records for May to September 1912 at site 3 miles downstream not equivalent owing to difference in drainage area.

Gage.--Water-stage recorder. Altitude of gage is 4,220 ft (by barometer).

Average discharge.--22 years, 155 cfs (112,200 acre-ft per year).

Extremes.--Maximum discharge during year, 160 cfs Oct. 8 (gage height, 1.46 ft); minimum, 108 cfs Mar. 17.  
1938-60: Maximum discharge, 250 cfs July 28, 1952 (gage height, 1.94 ft); minimum, 68 cfs Apr. 6, 1942.

Remarks.--Records fair. Water diverted only to ponds at fish hatchery 50 ft above station, from which water returns to river above station. Momentary extremes are caused by operation of fish hatchery.

Revisions (water years).--WSP 984: 1938-42(M,m).

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

1.2 116  
1.5 167

Discharge, in cubic 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	149	146	146	140	140	142	144	139	135	135	*132
2	153	149	146	146	140	140	142	144	139	135	135	130
3	153	149	146	146	140	140	142	144	139	135	135	130
4	153	149	146	146	140	140	142	144	139	135	135	130
5	151	149	146	146	140	140	142	144	139	135	135	130
6	151	149	146	*146	140	140	142	142	139	135	135	130
7	151	149	146	144	140	140	142	142	139	135	135	130
8	151	149	146	144	140	140	142	142	139	135	135	129
9	151	149	146	142	140	140	142	142	139	*135	135	129
10	151	149	146	142	140	140	142	142	137	135	135	129
11	151	149	146	142	140	140	142	142	137	135	134	129
12	151	147	146	142	140	140	142	142	137	135	134	129
13	151	147	146	142	140	140	144	142	137	135	134	129
14	151	147	146	142	140	140	142	142	137	135	134	129
15	151	147	146	142	140	*139	142	142	137	135	134	129
16	151	147	146	142	140	140	142	142	137	135	134	129
17	151	147	146	142	140	139	142	142	137	135	134	129
18	151	147	146	142	140	140	142	142	137	135	134	129
19	151	147	146	142	140	140	142	142	137	135	134	129
20	151	147	146	142	140	140	142	142	137	135	134	129
21	151	147	146	140	140	140	142	140	137	135	132	129
22	151	147	146	140	140	140	144	140	137	135	132	129
23	151	146	146	140	140	140	144	140	137	135	132	129
24	151	146	146	140	140	140	144	140	137	135	132	129
25	149	146	146	140	140	140	144	140	137	135	132	129
26	149	146	146	140	140	140	144	140	137	135	132	129
27	149	146	146	140	140	140	144	*140	137	135	132	129
28	149	146	146	140	140	140	144	140	135	135	132	129
29	149	146	146	140	140	140	*144	140	135	135	132	129
30	149	146	146	140	-----	142	144	140	135	135	132	129
31	149	-----	146	140	-----	142	-----	139	-----	135	132	-----
Total	4,675	4,424	4,526	4,408	4,060	4,342	4,280	4,369	4,122	4,185	4,142	3,879
Mean	151	147	146	142	140	140	143	142	137	135	134	129
Ac-ft	9,270	8,770	8,980	8,740	8,050	8,610	8,490	8,710	8,180	8,300	8,220	7,690
Calendar year 1959: Max	180			Min	140		Mean	160	Ac-ft	115,800		
Water year 1959-60: Max	153			Min	129		Mean	141	Ac-ft	102,000		

\* Discharge measurement made on this day.

Note.--No gage-height record Dec. 23 to Jan. 5, Jan. 10 to Mar. 14; discharge interpolated.

600. Crescent Creek at Crescent Lake, near Crescent, Oreg.

Location.--Lat 43°30'00", long 121°58'20", in SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.11, T.24 S., R.6 E., on left bank 400 ft downstream from Crescent Lake Dam, three-quarters of a mile south of town of Crescent Lake, and 14 miles west of Crescent.

Drainage area.--60.7 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available.--January to September 1911 (gage heights and discharge measurements only), January 1912 to July 1915, July to September 1927, May 1928 to September 1960. Published as Crescent Lake outlet near Crescent January 1911 to September 1912, and as Crescent Creek at outlet of Crescent Lake, near Crescent October 1913 to July 1915.

Gage.--Water-stage recorder and, since Sept. 11, 1956, Parshall flume. Datum of gage is 4,819.96 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Jan. 11, 1911, to July 31, 1915, staff gages near present site at different datums. July 19, 1927, to June 1936, water-stage recorder near present site at different datum. June 1936 to July 14, 1955, water-stage recorder and Parshall flume at site 100 ft upstream at datum 6.76 ft higher. July 15, 1955, to Sept. 10, 1956, water-stage recorder at site 150 ft downstream at different datum.

Average discharge.--34 years (1912-14, 1928-60), 57.7 cfs (41,770 acre-ft per year).

Extremes.--Maximum discharge during year, 265 cfs May 16-18 (gage height, 2.80 ft); minimum not determined; minimum daily, 5.0 cfs Oct. 16-20, Nov. 13 to Dec. 11, 1912-15, 1927-60: Maximum discharge, 313 cfs July 9, 1929, Aug. 9, 1936; no flow at times.

Remarks.--Records good except those for periods of no gage-height record and those below 8 cfs, which are poor. Flow regulated since 1922 by Crescent Lake (see p. 59). No diversion above station.

Revisions.--WSP 1218: Drainage area.

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

0.2	5.0	1.0	46
.3	8.0	1.5	92
.4	12	2.0	148
.6	21	3.0	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	14	5.6	5.0	5.9	5.9	6.2	6.8	22	134	148	180	190
2	13	5.6	5.0	5.9	5.9	5.9	7.1	*22	134	148	192	158
3	13	5.6	5.0	5.9	5.9	5.9	7.1	22	135	148	190	74
4	13	5.6	5.0	5.9	5.9	6.2	7.1	22	136	148	188	35
5	13	5.6	5.0	5.9	5.9	6.2	7.1	46	136	148	187	33
6	13	5.3	5.0	5.9	5.9	6.2	7.1	92	136	148	184	33
7	13	5.3	5.0	5.9	6.2	6.2	7.1	92	137	148	182	33
8	12	5.3	5.0	5.9	6.2	6.5	7.1	92	137	169	180	33
9	12	5.3	5.0	5.9	6.2	6.5	7.1	92	137	*190	205	33
10	12	5.3	5.0	5.9	6.2	6.8	7.1	93	164	190	228	33
11	12	5.3	5.0	5.9	6.2	6.8	7.4	93	208	188	224	34
12	12	5.3	5.3	5.9	6.2	6.8	7.4	92	208	188	220	34
13	12	5.0	5.3	5.9	6.2	6.8	7.4	88	206	187	216	34
14	12	5.0	5.3	5.9	5.6	7.1	7.4	87	206	200	211	34
15	9.1	5.0	5.3	5.9	5.9	7.1	7.4	87	206	218	206	34
16	5.0	5.0	5.3	5.9	6.2	7.1	7.4	132	206	218	204	34
17	5.0	5.0	5.3	5.9	6.2	7.1	7.4	265	206	217	202	34
18	5.0	5.0	5.3	5.9	6.2	6.8	7.7	285	206	217	196	34
19	5.0	5.0	5.3	5.9	6.2	6.8	7.7	264	206	216	190	34
20	5.0	5.0	5.3	5.9	6.2	6.8	14	264	205	214	188	34
21	5.3	5.0	5.3	5.9	6.2	6.8	22	264	205	212	187	34
22	5.3	5.0	5.3	5.9	6.2	6.8	22	262	205	211	182	34
23	5.3	5.0	5.3	5.9	6.2	6.8	22	260	204	211	181	35
24	5.3	5.0	5.3	5.9	6.2	6.8	22	259	204	210	180	35
25	5.3	5.0	5.3	5.9	6.2	6.8	22	259	204	196	178	35
26	5.6	5.0	5.6	5.9	6.2	6.8	22	258	204	172	200	33
27	5.6	5.0	5.6	5.9	6.2	6.8	22	258	202	171	232	33
28	5.6	5.0	5.6	5.9	6.2	6.8	22	258	202	171	229	34
29	5.6	5.0	5.6	5.9	6.2	6.8	22	256	202	171	223	34
30	5.6	5.0	5.9	5.9	-----	6.8	22	256	176	171	220	*34
31	5.6	-----	5.9	5.9	-----	6.8	-----	199	-----	172	214	-----
Total	270.2	155.1	163.4	182.9	177.1	206.6	371.9	5,021	5,455	5,718	6,199	1,328
Mean	8.72	5.17	5.27	5.90	6.11	6.66	12.4	162	182	184	200	44.3
Ac-ft	556	308	324	363	351	410	738	9,960	10,820	11,340	12,300	2,630
Calendar year 1959: Max	252			Min	5.0	Mean	80.7	Ac-ft	58,580			
Water year 1959-60: Max	265			Min	5.0	Mean	69.0	Ac-ft	50,080			

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 3-14, 16-29, Oct. 31 to Nov. 18, Nov. 20 to Dec. 19; discharge interpolated or estimated on basis of notes of regulation.

## 630. Little Deschutes River near Lapine, Oreg.

Location.--Lat 43°41'30", long 121°30'10". in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 2, T.22 S., R.10 E., on right bank just downstream from bridge at former town of Rosland,  $1\frac{1}{4}$  miles north of Lapine.

Drainage area.--859 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available.--September 1910 to January 1911, March, April, August 1911, March to September 1912, June to October 1913, June to November 1918, August to October 1920, May 1924 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Published as Deschutes River near Lapine 1910-12 and as East Fork near Lapine 1913-20.

Gage.--Water-stage recorder. Datum of gage is 4,192.81 ft above mean sea level, datum of 1929. Sept. 1, 1910, to Aug. 31, 1911, staff gage at present site at different datum. Mar. 1 to Sept. 30, 1912, staff gage at site  $1\frac{1}{4}$  miles downstream at different datum. June 1, 1913, to Sept. 28, 1928, staff gage and Sept. 29, 1928, to Sept. 30, 1931, water-stage recorder, at present site at different datums.

Average discharge.--36 years (1924-60), 200 cfs (144,800 acre-ft per year).

Extremes.--Maximum discharge during year, 572 cfs May 24 (gage height, 5.84 ft); minimum, 41 cfs Dec. 5, 1910-13, 1918, 1920, 1924-60: Maximum discharge, 1,320 cfs June 13, 1950, May 9, 1956 (gage height, 7.25 ft); minimum, 8 cfs Sept. 2, 3, 1931.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated since 1922 by Crescent Lake (see following page). Diversions for irrigation of 13,700 acres above station.

Revisions (water years).--WSP 1218: 1950.

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. 6 to May 2)

Oct. 1 to Mar. 3

Mar. 4 to Sept. 30

1.6	40	2.0	74
2.0	73	3.0	181
2.5	123	4.0	306
3.0	186	6.0	598
3.5	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	83	58	75	b46	a75	a80	236	254	474	280	254	217
2	75	58	68	b44	a80	a60	217	255	464	248	255	210
3	70	58	b66	b44	a85	a70	231	251	409	233	239	175
4	68	58	b64	b46	*b90	b80	245	251	402	227	224	160
5	66	60	62	b50	b95	89	249	249	408	221	218	115
6	65	60	61	60	b100	113	266	242	413	*209	212	102
7	65	58	63	66	b140	147	298	286	423	204	206	97
8	79	65	64	72	228	159	328	314	420	203	203	94
9	98	71	70	72	230	151	342	333	403	201	197	92
10	92	70	67	67	226	125	371	343	394	222	195	92
11	93	70	73	78	200	115	378	349	394	223	221	90
12	81	70	75	80	178	113	382	357	381	222	223	*89
13	76	68	68	76	140	117	388	373	398	221	217	86
14	*72	67	70	b60	122	120	349	389	392	219	217	83
15	68	62	69	b65	112	*114	366	412	388	218	216	85
16	67	62	62	b70	105	110	354	423	388	229	215	83
17	65	57	b62	b75	81	116	324	410	388	233	211	80
18	62	58	b75	b80	128	128	311	405	387	231	206	80
19	62	68	b60	b70	75	144	309	*440	381	227	203	79
20	62	81	60	b65	84	160	307	496	370	224	197	80
21	62	76	58	b65	81	181	307	524	357	228	192	79
22	65	83	58	*b62	74	200	*349	529	340	223	192	81
23	68	92	58	b65	75	213	329	552	328	219	194	79
24	70	100	66	b65	73	212	290	571	319	218	197	75
25	68	99	71	b65	68	217	267	558	310	219	195	76
26	65	91	72	a70	a65	223	259	*547	302	221	187	76
27	62	82	68	a75	a60	231	253	535	298	205	194	76
28	62	68	55	a70	a55	235	251	542	293	199	217	78
29	60	71	b54	a70	a55	239	251	540	286	198	222	76
30	59	71	b50	a70	-----	240	251	514	283	213	217	*74
31	58	-----	b48	a70	-----	257	-----	488	-----	223	213	-----
Total	2,158	2,113	1,979	2,028	3,142	4,739	9,036	12,732	11,183	8,981	6,549	2,959
Mean	69.8	70.4	63.8	65.4	108	153	301	411	373	221	211	98.6
Ac-ft	4,280	4,190	3,930	4,020	6,230	9,400	17,920	25,250	22,180	13,610	12,990	5,870
Calendar year 1959: Max	396			Min 48		Mean 179		Ac-ft 129,800				
Water year 1959-60: Max	571			Min 44		Mean 179		Ac-ft 129,900				

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records, recorded range in stage, and records for Odell Creek near Crescent.

b Stage-discharge relation affected by ice.

## Reservoirs in Deschutes River basin above Bend, Oreg.

535. **Crane Prairie Reservoir.**--Lat 43°45'20", long 121°46'50", in NW<sup>1</sup> sec.16, T.21 S., R.8 E., on control structure at Crane Prairie Dam on Deschutes River, 15 miles north-west of Lapine. Drainage area, 254 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange. Records available, November 1922 to November 1935, April to December 1936, April 1937 to September 1960. Staff gage read daily during summer and two or more times a month during winter. Datum of gage is 4,400.0 ft above mean sea level (levels by Bureau of Reclamation). Prior to July 13, 1940, at site 150 ft upstream at same datum. Gage readings have been reduced to elevations above mean sea level. Maximum contents observed during year, 39,480 acre-ft Feb. 21 (elevation, 4,441.60 ft); minimum observed, 15,300 acre-ft Sept. 30 (elevation, 4,435.36 ft). Maximum contents observed during period 1922-60, 60,500 acre-ft June 5-7, 1943 (elevation, 4,446.0 ft); no usable contents at times.

Reservoir originally formed by earth-fill dam completed in 1922, reconstructed as rock-faced, earth-fill dam in 1940. Capacity, 55,340 acre-ft between elevations 4,424.0 (lip of fish-screen structure) and 4,445.0 ft (crest of spillway). Some dead storage in isolated pools in reservoir at stages below 4,428 ft and natural flow passing through reservoir when outlet gates are open prevents withdrawal of remaining storage to elevation of sill of gates. Water is diverted from Deschutes River near Bend for irrigation near Bend and Redmond.

Revisions (water years)--WSP 1218: Drainage area. WSP 1318: 1925, 1940-41, 1950. WSP 1448: 1925(M,m), 1940(m), 1950(m).

560. **Wickiup Reservoir.**--Lat 43°41'10", long 121°41'10", in NE<sup>1</sup> sec.7, T.22 S., R.9 E., in gate chamber structure at Wickiup Dam on Deschutes River, 9 miles west of Lapine. Drainage area, 482 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange. Records available, December 1942, when storage began, to September 1960. Tape gage read daily. Datum of gage is at mean sea level (levels by Bureau of Reclamation). Prior to Jan. 15, 1945, staff gages at nearby sites at same datum. Maximum contents observed during year, 189,900 acre-ft Apr. 14 (elevation, 4,336.74 ft); minimum observed, 10,380 acre-ft Sept. 30 (elevation, 4,286.63 ft). Maximum contents observed during period 1942-60, 201,500 acre-ft May 8, 1956 (elevation, 4,337.80 ft); minimum observed since reservoir first filled in March 1949, 523 acre-ft Oct. 18, 1952 (elevation, 4,270.86 ft).

Reservoir is formed by rock-faced, earth-fill dam completed in 1949. Capacity, 182,100 acre-ft between elevations 4,265.0 (no storage) and 4,336.0 ft (crest of spillway, with earth soft plug to elevation 4,339.0 ft). Water is diverted from Deschutes River at Bend for irrigation near Madras. Daily elevations and capacity table furnished by Bureau of Reclamation.

595. **Crescent Lake.**--Lat 43°30'00", long 121°58'20", in SW<sup>1</sup> sec.11, T.24 S., R.6 E., on outlet works at dam on Crescent Creek, three-quarters of a mile south of town of Crescent Lake and 14 miles west of Crescent. Drainage area, 60.7 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange. Records available, August 1922 to September 1960. Wire-weight gage read once or twice a month. Datum of gage is at mean sea level (levels by Bureau of Reclamation). Prior to Oct. 1, 1956, staff gage at nearby site at datum 4,825.16 ft above mean sea level. Oct. 1, 1956, to Oct. 17, 1957, staff gage at present site and datum. Maximum contents observed during year, 51,320 acre-ft May 16 (elevation, 4,836.28 ft); minimum observed, 26,410 acre-ft Sept. 3 (elevation, 4,829.48 ft). Maximum contents observed during period 1922-60, 79,970 acre-ft Mar. 8, 1957 (elevation, 4,843.76 ft); minimum observed, 9,640 acre-ft Oct. 21, 1931 (elevation, 4,827.91 ft).

Reservoir originally formed by dam of earth and logs completed in 1922, reconstructed as earth-fill dam in 1956. Capacity, 117,200 acre-ft between elevations 4,821.5 (sill of outlet gate) and 4,853.0 ft (crest of spillway). Dead storage not known; records given herein represent usable contents. Water surface probably cannot be lowered below elevation 4,823.4 ft due to natural flow through reservoir. Water is diverted from Deschutes River at Bend for irrigation near Tumalo.

Revisions (water years)--WSP 1218: Drainage area. WSP 1318: 1922-31. WSP 1448: 1923-31(M,m).

Month-end elevations 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)	Elevation (feet)†	Contents (acre- feet)	Change in contents (acre- feet)
	Crane Prairie Reservoir			Wickiup Reservoir			Crescent Lake		
Sept. 30.....	4,436.23	18,270	-	4,294.78	20,390	-	4,832.08	35,790	-
Oct. 31.....	4,437.64	23,360	+5,110	4,303.81	35,580	+15,190	-	438,850	+3,060
Nov. 30.....	4,439.14	29,170	+5,790	4,317.86	69,480	+33,900	-	440,700	+1,850
Dec. 31.....	4,440.20	33,490	+4,320	4,325.26	97,920	+28,440	-	442,600	+1,900
Calendar year 1959.	-	-	-8,020	-	-	-50,180	-	-	-17,400
Jan. 31.....	4,441.07	37,170	+3,680	4,329.57	124,800	+26,880	-	444,100	+1,500
Feb. 29.....	4,439.92	32,330	-4,840	4,333.24	155,000	+30,200	4,835.01	46,590	+2,490
Mar. 31.....	-	335,400	+1,070	4,356.11	183,200	+28,200	4,835.67	49,060	+2,470
Apr. 30.....	4,439.83	31,950	-1,440	4,336.10	183,100	-100	-	450,800	+1,740
May 31.....	4,439.91	32,290	+330	4,333.46	157,100	-26,000	4,835.35	47,840	-2,960
June 30.....	4,438.85	28,020	-4,270	4,326.45	104,400	-52,700	4,834.70	45,430	-2,410
July 31.....	4,437.42	22,560	-5,460	4,311.51	52,250	-52,150	-	437,500	-7,950
Aug. 31.....	4,437.09	21,350	-1,210	4,294.70	20,270	-31,980	4,829.68	27,130	-10,370
Sept. 30.....	4,435.36	15,300	-6,050	4,286.63	10,380	-9,990	4,829.58	26,770	-360
Water year 1959-60.	-	-	-2,970	-	-	-10,010	-	-	-9,020

† Gage usually read at 8 a.m.

\* Time of gage reading unknown.

a No gage-height record; contents interpolated.

## 645. Deschutes River at Benham Falls, near Bend, Oreg.

Location.--Lat 43°55'50", long 121°24'30", in NE $\frac{1}{4}$  sec.16, T.19 S., R.11 E., on right bank 1,700 ft upstream from head of Benham Falls,  $\frac{1}{4}$  miles downstream from damsite for proposed Benham Falls Reservoir, 10 miles southwest of Bend, and at mile 181.4.

Drainage area.--1,759 sq mi.

Records available.--April 1906 to September 1913, April to September 1914, August to December 1920, April to September 1921, February 1924 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Published as "at West's ranch, near Lava" April 1906 to February 1909, April to September 1914. Records for January 1905 to March 1906 and October 1913 to September 1914, published under present name in WSP 370 and 394, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 4,142.10 ft above mean sea level (Bureau of Reclamation bench mark). Apr. 1, 1906, to Feb. 28, 1909, and Apr. 1 to Sept. 30, 1914, staff gage at site 8 miles upstream at various datums. Mar. 1, 1909, to Sept. 30, 1913, and Aug. 27, 1920, to Sept. 30, 1921, staff gages at two different sites within 1,000 ft downstream from present site at various datums. Feb. 12, 1924, to Nov. 12, 1947, water-stage recorder at site 1,500 ft downstream at datum 2.00 ft higher and Nov. 13, 1947, to Nov. 19, 1958, at datum 1.00 ft higher.

Average discharge.--43 years (1906-13, 1924-60), 1,411 cfs (1,022,000 acre-ft per year).

Extremes.--Maximum discharge during year, 2,760 cfs July 18 (gage height, 6.32 ft); minimum, 507 cfs Mar. 3.

1906-14, 1920-21, 1924-60: Maximum discharge, 5,000 cfs (estimated) Nov. 27, 1909 (gage height not determined); minimum, 448 cfs sometime during period Jan. 11 to Feb. 3, 1950 (from recorded range in stage).

Remarks.--Records good except those for period of no gage-height record, which are fair. Flow regulated since 1922 by Crane Prairie Reservoir and Crescent Lake, and since 1942, by Wickiup Reservoir (see preceding page). Diversions for irrigation of over 14,000 acres above station.

Revisions.--See Records available.

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

2.0	545
3.0	950
5.0	1,980
6.4	2,810

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	1,400	655	631	590	667	608	8550	1,750	2,060	2,560	2,450	2,100
2	1,360	*631	639	584	671	612	8550	1,750	2,110	2,550	2,410	2,020
3	1,360	631	631	590	663	587	8540	1,750	2,310	2,550	2,380	1,980
4	1,360	627	623	576	651	655	848	1,750	2,450	2,550	2,350	1,960
5	1,350	623	601	594	*647	671	856	1,750	2,520	2,580	2,320	1,940
6	1,350	619	608	594	659	675	856	1,770	2,580	2,630	2,280	1,940
7	1,350	619	615	601	663	667	905	1,760	2,670	2,650	2,260	2,040
8	1,340	619	604	604	763	815	923	1,910	2,700	*2,700	*2,250	2,100
9	1,300	623	608	598	783	783	941	1,960	2,700	2,730	2,250	2,100
10	1,300	639	608	590	759	755	950	1,910	2,700	2,730	2,280	2,100
11	1,300	635	623	608	735	719	990	1,910	2,680	2,740	2,290	2,070
12	1,300	631	623	601	743	707	1,250	2,040	*2,670	2,750	2,310	*2,060
13	1,300	627	615	580	727	707	1,250	2,060	2,640	2,750	2,320	2,060
14	1,280	623	615	604	707	707	1,340	2,100	2,640	2,750	2,330	2,000
15	1,280	619	619	601	687	703	1,540	2,160	2,640	2,750	*2,330	1,910
16	1,270	615	619	598	675	699	1,640	2,180	2,640	2,750	2,330	1,880
17	1,270	604	619	594	707	683	1,640	2,190	2,650	2,750	2,330	1,860
18	1,260	615	608	598	663	723	1,630	2,190	2,650	2,760	2,320	1,850
19	1,260	619	604	594	647	a735	1,620	2,190	2,620	2,750	2,320	1,850
20	1,260	619	604	594	635	a740	1,610	2,190	2,620	2,620	2,310	1,810
21	1,240	651	604	590	643	a760	*1,620	2,170	2,620	2,580	2,310	1,760
22	1,220	655	604	598	635	a780	1,660	2,160	2,620	2,580	2,310	1,760
23	1,200	663	608	598	623	a800	1,780	2,180	2,670	2,580	2,310	1,750
24	1,200	663	623	601	627	a800	1,780	2,120	2,670	2,590	2,310	1,740
25	1,010	667	619	608	627	a800	1,740	*2,070	2,670	2,590	2,310	1,720
26	856	667	604	612	619	a900	1,720	2,050	2,680	2,580	2,270	1,720
27	842	659	612	612	573	a810	1,710	1,980	2,670	2,560	2,230	1,710
28	811	647	608	619	601	a820	1,740	1,960	2,650	2,550	2,210	1,710
29	783	635	594	635	608	a830	1,750	1,960	2,650	2,510	2,180	1,710
30	779	631	601	667	-----	a840	1,750	1,940	2,620	2,480	2,170	1,710
31	751	-----	598	667	-----	a850	-----	1,970	-----	2,470	2,130	-----
Total	36,942	19,031	18,992	18,700	19,384	22,865	40,557	61,910	77,800	81,650	71,160	56,920
Mean	1,192	634	613	603	668	738	1,352	1,997	2,593	2,634	2,295	1,897
Ac-ft	73,270	37,750	37,670	37,090	38,450	45,350	80,440	122,860	154,300	162,000	141,100	112,900

Calendar year 1959: Max 2,730 Min 594 Mean 1,577 Ac-ft 1,142,000  
 Water year 1959-60: Max 2,760 Min 573 Mean 1,437 Ac-ft 1,043,000

\* Discharge measurement made on this day.  
 a No gage-height record; discharge estimated on basis of weather records, recorded range in stage, and unpublished records for station above Lava Island adjusted for flow in Arnold Canal.

660. Deschutes River below Lava Island, near Bend, Oreg.

Location.--Lat 44°00'00", long 121°22'30", in SW $\frac{1}{4}$  sec.23, T.18 S., R.11 E., on right bank three-quarters of a mile downstream from Lava Island,  $1\frac{1}{2}$  miles downstream from intake of Arnold Canal, 5 miles southwest of Bend, and at mile 173.0.

Drainage area.--1,829 sq mi.

Records available.--March 1926 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 3,825 ft (by barometer). Prior to May 4, 1927, at site a quarter of a mile upstream at different datum. May 4, 1927, to Nov. 11, 1947, and Nov. 12, 1947, to Oct. 24, 1959, at present site at datum 2.00 and 1.00 ft higher, respectively.

Average discharge.--34 years, 1,230 cfs (890,500 acre-ft per year).

Extremes.--Maximum discharge during year, 2,500 cfs July 12-15, 18 (gage height, 4.41 ft); minimum, 495 cfs Mar. 3.

1926-60: Maximum discharge, 2,940 cfs May 10, 1956 (gage height, 4.78 ft, present datum); minimum, 416 cfs Jan. 18, 1950.

Remarks.--Records good. Flow regulated by Crescent Lake and Crane Prairie Reservoir and, since 1942, by Wickup Reservoir (see p. 59). Arnold Canal diverts water above station for irrigation (see following page).

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	
1.7	980	2.1	510
2.1	1,310	2.5	770
		3.0	1,160
		4.5	2,810

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	1,280	606	600	546	618	582	812	1,540	1,720	2,230	2,190	1,880
2	1,210	612	606	534	624	582	812	1,540	1,770	2,190	2,140	1,800
3	1,200	606	600	552	618	558	777	1,540	1,920	2,190	2,110	1,750
4	1,200	600	594	534	612	618	770	1,540	2,080	2,200	2,090	1,730
5	1,200	594	582	552	606	630	770	1,540	2,150	2,220	2,050	1,720
6	1,200	588	576	552	618	637	760	1,540	2,220	*2,310	2,020	1,700
7	1,200	588	582	558	637	686	780	1,630	2,300	2,370	2,000	1,760
8	1,200	588	576	570	714	749	798	1,670	2,360	2,420	1,980	1,840
9	1,160	588	576	558	742	714	798	1,700	2,360	2,460	1,980	1,860
10	1,150	606	576	546	721	672	819	1,670	2,360	2,470	*2,000	1,860
11	1,160	600	594	570	*700	644	833	1,630	2,360	2,480	2,010	1,830
12	1,160	594	588	564	700	618	1,050	1,740	*2,360	2,490	2,030	1,820
13	1,140	594	582	546	686	630	1,070	1,770	2,320	2,500	2,040	1,820
14	1,130	594	582	564	672	644	1,110	1,800	2,310	2,500	2,050	1,770
15	1,120	588	582	570	651	644	1,290	1,850	2,310	2,490	2,050	1,690
16	1,120	582	582	564	637	637	1,400	1,870	2,320	2,480	2,050	1,640
17	1,120	576	552	558	624	644	1,430	1,880	2,320	2,480	2,050	1,620
18	1,120	*576	522	564	624	658	1,410	1,880	2,320	2,490	2,050	1,620
19	1,110	582	516	558	612	679	1,400	1,880	2,300	2,480	2,050	1,620
20	1,100	564	534	558	606	693	1,400	1,890	2,280	2,380	2,040	1,590
21	1,090	570	564	552	612	707	*1,400	1,880	2,280	2,340	2,050	1,550
22	*1,070	576	564	564	612	728	1,440	1,880	2,280	2,320	2,050	1,540
23	1,050	606	570	552	600	742	1,540	1,850	2,310	2,310	2,050	1,540
24	1,050	624	582	564	576	763	1,550	1,850	2,340	2,320	2,050	1,540
25	944	624	582	540	558	763	1,540	*1,790	2,320	2,340	2,050	1,510
26	756	630	570	540	576	763	1,570	1,770	2,350	2,320	2,030	1,500
27	742	624	570	528	546	763	1,560	1,700	2,320	2,300	1,990	1,500
28	714	612	564	534	570	777	1,580	1,670	2,300	2,290	1,970	1,500
29	686	606	552	570	576	777	1,590	1,570	2,290	2,270	1,940	1,500
30	686	600	558	518	791	791	1,560	1,650	2,290	2,240	1,930	1,500
31	872	-----	552	618	-----	805	-----	1,660	-----	2,220	1,900	-----
Total	32,720	17,898	17,730	17,298	18,248	21,298	35,619	53,430	67,520	73,100	62,990	50,100
Mean	1,055	597	572	558	629	687	1,187	1,724	2,251	2,358	2,032	1,670
Ac-ft	64,900	35,500	35,170	34,310	36,190	42,240	70,650	106,000	133,900	145,000	124,900	99,370
Calendar year 1959: Max	2,550			Min	516	Mean	1,439	Ac-ft	1,042,000			
Water year 1959-60: Max	2,500			Min	516	Mean	1,279	Ac-ft	928,100			

\* Discharge measurement made on this day.

## Diversions from Deschutes River near Bend, Oreg.

The following six canals, which are equipped with water-stage recorders, are the only diversions from Deschutes River between gaging stations at Benham Falls and below Bend.

655. Arnold Canal diverts from right bank at head of Lava Island, in SW $\frac{1}{4}$  sec.27, T.18 S., R.11 E.; water used for irrigation southeast of Bend.

665. Central Oregon Canal diverts from right bank in NE $\frac{1}{4}$  sec.13, T.18 S., R.11 E.; water used for irrigation east of Bend. Beginning Oct. 1, 1932, record obtained upstream from intake of Pilot Butte Canal.

685. Deschutes County Municipal Improvement District Canal diverts from left bank in NE $\frac{1}{4}$  sec.32, T.17 S., R.12 E., at Bend; water stored in Crescent Lake for Tumalo project is diverted by this canal and supplements flow in Tumalo project feed canal for irrigation near Tumalo.

690. North Unit main canal diverts water from right bank in NE $\frac{1}{4}$  sec.29, T.17 S., R.12 E.; water used for irrigation near Madras.

695. North Canal diverts from right bank in NE $\frac{1}{4}$  sec.29, T.17 S., R.12 E.; water used for irrigation north of Bend, mostly near Redmond.

700. Swalley Canal diverts from right bank in NE $\frac{1}{4}$  sec.29, T.17 S., R.12 E.; water used for irrigation north of Bend, mostly near Redmond.

Records of monthly discharge of these canals, published as a group, are available from October 1926 to September 1960; records for each canal published separately prior to 1926.

Diversions, in acre-feet, water year October 1959 to September 1960

Month	Arnold Canal	Central Oregon Canal	Deschutes County Municipal Improvement District Canal	North Unit main canal	North Canal	Swalley Canal	Total
October.....	4,060	19,940	470	17,050	19,260	2,790	63,570
November.....	294	1,030	0	12,370	704	668	15,070
December.....	266	4,010	0	0	3,600	676	8,550
January.....	383	1,890	0	0	1,820	345	4,240
February.....	169	216	0	0	956	424	1,740
March.....	349	1,520	0	0	1,230	422	3,520
April.....	2,230	17,430	58	18,690	16,210	3,380	58,200
May.....	5,250	28,500	3,170	36,440	28,650	5,710	107,700
June.....	6,470	33,940	1,110	54,140	31,890	6,800	134,400
July.....	7,580	36,760	5,480	55,850	34,750	7,010	147,400
August.....	7,300	36,020	8,230	33,990	34,480	6,970	127,000
September.....	5,980	29,630	1,760	29,110	28,340	5,370	100,200
Water year 1959-60.	40,320	210,900	20,280	257,800	201,700	40,560	771,600

705. Deschutes River below Bend, Oreg.

Location.--Lat 44°05'00", long 121°18'20", in SE $\frac{1}{4}$  sec.20, T.17 S., R.12 E., on right bank half a mile downstream from North Canal, half a mile north of Bend city limits, and at mile 164.4.

Drainage area.--1,899 sq mi.

Records available.--October 1914 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 3,503.96 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 1, 1931, at site 200 ft downstream at datum 1.00 ft higher.

Average discharge.--46 years, 584 cfs (422,800 acre-ft per year).

Extremes.--Maximum discharge during year, 1,140 cfs June 15 (gage height, 3.20 ft); minimum, 5.6 cfs Nov. 30.

1914-60: Maximum discharge, 2,500 cfs Mar. 31, 1918, Dec. 7, 1921 (gage height, 3.9 ft, present datum); maximum gage height, 5.38 ft Dec. 15, 1932 (backwater from ice); minimum discharge, 1 cfs Aug. 25, 1930.

Maximum discharge known near this site since 1905, 4,820 cfs Nov. 27, 1909.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Flow regulated by powerplant at Bend, since 1922 by Crescent Lake and Crane Prairie Reservoir, and since 1942 by Wickiup Reservoir (see p. 59). Six large canals (see preceding page) and several small ditches divert water above station for irrigation.

Revisions (water years).--WSP 1318: 1916-18(M), 1926(M), 1931(M).

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

0.9	14	2.0	325
1.0	22	2.5	630
1.2	47	3.0	1,010
1.4	88	3.5	1,480
1.7	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	93	637	23	a560	489	574	910	61	91	33	83	86
2	61	651	31	a560	616	567	778	56	76	36	65	51
3	56	844	61	a560	609	584	728	52	102	33	74	46
4	47	616	70	a560	609	609	707	52	83	36	83	60
5	47	588	354	a560	609	602	714	51	72	41	76	49
6	52	581	595	a570	616	340	651	56	67	61	60	34
7	58	581	609	a580	637	208	475	112	88	58	52	79
8	72	581	602	581	714	298	271	102	107	61	a50	65
9	54	585	602	a580	735	473	204	99	115	a58	52	79
10	44	644	602	a570	714	672	199	67	132	60	56	74
11	58	425	616	a570	700	651	136	86	107	63	47	65
12	60	262	616	a570	700	630	134	115	93	72	49	76
13	52	262	616	a560	693	*637	52	112	65	65	52	47
14	47	266	609	a580	679	651	61	93	46	61	52	41
15	47	266	616	a580	651	630	208	102	137	63	46	79
16	51	262	616	a580	644	602	158	102	1,130	63	47	58
17	41	253	602	a580	630	609	88	104	788	61	31	41
18	43	253	540	a580	609	616	74	99	138	56	61	34
19	71	256	a510	a580	581	630	47	88	76	52	43	40
20	104	248	a510	a580	567	665	37	118	58	46	43	34
21	102	258	a540	a580	560	707	*34	86	52	58	46	40
22	81	248	a540	581	560	721	61	76	46	40	49	33
23	67	271	a540	567	547	742	118	86	65	43	58	34
24	67	294	a570	540	477	756	86	110	83	46	74	56
25	176	298	a600	508	320	756	70	65	56	47	47	43
26	140	302	a580	502	345	763	65	132	58	44	79	51
27	122	271	a310	411	540	763	49	91	52	41	70	43
28	104	226	a75	183	560	778	56	110	61	46	41	49
29	79	173	a80	140	574	778	63	99	58	60	69	49
30	76	20	a310	162	-----	794	67	74	47	61	70	49
31	322	-----	a560	190	-----	810	-----	79	-----	65	70	-----
Total	2,499	11,234	14,105	15,805	17,285	19,586	7,201	2,753	4,129	1,630	1,855	1,603
Mean	80.6	374	455	510	596	632	240	88.8	138	52.6	59.8	53.4
Ac-ft	4,960	22,280	27,980	31,350	34,280	38,850	14,280	5,460	8,190	3,230	3,680	3,180
Calendar year 1959: Max	1,190				Min 20		Mean 365		Ac-ft 264,000			
Water year 1959-60: Max	1,130				Min 20		Mean 272		Ac-ft 197,700			

\* Discharge measurement made on this day.  
a No gage-height record; discharge estimated on basis of records for station below Lava Island adjusted for flow in intervening canals.

## 730. Tumalo Creek near Bend, Oreg.

Location.--Lat 44°05'20", long 121°22'20", near center of sec.23, T.17 S., R.11 E., on left bank a quarter of a mile upstream from Tumalo feed canal, 3 miles upstream from mouth, and 4 miles northwest of Bend.

Drainage area.--47.3 sq mi.

Records available.--October 1913 to December 1921, February, April to November 1922, March 1923 to September 1960. Published as "below Bend" 1949-50.

Gage.--Water-stage recorder. Datum of gage is 3,566.82 ft above mean sea level, datum of 1929. Prior to Apr. 27, 1913, staff gage and Apr. 27, 1915, to Sept. 30, 1918, water-stage recorder or staff gage, at same site and datum.

Average discharge.--42 years (1913-14, 1916-21, 1923-35, 1936-60), 103 cfs (74,570 acre-ft per year).

Extremes.--Maximum discharge during year, 535 cfs June 16; minimum daily, 45 cfs Jan. 21, 22, Feb. 27 to Mar. 2.

1913-60: Maximum discharge, 1,000 cfs about Jan. 6, 1923 (no flow in canal), from rating curve extended above 450 cfs; minimum daily, 25 cfs Jan. 3, 1924.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. All records presented herein include flow in Columbia Southern Canal, which diverts 8 miles above station for irrigation of lands near Tumalo. No flow in the canal Oct. 9 to Apr. 10, Apr. 15 to May 8, Sept. 8-30. Crater Creek Canal diverts flow of tributaries of Soda Creek into head of Tumalo Creek. Diversion above station for municipal water supply of Bend began Dec. 15, 1926, and averaged 5.6 cfs for water year 1960.

Revisions (water years).--WSP 864: 1937. WSP 1218: Drainage area. WSP 1448: 1923(M), 1927-29(M), 1935-38(M), 1942(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	64	68	66	b56	52	b45	89	79	252	224	77	54
2	61	*66	66	b54	50	b45	98	81	266	180	68	54
3	59	81	66	b52	50	46	101	83	293	173	84	57
4	58	76	b64	b50	50	50	105	83	311	182	65	64
5	58	72	b62	b60	52	55	105	81	320	189	62	59
6	57	66	b62	b70	53	*60	130	87	338	193	60	54
7	57	65	64	b75	83	b70	181	125	311	193	60	46
8	96	62	b64	b70	74	b68	181	115	*265	*168	60	56
9	168	62	64	b65	60	68	163	116	257	143	61	56
10	118	64	62	b60	59	b66	148	127	252	131	59	56
11	178	64	60	b60	59	66	140	160	257	118	57	58
12	95	64	62	b60	58	65	*127	*194	275	115	56	58
13	79	59	b66	*b60	56	64	119	155	287	114	55	59
14	70	b62	b68	b60	58	65	115	137	312	109	56	58
15	65	62	66	b60	56	66	115	140	402	103	56	58
16	61	b65	65	b58	b56	65	103	140	460	97	55	59
17	59	b65	65	55	b54	66	98	129	387	107	52	56
18	59	64	65	52	54	70	98	119	304	113	54	56
19	56	64	65	50	b53	70	92	116	267	105	54	56
20	61	62	65	48	b53	70	89	133	201	97	56	59
21	62	70	65	45	53	72	87	129	178	89	59	58
22	200	78	65	45	b53	78	85	120	183	86	60	56
23	132	135	65	50	b52	78	85	109	207	79	60	56
24	85	101	66	55	b50	81	83	105	239	75	60	54
25	76	83	65	60	b48	85	81	106	239	73	57	58
26	70	76	b65	58	b46	94	78	116	207	69	57	56
27	68	74	b65	56	b45	103	78	129	197	76	55	58
28	66	72	b65	55	b45	98	78	128	198	76	54	53
29	65	70	b64	54	b45	98	78	147	237	75	52	53
30	65	68	b62	53	-----	96	78	175	239	96	50	53
31	68	-----	b60	52	-----	94	-----	228	-----	90	56	-----
Total	2,536	2,140	1,994	1,758	1,577	2,217	3,208	3,892	8,141	3,738	1,807	1,686
Mean	81.8	71.3	64.3	56.7	54.4	71.5	107	126	271	121	58.3	56.2
Ac-ft	5,030	4,240	3,960	3,490	3,130	4,400	6,360	7,720	16,150	7,410	3,580	3,340
Calendar year 1959: Max			287		Min 37		Mean 85.7		Ac-ft 62,070			
Water year 1959-60: Max			460		Min 45		Mean 94.8		Ac-ft 68,810			

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Jan. 17-28, Mar. 3-5; discharge estimated on basis of records for Squaw Creek near Sisters and Lake Creek near Sisters.

## 750. Squaw Creek near Sisters, Oreg.

Location.--Lat 44°14'02", long 121°33'57", in SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.29, T.15 S., R.10 E., on right bank 600 ft upstream from intake of McAllister ditch and 4 miles south of Sisters.

Drainage area.--54.8 sq mi.

Records available.--July 1906 to October 1918, June to August 1919, October 1919 to September 1920, May 1921 to September 1924 (no winter records), April 1925 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Altitude of gage is 3,490 ft (by barometer). July 1, 1906, to May 29, 1913, staff gage at site 800 ft downstream at different datum, below intake of McAllister ditch (records include flow in McAllister ditch). May 30, 1913, to Sept. 2, 1915, staff gage and Mar. 24, 1916, to Oct. 5, 1928, water-stage recorder, at site 100 ft downstream at different datum.

Average discharge.--48 years (1906-18, 1919-20, 1925-60), 106 cfs (76,740 acre-ft per year).

Extremes.--Maximum discharge during year, 710 cfs June 16 (gage height, 2.92 ft); minimum, 28 cfs Feb. 28.

1906-60: Maximum gage height, about 8.75 ft (over top of gage) Nov. 22, 1909, site and datum then in use (discharge not determined); maximum discharge since 1909, 1,130 cfs Dec. 2, 1941 (gage height, 3.33 ft); minimum, 19 cfs Dec. 6, 1922.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. No regulation. A canal near mouth of Pole Creek, a tributary above station, diverts entire flow of that creek for irrigation of lands near Sisters.

Revisions.--WSP 1218: 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 Mar. 28 to May 9, May 30 to July 3, Aug. 12 to Sept. 5)

1.1	23	2.0	220
1.3	46	2.5	440
1.5	80	3.0	690
1.7	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	75	*76	59	b52	42	b30	60	66	210	248	122	75
2	71	80	59	b50	38	b32	67	66	252	213	110	76
3	66	94	56	b50	37	b32	66	66	280	210	108	84
4	60	96	49	b50	37	b34	75	62	318	213	102	84
5	57	86	b50	b55	36	b35	84	64	309	220	100	76
6	52	84	b52	b60	40	b38	105	76	318	228	100	67
7	51	84	56	67	*94	b40	100	284	244	244	102	66
8	88	82	54	62	85	43	128	88	248	220	102	67
9	164	80	56	b60	66	43	134	90	*232	196	105	67
10	149	80	56	b55	56	45	125	108	232	173	105	69
11	152	78	56	b52	54	42	118	143	248	173	105	73
12	140	78	54	*b50	52	37	110	149	268	*176	102	75
13	112	73	57	b48	49	37	102	118	314	182	96	76
14	96	75	59	b46	48	37	100	102	358	188	92	75
15	86	75	59	b45	46	36	*92	100	490	196	90	73
16	80	71	56	b45	45	37	88	94	590	188	88	66
17	75	69	56	b44	46	37	86	86	465	185	90	64
18	a70	69	54	b44	43	37	84	80	358	182	94	67
19	a70	69	54	b42	43	38	80	76	298	179	94	67
20	a100	69	54	b40	43	41	82	96	224	167	90	67
21	a150	76	54	b40	40	43	78	86	216	152	88	62
22	a200	140	52	b40	42	46	75	76	228	149	84	59
23	a130	167	52	b42	41	48	73	*73	240	134	*80	*59
24	a90	82	54	b45	41	51	69	71	272	128	80	62
25	a80	69	54	b48	40	54	67	69	272	122	78	62
26	a75	62	57	b50	38	64	66	98	240	128	76	62
27	a70	64	67	52	34	64	67	105	236	149	75	62
28	a70	60	b85	52	33	60	64	100	248	143	73	60
29	a70	59	b62	49	b30	64	66	115	280	134	71	57
30	a70	58	b60	45	-----	64	66	152	280	155	71	57
31	a70	-----	b55	43	-----	59	-----	168	-----	143	71	-----
Total	2,887	2,404	1,738	1,523	1,342	1,368	2,641	2,963	8,788	5,518	2,846	2,038
Mean	93.1	80.1	56.1	49.1	46.3	44.1	88.0	95.6	293	178	91.8	67.9
Ac-ft	5,730	4,770	3,450	3,020	2,660	2,710	5,240	5,880	17,430	10,940	5,640	4,040
Calendar year 1959: Max 434 Min 49 Mean 93.4 Ac-ft 67,620												
Water year 1959-60: Max 590 Min 30 Mean 98.5 Ac-ft 71,510												

Peak discharge (base, 470 cfs).--June 16 (6:30 p.m.) 710 cfs (2.92 ft).

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Tumalo Creek near Bend and Lake Creek near Sisters.

b Stage-discharge relation affected by ice.

## 765. Deschutes River near Culver, Oreg.

Location.--Lat 44°32'30", long 121°17'10", in SW $\frac{1}{4}$  sec.10, T.12 S., R.12 E., on right bank 0.7 mile downstream from bridge on Cove-Grandview road, 2.5 miles upstream from Crooked River, 4 miles northwest of Culver, and at mile 116.5.

Drainage area.--2,723 sq mi.

Records available.--July 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,755 ft above mean sea level (river-profile survey).

Average discharge.--8 years, 1,010 cfs (781,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,990 cfs June 17 (gage height, 4.02 ft); minimum, 489 cfs July 22, 23.  
1952-60: Maximum discharge, 3,040 cfs Dec. 22, 1955 (gage height, 5.18 ft); minimum, 446 cfs Aug. 21, 1955.

Remarks.--Records excellent. Slight regulation by Crescent Lake and Crane Prairie and Wickiup Reservoirs (see p. 59). Many diversions for irrigation above station. Records of 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)

1.3	475
2.5	995
4.0	1,980

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	545	854	570	1,130	790	*1,110	1,390	538	548	542	531	524
2	570	1,020	545	1,090	1,140	1,120	1,400	538	562	520	545	552
3	542	*1,040	548	1,090	1,160	1,150	1,340	528	562	500	542	531
4	534	1,050	528	1,090	1,180	1,130	1,300	524	580	496	542	517
5	524	990	520	1,100	1,160	1,210	1,250	520	576	496	551	524
6	520	1,020	994	1,140	1,170	1,160	1,210	520	576	*496	542	524
7	524	1,030	1,090	1,150	1,250	880	1,160	520	594	503	528	514
8	545	1,030	1,090	1,160	1,350	855	951	562	590	506	520	538
9	584	1,040	1,150	1,120	1,350	890	790	566	573	510	510	556
10	627	1,040	1,160	1,100	1,350	1,150	718	562	573	506	503	538
11	584	1,050	1,150	1,140	1,300	1,230	691	545	584	510	514	542
12	660	795	1,150	1,130	1,230	1,190	*831	552	562	510	510	542
13	594	750	1,120	1,090	1,220	1,120	612	598	573	520	503	548
14	559	786	1,140	1,100	1,200	1,130	534	573	566	520	506	524
15	559	810	*1,160	1,110	1,210	1,160	534	556	635	517	510	514
16	545	795	1,110	1,120	1,190	1,120	660	570	1,230	514	506	531
17	545	795	1,110	1,130	1,160	1,120	635	562	1,920	517	510	538
18	524	800	1,060	1,110	1,140	1,140	556	562	1,040	517	531	520
19	520	763	995	1,120	1,100	1,150	548	559	655	514	528	514
20	534	763	990	1,100	1,070	1,170	542	562	584	510	510	510
21	570	763	1,040	1,090	1,050	1,220	514	580	534	503	506	510
22	590	763	1,100	1,100	1,050	1,250	510	562	517	506	506	510
23	714	930	1,110	1,120	1,060	1,260	520	548	510	500	510	506
24	601	935	1,130	1,130	1,070	1,300	576	*545	514	496	*510	510
25	552	885	1,160	1,090	895	1,300	556	573	538	503	528	514
26	627	875	1,120	*1,010	820	1,260	548	548	545	506	514	520
27	598	870	1,100	984	920	1,330	542	590	528	510	517	517
28	580	800	816	875	1,040	1,340	520	559	524	510	545	520
29	562	732	623	682	1,070	1,350	520	566	510	503	520	514
30	548	722	627	639	-----	1,370	538	559	524	517	510	517
31	545	-----	937	696	-----	1,380	-----	556	-----	538	542	-----
Total	17,636	26,496	29,923	32,736	32,675	36,545	22,776	17,203	19,327	15,816	16,130	15,739
Mean	569	883	965	1,056	1,127	1,179	759	555	644	510	520	525
Ac-ft	34,980	52,550	59,350	64,930	64,810	72,490	45,180	34,120	38,330	31,370	31,990	31,220

Calendar year 1959: Max 1,720 Min 492 Mean 852 Ac-ft 616,600  
Water year 1959-60: Max 1,920 Min 496 Mean 773 Ac-ft 561,300

\* Discharge measurement made on this day.

780. Beaver Creek near Paulina, Oreg.

Location.--Lat 44°09'50", long 119°55'20", in NE<sup>1</sup> sec.26, T.16 S., R.23 E., on right bank three-quarters of a mile downstream from Paulina Creek, 1<sup>1</sup>/<sub>2</sub> miles downstream from Wolf Creek, and 3 miles northeast of Paulina.

Drainage area.--450 sq mi, approximately.

Records available.--October 1942 to September 1960. Prior to October 1945 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Altitude of gage is 3,690 ft (by barometer).

Average discharge.--18 years, 96.3 cfs (69,720 acre-ft per year).

Extremes.--Maximum discharge during year, 821 cfs Mar. 21 (gage height, 3.36 ft); minimum, 0.2 cfs Sept. 1-3.

1942-60: Maximum discharge, 3,620 cfs Dec. 28, 1945 (gage height, 10.2 ft), from rating curve extended above 900 cfs on basis of slope-area measurement at gage height 8.7 ft, and shape of later curves; maximum gage height, 10.38 ft Mar. 26, 1952; no flow Oct. 13-29, 1945.

Remarks.--Records excellent except those for periods of shifting control or no gage-height record, which are good. No regulation. Diversions for irrigation of about 6,400 acres above station. Two small ditches divert above station for irrigation of about 250 acres below.

Revisions (water years).--WSP 1348: Drainage area. WSP 1448: 1946, 1948, 1949-50(M), 1951-52.

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 Nov. 4			Nov. 5 to Mar. 21			Mar. 22 to Sept. 30				
0.4	4.1		0.4	5.0	1.2	74	0.13	0.2	0.9	32
.5	7.0		.5	8.6	1.5	128	.2	.6	1.1	53
			.6	14	2.0	260	.3	2.0	1.5	114
			.7	20	3.0	675	.4	4.2	2.0	240
			.9	37			.5	7.5	2.5	430
							.6	12	3.0	675
							.7	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	4.7	4.7	9.1	7.9	15	17	240	13	72	0.6	al.0	0.2
2	4.7	4.7	9.1	7.5	17	15	266	14	57	.6	a.9	.2
3	4.7	5.3	9.6	7.2	18	15	282	19	44	.6	a.9	.2
4	4.7	5.4	8.6	6.8	17	*17	308	22	19	.6	a.9	.3
5	4.7	*7.9	7.9	6.8	17	57	326	6.8	4.2	.6	a.9	.3
6	4.7	7.9	8.2	7.2	21	137	318	6.2	2.0	.6	a.9	.4
7	4.7	7.9	8.6	7.5	29	244	286	6.8	1.1	.6	a.9	.4
8	5.0	8.2	8.6	8.6	98	278	275	7.5	.9	*.6	a.9	.4
9	5.0	8.2	8.6	8.6	162	168	244	6.8	.9	.6	a.9	3.1
10	5.0	8.2	8.6	8.6	88	97	225	5.8	.9	.6	a.9	4.2
11	5.0	8.2	8.6	8.6	56	82	184	3.1	.8	.6	a.9	4.2
12	5.0	8.2	9.1	8.6	48	99	158	2.0	.8	.6	a.9	4.2
13	5.0	7.9	8.6	a9	40	195	*134	2.4	.8	.6	a.9	4.2
14	5.0	7.5	8.2	al0	35	155	120	3.1	.7	.6	a.9	4.2
15	5.0	8.2	8.6	al2	31	112	114	2.7	.7	.6	a.9	4.2
16	5.0	8.2	8.6	al2	28	90	105	1.2	.7	.6	.9	4.2
17	5.0	8.2	*8.6	al2	24	118	80	2.0	.6	.6	.9	a3.5
18	5.0	8.2	8.6	al2	23	245	85	2.7	.6	.6	.7	a3
19	5.0	9.1	7.9	al2	22	362	83	3.3	.6	.6	.6	a3
20	5.0	9.1	7.5	al2	21	472	76	3.5	.6	.6	.5	a3
21	5.0	10	7.5	al3	20	585	76	11	.6	.6	.4	a3
22	5.0	11	7.2	al3	20	630	67	21	.6	.6	.4	a3.5
23	5.3	10	7.9	al3	18	*800	36	20	.6	a.7	.4	a4
24	5.3	10	9.1	al3	18	595	23	16	.6	a.7	.4	a4.5
25	5.3	10	9.1	al3	19	560	24	*19	.6	a.8	*.4	4.5
26	5.3	9.6	8.2	al2	17	540	21	.69	.6	a.9	.4	1.8
27	5.0	8.6	7.9	al2	15	465	14	240	.6	a.9	.4	.7
28	4.7	8.6	7.9	*12	18	414	15	240	.6	a.9	.3	*.7
29	4.7	8.6	7.5	12	18	296	12	156	.6	a.9	.3	.7
30	4.7	8.6	7.9	13	-----	240	13	112	.6	al.0	.3	.7
31	4.7	-----	7.9	14	-----	216	-----	90	-----	al.0	.3	-----
Total	152.9	246.2	259.3	324.9	973	8,116	4,228	1,127.9	214.9	21.0	21.2	71.5
Mean	4.93	8.21	8.36	10.5	33.6	262	141	36.4	7.16	0.68	0.68	2.38
Ac-ft	303	488	514	644	1,930	16,100	8,390	2,240	426	42	42	142

Calendar year 1959: Max 216 Min 0.6 Mean 20.3 Ac-ft 14,720  
 Water year 1959-60: Max 630 Min 0.2 Mean 43.1 Ac-ft 31,260

Peak discharge (base, 700 cfs).--Mar. 21 (10 p.m.) 821 cfs (3.36 ft).

\* Discharge measurement made on this day.  
 a No gage-height record; discharge estimated on basis of weather records, recorded range in stage, and records for Crooked River near Post.

Note.--Shifting-control method used Nov. 4, Aug. 16 to Sept. 9, Sept. 25-30.

## 795. Crooked River near Post, Oreg.

Location.--Lat 44°07'00", long 120°15'50", in NW¼ sec.7, T.17 S., R.21 E., on right bank 1 mile downstream from North Fork and 11.5 miles southeast of Post.

Drainage area.--2,160 sq mi, approximately, of which 500 sq mi is probably noncontributing.

Records available.--November 1908 to May 1911, December 1939 to September 1960 (discontinued). Records for June to August 1911, published in WSP 312, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 3,461.60 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Nov. 9, 1908, to May 31, 1911, staff gage at site half a mile upstream at different datum.

Average discharge.--20 years (1940-60), 330 cfs (238,900 acre-ft per year).

Extremes.--Maximum discharge during year, 2,560 cfs Apr. 6 (gage height, 4.66 ft); minimum, 6.6 cfs July 16.

1908-11, 1939-60: Maximum discharge, 7,550 cfs Mar. 26, 1952 (gage height, 7.31 ft), from rating curve extended above 3,800 cfs; minimum, 4 cfs Aug. 21-31, 1909, Aug. 20, 1953.

Remarks.--Records good except those for periods of ice effect, which are fair. No regulation. Many diversions for irrigation above station. One small ditch diverts above station for irrigation of about 60 acres below. Records of suspended sediment loads and water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1448: 1909-11. 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)

0.7	5.5	2.0	250
.8	9.0	2.5	425
.9	14	3.0	700
1.1	37	4.0	1,700
1.5	116	5.0	3,070

Discharge, in cubic 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	54	b55	b50	b80	b70	913	247	265	8.0	12	10
2	22	52	b55	b40	b90	b75	1,120	329	220	8.3	11	9.6
3	22	54	60	b44	b90	b70	1,850	314	187	8.3	9.6	8.6
4	22	58	b60	b46	b90	*84	2,020	295	168	8.3	9.6	9.0
5	22	*52	b50	b50	b90	99	2,220	256	139	9.0	10	8.3
6	22	51	b42	b50	b100	214	2,230	247	101	10	9.6	9.0
7	23	54	b50	b55	112	353	2,220	304	84	10	9.0	9.0
8	29	54	b50	b55	171	500	2,170	324	68	10	8.6	12
9	33	52	b55	b50	238	357	1,730	289	58	9.0	9.0	12
10	37	51	b50	b55	226	265	1,220	268	52	10	9.6	11
11	49	49	b60	b55	168	211	1,040	256	46	11	8.6	11
12	46	51	b65	b55	146	214	802	250	36	11	9.0	11
13	44	46	b60	b55	128	331	*680	301	32	*10	8.6	10
14	42	44	b60	b60	121	342	687	256	29	8.6	8.6	10
15	42	b48	b70	b70	116	265	575	199	28	8.3	9.6	9.6
16	47	b48	b70	b70	110	217	510	187	25	7.6	8.6	9.6
17	47	b48	*b60	b70	99	232	475	185	24	8.0	8.3	8.6
18	49	b55	b55	b70	95	385	452	190	23	8.0	8.6	9.0
19	49	62	b50	b70	103	617	448	153	21	9.0	9.0	9.0
20	47	58	b46	b70	93	859	397	144	18	8.6	9.0	9.0
21	51	62	b46	b75	84	1,100	425	229	15	8.6	9.0	9.6
22	54	66	b50	b75	74	1,320	377	217	15	8.6	8.6	11
23	54	68	b65	b75	74	1,450	320	211	13	9.0	9.0	12
24	56	68	b70	b75	68	1,600	286	187	13	9.0	10	12
25	56	66	b70	b75	74	1,750	262	*259	12	10	9.6	12
26	54	60	b55	b70	72	1,960	250	485	11	11	*11	11
27	56	47	b46	b70	b65	1,910	238	778	12	9.6	11	10
28	58	b50	b50	*b70	b65	1,780	256	674	11	11	10	*10
29	56	b50	b50	b70	b60	1,310	235	510	11	9.6	11	10
30	54	b50	b50	b75	-----	1,280	232	381	9.0	11	11	10
31	54	-----	b50	b75	-----	967	-----	320	-----	13	11	-----
Total	1,319	1,628	1,725	1,945	3,136	22,187	26,440	9,244	1,746.0	291.4	297.1	303.5
Mean	42.5	54.3	55.6	62.7	108	716	881	298	58.2	9.40	9.58	10.1
Ac-ft	2,620	3,230	3,420	3,860	6,220	44,010	52,440	18,340	3,460	578	589	602

Calendar year 1959: Max 1,010 Min 5 Mean 127 Ac-ft 92,240  
Water year 1959-60: Max 2,230 Min 7.6 Mean 192 Ac-ft 139,400

Peak discharge (base, 2,000 cfs).--Mar. 25 (11:30 p.m.) 2,350 cfs (4.50 ft); Apr. 6 (1 a.m.) 2,560 cfs (4.66 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

805. Crooked River above Hoffman Dam, near Prineville, Oreg.

Location.--Lat 44°08'40", long 120°49'40", in NE $\frac{1}{4}$  sec.32, T.16 S., R.16 E., on right bank 0.9 mile upstream from Hoffman diversion dam and 11 miles south of Prineville.

Drainage area.--2,760 sq mi, approximately, of which 500 sq mi is probably noncontributing.

Records available.--November 1908 to September 1914, March 1941 to September 1960. Published as "near Prineville" 1908-12 and as "at Hoffman's ranch, near Prineville" 1913-14. The estimate of monthly mean discharge for October 1908, published in WSP 370, has been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 2,981.00 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Jan. 1, 1913, staff gage at Stearn's ranch 8 miles downstream at different datum. January 1913 to September 1914, staff gage at Hoffman's ranch 3 miles downstream at different datum.

Average discharge.--24 years (1909-14, 1941-60), 378 cfs (273,700 acre-ft per year).

Extremes.--Maximum discharge during year, 2,380 cfs Apr. 8 (gage height, 4.85 ft); minimum, 0.6 cfs July 26-28.

1908-14, 1941-60: Maximum discharge, 8,410 cfs Mar. 26, 1952 (gage height, 8.2 ft, from floodmarks); no flow Aug. 13-21, 1959.

Remarks.--Records excellent except those for periods of ice effect, which are good. Some regulation caused by construction operations at Prineville Dam 5 miles upstream. Diversions for irrigation of over 20,000 acres above station.

Revisions (water years).--WSP 1448: 1909-13, 1914(M), drainage area (present and former site). See also Records available.

Rating tables, water year 1959-60, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-10		Oct. 11 to Sept. 30	
1.1	7.7	0.8	0.6
1.2	14	.9	1.5
1.3	22	1.0	3.4
1.4	34	1.1	6.6
		1.2	12
		1.3	20
		1.4	29
		1.6	52
		2.0	114
		2.5	255
		3.0	500
		4.0	1,340
		5.0	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	11	64	61	b50	97	82	1,020	255	336	7.6	2.1	2.5
2	11	62	64	42	101	97	1,050	275	287	6.2	2.1	2.5
3	18	61	68	50	101	*82	1,380	365	238	6.2	2.1	2.3
4	16	*61	68	44	106	106	1,780	331	204	5.4	1.9	2.3
5	13	61	52	51	103	127	2,040	308	178	5.8	2.5	3.4
6	19	62	40	b55	99	167	2,210	271	151	5.4	2.3	3.7
7	20	60	56	b60	112	331	2,300	275	108	5.1	2.5	3.6
8	22	58	52	b60	167	542	2,340	350	90	4.7	2.7	3.7
9	24	60	65	b65	238	514	2,270	340	75	3.1	2.5	4.3
10	27	60	58	b60	331	390	1,970	295	65	2.9	2.1	4.3
11	40	57	72	b65	248	308	1,460	267	58	2.7	1.9	4.0
12	36	57	75	b60	189	259	1,060	263	55	*2.5	1.9	4.0
13	47	57	57	65	164	300	790	271	47	2.1	1.5	4.0
14	46	58	64	65	144	425	*710	313	31	2.1	1.5	4.3
15	46	55	71	66	136	390	710	255	24	1.8	1.6	4.7
16	44	53	*73	76	127	304	591	204	24	1.5	1.8	4.7
17	45	51	71	79	123	267	535	192	26	1.5	1.9	4.3
18	51	64	64	79	114	318	494	189	23	1.5	1.8	4.3
19	55	68	56	78	110	521	476	183	22	1.5	1.8	4.3
20	57	69	53	76	112	774	458	175	22	1.3	1.6	4.3
21	61	71	50	79	108	1,000	425	175	20	1.2	1.6	4.0
22	57	68	55	84	103	1,300	440	263	20	1.1	1.8	5.2
23	61	71	71	93	95	*1,500	350	241	17	.9	1.8	5.4
24	61	73	73	92	87	1,660	345	220	16	.7	1.8	4.0
25	61	73	b70	90	84	1,800	304	*208	16	.7	*1.9	3.7
26	58	73	b65	85	b90	1,960	287	304	15	.7	2.3	3.6
27	65	71	b50	*79	81	2,080	275	640	13	.6	2.3	3.6
28	65	64	b50	79	62	2,100	271	782	8.6	1.1	2.5	3.6
29	65	60	b55	84	85	1,950	283	668	7.6	1.5	2.7	*3.4
30	65	64	b55	90	-----	1,580	255	514	8.0	1.2	2.9	3.4
31	65	-----	b55	93	-----	1,340	-----	410	-----	2.5	2.7	-----
Total	1,332	1,688	1,889	2,190	3,697	24,574	28,919	9,802	2,205.2	93.0	64.4	115.4
Mean	43.0	62.9	60.9	70.6	127	793	964	316	73.5	3.00	2.08	3.85
Ac-ft	2,640	3,740	3,750	4,340	7,330	48,740	57,360	19,440	4,370	184	128	229

Calendar year 1959: Max 975 Min 0 Mean 133 Ac-ft 96,630  
Water year 1959-60: Max 2,340 Min 0.6 Mean 210 Ac-ft 152,500

Peak discharge (base, 2,500 cfs).--No peak above base.

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## DESCHUTES RIVER BASIN

875. Crooked River near Culver, Oreg.

Location.--Lat 44°33'40", long 121°16'10", in sec. 3 (50 ft west of  $\frac{1}{4}$ -corner on line between secs. 2 and 3), T.12 S., R.12 E., on right bank 1 mile upstream from mouth, 1.2 miles downstream from Cove powerplant, and 4 miles northwest of Culver.

Drainage area.--4,330 sq mi, approximately, of which 500 sq mi is probably noncontributing.

Records available.--October 1917 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,664.86 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Aug. 2, 1945, staff gages at several sites within 1.2 miles of present site at various datums.

Average discharge.--43 years, 1,549 cfs (1,121,000 acre-ft per year).

Extremes.--Maximum discharge during year, 3,750 cfs Apr. 9 (gage height, 5.22 ft); minimum, 1,140 cfs July 6.

1917-60: Maximum discharge observed, 8,260 cfs Mar. 30, 31, 1943 (gage height, 6.70 ft, site and datum then in use); minimum recorded, 920 cfs Oct. 14, 1945.

Remarks.--Records excellent. Flow slightly regulated by Ochoco Reservoir (capacity, 47,500 acre-ft); occasional diurnal fluctuation caused by powerplant 1.2 miles above station. Water is diverted for irrigation of land above station. The area served increased from about 30,000 acres in 1918 to 37,000 acres in 1946. Several hundred cubic feet per second of water diverted from Deschutes River for irrigation of other lands above station. Opal Springs and several other springs within about 17 miles above station contribute about 1,000 cfs to the flow. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 864: 1922, 1925, 1928, 1932, 1936-37. WSP 1318: 1924-85(N).

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

2.5	1,290
3.0	1,620
4.0	2,430
6.0	4,760

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	1,430	1,470	1,420	1,420	1,480	1,380	2,520	1,530	1,690	1,330	1,340	1,370
2	1,430	1,440	1,410	1,370	1,460	1,390	2,320	1,540	1,620	1,330	1,340	1,370
3	1,420	1,430	1,420	1,380	1,440	1,410	2,380	1,550	1,550	1,330	1,340	1,370
4	1,420	*1,420	1,440	1,370	1,430	1,410	2,740	1,640	1,530	1,330	1,360	1,370
5	1,400	1,410	1,460	1,390	1,440	1,430	3,110	1,600	1,490	1,330	1,340	1,390
6	1,400	1,420	1,440	1,390	1,430	1,460	3,340	1,640	1,450	1,320	1,340	1,390
7	1,400	1,420	1,420	1,400	1,430	*1,550	3,490	1,560	1,450	*1,350	1,340	1,400
8	1,420	1,450	1,410	1,400	1,450	1,870	3,580	1,560	1,400	1,330	1,340	1,400
9	1,420	1,420	1,410	1,400	1,510	1,970	3,620	1,630	1,370	1,320	1,340	1,400
10	1,410	1,420	1,410	1,380	1,540	1,870	3,540	1,590	1,500	1,330	1,340	1,410
11	1,410	1,420	1,410	1,420	1,610	1,720	3,210	1,560	1,360	1,330	1,340	1,400
12	1,410	1,420	1,410	1,400	1,540	1,650	*2,710	1,520	1,360	1,330	1,340	1,390
13	1,420	1,410	1,410	1,370	1,500	1,610	2,360	1,520	1,360	1,330	1,340	1,380
14	1,430	1,410	1,400	1,400	1,480	1,650	2,160	1,520	1,360	1,340	1,350	1,370
15	1,430	1,410	1,400	1,400	1,460	1,740	2,090	1,550	1,360	1,340	1,350	1,370
16	1,440	1,410	*1,410	1,390	1,440	1,680	2,030	1,560	1,340	1,340	1,340	1,370
17	1,440	1,410	1,410	1,390	1,440	1,610	1,990	1,510	1,340	1,340	1,350	1,370
18	1,440	1,410	1,410	1,390	1,440	1,600	1,920	1,480	1,330	1,330	1,350	1,370
19	1,440	1,420	1,410	1,390	1,430	1,640	1,830	1,470	1,330	1,340	1,350	1,360
20	1,440	1,440	1,410	1,380	1,420	1,890	1,800	1,500	1,330	1,340	1,360	1,360
21	1,440	1,450	1,400	1,390	1,420	2,180	1,760	1,540	1,340	1,340	1,360	1,360
22	1,460	1,450	1,400	1,390	1,420	2,420	1,760	1,520	1,340	1,340	1,370	1,370
23	1,470	1,440	1,400	1,390	1,420	2,700	1,720	1,610	1,330	1,340	*1,370	1,370
24	1,470	1,450	1,410	1,390	1,420	2,810	1,690	*1,590	1,330	1,340	1,390	1,370
25	1,460	1,410	1,410	1,400	1,410	2,930	1,630	1,580	1,330	1,340	1,390	1,390
26	1,470	1,410	1,410	1,400	1,430	3,090	1,590	1,560	1,330	1,340	1,390	1,390
27	1,480	1,410	1,390	*1,400	1,430	3,250	1,570	1,680	1,330	1,340	1,390	1,370
28	1,460	1,410	1,380	1,400	1,390	3,340	1,580	2,020	1,330	1,340	1,380	1,370
29	1,470	1,400	1,430	1,420	1,390	3,280	1,550	2,070	1,330	1,340	1,370	1,370
30	1,470	1,390	1,470	1,320	1,390	3,080	1,550	1,930	1,330	1,340	1,380	1,370
31	1,480	-----	1,480	1,490	-----	2,780	-----	1,790	-----	1,360	1,380	-----
Total	44,580	42,640	43,900	43,410	42,100	64,330	69,140	49,920	41,670	41,400	42,060	41,340
Mean	1,438	1,421	1,416	1,400	1,452	2,075	2,305	1,610	1,389	1,335	1,357	1,378
Ac-ft	88,420	84,580	87,070	86,100	83,500	127,600	137,100	99,010	82,650	82,120	83,420	82,000
Calendar year 1959: Max		2,340		Min	1,350	Mean	1,503	Ac-ft	1,088,000			
Water year 1959-60: Max		3,620		Min	1,320	Mean	1,548	Ac-ft	1,124,000			

\* Discharge measurement made on this day.

## 880. Lake Creek near Sisters, Oreg.

Location.--Lat 44°25'40", long 121°43'30", in SW<sup>1</sup> sec.24, T.13 S., R.8 E., on left bank a quarter of a mile downstream from Suttle Lake and 13 miles northwest of Sisters.

Drainage area.--22.2 sq mi.

Records available.--June to November 1911, March to September 1912, May to October 1913, April 1915 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Altitude of gage is 3,430 ft (from topographic map). June 1, 1911, to Oct. 31, 1913, and Apr. 1, 1915, to Mar. 31, 1916, staff gage at two sites 1,000 ft upstream at different datums. Apr. 1, 1916, to Oct. 12, 1928, staff gage or water-stage recorder at site 40 ft downstream at different datum.

Average discharge.--45 years (1915-60), 52.0 cfs (37,650 acre-ft per year).

Extremes.--Maximum discharge during year, 122 cfs Apr. 9 (gage height, 2.08 ft); minimum, 27 cfs Sept. 6.

1911-13, 1915-60: Maximum discharge, 380 cfs Dec. 24, 1955 (gage height, 3.65 ft); minimum, 1.0 cfs Nov. 4, 5, 1940; minimum daily, 8 cfs Nov. 5, 1940, Oct. 6, 1942.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Occasional regulation by storage in Suttle Lake. No diversion above station.

Revisions (water years).--WSP 1124: 1943, 1947. WSP 1218: Drainage area. WSP 1448: 1916(M), 1925.

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

0.9	26
1.0	31
1.5	66
2.0	113

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	*34	34	31	33	38	89	67	75	49	34	31
2	33	31	31	30	33	39	87	78	78	46	34	30
3	33	30	31	30	34	41	86	68	85	46	35	29
4	32	28	31	30	35	44	87	68	93	44	35	28
5	32	28	31	30	35	44	87	68	102	*43	35	28
6	32	30	31	30	35	45	89	68	105	38	35	28
7	32	31	31	30	38	46	94	70	98	35	35	28
8	35	31	32	32	42	47	96	71	93	34	35	28
9	37	32	32	33	44	51	107	72	*93	34	35	30
10	36	32	32	33	44	49	113	78	90	34	34	33
11	36	32	33	33	43	47	110	86	86	34	34	32
12	35	32	35	*33	43	47	107	85	81	34	33	31
13	35	32	34	33	43	47	105	89	77	33	32	30
14	34	32	34	33	44	47	104	99	58	33	31	30
15	33	33	34	33	46	46	*104	102	60	33	30	30
16	33	33	34	33	45	45	98	102	66	35	30	30
17	a33	33	34	33	44	44	93	102	71	37	30	30
18	a33	32	33	34	43	44	90	100	79	35	31	30
19	a33	33	33	35	43	43	86	97	81	35	31	30
20	a33	33	33	35	42	43	87	99	75	34	30	30
21	a33	36	33	35	43	42	87	100	67	33	30	28
22	a35	38	33	34	42	42	94	100	63	33	a30	28
23	a38	38	33	33	41	42	85	*97	52	33	*31	*28
24	a40	42	34	33	41	43	79	95	50	33	35	28
25	a42	47	34	33	40	43	70	93	50	34	37	29
26	a38	44	33	33	40	44	64	90	50	34	35	29
27	a36	42	32	33	40	46	64	86	51	35	34	29
28	a35	41	32	33	39	50	66	84	52	35	34	29
29	a34	39	31	33	39	58	66	82	52	35	35	29
30	a34	38	31	33	-----	87	87	81	51	35	32	30
31	a34	-----	32	33	-----	92	-----	80	-----	35	32	-----
Total	1,072	1,058	1,011	1,010	1,174	1,486	2,649	2,647	2,184	1,121	1,022	883
Mean	34.6	34.6	32.6	32.6	40.5	47.9	88.3	85.4	72.8	36.2	33.0	29.4
Ac-ft	2,130	2,060	2,010	2,000	2,330	2,950	5,250	5,250	4,330	2,220	2,030	1,750

Calendar year 1959: Max 100 Min 24 Mean 45.9 Ac-ft 33,220  
 Water year 1959-60: Max 113 Min 28 Mean 47.3 Ac-ft 34,310

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Squaw Creek near Sisters and Tumalo Creek near Bend.

## DESCHUTES RIVER BASIN

915. Metolius River near Grandview, Oreg.

Location.--Lat 44°36'40", long 121°27'10", in NE<sup>1</sup>/<sub>4</sub> sec.19, T.11 S., R.11 E., on right bank 0.7 mile upstream from Street Creek, 7.5 miles northwest of Grandview, and 13 miles northwest of Culver.

Drainage area.--324 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available.--April 1910 to February 1912 (gage heights and discharge measurements only), March 1912 to December 1913, October 1921 to September 1960. Published as "at Hubbard's ranch, near Sisters" 1910, and as "at Hubbard's ranch, near Grandview" 1910-13.

Gage.--Water-stage recorder. Datum of gage is 1,910 ft above mean sea level (river-profile survey). Prior to Dec. 31, 1913, staff gage at site 5 miles upstream at different datum. Oct. 1, 1921, to May 3, 1949, staff gage at site 20 ft downstream at present datum.

Average discharge.--40 years (1912-13, 1921-60), 1,475 cfs (1,068,000 acre-ft per year).

Extremes.--Maximum discharge during year, 2,070 cfs June 16 (gage height, 1.11 ft); minimum, 1,280 cfs Feb. 27 or 28.  
1912-13, 1921-60: Maximum discharge, 5,780 cfs Jan. 7, 1923 (gage height, 3.32 ft), from rating curve extended above 2,200 cfs; minimum, 1,080 cfs Feb. 17, 1932, Oct. 2-31, Nov. 6, 7, 10-14, 1942.

Remarks.--Records excellent except those for period of no gage-height record, which are good. No regulation. Many small diversions for irrigation of about 670 acres above station. Stream is spring fed. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1448: 1913.

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

0.49	1,300
.5	1,310
1.0	1,940
1.5	2,580

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	1,380	1,400	1,410	1,360	1,400	*1,350	1,740	1,540	1,760	1,660	1,510	1,440
2	1,370	1,400	1,410	1,350	1,400	1,380	1,740	1,540	1,770	1,820	1,500	1,440
3	1,370	*1,460	1,410	1,350	1,400	1,360	1,740	1,540	1,820	1,600	1,500	1,450
4	1,370	1,410	1,400	1,350	1,400	1,380	1,750	1,520	1,860	1,610	1,480	1,460
5	1,370	1,400	1,380	1,350	1,400	1,400	1,760	1,520	1,850	1,610	1,480	1,450
6	1,370	1,380	1,380	1,360	1,450	1,410	1,800	1,540	1,870	*1,610	1,480	1,450
7	1,370	1,380	1,380	1,370	1,500	1,450	1,840	1,620	1,850	1,620	1,480	1,440
8	1,460	1,380	1,370	1,370	1,460	1,460	1,850	1,610	1,770	1,610	1,470	1,440
9	1,700	1,380	1,370	1,350	1,550	1,440	1,840	1,600	1,740	1,580	1,470	1,420
10	1,470	1,370	1,370	1,350	1,500	1,410	1,800	1,610	1,740	1,570	1,470	1,440
11	1,560	1,370	1,400	1,370	1,450	1,410	1,770	1,680	1,740	1,560	1,470	1,440
12	1,470	1,370	1,410	1,350	1,400	1,410	*1,740	1,750	1,750	1,560	1,460	1,440
13	1,420	1,370	1,400	1,350	1,400	1,410	1,710	1,710	1,750	1,570	1,460	1,440
14	1,410	1,370	1,380	1,360	1,400	1,400	1,720	1,670	1,780	1,570	1,450	1,420
15	1,400	1,370	*1,410	1,350	1,500	1,400	1,710	1,660	1,940	1,570	1,450	1,420
16	1,400	1,360	1,410	1,350	1,400	1,400	1,670	1,660	1,980	1,550	1,440	1,410
17	1,380	1,560	1,400	1,350	1,400	1,410	1,660	1,650	1,880	1,560	1,450	1,410
18	1,380	1,370	1,400	1,360	1,400	1,440	1,640	1,620	1,760	1,560	1,460	1,400
19	1,380	1,370	1,380	1,350	1,400	1,450	1,620	1,610	1,750	1,560	1,450	1,400
20	1,410	1,370	1,370	1,350	1,350	1,460	1,650	1,670	1,680	1,550	1,440	1,400
21	1,410	1,460	1,370	1,350	1,350	1,480	1,650	1,680	1,650	1,520	1,440	1,380
22	1,650	1,510	1,370	1,350	1,350	1,510	1,610	1,640	1,520	1,440	1,420	1,380
23	1,620	1,860	1,370	1,350	1,350	1,540	1,600	1,620	1,620	1,650	1,420	1,380
24	1,470	1,570	1,400	1,350	1,350	1,550	1,570	*1,600	1,670	1,500	*1,450	1,400
25	1,460	1,500	1,380	1,350	1,350	1,560	1,560	1,600	1,680	1,500	1,440	1,400
26	1,420	1,450	1,370	*1,350	1,350	1,600	1,540	1,620	1,650	1,500	1,440	1,400
27	1,410	1,440	1,370	1,350	1,300	1,640	1,540	1,620	1,640	1,510	1,420	1,380
28	1,410	1,440	1,370	1,400	1,300	1,650	1,540	1,610	1,650	1,510	1,410	1,380
29	1,400	1,420	1,360	1,450	1,350	1,660	1,540	1,620	1,670	1,510	1,410	1,370
30	1,400	1,420	1,370	1,400	-----	1,750	1,540	1,660	1,680	1,510	1,410	1,370
31	1,400	-----	1,360	1,400	-----	1,750	-----	1,720	-----	1,510	1,440	-----
Total	44,490	42,710	42,930	42,200	40,750	45,910	50,440	50,310	52,620	48,300	45,070	42,450
Mean	1,435	1,424	1,385	1,361	1,405	1,481	1,681	1,623	1,754	1,558	1,454	1,415
Ac-ft	86,240	84,710	85,150	83,700	80,830	91,060	100,000	99,790	104,400	95,800	89,400	84,200
Calendar year 1959:	Max	1,880	Min	1,360	Mean	1,528	Ac-ft	1,106,000				
Water year 1959-60:	Max	1,980	Min	1,300	Mean	1,498	Ac-ft	1,087,000				

\* Discharge measurement made on this day.

Note.--No gage-height record Jan. 27 to Feb. 29; discharge estimated on basis of weather records, recorded range in stage, and records for Crooked River near Culver and Salmon River near Government Camp.

## 925. Deschutes River near Madras, Oreg.

Location.--Lat 44°43'40", long 121°14'50", in NW $\frac{1}{4}$  sec.1, T.10 S., R.12 E., on right bank 400 ft downstream from reregulating dam,  $2\frac{1}{2}$  miles downstream from Pelton Dam, 3 miles upstream from Shitike Creek,  $8\frac{1}{2}$  miles northwest of Madras, and at mile 100.1.

Drainage area.--7,820 sq mi, approximately.

Records available.--October 1923 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,390.25 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Portland General Electric Co.). Prior to May 6, 1924, staff gage and May 6, 1924, to June 14, 1933, water-stage recorder, at site  $2\frac{1}{2}$  miles upstream at different datum. June 15, 1933, to Nov. 30, 1956, water-stage recorder and Dec. 1, 1956, to Nov. 22, 1957, staff gage, at site  $1\frac{1}{4}$  miles upstream at different datum.

Average discharge.--37 years, 4,428 cfs (3,206,000 acre-ft per year).

Extremes.--Maximum discharge during year, 7,430 cfs Apr. 7 (gage height, 4.11 ft); minimum, 2,870 cfs Mar. 2.

1923-60: Maximum discharge, 13,300 cfs Jan. 1, 1943 (gage height, 6.89 ft, site and datum then in use); minimum, 1,200 cfs Dec. 13, 1957.

Remarks.--Records excellent. Flow regulated by Lake Simtustus and reregulating dam since Nov. 23, 1957. Large diversions in upper river basin for irrigation. Some winter and spring runoff stored in Ochoco Reservoir (capacity, 47,500 acre-ft) and in Crescent Lake, and Crane Prairie and Wickiup Reservoirs (see p. 59).

Revisions.--WSP 1398: Drainage area.

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

2.7 3,520  
4.0 7,070

Discharge, in cubic 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	4,140	4,040	4,530	4,040	4,340	6,220	4,140	4,500	4,120	3,970	3,770		
2	3,890	*4,680	3,750	4,450	4,580	*4,530	6,020	4,140	4,470	4,020	3,970	3,730		
3	3,870	4,450	3,920	4,340	4,550	4,550	6,050	4,040	4,400	3,970	3,890	3,750		
4	3,870	4,580	3,920	4,370	4,530	4,450	6,300	4,040	4,400	3,940	3,870	3,750		
5	3,870	4,140	3,850	4,420	4,530	4,690	6,690	4,090	4,500	*3,990	3,850	3,730		
6	3,870	4,500	4,340	4,420	4,530	4,580	6,910	4,090	4,340	3,940	3,850	3,730		
7	3,850	4,370	4,500	4,420	4,770	*4,530	7,070	4,240	4,340	3,940	3,870	3,700		
8	3,920	4,400	4,420	4,580	4,990	4,770	6,940	4,160	4,320	3,990	3,820	3,680		
9	4,220	4,400	4,530	4,400	4,990	5,010	6,810	4,240	4,220	3,920	3,850	3,730		
10	4,220	4,530	4,530	4,290	4,960	4,960	6,660	4,290	4,090	3,890	3,820	3,850		
11	3,990	4,370	4,530	4,500	4,850	4,990	*6,220	4,140	4,160	3,850	3,850	3,820		
12	4,140	4,340	4,530	4,450	4,820	4,820	5,660	4,190	4,190	3,990	3,820	3,820		
13	4,140	3,990	4,530	4,450	4,720	4,740	5,320	4,400	4,190	3,990	3,770	3,800		
14	3,890	4,020	*4,450	4,530	4,660	4,840	4,900	4,160	4,120	3,800	3,750	3,800		
15	3,920	4,220	4,450	4,370	4,690	4,820	4,880	4,190	4,290	3,920	3,800	3,730		
16	3,920	4,140	4,530	4,340	4,660	4,900	4,990	4,090	4,960	3,920	3,770	3,610		
17	3,940	4,140	4,470	4,400	4,640	4,720	4,800	4,190	5,880	3,870	3,770	3,700		
18	3,940	4,240	4,400	4,340	4,580	4,660	4,660	4,140	4,900	3,890	3,850	3,680		
19	3,940	4,190	4,370	4,370	4,450	4,770	4,550	4,090	4,140	3,920	3,820	3,590		
20	3,990	4,120	4,320	4,400	4,450	5,040	4,420	4,120	4,120	3,850	3,820	3,640		
21	4,040	4,240	4,320	4,420	4,450	5,570	4,580	4,320	4,040	3,890	3,800	3,640		
22	4,160	4,190	4,370	4,400	4,450	5,570	4,340	4,060	3,940	3,850	3,770	3,680		
23	4,610	4,660	4,420	4,370	4,420	6,330	4,490	*4,270	3,970	3,850	*3,820	3,680		
24	4,240	4,420	4,450	4,450	4,450	6,190	4,190	4,140	4,020	3,870	3,770	3,680		
25	3,890	4,450	4,470	*4,420	4,370	6,540	4,270	4,270	4,060	3,850	3,800	3,770		
26	4,120	4,340	4,450	4,340	4,120	6,570	4,240	4,270	4,020	3,870	3,800	3,680		
27	4,190	4,160	4,370	4,320	4,140	6,750	4,160	4,320	3,990	3,870	3,800	3,700		
28	4,040	4,450	4,240	4,240	4,420	7,070	4,120	4,640	3,990	3,870	3,730	3,700		
29	3,940	4,120	3,750	3,920	4,340	6,750	4,090	4,820	4,040	3,870	3,770	3,700		
30	3,920	4,040	4,040	3,990	-----	6,850	4,060	4,610	4,020	3,850	3,700	3,730		
31	3,970	-----	4,240	4,190	-----	6,450	-----	4,470	-----	3,850	3,750	-----		
Total	124,480	129,410	133,500	135,430	132,120	165,150	158,520	131,370	128,620	121,210	118,290	111,550		
Mean	4,015	4,314	4,306	4,369	4,556	5,327	5,284	4,238	4,287	3,910	3,816	3,718		
Ac-ft	246,900	256,700	264,800	268,600	262,100	327,600	314,400	260,600	255,100	240,400	234,600	221,300		
Calendar year 1959: Max	6,250			Min	3,750			Mean	4,429			Ac-ft	3,207,000	
Water year 1959-60: Max	7,070			Min	3,590			Mean	4,343			Ac-ft	3,153,000	

\* Discharge measurement made on this day.

## 1015. White River below Tygh Valley, Oreg.

Location.--Lat 45°14'30", long 121°05'40", in NE¼NE¼ sec. 7, T.4 S., R.14 E., on left bank 200 ft downstream from Pacific Power & Light Co.'s powerplant at White River Falls, 2 miles upstream from mouth, and 4 miles east of town of Tygh Valley.

Drainage area.--368 sq mi.

Records available.--October 1917 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 870.15 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Pacific Power & Light Co.). Prior to July 28, 1931, at site 750 ft downstream at different datum. July 28, 1931, to Sept. 30, 1954, at site 700 ft downstream at different datums.

Average discharge.--43 years, 434 cfs (314,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,390 cfs Apr. 8 (gage height, 4.20 ft); minimum, 22 cfs Sept. 26; minimum daily, 112 cfs Sept. 29.  
1917-60: Maximum discharge, 13,300 cfs Jan. 6, 1923 (gage height, about 13.3 ft), from rating curve extended above 5,000 cfs; minimum, 10 cfs Dec. 11-14, 1919, Aug. 9, 1931 (estimated by observer); minimum daily, 71 cfs Aug. 31, 1941.

Remarks.--Records good. Diurnal fluctuation caused by powerplant 200 ft upstream. Diversions above station for irrigation.

Revisions (water years).--WSP 1448: 1920, 1923, 1927-28, drainage area.

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

1.6	97	3.5	870
2.0	185	4.0	1,230
2.5	350	4.5	1,640
3.0	575		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	254	245	289	227	218	254	1,020	565	800	254	160	*131
2	224	242	278	212	251	260	1,090	605	821	248	153	137
3	206	254	*282	209	260	245	1,090	600	835	233	*148	131
4	191	275	272	203	289	248	1,090	575	842	230	182	133
5	180	236	257	215	278	257	1,170	555	782	221	172	133
6	175	227	254	239	314	266	1,260	570	752	218	153	131
7	175	224	251	257	500	314	1,320	658	692	218	148	129
8	188	221	260	239	758	406	1,340	669	620	218	155	126
9	374	215	239	206	698	422	1,320	642	570	212	158	122
10	300	209	254	180	585	402	1,160	664	550	206	148	124
11	439	206	286	239	490	370	1,070	734	520	209	170	122
12	426	233	303	224	439	348	968	835	500	203	162	122
13	358	206	282	*194	406	390	905	807	485	203	139	124
14	292	185	260	209	394	448	877	758	495	218	133	122
15	263	212	374	212	448	457	814	692	590	197	133	116
16	245	191	430	215	439	475	722	680	565	191	137	114
17	230	230	382	209	402	439	698	636	535	191	137	131
18	224	224	342	197	378	428	664	625	470	188	175	126
19	215	257	318	186	358	430	605	*575	430	178	282	124
20	224	251	310	180	334	466	595	680	414	180	212	120
21	224	310	300	182	330	525	664	728	386	180	206	122
22	324	369	314	185	318	605	610	664	*358	170	170	120
23	*590	870	292	197	296	680	580	625	338	158	168	118
24	452	669	292	197	289	710	545	620	318	155	212	118
25	366	540	292	185	289	764	520	595	300	151	185	129
26	318	422	266	239	*272	870	515	680	286	151	155	120
27	310	374	251	212	224	996	475	728	278	175	158	120
28	292	362	248	194	245	1,080	490	698	275	182	137	116
29	278	334	260	206	245	1,060	515	669	266	160	129	112
30	263	303	236	235	-----	1,230	535	716	260	180	120	148
31	251	-----	236	218	-----	*1,140	-----	782	-----	160	122	-----
Total	8,671	9,096	8,910	6,502	10,747	16,981	25,227	20,630	15,333	6,018	5,019	3,741
Mean	286	303	287	210	371	548	841	665	511	194	162	125
Ac-ft	17,600	18,040	17,670	12,900	21,320	33,680	50,040	40,920	30,410	11,940	9,960	7,420

Calendar year 1959: Max 1,360 Min 124 Mean 393 Ac-ft 284,800  
Water year 1959-60: Max 1,340 Min 112 Mean 375 Ac-ft 271,900

Peak discharge (base, 1,200 cfs).--Apr. 8 (6 a.m.) 1,390 cfs (4.20 ft).

\* Discharge measurement made on this day.

1030. Deschutes River at Moody, near Biggs, Oreg.

Location.--Lat 45°37'20", long 120°54'05", in SE $\frac{1}{4}$  sec.26, T.2 N., R.15 E., on right bank at Moody, 1 mile upstream from mouth and 4 miles southwest of Biggs.

Drainage area.--10,500 sq mi, approximately.

Records available.--October 1897 to December 1899 (published as "near Moro"), July 1906 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 167.54 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Oct. 19, 1897, to Dec. 31, 1899, staff gage at site 10 miles upstream at different datum. July 22, 1906, to July 18, 1930, staff gage at site 300 ft downstream at datum 0.5 ft lower.

Average discharge.--56 years, 5,856 cfs (4,240,000 acre-ft per year).

Extremes.--Maximum discharge during year, 9,960 cfs Apr. 8 (gage height, 4.14 ft); minimum, 4,030 cfs Sept. 17.

1897-99, 1906-60: Maximum discharge, 43,600 cfs Jan. 7, 1923 (gage height, 10.2 ft, site and datum then in use), from rating curve extended above 15,000 cfs; minimum, 2,400 cfs Dec. 5, 1957 (gage height, 1.78 ft).

Remarks.--Records excellent. Some fluctuation caused by regulation at Lake Simtustus, 99 miles upstream. Many diversions for irrigation in upper river basin. Some winter and spring runoff stored in Ochoco Reservoir (capacity, 47,500 acre-ft) and in Crescent Lake and Crane Prairie and Wickiup Reservoirs (see p. 59).

Revisions.--WSP 754: Drainage area.

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

2.3	3,860
3.0	5,930
5.0	13,800

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	4,640	4,670	*4,880	4,910	4,940	5,000	8,720	5,420	6,080	4,820	4,460	4,370
2	4,610	5,030	4,700	5,210	4,910	5,090	8,350	5,540	6,170	4,850	4,490	4,340
3	4,550	5,240	*4,490	5,000	5,390	5,270	8,240	5,600	6,110	4,730	4,430	4,340
4	4,490	5,270	4,640	4,940	5,300	5,180	8,240	5,510	6,080	4,670	*4,430	4,340
5	4,490	5,150	4,640	4,970	5,300	5,210	8,800	5,480	6,290	4,640	4,370	4,340
6	4,490	4,850	4,580	5,060	5,300	5,480	9,130	5,420	6,050	4,670	4,310	*4,340
7	4,490	5,180	5,120	5,060	5,480	5,450	9,560	5,540	5,870	4,610	4,310	4,340
8	4,490	5,030	5,090	5,150	6,600	6,380	9,680	5,750	5,810	4,640	4,370	4,280
9	4,760	5,030	5,060	5,210	7,410	6,320	9,360	5,660	5,600	4,640	4,340	4,230
10	5,270	5,000	5,180	4,880	6,540	6,290	9,250	5,610	5,480	4,550	4,340	4,260
11	5,090	5,090	5,150	4,910	6,260	6,110	8,760	5,780	5,360	4,580	4,280	4,310
12	5,030	5,000	5,240	5,210	5,960	6,050	7,910	5,930	5,390	4,490	4,310	4,310
13	5,120	4,940	5,240	5,000	5,870	5,870	7,270	6,080	5,380	4,640	4,280	4,230
14	4,880	4,700	5,180	*5,030	5,660	5,990	7,060	6,080	5,390	4,550	4,230	4,200
15	4,670	4,730	5,150	5,090	5,660	5,840	6,670	5,870	5,450	4,460	4,260	4,200
16	4,670	4,940	5,330	5,030	5,720	6,290	6,600	5,640	5,780	4,580	4,280	4,170
17	4,700	4,730	5,330	5,060	5,600	6,510	6,800	*5,630	6,290	4,490	4,280	4,110
18	4,670	4,790	5,210	5,090	5,510	6,320	6,320	5,720	6,760	4,520	4,310	4,230
19	4,670	4,940	5,150	5,060	5,450	6,170	6,110	5,540	5,480	4,490	4,370	4,170
20	4,640	4,880	5,090	4,970	5,300	6,230	5,960	5,540	5,180	4,550	4,310	4,080
21	4,700	4,910	5,030	4,970	5,300	6,510	5,960	5,840	5,090	4,460	4,310	4,140
22	*4,820	5,150	5,060	4,970	5,270	6,890	6,050	5,960	5,030	4,460	4,310	4,140
23	5,360	5,660	5,090	5,000	5,240	7,240	5,780	5,570	*4,880	4,400	4,340	4,170
24	5,600	6,170	5,180	5,030	*5,180	7,910	5,780	5,720	4,880	4,400	4,430	4,140
25	5,030	5,840	5,210	5,090	5,180	7,870	5,630	5,570	4,940	4,400	4,400	4,170
26	4,790	5,330	5,210	5,030	5,060	8,350	5,800	5,720	4,940	4,400	4,400	4,260
27	4,970	5,210	5,150	4,970	4,820	8,460	5,540	5,750	4,850	4,420	4,400	4,200
28	4,910	5,000	5,060	4,940	4,790	9,100	5,540	5,870	4,820	4,430	4,400	4,200
29	4,790	5,240	4,850	4,820	5,120	9,130	5,420	6,140	4,820	4,430	4,310	4,170
30	4,730	4,790	4,480	4,730	-----	*9,400	5,480	6,140	4,850	4,400	4,340	4,200
31	4,640	-----	4,820	-----	-----	9,210	-----	6,050	-----	4,430	4,280	-----
Total	148,760	152,490	155,570	155,210	160,120	207,120	215,370	178,070	165,110	140,840	134,680	126,920
Mean	4,799	5,083	5,018	5,007	5,221	6,681	7,173	5,744	5,504	4,543	4,345	4,231
Ac-ft	295,100	302,500	308,600	307,900	317,600	410,800	427,200	353,200	327,500	279,400	267,100	251,700

Calendar year 1959: Max 8,560 Min 4,280 Mean 5,375 Ac-ft 3,891,000  
 Water year 1959-60: Max 9,680 Min 4,080 Mean 5,301 Ac-ft 3,849,000

\* Discharge measurement made on this day.

## 1057. Columbia River at The Dalles, Oreg.

Location.--Lat 45°36'10", long 121°10'40", in NW¼ sec.3, T.1 N., R.13 E., at upstream end of Port of The Dalles dock at The Dalles, 3.2 miles downstream from The Dalles Dam and at mile 189.3.

Drainage area.--237,000 sq mi, approximately.

Records available.--June 1878 to September 1960. Published as "near The Dalles" 1936-56.

Maximum discharge only for each year in period 1858-77, at Lower Cascades Landing, published in WSP 1318.

Gage.--Water-stage recorder. Auxiliary water-stage recorder 19.3 miles downstream at Hood River. Datum of both gages is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 1, 1931, records based on staff gage near present site at datum 46.98 ft higher, supplemented for a few short periods by gage-height records at Umatilla and Cascade Locks. Oct. 1, 1931, to May 1, 1935, staff gage in entrance to Celilo Canal 11.6 miles upstream at datum 37.71 ft higher. May 2, 1935, to Mar. 15, 1957, water-stage recorder at site 11.7 miles upstream at datum 0.12 ft higher.

Average discharge.--82 years, 195,300 cfs (141,400,000 acre-ft per year).

Extremes.--Maximum discharge during year, 470,000 cfs June 6; maximum gage height, 87.54 ft June 7; minimum daily discharge, 85,600 cfs Sept. 7.

1858-1960: Maximum discharge, 1,240,000 cfs June 6, 1894 (gage height, 59.6 ft, site and datum then in use); minimum observed, 35,000 cfs Jan. 12, 1937 (gage height, 126.0 ft, site and datum then in use).

Remarks.--Records good. Daily discharge determined by routing from station below McNary Dam. Some regulation by Franklin D. Roosevelt Lake and by reservoirs in Kootenai, Flathead, Pend Oreille, Spokane, Chelan, Yakima, and Snake River basins. Diurnal fluctuations caused by powerplant and gates at The Dalles Dam. Many diversions for irrigation above station. Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 534: 1920(m). WSP 1094: 1894. WSP 1248: 1886, 1888, 1899, 1909. WSP 1518: 1876(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	186,000	183,000	195,000	116,000	149,000	96,200	235,000	188,000	356,000	328,000	183,000	106,000
2	176,000	174,000	192,000	117,000	146,000	112,000	227,000	197,000	365,000	339,000	*176,000	105,000
3	171,000	176,000	187,000	108,000	*131,000	103,000	212,000	202,000	374,000	352,000	185,000	105,000
4	163,000	179,000	185,000	109,000	137,000	101,000	215,000	205,000	393,000	347,000	173,000	92,500
5	157,000	169,000	186,000	111,000	134,000	108,000	230,000	210,000	425,000	346,000	195,000	94,000
6	152,000	175,000	180,000	112,000	128,000	105,000	244,000	214,000	442,000	347,000	192,000	90,800
7	149,000	173,000	169,000	110,000	130,000	110,000	268,000	207,000	432,000	346,000	189,000	85,600
8	153,000	165,000	165,000	108,000	140,000	101,000	282,000	213,000	423,000	353,000	191,000	92,000
9	147,000	165,000	142,000	104,000	143,000	125,000	293,000	231,000	*423,000	345,000	171,000	105,000
10	150,000	161,000	136,000	106,000	122,000	126,000	304,000	246,000	418,000	326,000	172,000	106,000
11	148,000	154,000	132,000	108,000	141,000	111,000	315,000	245,000	406,000	317,000	170,000	104,000
12	150,000	157,000	124,000	111,000	145,000	105,000	*311,000	256,000	406,000	315,000	172,000	104,000
13	161,000	144,000	126,000	116,000	140,000	107,000	312,000	288,000	402,000	304,000	175,000	105,000
14	185,000	138,000	125,000	105,000	135,000	107,000	310,000	346,000	406,000	291,000	156,000	106,000
15	178,000	133,000	120,000	114,000	137,000	109,000	303,000	372,000	405,000	293,000	160,000	105,000
16	173,000	130,000	130,000	110,000	136,000	106,000	301,000	364,000	408,000	288,000	144,000	97,800
17	173,000	127,000	146,000	118,000	125,000	105,000	286,000	354,000	420,000	249,000	151,000	104,000
18	176,000	128,000	147,000	122,000	118,000	115,000	275,000	359,000	418,000	282,000	148,000	102,000
19	176,000	128,000	136,000	125,000	121,000	108,000	264,000	354,000	411,000	271,000	151,000	106,000
20	175,000	124,000	133,000	126,000	103,000	108,000	263,000	349,000	402,000	272,000	159,000	101,000
21	172,000	132,000	135,000	125,000	111,000	125,000	270,000	355,000	400,000	265,000	113,000	98,100
22	177,000	132,000	130,000	122,000	115,000	126,000	270,000	364,000	385,000	267,000	136,000	98,200
23	180,000	142,000	128,000	124,000	109,000	128,000	264,000	371,000	371,000	286,000	126,000	98,700
24	188,000	159,000	132,000	124,000	109,000	137,000	258,000	371,000	*362,000	258,000	120,000	102,000
25	212,000	191,000	124,000	123,000	106,000	161,000	248,000	354,000	347,000	242,000	122,000	107,000
26	204,000	210,000	127,000	127,000	105,000	183,000	244,000	*349,000	325,000	239,000	118,000	111,000
27	201,000	216,000	125,000	126,000	104,000	205,000	232,000	338,000	320,000	208,000	116,000	114,000
28	199,000	217,000	124,000	128,000	105,000	208,000	216,000	345,000	316,000	235,000	111,000	108,000
29	195,000	204,000	121,000	129,000	105,000	216,000	205,000	342,000	308,000	213,000	110,000	109,000
30	195,000	195,000	116,000	124,000	-----	220,000	185,000	344,000	316,000	178,000	109,000	112,000
31	198,000	-----	116,000	131,000	-----	229,000	-----	345,000	-----	240,000	98,200	-----
Total	\$5,420	\$4,881	\$4,434	\$3,639	\$3,632	\$4,107.2	\$7,842	\$9,278	\$11,585	\$8,912	\$4,692.2	\$3,074.5
Mean	174,800	162,700	143,000	117,400	125,200	132,500	261,400	299,300	386,200	287,500	151,400	102,500
Ac-ft	*10,750	*9,681	*8,795	*7,218	*7,204	*8,147	*15,550	*18,400	*22,980	*17,680	*9,307	*6,098
Calendar year 1959: Max 552,000 Min 104,000 Mean 223,600 Ac-ft 161,800,000												
Water year 1959-60: Max 442,000 Min 85,600 Mean 195,300 Ac-ft 141,800,000												

\* Discharge measurement made on this day.

\* Expressed in thousands.

1058.5. South Fork Mill Creek near The Dalles, Oreg.

Location.--Lat 45°32'15", long 121°19'00", in NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.28, T.1 N., R.12 E., on right bank 0.2 mile upstream from Wicks Reservoir, 1.1 miles upstream from confluence with North Fork, and 7.8 miles southwest of The Dalles.

Drainage area.--28.0 sq mi.

Records available.--October 1959 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 914.52 ft above mean sea level (levels by city of The Dalles).

Extremes.--Maximum discharge during year, 104 cfs Mar. 30 (gage height, 2.35 ft); minimum, 1.9 cfs Jan. 2, 4.

Remarks.--Records good. No regulation. During summer months water is diverted from Dog River (Hood River basin) into South Fork Mill Creek several miles above station.

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

1.0	2.2	1.6	28
1.1	4.0	2.0	67
1.2	6.6	2.4	110
1.3	10		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.2	5.2	*5.4	3.4	5.2	5.4	74	39	18	16	7.9	6.6
2	*5.2	5.2	5.4	2.5	6.0	5.4	66	39	17	15	*7.6	*6.6
3	5.2	5.7	5.4	3.0	5.7	4.7	62	37	16	15	7.9	6.3
4	5.2	5.7	5.2	2.8	5.7	5.0	60	34	15	14	7.6	6.0
5	5.2	5.0	4.0	4.7	6.6	5.2	64	30	14	14	7.2	6.0
6	5.2	5.2	5.0	5.0	7.6	5.2	66	29	*14	13	7.2	6.0
7	5.4	5.2	6.3	4.7	17	6.0	64	29	22	12	6.9	5.7
8	5.7	5.2	5.4	5.0	26	7.9	60	27	21	12	6.6	5.7
9	7.9	5.2	4.7	3.4	22	9.0	54	24	20	12	6.6	5.4
10	6.9	5.2	5.2	3.2	20	10	45	24	20	11	6.3	5.4
11	11	5.2	6.6	4.2	13	10	39	24	20	11	6.3	5.4
12	7.6	5.0	7.2	*4.2	11	10	*34	24	19	11	6.3	5.4
13	6.6	3.6	6.0	3.2	9.4	15	31	22	19	11	6.3	5.4
14	6.0	2.8	6.0	3.0	9.0	18	30	21	19	11	6.3	5.2
15	5.7	6.0	6.9	3.4	16	34	28	19	19	11	6.9	5.2
16	5.7	4.0	6.6	3.8	14	36	26	19	18	10	6.6	5.0
17	5.4	3.0	6.0	3.4	12	41	26	*18	18	10	6.6	5.0
18	5.4	4.4	5.7	3.4	11	42	25	17	17	9.8	6.6	5.0
19	5.4	7.2	5.2	3.6	9.0	45	25	16	17	9.4	6.6	5.0
20	*5.7	7.2	5.2	4.4	7.9	50	30	20	17	9.4	6.3	5.0
21	5.7	7.9	5.0	4.0	7.9	55	40	20	*17	9.0	6.6	5.2
22	6.0	6.9	4.7	3.4	7.6	59	41	19	17	9.0	6.9	5.2
23	6.0	7.2	4.7	3.4	6.9	63	39	19	17	8.6	6.9	5.2
24	5.7	7.2	5.2	3.4	*6.9	62	37	20	17	8.6	6.9	5.2
25	5.7	6.3	5.0	3.4	6.6	62	36	21	17	8.6	6.9	5.4
26	5.7	6.0	3.0	3.4	4.2	66	37	24	16	8.6	6.9	5.4
27	5.4	5.2	4.0	3.8	4.2	*70	37	24	16	8.2	6.9	5.2
28	5.4	5.7	3.8	5.0	7.2	71	37	24	16	8.2	6.6	5.2
29	5.4	5.7	3.2	6.0	5.2	*78	38	25	16	7.9	6.3	5.2
30	5.2	5.4	4.0	6.3	-----	100	39	22	16	7.9	6.3	5.2
31	5.2	-----	4.7	5.4	-----	*86	-----	20	-----	7.9	6.3	-----
Total	183.0	164.7	160.7	121.8	290.8	1,136.8	1,290	748	525	330.1	210.1	163.7
Mean	5.90	5.49	5.18	3.93	10.0	36.7	43.0	24.1	17.5	10.6	6.78	5.46
Ac-ft	363	327	319	242	577	2,250	2,560	1,480	1,040	655	417	325

Calendar year 1959: Max - Min - Mean - Ac-ft -  
 Water year 1959-60: Max 100 Min 2.5 Mean 14.5 Ac-ft 10,560

Peak discharge (base, 90 cfs).--Mar. 30 (7 a.m.) 104 cfs (2.35 ft).

\* Discharge measurement made on this day.

1070. Klickitat River above West Fork, near Glenwood, Wash.

Location.--Lat 46°15'40", long 121°14'30", in S $\frac{1}{2}$  sec.18, T.9 N., R.13 E., on right bank half a mile upstream from Swamp Creek,  $1\frac{1}{2}$  miles upstream from West Fork, and 17 miles north of Glenwood.

Drainage area.--151 sq mi.

Records available.--October 1944 to September 1960. Monthly discharge only for some periods published in WSP 1318.

Gage.--Water-stage recorder. Altitude of gage is 2,720 ft (from river-profile map).

Average discharge.--16 years, 344 cfs (249,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,470 cfs May 12 (gage height, 3.14 ft); minimum, 75 cfs Sept. 21, 22 (gage height, 1.00 ft).

1944-60: Maximum discharge, 3,280 cfs May 27, 1948 (gage height, 4.28 ft); minimum, 4.4 cfs Feb. 1, 1957 (result of freezeup, discharge measurement); minimum gage height recorded, 0.89 ft Nov. 21, 1957.

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)

1.0	75	2.5	845
1.5	225	3.1	1,430
2.0	475		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	144	184	246	160	180	155	395	475	980	401	138	102
2	138	177	238	155	177	155	417	512	1,120	363	135	105
3	132	229	221	155	167	155	463	925	1,200	343	144	102
4	126	214	198	150	163	150	500	518	1,150	348	138	100
5	120	184	191	160	170	*150	598	557	1,020	338	132	102
6	118	180	198	170	184	150	*735	657	1,020	338	129	102
7	118	170	177	138	406	155	881	908	989	338	126	102
8	*152	160	*160	138	343	170	998	828	802	328	123	100
9	353	153	160	135	299	153	1,020	785	785	304	120	102
10	233	150	160	135	272	129	853	863	785	285	118	100
11	537	144	187	135	246	126	759	1,070	793	263	115	95
12	434	141	173	135	233	123	657	1,410	759	242	113	93
13	308	*118	147	130	225	123	598	1,140	727	242	113	90
14	254	160	170	130	221	120	571	971	751	242	113	88
15	217	141	390	130	214	118	518	890	802	225	115	88
16	195	187	353	130	191	123	463	836	890	217	115	86
17	180	333	285	129	187	132	446	751	768	214	113	84
18	170	225	259	135	187	135	417	*672	612	206	110	79
19	163	167	238	135	177	150	401	649	557	198	107	82
20	187	184	221	130	177	173	395	819	551	187	107	82
21	195	348	210	130	177	217	379	703	475	180	105	79
22	397	392	198	130	160	281	358	635	446	173	110	77
23	512	1,100	198	125	167	333	353	598	440	167	113	79
24	353	854	195	125	173	368	333	578	475	163	*118	82
25	353	672	180	120	156	452	323	564	481	160	113	84
26	285	475	170	120	147	544	323	635	440	*156	118	84
27	254	385	165	*118	153	578	333	635	423	153	115	84
28	250	338	163	123	156	544	358	627	*412	147	107	*82
29	225	299	160	258	155	512	395	687	417	144	105	79
30	206	263	163	253	---	494	429	811	423	147	102	79
31	191	---	167	198	---	429	---	962	---	144	100	---
Total	7,500	8,727	6,338	4,522	5,863	7,597	15,679	23,271	21,493	7,356	3,630	2,693
Mean	242	291	204	146	202	245	523	751	716	237	117	89.8
Cfsm	1.60	1.93	1.35	0.967	1.34	1.62	3.46	4.97	4.74	1.57	0.775	0.595
In.	1.85	2.15	1.56	1.11	1.44	1.87	3.86	5.73	5.29	1.81	0.89	0.66
Ac-ft	14,880	17,310	12,570	8,970	11,630	15,070	31,100	46,160	42,630	14,590	7,200	5,340
Calendar year 1959: Max	1,100											
Water year 1959-60: Max												

Calendar year 1959: Max 1,100 Min 97 Mean 324 Cfsm 2.15 In. 29.16 Ac-ft 234,800  
 Water year 1959-60: Max 1,410 Min 77 Mean 313 Cfsm 2.07 In. 28.22 Ac-ft 227,400

Peak discharge (base, 1,300 cfs).--May 12 (8:30 a.m.) 1,470 cfs (3.14 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 27, 29, Jan. 1-6, 9-16, 19-25, Feb. 29 to Mar. 7.

1100. Klickitat River near Glenwood, Wash.

Location.--Lat 46°05'20", long 121°15'30", in SE $\frac{1}{4}$  sec.14, T.7 N., R.12 E., on left bank half a mile downstream from Dairy Creek, 5 miles north of Glenwood, and 7 miles upstream from Trout Creek.

Drainage area.--360 sq mi.

Records available.--June to September 1905 and July 1907 to June 1908 (discharge measurements only), October 1909 to September 1960 (November 1956 to June 1957, monthly discharge only). Monthly discharge only for some periods, published in WSP 1318. Prior to Oct. 29, 1909, published as "above and below Big Muddy River, near Klickitat."

Gage.--Water-stage recorder. Datum of gage is 1,703 ft above mean sea level, datum of 1929. Prior to July 19, 1910, staff gages and July 19 to Dec. 16, 1910, water-stage recorder, at site  $\frac{1}{4}$  miles upstream at different datum. Dec. 17, 1910, to Sept. 30, 1918, water-stage recorder at datum 1.50 ft higher and Oct. 1, 1918, to Nov. 6, 1928, water-stage recorder at datum 0.50 ft higher, at site 50 ft downstream. Nov. 7, 1928, to Sept. 30, 1934, at present site at datum 1 ft higher.

Average discharge.--51 years (1909-60), 847 cfs (613,200 acre-ft per year).

Extremes.--Maximum discharge during year, 2,800 cfs May 12 (gage height, 5.36 ft); minimum, 346 cfs Jan. 18 (gage height, 2.63 ft).

1909-60: Maximum discharge, 9,870 cfs Dec. 22, 1933 (gage height, 7.9 ft, present datum), from rating curve extended above 2,000 cfs; minimum, 204 cfs Nov. 28, 1931.

Remarks.--Records excellent except those for period of no gage-height record, which are fair. All low-water flow of Hellroaring Creek, a tributary of Big Muddy Creek, is diverted for irrigation of about 7,000 acres below station in the vicinity of Glenwood. No regulation.

Revisions (water years).--WSP 1398: 1927. WSP 1568: 1920(M).

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

2.6	335
3.3	650
4.0	1,180
5.5	3,000

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	459	575	a700	454	575	482	1,070	1,110	2,130	970	525	418
2	450	555	a680	458	565	482	1,070	1,180	2,440	922	515	418
3	442	639	a660	442	550	472	1,140	1,180	2,590	906	525	414
4	430	628	a620	422	535	*472	1,180	1,180	2,610	906	500	410
5	430	575	a600	464	580	486	1,350	1,210	2,400	906	495	414
6	430	565	a600	472	687	486	*1,550	1,360	2,310	890	490	402
7	430	550	a580	450	1,210	505	1,730	1,750	2,050	898	490	398
8	*505	535	*535	454	1,000	505	2,030	1,670	1,860	882	495	394
9	843	525	550	414	906	477	2,090	1,590	1,770	829	486	394
10	668	515	550	398	822	468	1,850	1,690	1,760	780	490	394
11	1,560	505	606	434	745	459	1,670	2,090	1,750	738	486	394
12	1,140	495	612	430	704	459	1,510	2,750	1,700	717	477	394
13	882	*442	535	406	674	464	1,400	2,430	1,660	724	464	390
14	745	459	575	418	668	454	1,350	2,120	1,700	717	450	366
15	674	486	890	422	680	464	1,260	1,970	1,920	698	442	362
16	617	422	866	422	622	464	1,160	1,890	2,090	680	442	378
17	580	450	738	418	622	477	1,130	*1,730	1,810	686	459	374
18	560	530	686	370	595	486	1,070	1,590	1,500	698	464	374
19	540	530	639	398	575	505	1,040	1,520	1,370	686	450	382
20	580	585	612	426	560	550	1,050	1,830	1,280	686	434	374
21	595	866	595	410	580	612	1,010	1,670	1,220	662	426	370
22	994	278	580	398	570	719	370	1,500	1,150	644	426	366
23	1,270	2,130	575	418	520	822	978	1,430	1,140	617	422	374
24	1,030	1,650	570	418	535	882	938	1,380	1,170	590	*438	390
25	978	1,510	545	418	530	1,020	906	1,380	1,160	560	430	386
26	829	1,040	486	418	468	1,180	898	1,510	1,100	*575	430	374
27	745	a980	515	*418	446	1,280	898	1,490	1,070	595	430	370
28	704	a890	505	468	477	1,260	946	1,470	1,040	565	422	*374
29	662	a800	486	734	454	1,300	1,010	1,550	*1,030	535	418	366
30	617	a750	490	680	---	1,310	1,050	1,770	1,010	535	418	*363
31	595	---	450	580	---	1,170	---	2,060	---	535	412	---
Total	21,984	22,361	18,631	13,972	18,395	21,163	37,364	51,010	49,790	22,332	14,261	11,617
Mean	709	745	601	451	634	683	1,245	1,645	1,660	720	480	387
Cfs/m	1.97	2.07	1.67	1.25	1.78	1.90	3.46	4.57	4.61	2.00	1.28	1.08
In.	2.27	2.31	1.92	1.44	1.90	2.19	3.66	5.27	5.14	2.31	1.47	1.20
Ac-ft	43,600	44,350	36,950	27,710	36,490	41,980	74,110	101,200	98,760	44,290	28,290	23,040

Calendar year 1959: Max 2,130 Min 386 Mean 837 Cfs/m 2.32 In. 31.55 Ac-ft 605,700  
 Water year 1959-60: Max 2,750 Min 363 Mean 828 Cfs/m 2.30 In. 31.28 Ac-ft 600,800

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for station near Pitt.

1120. Little Klickitat River near Goldendale, Wash.

Location.--Lat 45°48'45", long 120°46'50", in SW $\frac{1}{4}$  sec.10, T.4 N., R.16 E., on left bank 150 ft upstream from highway bridge, 2 $\frac{1}{2}$  miles northeast of Goldendale, 7 $\frac{1}{2}$  miles downstream from Emerson Creek, and 13 miles upstream from mouth.

Drainage area.--78 sq mi, approximately.

Records available.--October 1910 to June 1912, October 1946 to September 1951. October 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,690 ft (by altimeter). Prior to July 1, 1912, staff gage 40 ft upstream from present highway bridge at different datum. Oct. 21, 1946, to Feb. 11, 1951, water-stage recorder at site 250 ft downstream at different datum, destroyed by flood of Feb.11,1951. Apr. 11 to Sept. 30, 1951, staff gage just downstream from highway bridge at different datum. Oct. 27, 1957, to Sept. 30, 1958, staff gage just upstream from highway bridge at same datum.

Average discharge.--9 years (1910-11, 1946-51, 1957-60), 64.5 cfs (46,700 acre-ft per year).

Extremes.--Maximum discharge during year, 511 cfs Mar.29 (gage height, 5.64 ft); minimum, 1.0 cfs for many days in August and September; minimum gage height, 2.01 ft Sept. 18.

1910-12, 1946-51, 1957-60: Maximum discharge, 1,760 cfs Jan. 7, 1948 (gage height, 5.55 ft, site and datum then in use), from rating curve extended above 665 cfs; minimum, 0.6 cfs Aug. 28, 1947.

Revisions.--The maximum discharge for the water year 1959 has been revised to 692 cfs Jan. 11, 1959 (gage height, 6.07 ft), superseding figure published in WSP 1638.

Remarks.--Records good except those for periods of ice effect, which are fair. Several small diversions for domestic use and irrigation of 35 acres above station. No regulation.

Revisions (water years).--WSP 1818: 1911. Revised figures of discharge, in cubic feet per second, for high-water periods in the water year 1959, superseding those published in WSP 1638, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1958		1959-Con.		1959-Con.		1959-Con.	
Nov. 20	164	Jan. 14	260	Jan. 26	257	Apr. 1	249
Dec. 11	201	15	204	27	387	2	274
		16	191	28	303	3	238
1959		17	158	29	251	4	211
Jan. 11	249	23	183	30	211	5	189
12	531	24	375	31	184	6	164
13	345	25	287	Mar. 31	164		

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
November 1958.....	953.0	164	4.4	31.8	0.408	0.45	1,890
Calendar year 1958.....	-	572	1.3	71.8	.921	12.50	51,980
January 1959.....	5,512	531	37	178	2.28	2.63	10,930
March.....	2,495	164	54	80.5	1.03	1.19	4,950
April.....	3,044	274	48	101	1.29	1.45	6,040
Water year 1958-59.....	-	531	1.0	49.5	.635	8.60	35,850

Discharge, in cubic 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	4.3	6.0	6.5	15	22	257	93	47	10.5	1.9	1.8
2	2.8	4.3	6.3	7.0	16	21	232	92	50	10	2.1	1.9
3	2.8	4.4	6.3	8.0	19.5	20	208	87	51	9.3	2.3	1.7
4	2.9	4.4	6.1	8.5	19.5	*18	194	81	49	8.9	2.3	1.9
5	2.6	4.4	6.0	9.0	28	20	*189	76	46	7.6	2.4	1.9
6	2.8	4.3	7.5	9.0	36	20	180	76	44	6.8	1.9	1.7
7	*2.8	4.4	*7.2	8.9	149	25	170	88	39	6.3	1.8	1.6
8	3.3	4.4	6.1	8.6	166	30	160	78	36	6.1	1.6	1.4
9	5.0	4.4	5.4	7.8	128	30	145	73	34	6.1	1.5	1.4
10	4.8	4.6	5.8	6.5	92	29	123	72	32	6.1	1.3	1.2
11	9.8	4.4	6.8	8.0	69	29	106	78	31	5.9	1.2	1.1
12	7.2	*4.4	8.6	7.0	58	32	93	84	30	5.6	1.2	1.1
13	5.3	4.3	7.8	6.0	49	53	86	76	28	5.2	1.2	1.1
14	4.7	3.5	8.0	8.0	52	40	81	70	29	5.0	1.2	1.2
15	4.0	3.7	19.5	9.0	83	48	79	64	30	4.7	1.4	1.0
16	3.8	3.5	18	9.0	64	44	69	80	31	4.1	1.6	1.0
17	3.9	4.0	13.5	7.5	57	49	66	*55	27	3.6	1.6	1.0
18	3.5	4.1	12.5	6.4	51	57	64	50	25	3.5	1.3	1.0
19	3.6	5.6	11	6.5	44	67	65	46	23	3.2	1.1	1.0
20	4.6	6.8	10	6.5	39	83	60	56	*22	3.0	1.1	1.0
21	5.4	11	11	6.5	37	111	84	49	20	3.0	1.1	1.1
22	5.9	8.9	10.5	6.5	32	145	81	44	19	3.0	*1.4	1.2
23	5.8	9.8	10	7.0	30	168	96	42	18	2.8	1.4	1.1
24	5.0	9.1	11	7.0	29	173	99	39	16.5	2.6	2.0	1.2
25	4.7	7.8	11	7.5	27	184	98	40	15.5	*2.5	2.0	1.3
26	4.6	7.0	9.0	8.0	23	206	98	47	15	2.6	1.9	1.3
27	4.6	6.2	9.0	8.0	20	206	95	44	14	2.6	1.7	*1.2
28	4.4	6.2	9.0	9.3	20	263	104	41	13	2.3	1.7	1.1
29	4.4	6.0	8.9	16.5	21	370	100	41	11.5	2.1	1.6	1.1
30	4.3	6.0	8.6	20	---	390	96	43	11	2.4	1.5	1.0
31	4.3	---	7.6	18	---	318	---	46	---	2.4	1.4	---
Total	136.4	167.0	284.0	266.1	1,474.0	3,273	3,598	1,931	857.5	149.8	49.7	38.6
Mean	4.40	5.57	9.16	8.58	50.8	106	120	62.3	28.6	4.83	1.60	1.29
Cfsm	0.056	0.071	0.117	0.110	0.651	1.36	1.54	0.799	0.367	0.062	0.021	0.017
In.	0.07	0.08	0.14	0.13	0.70	1.56	1.72	0.92	0.41	0.07	0.02	0.02
Ac-ft	271	331	563	528	2,920	6,490	7,140	3,830	1,700	297	99	77

Calendar year 1959: Max 531 Min 1.0 Mean 42.8 Cfsm 0.549 In. 7.45 Ac-ft 30,990  
 Water year 1959-60: Max 390 Min 1.0 Mean 33.4 Cfsm 0.428 In. 5.84 Ac-ft 24,250

Peak discharge (base, 500 cfs).--Mar. 29 (4:30 p.m.) 511 cfs (5.64 ft).

\* Discharge measurement made on this day. Note.--Stage-discharge relation affected by ice Nov. 15, 16, Nov. 27 to Dec. 1, Dec. 5, 6, 19, 20, 26-28, Jan. 1-6, 10-27, Feb. 27 to Mar. 8.

1125. Little Klickitat River near Wahkiacus, Wash.

Location.--Lat 45°50'30", long 121°03'20", in SE<sup>1</sup> sec.9, T.4 N., R.14 E., on right bank half a mile downstream from Bowman Creek, three-quarters of a mile upstream from mouth, and 2 miles northeast of Wahkiacus.

Drainage area.--280 sq mi, approximately.

Records available.--November 1944 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 576.2 ft above mean sea level (river-profile survey). Prior to Dec. 29, 1950, staff gage and crest-stage indicator at same site and datum.

Average discharge.--15 years (1945-60), 190 cfs (137,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,050 cfs Mar. 29 (gage height, 5.29 ft); minimum, 15.5 cfs Aug. 11 (gage height, 2.36 ft).

1944-60: Maximum discharge, 7,000 cfs Jan. 7, 1948 (gage height, 9.4 ft, from high-water mark), from rating curve extended above 2,600 cfs; minimum observed, that of Aug. 11, 1960; minimum gage height observed, 1.24 ft Aug. 25, 26, 27, 1945.

Remarks.--Records excellent except those for periods of ice effect, which are fair.

Small diversions above station for irrigation of 600 acres. No regulation.

Revisions (water years).--WSP 1248: Drainage area. WSP 1348: 1945(M), 1946, 1947(M), 1948.

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

2.6	32	4.0	290	2.7	16	4.0	290
3.0	74	4.5	505	2.6	32	4.5	505
3.5	156	5.0	810	3.0	74	5.0	810
				3.5	156		

Discharge, in cubic 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	37	39	38	59	75	530	210	115	36	18	24
2	35	37	40	b35	90	73	455	207	112	37	18	25
3	34	37	39	38	*102	65	410	205	113	37	18	24
4	34	37	37	41	90	*59	374	195	112	36	18	26
5	33	37	37	45	107	73	*365	188	105	34	18.5	26
6	33	37	44	46	146	71	349	212	101	30	17.5	25
7	*33	36	*44	45	341	95	337	218	96	28	19.5	24
8	35	39	39	45	567	200	325	202	92	27	18	24
9	36	39	39	35	455	197	308	188	86	27	17.5	23
10	40	39	40	b34	297	192	270	180	82	27	16.5	22
11	57	38	43	b45	207	183	245	192	80	26	16	24
12	48	*37	49	b40	176	183	218	202	77	26	16	25
13	42	35	44	b32	154	360	202	190	75	25	17.5	24
14	40	43	44	b43	154	262	197	176	74	25	18.5	24
15	58	37	52	b49	220	325	202	165	79	24	19.5	24
16	37	34	62	b47	171	242	178	156	77	23	19.5	23
17	36	43	53	b42	152	223	167	*146	75	23	21	23
18	36	39	49	b40	146	220	160	140	69	23	19.5	24
19	36	41	47	b40	132	220	165	131	65	22	18	23
20	38	43	44	b41	122	234	183	140	64	20	17.5	24
21	40	49	46	b42	118	251	192	138	*63	20	18.5	24
22	52	50	46	b42	107	248	180	127	60	19	18.5	24
23	41	47	46	b42	99	297	228	122	52	20	*19	25
24	40	46	49	b42	99	297	245	118	50	20	22	26
25	38	43	48	b42	96	297	228	120	47	*19	22	26
26	38	41	42	43	75	318	220	131	46	18.5	22	26
27	37	39	43	44	68	337	220	129	44	18.5	22	*24
28	37	39	44	46	75	432	237	118	42	17.5	22	23
29	36	39	43	53	73	649	225	115	40	16.5	21	24
30	37	39	43	63	---	810	218	112	38	18.5	21	24
31	37	---	42	64	---	640	---	113	---	19	22	---
Total	1,179	1,198	1,379	1,344	4,798	8,138	7,833	4,986	2,231	762.5	592.5	725
Mean	38.0	39.9	44.5	43.4	185	263	261	161	74.4	24.6	19.1	24.2
Ac-ft	2,340	2,380	2,740	2,670	9,520	16,140	15,540	9,890	4,430	1,510	1,180	1,440

Calendar year 1959: Max 1,420 Min 113 Mean 113 Ac-ft 82,180

Water year 1959-60: Max 810 Min 16 Mean 96.1 Ac-ft 69,780

Peak discharge (base, 1,600 cfs).--No peak above base.

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## 1130. Klickitat River near Pitt, Wash.

Location.--Lat 45°45'30", long 121°12'30", in SW $\frac{1}{4}$  sec. 8, T.3 N., R.13 E., on left bank  $\frac{3}{4}$  miles south of Pitt, 5 miles upstream from Silvias Creek, and 7 miles upstream from mouth at Lyle.

Drainage area.--1,290 sq mi, approximately.

Records available.--July 1909 to January 1912, October 1928 to September 1960. Published as "at Klickitat" 1909-12 and as "at Pitt" 1928-35.

Gage.--Water-stage recorder. Datum of gage is 288.9 ft above mean sea level (river-profile survey). July 3, 1909, to Jan. 31, 1912, staff gage at Klickitat just downstream from Snider Creek, 7 miles upstream at different datum. Oct. 1, 1928, to Sept. 30, 1935, staff gage at site 175 ft downstream from highway bridge at Pitt, 3.5 miles upstream from present site at different datum.

Average discharge.--34 years (1909-11, 1928-60), 1,591 cfs (1,152,000 acre-ft per year).

Extremes.--Maximum discharge during year, 5,530 cfs Mar. 30 (gage height, 7.00 ft); minimum, 668 cfs Jan. 18, 19 (gage height, 3.85 ft).

1909-12, 1928-60: Maximum discharge, 25,500 cfs Dec. 22, 1933 (gage height, 12.50 ft, site and datum then in use, from graph based on gage readings), from rating curve extended above 3,400 cfs on basis of velocity-area study and gage-height curve of relation; minimum, 466 cfs Feb. 4, 1937.

Remarks.--Records excellent. Several small diversions above station for irrigation of about 7,500 acres mostly in vicinity of Glenwood. Measured flow of Hellroaring Irrigation Canal, 73.2 cfs Aug. 25, 1948. No regulation. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1218: Drainage area. WSP 1348: 1910(M), 1929-33(M), 1934, 1935-38(M), 1940(M), 1942-43(M), 1946(M), 1948(M).

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

Oct. 1 to Mar. 14

Mar. 15 to Sept. 30

3.9	710	3.8	625	6.0	3,530
5.0	1,900	4.3	1,090	7.0	5,530
6.0	3,460	5.0	1,950		

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	908	971	1,070	800	1,010	1,010	3,670	2,270	2,720	1,370	881	755
2	881	944	1,040	782	1,090	1,000	3,310	2,300	2,990	1,310	845	784
3	854	962	1,020	809	*1,130	*953	3,190	2,320	3,190	1,300	872	737
4	845	1,050	980	764	1,120	935	3,050	2,260	3,210	1,290	845	737
5	827	971	926	800	1,260	952	3,090	2,220	2,960	1,270	836	737
6	827	953	926	854	1,450	953	3,160	2,320	2,880	1,270	818	737
7	818	926	935	818	2,730	1,020	3,280	2,750	2,590	1,220	827	728
8	845	908	899	836	3,180	1,260	*3,500	2,720	2,390	1,230	827	719
9	1,220	899	890	773	2,860	1,280	3,570	2,560	2,280	1,190	809	710
10	1,140	890	890	719	2,420	1,270	3,260	2,590	2,270	1,130	809	710
11	1,840	863	953	773	2,040	1,250	2,990	2,860	2,240	1,100	809	702
12	1,780	*863	1,040	809	1,840	1,240	2,730	3,550	2,180	1,080	800	710
13	1,400	809	971	755	1,720	1,440	2,560	3,390	2,120	1,070	782	710
14	1,200	782	935	764	1,680	1,450	2,510	2,970	2,150	1,090	782	719
15	1,100	854	1,130	782	1,870	1,850	2,480	2,760	2,400	1,070	755	719
16	1,040	791	1,340	773	1,690	1,740	2,300	*2,670	2,460	1,040	755	710
17	980	773	1,170	773	1,590	1,670	2,180	2,520	2,400	1,030	755	710
18	*962	881	1,090	719	1,530	1,590	2,100	2,360	2,010	1,040	773	702
19	926	935	1,040	719	1,440	1,590	2,080	2,220	1,820	1,030	773	702
20	953	944	1,010	755	1,370	1,650	2,150	2,480	1,740	1,010	746	710
21	1,000	1,240	980	755	1,360	1,760	2,210	2,420	*1,670	1,010	728	693
22	1,070	1,250	962	746	1,280	1,910	2,100	2,210	1,640	990	728	676
23	1,780	2,360	953	746	1,210	2,090	2,300	2,090	1,540	970	*737	593
24	1,520	2,400	962	764	1,200	2,200	2,340	2,030	1,560	940	764	693
25	1,410	2,040	944	755	1,180	2,320	2,280	2,020	1,560	*890	755	719
26	1,260	1,650	890	755	1,070	2,510	2,280	2,240	1,500	890	755	702
27	1,150	1,400	856	755	980	2,720	2,240	2,200	1,450	930	764	693
28	1,090	1,270	*872	764	1,020	3,000	2,270	2,120	1,430	920	755	693
29	1,060	1,190	845	1,080	971	3,670	2,270	2,150	1,420	890	746	684
30	1,000	1,120	863	1,160	-----	5,050	2,260	2,340	1,420	872	746	*684
31	980	-----	836	1,050	-----	4,230	-----	2,650	-----	890	755	-----
Total	34,666	33,889	30,198	24,907	45,291	57,573	79,690	76,560	64,190	33,332	24,332	21,358
Mean	1,118	1,130	974	803	1,562	1,857	2,656	2,470	2,140	1,075	785	712
Cfs/m	0.867	0.876	0.755	0.622	1.21	1.44	2.06	1.91	1.66	0.833	0.609	0.552
In.	1.00	0.98	0.87	0.72	1.31	1.68	2.30	2.21	1.85	0.96	0.70	0.62
Ac-ft	68,760	67,220	59,900	49,400	89,830	114,200	158,100	151,900	127,300	66,110	48,260	42,360

\* Discharge measurement made on this day.

1134. Dog River near Parkdale, Oreg.

Location.--Lat 45°24'30", long 121°31'10" in SW¼ sec.11, T.2 S., R.10 E., on right bank 0.8 mile south of Brooks Meadow and 8.6 miles south of Parkdale.

Drainage area.--4.50 sq mi.

Records available.--October 1959 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 4,347 ft above mean sea level (levels by city of The Dalles).

Extremes.--Maximum discharge during year, 25 cfs June 5 (gage height, 3.08 ft); minimum daily, 0.2 cfs Dec. 8-15, Dec. 19 to Jan. 3.

Remarks.--Records good 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)

2.2	0.2	2.6	6.5
2.3	.6	2.7	12
2.4	1.3	2.9	20
2.5	3.2	3.1	26

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*2.7	2.4	2.1	0.2	2.5	2.2	5.6	8.1	21	14	*5.0	3.8
2	2.7	2.4	2.2	.2	3.0	2.3	6.0	8.1	22	13	5.0	3.5
3	2.7	3.5	1.2	.2	2.8	2.1	6.5	7.8	22	12	5.3	3.5
4	2.7	3.0	.6	1.6	3.1	2.0	6.5	7.4	24	12	5.0	3.2
5	2.4	2.5	.4	1.1	2.9	2.1	7.6	7.4	24	11	5.0	3.2
6	2.4	2.4	.4	1.5	3.5	2.4	9.2	8.1	*24	10	4.6	3.2
7	2.7	2.4	.4	2.5	5.0	3.0	10	10	23	9.7	4.6	3.2
8	3.5	2.3	.2	2.1	8.0	3.3	12	11	22	9.2	4.6	3.0
9	4.1	2.3	.2	1.8	7.0	3.5	13	10	22	9.2	4.6	3.0
10	4.1	2.2	.2	1.6	6.0	3.2	14	11	22	8.7	4.4	3.0
11	7.0	2.2	.2	2.2	5.4	3.0	14	12	22	8.1	4.1	3.0
12	3.8	2.1	.2	*2.0	4.7	2.8	14	13	22	8.1	4.1	3.0
13	3.2	2.1	.2	1.7	4.3	3.2	13	12	22	8.1	4.1	3.0
14	3.0	2.1	.2	1.4	4.0	3.6	13	12	22	8.1	3.8	2.7
15	3.0	2.3	.2	1.6	4.5	4.1	13	11	23	8.1	4.1	2.7
16	2.7	2.1	.3	2.0	5.0	3.9	12	10	23	8.1	3.8	2.7
17	2.7	2.0	.3	2.2	4.5	3.7	11	10	21	7.6	3.8	2.7
18	2.7	2.3	.3	2.1	4.2	3.7	11	9.6	20	7.6	3.5	2.7
19	2.7	2.6	.2	2.0	3.8	4.0	11	9.6	19	7.6	3.2	2.7
20	3.0	2.4	.2	1.9	3.5	4.1	11	11	18	7.0	3.2	2.4
21	*2.7	2.9	.2	1.8	3.4	4.3	10	12	*18	6.5	3.2	2.4
22	3.2	3.5	.2	1.7	3.3	4.6	9.7	11	17	6.5	3.5	2.4
23	3.0	4.5	.2	1.9	3.1	4.4	9.2	10	17	6.5	3.5	2.4
24	2.7	3.5	.2	2.3	3.0	4.4	9.2	10	17	6.0	3.8	2.4
25	2.7	2.5	.2	2.0	*b2.9	4.4	8.7	10	16	6.0	3.8	2.2
26	2.4	2.0	.2	3.0	b2.5	4.4	8.1	12	16	5.6	3.8	2.2
27	2.4	1.5	.2	2.7	b2.2	4.4	8.1	14	15	5.6	3.5	2.2
28	2.4	1.8	.2	2.4	b2.1	*4.6	8.1	16	15	5.3	3.5	2.0
29	2.4	1.9	.2	2.8	b2.1	5.0	8.1	17	14	5.3	3.5	2.0
30	2.4	2.0	.2	3.2	-----	5.3	8.1	19	14	5.3	3.5	2.0
31	2.4	-----	.2	2.7	-----	5.6	-----	20	-----	5.3	*3.5	-----
Total	92.5	73.7	12.4	57.4	112.3	113.6	300.7	350.1	597	251.1	124.9	82.4
Mean	2.98	2.46	0.40	1.85	3.87	3.66	10.0	11.3	19.9	8.10	4.03	2.75
Cfsm	0.662	0.547	0.089	0.411	0.860	0.813	2.22	2.51	4.42	1.80	0.896	0.611
In.	0.76	0.61	0.10	0.47	0.93	0.94	2.49	2.89	4.93	2.08	1.03	0.68
Ac-ft	183	146	25	114	223	225	596	694	1,180	498	248	163

Calendar year 1959: Max - Min - Mean - Cfsm - In. - Ac-ft -  
 Water year 1959-60: Max 24 Min 0.2 Mean 5.92 Cfsm 1.32 In. 17.91 Ac-ft 4,300

Peak discharge (base, 20 cfs).--June 5 (7 p.m.) 25 cfs (3.08 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Oct. 30 to Dec. 1, Dec. 12 to Feb. 24, Mar. 1-21, May 3-31; discharge estimated on basis of 1 discharge measurement, weather records, and records for Salmon River near Government Camp and White River below Tygh Valley.

1185. West Fork Hood River near Dee, Ore.

Location.--Lat 45°35'55", long 121°38'05", in SE<sup>1</sup>/<sub>4</sub> sec. 1, T.1 N., R.9 E., on left bank 0.3 mile upstream from Dead Point Creek, 0.5 mile upstream from mouth, and 1 mile north-west of Dee.

Drainage area.--96 sq mi, approximately.

Records available.--September 1913 to February 1916 (incomplete), June 1932 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 802.1 ft above mean sea level, datum of 1929. Sept. 1, 1913, to Feb. 12, 1916, staff gage at site half a mile upstream at different datum.

Average discharge.--29 years (1913-14, 1932-60), 557 cfs (403,300 acre-ft per year).

Extremes.--Maximum discharge during year, 5,320 cfs Feb. 7 (gage height, 7.85 ft); minimum, 133 cfs Sept. 30.  
1913-16, 1932-60: Maximum discharge, 12,900 cfs Dec. 22, 1933 (gage height, 12.4 ft), from rating curve extended above 5,300 cfs; minimum, 93 cfs Aug. 22, 1941.

Remarks.--Records excellent except those for periods of no gage-height record, which are good. No regulation. Dee Irrigation District canal diverts from right bank about 6 miles above station for irrigation above station and in Middle Fork basin. Diversions from Green Point Creek basin above station for irrigation near Oak Grove; water from two of these diversions is carried in Hood River Irrigation District canal.

Revisions (water years).--WSP 1448: 1914-16, 1939.

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

Oct. 1 to Mar. 29				Mar. 30 to Sept. 30			
1.6	220	5.0	2,010	1.3	140	3.0	760
2.0	345	7.0	4,140	1.6	220	5.0	2,080
3.0	745			2.0	345	6.0	2,980

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	390	404	426	280	534	342	*1,530	790	931	342	*214	189
2	345	380	415	274	642	332	1,660	838	948	325	212	181
3	312	530	415	268	606	328	1,440	760	953	322	206	181
4	283	478	384	262	574	338	1,400	688	892	319	198	203
5	265	422	362	262	750	328	1,460	842	810	322	192	209
6	259	390	348	293	1,370	376	1,450	683	750	335	192	187
7	306	373	366	280	3,270	426	1,440	a1,000	665	319	192	176
8	642	352	338	290	2,240	506	1,380	a950	611	306	198	162
9	1,520	335	315	271	1,710	443	1,220	a850	588	286	198	180
10	1,100	319	342	265	1,400	408	986	870	580	277	195	182
11	3,340	312	574	*288	1,020	384	892	970	562	271	189	188
12	1,520	296	390	253	850	376	843	1,080	544	274	184	178
13	940	280	740	250	776	390	914	1,120	522	283	176	170
14	709	268	686	250	1,130	390	1,010	1,030	a600	274	173	162
15	606	283	754	250	1,480	602	975	860	a800	265	195	155
16	508	259	768	244	1,010	558	838	*904	a900	262	173	148
17	446	258	637	238	815	566	816	936	a700	268	178	145
18	412	280	574	232	700	578	821	986	a800	271	184	142
19	*376	370	522	223	614	594	887	892	a550	256	170	152
20	415	348	462	238	554	691	1,370	2,020	*552	250	165	160
21	408	673	446	238	566	845	1,280	a1,600	494	241	168	145
22	2,060	1,110	415	229	502	1,010	1,010	a1,300	454	235	181	145
23	1,710	2,130	401	226	*462	1,090	870	a1,100	440	226	206	150
24	1,050	1,230	401	223	446	1,100	755	a950	456	220	274	185
25	930	910	398	226	432	1,230	706	a900	415	220	220	168
26	714	709	362	274	404	1,480	874	1,020	394	229	256	150
27	608	594	342	277	376	1,610	896	1,080	384	238	229	145
28	570	562	322	312	362	1,410	745	958	373	226	203	145
29	510	506	309	578	348	2,260	745	898	373	229	189	140
30	454	*458	306	660	-----	2,540	755	904	359	232	*189	140
31	429	-----	299	588	-----	1,780	-----	1,000	-----	226	192	-----
Total	24,133	15,817	14,439	9,020	25,943	25,291	31,568	30,579	18,180	8,349	6,091	4,881
Mean	778	527	466	291	895	816	1,052	986	606	269	196	163
Ac-ft	47,870	31,370	28,640	17,890	51,460	50,160	62,610	60,650	36,080	16,560	12,080	9,880

Calendar year 1959: Max 3,340 Min 148 Mean 568 Ac-ft 411,400  
Water year 1959-60: Max 3,340 Min 140 Mean 585 Ac-ft 425,000

Peak discharge (base, 4,100 cfs).--Oct. 11 (7:30 a.m.) 5,020 cfs (7.65 ft); Feb. 7 (2 a.m.) 5,320 cfs (7.65 ft).

\* Discharge measurement made on this day.  
a No gage-height record; discharge estimated on basis of weather records, recorded range in stage, and records for Hood River near Hood River.

1210. Hood River near Hood River, Oreg.

Location.--Lat 45°42'00", long 121°30'30", in NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec.36, T.3 N., R.10 E., on right bank at Powerdale, 0.5 mile upstream from Pacific Power & Light Co. powerplant and 0.8 mile southeast of town of Hood River.

Drainage area.--329 sq mi.

Records available.--March 1913 to September 1960. Published as "at Powerdale, near Hood River" 1913-26.

Gage.--Water-stage recorder. Datum of gage is 106.37 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Nov. 13, 1934, staff gage or water-stage recorder at several sites within half a mile of present site at various datums.

Average discharge.--47 years, 1,101 cfs (797,100 acre-ft per year).

Extremes.--Maximum discharge during year, 5,310 cfs Feb. 7; minimum daily, 405 cfs Sept 18. 1913-60: Maximum discharge, 34,000 cfs Jan. 6, 1923 (gage height, 11.1 ft, present datum, site then in use), no diversion by power conduit; minimum daily, 165 cfs Aug. 5, 1941.

Remarks.--Records fair. Many diversions for irrigation above station. Daily discharge regulated by pondage at sawmill at Dee. All records presented herein include flow in Pacific Power & Light Co.'s conduit which diverts 2.7 miles above station and returns water to river 0.5 mile below station.

Cooperation.--Water-stage recorder inspected by employees of Pacific Power & Light Co.

Revisions (water years).--WSP 1448: For conduit: 1931-32; for river: 1915-16(M), 1918(M), 1920(M), 1924-25, 1931, 1934-37(M), 1938, 1939-40(M), 1943, 1945(M), 1946-48, 1949(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	729	838	860	640	989	764	2,740	1,500	1,820	855	537	495
2	700	798	853	620	1,170	751	2,810	1,540	1,900	787	*502	472
3	660	1,050	851	620	1,140	730	2,560	1,470	1,920	765	508	487
4	640	972	797	620	1,100	748	2,470	1,360	1,860	762	482	529
5	620	857	767	620	1,290	748	2,550	1,310	1,740	782	470	527
6	620	818	749	660	1,920	775	2,570	1,390	1,660	724	475	476
7	700	778	770	840	4,150	838	2,570	1,900	1,480	714	480	445
8	929	753	737	660	3,360	1,050	2,510	1,680	1,340	690	509	421
9	2,270	722	708	840	2,860	1,030	2,320	1,480	1,240	642	508	415
10	1,490	732	727	600	2,470	948	1,950	1,550	1,240	606	493	425
11	3,970	700	1,060	*600	1,920	911	1,780	1,770	1,220	582	496	436
12	2,390	680	1,520	580	1,610	884	1,670	2,020	1,200	626	459	451
13	1,670	660	1,230	580	1,490	933	1,720	1,950	1,150	682	436	467
14	1,350	640	1,150	580	1,800	980	1,880	1,830	1,330	690	426	455
15	1,180	680	1,380	580	2,370	1,300	1,860	1,580	1,740	658	464	427
16	995	640	1,350	580	1,800	1,300	1,600	*1,720	1,890	648	419	409
17	924	600	1,150	560	1,520	1,280	1,580	1,820	1,460	670	489	410
18	859	660	1,050	540	1,360	1,270	1,580	1,860	1,200	684	486	405
19	802	769	978	540	1,220	1,250	1,610	1,670	1,100	689	468	424
20	*858	746	923	560	1,130	1,320	2,290	3,020	*1,100	648	438	452
21	836	1,180	865	560	1,130	1,480	2,200	2,510	1,000	615	427	417
22	2,860	1,510	846	560	1,030	1,670	1,860	2,060	940	595	466	409
23	2,740	2,780	813	540	*965	1,820	1,710	1,810	932	561	474	422
24	1,780	2,230	824	540	911	1,860	1,530	1,700	964	545	576	464
25	1,640	1,730	813	560	916	1,960	1,470	1,600	932	538	515	511
26	1,300	1,360	760	640	857	2,200	1,430	1,610	846	575	503	469
27	1,170	1,190	740	680	794	2,480	1,430	1,940	839	609	529	455
28	1,080	1,090	720	800	782	2,370	1,480	1,720	797	574	477	455
29	1,010	1,020	700	1,130	759	2,780	1,470	1,620	825	560	*473	428
30	928	*955	700	1,200	759	3,730	1,470	1,680	806	573	464	444
31	892	-----	660	1,060	-----	*3,060	-----	1,900	-----	565	494	-----
Total	40,590	30,138	28,071	20,290	44,813	45,220	58,670	54,770	38,471	20,214	14,921	13,469
Mean	1,309	1,005	906	655	1,545	1,459	1,956	1,767	1,282	652	481	449
Ac-ft	80,510	59,780	55,680	40,240	88,890	89,690	116,400	108,600	76,310	40,090	29,600	26,720
Calendar year 1959: Max	3,970			Min	434		Mean	1,133	Ac-ft	820,400		
Water year 1959-60: Max	4,150			Min	405		Mean	1,119	Ac-ft	812,500		

Peak discharge (base, 4,600 cfs).--Feb. 7 (2:30 a.m.) 5,310 cfs.

\* Discharge measurement made on this day.

1213. White Salmon River below Cascades Creek, near Trout Lake, Wash.

Location--Lat 46°06'10", long 121°36'10", in SW 1/4 sec. 7, T.7 N., R.10 E., on right bank 100 ft downstream from Cascades Creek and 7 1/2 miles northwest of Trout Lake.

Drainage area--32.4 sq mi.

Records available--July 1957 to September 1960.

Gage--Water-stage recorder. Altitude of gage is 3,080 ft (from topographic map).

Extremes--Maximum discharge during year, 431 cfs Oct. 22 (gage height, 2.86 ft); minimum, 74 cfs Mar. 1 (gage height, 1.43 ft).  
1957-60: Maximum discharge, 551 cfs May 26, 1958 (gage height, 3.27 ft); minimum, 60 cfs Nov. 29, 1957; minimum gage height, 1.39 ft Oct. 31, 1958.

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

Revisions--WSP 1638: Drainage area.

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

1.4	70
1.7	118
2.0	184
2.6	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	113	134	153	97	124	98	162	167	281	194	140	95
2	109	130	151	97	128	94	179	179	309	187	132	92
3	107	167	145	92	116	90	174	174	329	189	132	97
4	104	138	136	92	*111	97	182	167	323	192	128	107
5	102	130	132	97	145	94	202	177	312	192	126	104
6	104	128	130	98	184	92	221	205	300	197	128	92
7	104	126	128	97	250	92	*248	242	278	200	128	87
8	175	122	124	97	205	*90	264	215	264	189	130	87
9	*211	118	124	94	182	86	258	221	259	179	128	89
10	159	118	*128	98	162	83	232	237	259	170	130	92
11	329	116	160	95	147	81	221	272	264	182	124	92
12	221	113	140	92	140	81	205	298	264	167	116	94
13	179	104	126	89	134	80	205	275	272	179	114	94
14	167	111	132	92	140	78	200	264	292	172	109	92
15	156	*109	205	90	138	80	177	245	300	162	113	89
16	142	102	170	89	124	80	165	237	332	160	109	86
17	136	118	147	89	120	86	156	218	278	174	124	84
18	132	136	142	85	116	87	151	*205	259	182	120	81
19	128	149	136	83	113	90	149	202	248	174	114	84
20	153	162	134	83	109	98	162	300	240	162	105	78
21	142	167	128	83	109	107	145	237	224	153	105	77
22	292	240	126	84	105	116	134	213	215	149	104	76
23	232	329	124	84	104	124	132	207	218	142	120	77
24	202	272	124	84	102	136	128	215	226	140	116	92
25	192	250	116	89	100	156	124	218	215	140	*111	87
26	165	213	114	95	95	177	128	250	210	153	109	83
27	156	194	113	89	113	202	138	232	210	*158	102	83
28	156	184	109	124	105	164	156	224	207	145	97	83
29	151	170	109	194	104	210	158	234	210	140	95	*81
30	142	158	109	138	-----	194	160	253	*213	145	98	81
31	138	-----	105	118	-----	170	-----	270	-----	142	98	-----
Total	4,999	4,728	4,122	3,026	3,825	3,533	5,314	7,053	7,811	5,190	3,603	2,636
Mean	161	158	133	97.6	132	114	177	228	260	167	116	87.9
Cfs/m	4.97	4.88	4.10	3.01	4.07	3.52	5.46	7.04	8.02	5.15	3.58	2.71
In.	5.74	5.43	4.73	3.47	4.39	4.06	6.10	8.90	8.97	5.96	4.14	3.03
Ac-ft	9,920	9,380	8,180	6,000	7,590	7,010	10,540	13,990	15,490	10,290	7,150	5,230

Calendar year 1959: Max	347	Min	82	Mean	154	Cfs/m	4.75	In.	64.32	Ac-ft	111,200
Water year 1959-60: Max	332	Min	76	Mean	153	Cfs/m	4.72	In.	64.12	Ac-ft	110,800

Peak discharge (base, 360 cfs)--Oct. 11 (7 a.m.) 424 cfs (2.84 ft); Oct. 22 (2:30 p.m.) 431 cfs (2.86 ft); Nov. 23 (3:30 a.m.) 404 cfs (2.78 ft); Feb. 7 (12:30 a.m.) 365 cfs (2.65 ft).

\* Discharge measurement made on this day.

1214. White Salmon River above Trout Lake Creek, near Trout Lake, Wash.

Location.--Lat 46°01'50", long 121°31'50", in SE $\frac{1}{4}$  sec. 3, T.6 N., R.10 E., on right bank 2 miles north of town of Trout Lake,  $2\frac{1}{2}$  miles downstream from Wicky Creek, and 3 miles upstream from Trout Lake Creek.

Drainage area.--64.9 sq mi.

Records available.--June 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,050 ft (from topographic map).

Extremes.--Maximum discharge during year, 523 cfs Oct. 22 (gage height, 3.07 ft); minimum, 137 cfs Jan. 10 (gage height, 1.84 ft).  
1959-60: Maximum discharge, that of Oct. 22, 1959; minimum, that of Jan. 10, 1960.

Remarks.--Records excellent except those for period of no gage-height record, 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. 1-22			Oct. 22 to Sept. 30		
1.9	163		1.8	125	
2.3	265		2.3	277	
2.8	424		2.9	469	

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1	190	215	239	176	a200	182	328	319	405	287	227	176	
2	187	209	236	179	a210	179	344	325	437	280	218	173	
3	185	245	230	173	a200	173	344	325	463	283	218	176	
4	182	218	221	176	*194	179	351	312	458	283	212	191	
5	180	206	215	173	239	*179	370	322	443	283	212	185	
6	180	203	212	173	278	176	*392	344	431	287	215	173	
7	182	200	212	170	392	179	424	389	402	290	215	170	
8	*233	187	203	173	335	179	450	357	383	285	218	167	
9	293	194	203	164	315	170	443	360	378	271	218	170	
10	230	191	*209	164	293	164	411	379	376	264	218	173	
11	417	191	251	167	267	164	399	418	383	255	218	173	
12	294	185	236	161	258	161	383	450	379	258	209	176	
13	254	170	215	158	248	161	379	427	386	267	203	176	
14	243	179	215	158	255	158	376	408	402	267	194	173	
15	233	179	296	155	261	167	347	389	415	255	203	170	
16	222	*161	267	155	239	164	325	376	443	251	194	164	
17	215	179	239	155	230	167	319	357	389	264	209	164	
18	210	212	233	149	227	170	309	*338	363	277	209	158	
19	207	230	227	146	221	176	303	331	351	271	203	164	
20	228	236	224	149	218	182	331	447	341	255	191	155	
21	220	277	215	149	218	200	309	373	319	248	194	152	
22	367	314	212	155	209	212	293	344	312	242	191	152	
23	328	431	209	a155	206	224	290	338	312	236	206	152	
24	287	380	212	a155	203	239	280	341	319	230	209	170	
25	280	341	206	a160	200	264	271	341	312	230	*197	167	
26	245	303	197	a175	191	293	277	383	303	239	194	161	
27	236	283	194	a170	176	335	287	363	303	*251	185	161	
28	236	274	191	a200	179	322	309	351	303	233	179	*158	
29	230	261	188	a300	179	367	309	360	303	227	179	152	
30	221	248	188	a250	---	370	309	379	*303	233	182	155	
31	218	---	185	a220	---	338	---	395	---	227	182	---	
Total	7,433	7,092	6,780	5,363	6,841	6,594	10,262	11,341	11,113	8,027	6,302	5,007	
Mean	240	236	219	173	236	213	342	366	370	259	203	167	
Cfsm	3.70	3.64	3.37	2.67	3.64	3.28	5.27	5.64	5.70	3.99	3.13	2.57	
In.	4.26	4.06	3.89	3.07	3.92	3.78	5.88	6.50	6.37	4.60	3.61	2.87	
Ac-ft	14,740	14,070	13,450	10,640	13,570	13,080	20,350	22,490	22,040	15,920	12,500	9,930	
Calendar year 1959: Max				Min		Mean		Cfsm		In.	Ac-ft		
Water year 1959-60: Max	463			Min	146	Mean	252	Cfsm	3.88	In.	52.81	Ac-ft	182,800

Peak discharge (base, 500 cfs).--Oct. 11 (7:30 a.m.) 517 cfs (3.06 ft); Oct. 22 (3:30 p.m.) 523 cfs (3.07 ft); Feb. 7 (2 a.m.) 507 cfs (3.02 ft); May 20 (4:30 a.m.) 507 cfs (3.02 ft); June 3 (9 p.m.) 501 cfs (3.00 ft).

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for station near Trout Lake.

1215. Trout Lake Creek near Trout Lake, Wash.

Location.--Lat 46°00'20", long 121°32'20", in SW $\frac{1}{4}$  sec.15, T.6 N., R. 10 E., on right bank a quarter of a mile downstream from Trout Lake and 1 mile northwest of town of Trout Lake.

Drainage area.--69.3 sq mi.

Records available.--September 1909 to October 1911 (published as Trout Creek at Guler), June 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,000 ft (from river-profile map). Sept. 16, 1909, to Oct. 31, 1911, staff gage at about same site at different datum.

Extremes.--Maximum discharge during year, 985 cfs Nov. 23 (gage height, 3.83 ft); minimum, 38 cfs Sept. 30 (gage height, 0.86 ft).  
1909-11, 1959-60: Maximum discharge, 1,580 cfs Nov. 25, 1909 (gage height, 7.31 ft, from graph based on gage readings, datum then in use); minimum, that of Sept. 30, 1960.

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.--WSP 1638: 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			
1.0	59	0.84	39	2.0	260		
1.5	140	1.0	59	3.0	593		
2.0	244	1.5	142	3.7	920		
3.2	590						

Discharge, in cubic 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	150	244	126	250	159	577	437	688	199	65	55
2	86	140	224	136	260	148	549	451	734	181	63	54
3	82	156	219	124	245	148	577	465	792	167	63	52
4	78	196	199	125	*232	b145	565	444	796	163	63	51
5	72	162	161	120	284	152	589	430	720	157	63	56
6	69	144	167	118	353	150	627	491	675	150	62	58
7	73	134	167	115	763	157	*675	670	606	144	59	55
8	85	127	159	113	820	165	758	711	534	138	58	51
9	*311	121	146	b108	670	*150	810	635	484	130	56	47
10	285	118	*146	105	545	138	734	635	472	120	54	46
11	505	112	226	110	454	132	648	734	454	115	54	44
12	590	107	321	110	400	128	585	860	451	109	54	44
13	385	101	279	105	368	124	557	850	450	104	52	42
14	285	91	229	100	359	122	585	772	423	101	52	42
15	235	96	362	100	413	144	553	716	526	98	51	41
16	204	*86	585	100	359	140	480	657	557	93	54	41
17	176	80	451	100	318	136	440	601	522	88	54	40
18	160	112	362	98	295	142	413	534	396	85	52	40
19	144	194	315	92	274	144	396	*503	347	80	50	39
20	148	254	282	90	255	152	430	725	353	78	47	41
21	170	460	260	92	247	176	454	810	324	76	47	41
22	222	469	239	100	232	204	406	635	290	74	54	40
23	427	883	224	100	212	234	390	561	274	72	58	41
24	323	801	216	100	202	265	362	557	274	72	*80	41
25	287	631	209	100	192	304	336	541	265	70	91	46
26	244	476	167	110	167	362	327	618	244	70	82	44
27	211	384	176	110	163	465	330	657	229	*70	76	41
28	194	338	167	150	b160	530	362	627	219	67	69	41
29	186	307	157	320	b160	565	400	606	*209	66	62	*41
30	170	274	152	300	---	739	420	644	207	66	58	39
31	158	---	144	260	---	670	---	702	---	67	55	---
Total	6,663	7,704	7,395	3,936	9,652	7,404	15,337	19,279	13,485	3,270	1,858	1,354
Mean	215	257	239	127	333	239	511	622	450	105	59.9	45.1
Cfsm	3.10	3.71	3.45	1.83	4.81	3.45	7.37	8.98	6.49	1.52	0.864	0.651
In.	3.58	4.13	3.97	2.11	5.18	3.98	8.23	10.35	7.24	1.75	1.00	0.73
Ac-ft	15,220	15,280	14,670	7,810	19,140	14,690	38,240	38,240	26,750	6,490	3,690	2,690

Calendar year 1959: Max - Min - Mean - Cfsm - In. - Ac-ft -  
Water year 1959-60: Max 883 Min 39 Mean 266 Cfsm 3.84 In. 52.24 Ac-ft 193,100

Peak discharge (base, 650 cfs).--Nov. 23 (3:30 p.m.) 985 cfs (3.83 ft); Feb. 7 (7 p.m.) 870 cfs (3.60 ft); May 13 (4 a.m.) 865 cfs (3.63 ft); May 20 (11 p.m.) 895 cfs (3.65 ft).

\* Discharge measurement made on this day.  
b Stage-discharge relation affected by ice.

Note.--No gage-height record Jan. 10 to Feb. 3; discharge estimated on basis of recorded range in stage and records for White Salmon River near Trout Lake and White Salmon River above Trout Lake Creek, near Trout Lake.

## 1220. White Salmon River near Trout Lake, Wash.

Location.--Lat 45°59'30", long 121°29'30", in SE $\frac{1}{4}$  sec.24, T.6 N., R.10 E., on left bank a quarter of a mile downstream from Trout Lake Creek and 2 miles southeast of town of Trout Lake.

Drainage area.--185 sq mi.

Records available.--July to September 1918 (published as "near Guler"), October 1928 to September 1931, August 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,870 ft (from river-profile map). July 17 to Sept. 30, 1918, chain gage at site half a mile downstream at different datum. Oct. 14, 1928, to Sept. 30, 1931, staff gage at site 250 ft upstream at different datum.

Average discharge.--6 years (1928-31, 1957-60), 348 cfs (251,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,260 cfs Nov. 23 (gage height, 5.27 ft); minimum, 78 cfs Sept. 18 (gage height, 1.35 ft).  
1918, 1928-31, 1957-60: Maximum discharge observed, 3,000 cfs Apr. 1, 1931 (gage height, 5.2 ft, site and datum then in use); minimum observed, 35 cfs Aug. 26, 1931 (gage height, -0.06 ft, site and datum then in use).

Remarks.--Records excellent. Very slight regulation. Diversions above station for irrigation of about 3,100 acres of farm land.

Revisions.--WSP 1638: Drainage area.

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

1.3	73	4.0	700
2.0	164	5.0	1,120
3.0	380	6.0	1,650

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	220	338	444	288	429	322	864	693	980	335	125	107
2	212	325	420	293	474	320	852	712	1,040	308	126	100
3	207	368	405	286	441	288	876	724	1,100	293	120	98
4	197	385	382	274	408	308	876	696	1,100	286	118	102
5	192	345	362	286	*507	318	912	690	1,010	277	118	102
6	188	322	350	279	616	318	964	768	956	274	118	96
7	195	303	350	274	1,100	328	*1,040	960	864	261	115	92
8	241	293	338	274	1,120	340	1,140	976	768	255	112	86
9	529	286	325	255	*952	*315	1,190	912	704	238	114	90
10	471	291	328	242	812	300	1,060	932	682	224	111	91
11	860	274	456	266	693	291	964	1,040	672	208	111	92
12	888	270	542	263	640	281	892	1,220	665	205	109	92
13	826	255	468	248	598	281	868	1,200	648	214	107	88
14	504	248	420	242	602	277	888	1,110	651	218	112	88
15	444	255	620	244	651	318	836	1,010	764	197	109	86
16	392	*234	804	244	574	305	748	948	828	181	101	85
17	*362	244	858	240	525	303	700	880	768	178	115	83
18	338	300	564	224	498	300	668	792	630	179	115	81
19	322	392	510	214	474	305	651	756	556	174	110	80
20	345	471	474	218	450	322	696	*1,060	550	161	101	83
21	362	708	447	224	444	352	708	1,080	501	146	105	82
22	540	748	420	232	420	392	648	900	458	142	105	84
23	732	1,180	405	234	395	429	634	824	429	135	116	87
24	588	1,050	398	236	388	474	598	820	432	132	134	96
25	542	900	385	234	375	532	567	804	414	132	*140	96
26	474	712	362	255	342	616	553	908	385	134	133	92
27	423	616	350	255	318	752	564	928	372	*145	126	90
28	398	564	338	281	322	812	620	892	362	133	116	91
29	385	519	*325	507	328	920	654	876	*360	125	112	*87
30	362	480	322	539	-----	1,040	672	920	355	125	111	87
31	350	-----	312	468	-----	964	-----	980	-----	127	111	-----
Total	12,888	13,666	13,284	8,619	15,896	13,423	23,903	28,011	20,005	6,141	3,576	2,724
Mean	416	456	429	278	548	433	797	904	667	198	115	90.8
Ac-ft	25,560	27,110	26,350	17,100	31,530	26,620	47,410	55,560	39,680	12,180	7,090	5,400
Calendar year 1959: Max	1,420			Min	91	Mean	421	Ac-ft	304,900			
Water year 1959-60: Max	1,220			Min	81	Mean	443	Ac-ft	321,600			

Peak discharge (base, 1,100 cfs).--Nov. 23 (1:30 p.m.) 1,260 cfs (5.27 ft); Feb. 7 (5 p.m.) 1,160 cfs (5.07 ft); Apr. 9 (10 a.m.) 1,200 cfs (5.14 ft); May 12 (10 p.m.) 1,240 cfs (5.20 ft); May 20 (9 p.m.) 1,180 cfs (5.07 ft).

\* Discharge measurement made on this day.

## WHITE SALMON RIVER BASIN

1229. White Salmon River at B-Z Corner, Wash.

Location.--Lat 45°51'45", long 121°30'15", in NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 1, T.4 N., R.10 E., on left bank 0.8 mile north of B-Z Corner and  $1\frac{1}{4}$  miles downstream from Wieberg Creek.

Drainage area.--269 sq mi.

Records available.--July 1958 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 705.30 ft above mean sea level (levels by Klickitat County Public Utility District No. 1).

Extremes.--Maximum discharge during year, 1,900 cfs May 13 (gage height, 3.73 ft); minimum, 350 cfs Sept. 20, 21 (gage height, 1.00 ft).  
1958-60: Maximum discharge, 2,410 cfs Jan. 12, 1959 (gage height, 4.26 ft), from rating curve extended above 1,100 cfs; minimum, 320 cfs Oct. 6, 1958 (gage height, 0.88 ft).

Remarks.--Records good except those for periods of no gage-height record, which are fair. Diversions for irrigation of about 4,500 acres above station. No regulation.

Cooperation.--Water-stage-recorder graph furnished by Klickitat County Public Utility District No. 1.

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

1.0	350	5.0	1,280
1.5	500	4.0	2,150
2.0	695		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	472	518	630	476	654	634	1,450	1,260	1,550	810	552	468
2	459	504	610	479	726	630	1,390	1,280	1,580	790	552	482
3	447	535	594	472	708	598	1,400	1,300	1,600	770	546	444
4	438	566	574	459	686	598	1,380	1,270	1,600	760	538	458
5	426	528	549	465	*790	618	1,400	1,250	1,500	755	538	452
6	414	500	538	462	951	618	1,450	1,340	1,440	760	532	423
7	417	479	538	459	1,710	*634	1,500	1,580	1,350	740	521	411
8	447	465	524	459	1,750	650	1,600	1,630	1,250	731	518	408
9	740	459	510	432	1,540	634	1,650	1,540	1,150	708	521	399
10	695	453	507	426	1,300	622	1,600	1,570	1,100	686	510	405
11	990	447	634	450	1,000	614	1,530	1,690	1,100	664	510	405
12	1,170	438	770	447	1,010	610	*1,420	1,650	1,050	650	518	399
13	860	420	682	435	950	610	1,390	1,840	1,050	664	514	396
14	770	414	618	432	944	610	1,420	1,740	1,050	682	518	387
15	650	*423	795	432	1,030	713	1,370	1,630	1,100	659	510	384
16	602	399	1,030	432	950	700	1,240	1,530	1,200	650	496	378
17	*563	408	890	426	880	690	1,180	1,440	1,200	638	496	378
18	542	456	785	414	840	690	1,150	1,340	1,100	650	493	372
19	521	549	731	405	805	695	1,140	*1,260	1,050	654	496	365
20	542	626	686	411	765	718	1,250	1,630	1,000	642	479	360
21	560	885	659	426	755	765	1,280	1,730	980	614	472	355
22	718	926	634	429	722	820	1,210	1,510	*930	606	482	358
23	938	1,460	614	420	700	855	1,200	1,420	910	598	500	358
24	785	1,340	606	417	690	896	1,150	1,400	900	580	510	360
25	736	1,150	586	417	677	950	1,100	1,390	900	580	546	378
26	659	932	556	435	646	1,030	1,100	1,500	870	*560	*549	387
27	610	820	538	447	622	1,190	1,110	1,530	850	570	540	384
28	586	750	524	462	622	1,280	1,170	1,500	840	560	528	378
29	570	704	*514	668	626	1,490	1,210	1,470	830	552	510	*375
30	549	659	510	755	-----	1,740	1,230	1,520	840	552	486	---372
31	532	-----	500	708	-----	1,610	-----	1,580	-----	560	479	-----
Total	19,408	19,213	19,436	14,457	26,049	25,512	39,670	46,550	33,870	20,395	15,960	11,819
Mean	626	640	627	466	898	823	1,322	1,502	1,129	658	515	394
Ac-ft	38,500	38,110	38,550	28,680	51,670	50,600	78,680	92,330	67,180	40,450	31,660	23,440

Calendar year 1959: Max 2,300 Min 362 Mean 806 Ac-ft 583,200  
Water year 1959-60: Max 1,860 Min 355 Mean 799 Ac-ft 579,800

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 11, Apr. 5-10, June 1-5, 7-29, July 1-4, 24, 25; discharge estimated on basis of recorded range in stage, 1 discharge measurement, and records for station at Husum.

## 1230. White Salmon River at Husum, Wash.

Location.--Lat 45°47'50", long 121°29'00", in SW<sup>1</sup> sec.30, T.4 N., R.11 E., on right bank at Husum, 500 ft upstream from Rattlesnake Creek.

Drainage area.--294 sq mi.

Records available.--September 1909 to October 1919, October 1929 to October 1941, August 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 360 ft (from river-profile map).

Sept. 23, 1909, to Oct. 11, 1912, and Feb. 21, 1915, to Oct. 31, 1919, staff gages and Oct. 12, 1912, to Feb. 20, 1915, water-stage recorder, at sites within a quarter of a mile at different datums.

Average discharge.--25 years, 969 cfs (701,500 acre-ft per year).

Extremes.--Maximum discharge during year, 2,210 cfs Feb. 8 (gage height, 4.68 ft); minimum, 560 cfs Sept. 20, 21, 23 (gage height, 1.70 ft).

1909-19, 1929-41, 1957-60: Maximum discharge, 10,800 cfs Dec. 22, 1933 (gage height, 11.0 ft), from rating curve extended above 2,500 cfs; minimum, 340 cfs Dec. 30, 1930 (gage height, 0.64 ft).

Remarks.--Records excellent except those for period of no gage-height record, which are good. Several diversions for irrigation of about 4,500 acres above station. No regulation.

Revisions.--WSP 1638: Drainage area.

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

1.7	560	4.0	1,650
2.0	662	5.0	2,500
3.0	1,090		

Discharge, in cubic 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	690	840	677	955	870	1,710	1,430	1,670	1,060	760	685
2	658	680	815	681	1,030	866	1,630	1,440	1,680	1,040	756	677
3	648	750	802	666	1,050	832	1,620	1,460	1,720	1,010	744	658
4	637	770	769	655	1,040	827	1,580	1,420	1,720	1,000	732	648
5	623	700	748	666	*1,140	849	1,610	1,400	1,650	991	728	640
6		616	680	728	662	1,280	849	1,470	1,570	986	720	637
7		619	670	724	655	2,020	*875	1,720	1,670	1,470	973	708
8		655	650	716	670	2,100	919	*1,820	1,710	1,360	964	708
9		950	640	704	637	1,900	950	1,860	1,620	1,300	937	712
10		924	630	700	630	1,630	968	1,760	1,640	1,290	910	700
11	1,210	620	827	655	1,410	964	1,640	1,740	1,280	892	700	616
12	1,320	610	982	651	1,300	964	1,550	1,920	1,280	875	716	609
13	1,080	600	914	637	1,240	964	1,510	1,920	1,260	884	712	609
14	942	600	857	630	1,230	964	1,560	1,810	1,260	901	720	599
15	866	620	986	626	1,320	1,120	1,520	1,720	1,400	884	720	595
16	810	*599	1,190	626	1,240	1,120	1,430	1,640	1,460	866	712	589
17	769	599	1,090	619	1,190	1,090	1,380	1,570	1,430	849	704	586
18	*740	648	991	609	1,150	1,080	1,350	1,480	1,300	853	704	579
19	716	740	837	602	1,110	1,060	1,350	*1,430	1,240	857	704	570
20	732	827	892	602	1,060	1,050	1,450	1,730	1,240	849	696	570
21	756	1,050	862	616	1,040	1,060	1,510	1,830	1,200	815	685	563
22	684	1,100	832	623	1,010	1,080	1,430	1,620	*1,160	806	692	566
23	1,120	1,500	815	612	978	1,110	1,430	1,540	1,140	794	708	563
24	996	1,440	806	607	964	1,140	1,390	1,510	1,140	789	744	570
25	946	1,280	794	609	946	1,180	1,350	1,500	1,120	785	760	586
26	875	1,130	765	633	910	1,240	1,320	1,600	1,090	777	*773	592
27	819	1,030	744	644	870	1,360	1,320	1,630	1,080	789	769	592
28	789	966	732	677	866	1,450	1,360	1,590	1,070	*773	752	589
29	773	928	720	960	870	1,660	1,400	1,570	1,070	760	732	582
30	730	879	*712	1,050	-----	2,000	1,410	1,610	1,080	756	704	582
31	710	-----	704	1,000	-----	1,880	-----	1,680	-----	756	686	-----
Total	25,590	24,628	25,698	20,687	34,649	34,341	45,630	49,900	39,730	27,181	22,371	18,119
Mean	825	821	829	674	1,202	1,108	1,521	1,610	1,324	877	722	604
Ac-ft	50,760	48,850	50,970	41,430	69,120	68,110	90,510	98,980	78,800	53,910	44,370	35,940

Calendar year 1959: Max 2,630 Min 573 Mean 1,005 Ac-ft 727,500  
 Water year 1959-60: Max 2,100 Min 563 Mean 1,008 Ac-ft 731,800

Peak discharge (base, 2,000 cfs).--Feb. 8 (8 a.m.) 2,210 cfs (4.68 ft); Mar. 30 (10 a.m.) 2,040 cfs (4.49 ft).

\* Discharge measurement made on this day.  
 Note.--No gage-height record Oct. 30 to Nov. 15; discharge estimated on basis of recorded range in stage and records for nearby stations.

## 1235. White Salmon River near Underwood, Wash.

Location.--Lat 45°45'00", long 121°31'30", in NW $\frac{1}{4}$  sec.14, T.3 N., R.10 E., on right bank 300 ft downstream from bridge, 1,000 ft downstream from Pacific Power & Light Co.'s Condit powerplant, and 2 miles north of Underwood and mouth.

Drainage area.--386 sq mi.

Records available.--October 1912 to February 1913 (published as "at Condit Dam, near Underwood"), March 1915 to September 1930, September 1935 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 112.96 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to March 1913, reference point at dam, 1 mile upstream at different datum. March 1915 to July 16, 1918, water-stage recorder at site 200 ft upstream at datum 3.24 ft higher and July 17, 1918, to Sept. 30, 1930, at datum 2.24 ft higher than present datum.

Average discharge.--40 years (1915-30, 1935-60), 1,106 cfs (800,700 acre-ft per year).

Extremes.--Maximum discharge during year, 3,790 cfs Feb. 8 (gage height, 6.71 ft); minimum, 77 cfs Aug. 16 (gage height, 1.81 ft); minimum daily, 546 cfs Nov. 17. 1912-13, 1915-30, 1935-60: Maximum discharge, 9,700 cfs Dec. 29, 1917 (gage height, 9.5 ft, site and datum then in use), from rating curve extended above 2,700 cfs; practically no flow at times when powerplant is shut down.

Remarks.--Records excellent. Water diverted to irrigate about 4,500 acres in the Trout Lake area. Low and medium flows regulated by powerplant of Pacific Power & Light Co.

Revisions (water years).--WSP 484: 1915-17. WSP 1348: 1936-41(m). WSP 1638: 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	664	737	866	718	945	1,020	2,500	1,690	1,780	1,060	796	702
2	685	765	828	708	1,210	995	2,280	1,690	1,840	1,070	794	680
3	682	775	826	721	*1,230	946	2,220	1,690	1,850	999	776	670
4	709	852	824	699	1,210	849	2,100	1,640	1,860	1,040	786	687
5	672	748	787	608	1,350	946	2,080	1,600	1,740	1,020	748	629
6	660	752	746	668	1,760	937	2,090	1,630	1,690	998	786	700
7	652	662	756	730	3,040	*1,010	2,160	1,880	1,550	982	700	580
8	694	754	686	748	3,070	1,070	2,220	1,910	1,460	1,030	762	595
9	1,040	680	738	637	2,720	1,080	*2,250	1,800	1,380	982	716	595
10	971	582	728	658	2,260	1,050	2,060	1,810	1,370	910	739	642
11	1,180	657	861	695	1,860	1,100	1,950	1,890	1,340	902	736	630
12	1,470	681	1,070	680	1,690	1,040	1,850	2,130	1,350	834	722	630
13	1,280	684	969	658	1,550	1,010	1,780	2,070	1,320	816	762	630
14	980	637	958	658	1,600	1,070	1,870	1,980	1,320	911	727	630
15	842	*606	910	728	1,790	1,400	1,900	1,870	1,510	894	734	636
16	889	688	1,200	647	1,630	1,400	1,760	1,770	1,530	879	714	600
17	*782	*546	1,270	652	1,520	1,390	1,650	1,730	1,520	870	739	595
18	776	709	1,060	718	1,420	1,420	1,640	1,610	1,380	872	698	652
19	734	789	954	652	1,360	1,390	1,690	*1,520	1,300	846	725	550
20	764	874	959	598	1,290	1,430	1,810	1,870	1,840	878	720	615
21	812	1,010	907	668	1,280	1,490	2,050	2,020	1,280	848	704	580
22	884	1,200	901	674	1,200	1,510	1,880	1,760	*1,240	826	696	610
23	1,140	1,590	859	558	1,180	1,530	1,920	1,670	1,200	820	764	575
24	1,160	1,560	866	628	1,110	1,520	1,850	1,650	1,180	802	788	595
25	961	1,390	860	715	1,100	1,560	1,780	1,640	1,170	792	738	630
26	956	1,260	827	598	1,080	1,630	1,720	1,770	1,140	759	853	605
27	850	1,020	722	678	976	1,770	1,700	1,760	1,130	778	746	615
28	826	1,040	786	872	937	1,910	1,700	1,740	1,100	721	771	615
29	817	898	*805	1,010	931	2,380	1,700	1,670	1,080	803	766	605
30	768	950	750	1,180	-----	3,050	1,690	1,750	1,080	764	864	*600
31	676	-----	765	1,140	-----	2,850	-----	1,800	-----	774	672	-----
Total	26,976	26,096	27,064	22,300	44,299	43,753	57,850	55,010	42,030	27,580	23,242	18,678
Mean	870	870	873	719	1,528	1,411	1,928	1,775	1,401	890	750	623
Ac-ft	53,510	51,760	53,680	44,230	87,870	86,780	114,700	109,100	83,370	54,700	46,100	37,050

Calendar year 1959: Max 3,760  
 Water year 1959-60: Max 3,070

Min 485  
 Min 546  
 Mean 1,130  
 Mean 1,134

Ac-ft 818,300  
 Ac-ft 822,800

\* Discharge measurement made on this day.

1245. Little White Salmon River at Willard, Wash.

Location.--Lat 45°46'50", long 121°37'30", in NW<sup>1</sup> sec.1, T.3 N., R.9 E., on right bank a quarter of a mile downstream from Lava Creek at Willard.

Drainage area.--114 sq mi.

Records available.--November 1903 to March 1905 (fragmentary), August 1905 to August 1906 (fragmentary), December 1944 to September 1960. Published as "below Lava Creek, near Cooks" 1903-6.

Gage.--Water-stage recorder. Altitude of gage is 1,230 ft (from river-profile map). Prior to Aug. 6, 1906, nonrecording gage near present site at different datum.

Average discharge.--15 years (1945-60), 447 cfs (323,600 acre-ft per year).

Extremes.--Maximum discharge during year, 2,110 cfs Feb. 7 (gage height, 7.94 ft); minimum, 37 cfs Sept. 30 (gage height, 1.75 ft).

1903-6, 1944-60: Maximum discharge, 4,140 cfs Dec. 15, 1946 (gage height, 9.50 ft), from rating curve extended above 2,500 cfs; minimum daily, 1.5 cfs Nov. 7, 1957.

Remarks.--Records excellent except those for periods of no gage-height record, which are good. Broughton Lumber Co. diversion, a quarter of a mile upstream, may at times carry as much as 30 cfs out of basin to Columbia River. Slight regulation. Other diversions for water supply, irrigation, and hatchery purposes above station.

Revisions (water years).--WSP 1318: 1945(M). WSP 1568: Drainage area.

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

1.7	34	3.0	160	6.0	850
2.0	54	4.0	339	7.0	1,210
2.5	98	5.0	565	8.0	2,180

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	51	181	233	300	438	367	997	635	565	390	224	98
2	50	179	231	296	545	353	949	615	558	408	226	96
3	49	190	228	289	592	353	910	592	548	403	218	92
4	49	184	223	285	585	357	853	568	538	399	211	91
5	49	179	218	277	673	347	820	545	532	386	204	89
6	50	174	218	277	*827	341	796	540	515	361	206	86
7	51	182	218	270	1,790	347	769	545	505	359	192	83
8	78	166	214	272	1,340	359	742	520	493	353	186	79
9	182	165	209	257	1,200	333	703	503	484	349	179	76
10	*135	162	214	249	1,050	*306	661	491	477	347	174	74
11	336	158	289	244	895	289	632	486	468	341	170	72
12	244	156	572	240	793	290	620	484	459	335	166	68
13	182	151	505	237	739	290	*612	486	454	329	163	67
14	156	148	450	231	808	281	545	473	463	327	a160	a65
15	141	146	447	224	1,030	434	707	459	459	323	a155	a62
16	134	141	441	219	919	430	691	459	466	317	a150	a60
17	134	137	421	214	811	412	676	473	450	311	a145	58
18	134	*145	401	209	727	423	679	470	445	308	a140	56
19	134	182	384	206	655	459	736	470	445	302	a135	56
20	148	202	370	212	602	550	928	*602	445	296	a135	54
21	145	315	359	214	582	646	1,000	602	438	290	131	52
22	219	339	353	211	540	694	925	582	432	287	131	50
23	275	425	345	206	510	682	880	570	430	281	130	48
24	244	380	345	202	486	643	826	568	*421	277	132	48
25	226	325	339	197	461	618	784	578	414	270	125	47
26	211	292	329	207	443	615	754	602	412	264	*120	45
27	202	290	323	211	427	640	736	602	405	258	115	42
28	195	281	317	240	425	679	721	606	401	*251	110	41
29	189	257	313	432	393	910	691	596	397	244	107	39
30	186	240	*311	486	-----	1,380	661	565	393	240	103	38
31	182	-----	308	459	-----	1,110	-----	580	-----	239	101	-----
Total	4,761	6,472	10,128	8,073	21,286	15,938	23,105	16,885	13,912	9,845	4,844	1,932
Mean	154	216	327	260	734	514	770	545	464	318	156	84.4
Ac-ft	9,440	12,840	20,090	16,010	42,220	31,610	45,630	33,490	27,590	19,530	9,610	3,830
Calendar year 1959: Max			2,070		Min 48		Mean 376		Ac-ft 272,000			
Water year 1959-60: Max			1,790		Min 38		Mean 375		Ac-ft 272,100			

Peak discharge (base, 1,500 cfs).--Feb. 7 (6 a.m.) 2,110 cfs (7.94 ft); Mar. 30 (4 a.m.) 1,520 cfs (7.37 ft).

\* Discharge measurement made on this day.

No gage-height record; discharge estimated on basis of recorded range in stage and records from station near Cook.

1250. Little White Salmon River above Lapham Creek, near Willard, Wash.

Location.--Lat 45°46'00", long 121°37'40", on line between secs.11 and 12, T.3 N., R.9 E., on right bank 0.2 mile upstream from Lapham Creek and 1.2 miles south of Willard.

Drainage area.--117 sq mi.

Records available.--September 1949 to September 1960. Prior to October 1957, published as "below Lapham Creek, near Willard."

Gage.--Water-stage recorder. Altitude of gage is 980 ft (from river-profile map).

Average discharge.--11 years, 538 cfs (389,500 acre-ft per year).

Extremes.--Maximum discharge during year, 2,230 cfs Feb. 7 (gage height, 5.08 ft); minimum, 103 cfs Sept. 30 (gage height, 1.73 ft).

1949-60: Maximum discharge, 3,610 cfs Jan. 9, 1953 (gage height, 5.98 ft); minimum, 28 cfs Oct. 29, 1958; minimum gage height, 1.35 ft Oct. 31, 1952.

Remarks.--Records good. Broughton Lumber Co. diversion,  $1\frac{1}{4}$  miles upstream, may at times carry as much as 30 cfs out of basin to Columbia River. Other diversions above station for water supply, irrigation, and hatchery operation. Possibly some regulation.

Revisions.--WSP 1568: Drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 20 to Sept. 9)

1.8	108	4.0	1,170
2.2	230	5.0	2,130
3.0	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	113	265	320	392	545	480	1,290	792	895	515	352	192
2	111	265	316	388	670	460	1,200	762	880	530	356	189
3	108	276	312	380	744	455	1,130	738	870	520	340	186
4	108	268	308	376	726	455	1,050	705	855	515	336	183
5	108	282	300	368	846	445	1,020	675	850	510	328	183
6	111	258	300	368	*1,060	435	974	670	835	480	328	177
7	113	265	300	360	1,990	445	942	670	820	475	312	174
8	148	251	296	364	1,630	465	912	640	810	475	308	171
9	282	251	293	344	1,470	430	870	625	595	475	300	174
10	*223	248	296	336	1,300	*400	822	610	590	470	296	159
11	445	240	380	328	1,120	388	785	605	580	465	293	156
12	344	237	732	320	1,000	384	*774	605	570	460	282	156
13	272	230	635	312	942	388	762	610	565	450	279	153
14	240	230	565	308	1,010	380	828	590	575	445	272	150
15	223	230	560	300	1,270	580	888	590	570	445	265	147
16	220	223	560	293	1,140	570	870	585	575	440	262	144
17	212	216	535	290	1,020	550	858	590	560	435	254	144
18	212	*223	515	282	906	560	858	590	555	435	254	138
19	212	258	495	279	828	605	924	595	555	425	248	138
20	230	282	480	282	750	710	1,190	*756	555	420	244	138
21	226	412	465	286	720	828	1,290	756	545	416	240	135
22	304	440	455	282	670	882	1,160	720	545	412	240	130
23	384	540	450	279	635	870	1,090	710	*530	408	240	127
24	340	495	450	276	610	816	1,020	705	520	404	244	127
25	320	420	440	268	585	780	974	710	525	400	230	127
26	300	388	420	279	560	780	930	750	520	396	226	122
27	290	384	416	282	540	810	906	750	515	388	*220	119
28	282	372	408	312	535	864	888	744	510	*380	212	116
29	276	348	404	540	500	1,210	864	738	505	372	209	113
30	272	324	*400	605	1,750	828	720	510	368	206	111	
31	268	400	575	575	1,440		710		368	198		
Total	7,297	9,101	13,206	10,654	26,322	20,615	28,898	21,016	17,285	13,697	8,374	4,479
Mean	235	303	426	344	908	665	963	678	576	442	270	149
Ac-ft	14,470	18,050	26,190	21,130	52,210	40,890	57,320	41,680	34,280	27,170	16,610	8,880
Calendar year 1959: Max			2,080		Min	101	Mean	486	Ac-ft	352,200		
Water year 1959-60: Max			1,990		Min	108	Mean	494	Ac-ft	358,900		

Peak discharge (base, 1,500 cfs).--Feb. 7 (6 a.m.) 2,230 cfs (5.08 ft); Mar. 30 (2 a.m.) 1,930 cfs (4.83 ft).

\* Discharge measurement made on this day.

## 1255. Little White Salmon River near Cook, Wash.

Location.--Lat 45°43'30", long 121°38'05", in NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec.26, T.3 N., R.9 E., on left bank 1 mile upstream from mouth and  $\frac{1}{2}$  miles northeast of Cook.

Drainage area.--134 sq mi.

Records available.--September 1956 to September 1960. Records for October to November 1909, published as "near Cooks" in WSP 253, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Altitude of gage is 150 ft (from topographic map). Oct. 4 to Nov. 10, 1909, staff gage at hatchery half a mile downstream at different datum.

Extremes.--Maximum discharge during year, 2,170 cfs Feb. 7 (gage height, 5.78 ft); minimum, 140 cfs Sept. 30 (gage height, 0.91 ft).  
1956-60: Maximum discharge, 2,330 cfs Feb. 26, 1957 (gage height, 5.98 ft); minimum, 98 cfs Oct. 29, 1958 (gage height, 0.58 ft).

Remarks.--Records excellent. Broughton Lumber Co. diversion above station may at times carry as much as 30 cfs out of basin into Columbia River. Other diversions above station for water supply, irrigation, and hatchery purposes. Slight regulation.

Revisions.--WSP 1568: Drainage area. See also Records available.

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

0.9	139	4.0	1,010
2.0	330	5.0	1,600
3.0	600	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	163	308	355	418	572	532	1,370	830	730	517	344	208
2	161	304	353	412	714	514	1,250	870	718	523	344	203
3	160	317	351	408	774	514	1,160	786	706	520	337	200
4	160	310	344	400	762	514	1,090	758	694	514	328	199
5	159	302	339	398	854	499	1,050	730	682	502	323	199
6	163	300	337	398	*1,040	490	1,010	726	666	478	321	194
7	163	304	337	390	1,920	502	975	728	649	472	308	191
8	196	291	335	395	1,630	535	*940	690	638	470	302	188
9	335	289	330	376	1,520	*508	902	670	632	465	300	188
10	269	283	337	369	1,370	470	862	660	621	462	293	182
11	493	279	418	364	1,130	455	838	652	610	458	285	178
12	393	277	766	360	1,020	455	830	652	604	450	281	176
13	319	271	674	355	965	480	814	660	593	448	277	174
14	287	267	600	351	1,030	455	670	635	607	442	271	173
15	267	265	593	344	1,370	718	940	628	607	438	267	170
16	261	259	582	337	1,190	670	910	632	607	430	261	168
17	256	256	553	330	1,040	635	890	646	590	425	258	166
18	*256	*261	535	326	950	649	890	646	579	422	254	164
19	254	295	514	321	874	678	950	642	582	418	248	163
20	267	319	499	326	818	774	1,210	*822	582	412	243	161
21	265	442	487	328	794	878	1,360	814	568	408	241	159
22	360	470	475	321	738	910	1,190	774	582	400	241	157
23	430	572	470	319	702	898	1,120	758	*556	395	243	156
24	368	523	470	315	670	862	1,040	750	550	390	246	156
25	367	455	462	310	649	834	1,000	754	544	386	235	153
26	348	418	450	321	618	834	960	782	538	378	232	150
27	357	410	442	330	593	858	935	782	532	374	*225	149
28	326	400	435	358	590	898	915	770	526	*367	220	147
29	319	381	430	366	553	1,230	690	766	520	362	216	146
30	312	362	*430	346	-----	1,740	858	754	514	358	213	145
31	308	-----	425	607	-----	1,520	-----	746	-----	360	210	-----
Total	8,744	10,190	14,128	11,301	27,450	22,489	30,019	22,451	18,107	13,444	8,367	5,163
Mean	262	340	456	365	947	725	1,001	724	604	434	270	172
Ac-ft	17,340	20,210	28,020	22,420	54,450	44,610	59,540	44,530	35,910	26,670	16,600	10,240
Calendar year 1959: Max 2,010 Min 153 Mean 534 Ac-ft 366,700												
Water year 1959-60: Max 1,920 Min 145 Mean 524 Ac-ft 360,500												

Peak discharge (base, 1,600 cfs).--Feb. 7 (6:30 a.m.) 2,170 cfs (5.78 ft); Mar. 30 (2:30 a.m.) 1,850 cfs (5.36 ft).

\* Discharge measurement made on this day.

1270. Wind River above Trout Creek, near Carson, Wash.

Location.--Lat 45°48'30", long 121°54'30", in NE $\frac{1}{4}$  sec.26, T.4 N., R.7 E., on left bank 30 ft downstream from bridge, three-quarters of a mile upstream from Trout Creek, and 7 miles northwest of Carson.

Drainage area.--108 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Staff gage and crest-stage indicator; gage read twice daily. Datum of gage is 890.3 ft (river-profile survey).

Average discharge.--16 years, 590 cfs (427,100 acre-ft per year).

Extremes.--Maximum discharge during year, 4,460 cfs Feb. 7 (gage height, 11.44 ft); minimum observed, 81 cfs Sept. 29, 30 (gage height, 1.72 ft).  
1944-60: Maximum discharge, 8,880 cfs Feb. 8, 1945 (gage height, 15.5 ft, from high-water mark), from rating curve extended above 5,000 cfs; minimum observed, 52 cfs Oct. 27-30, 1945.

Remarks.--Records good except those for periods of doubtful or no gage-height record, which are poor. Very small regulation by fish hatchery dam above station. Upstream diversions returned to stream above station.

Revisions (water years).--WSP 1318: 1946(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

2.3	134	6.0	1,080	1.7	79	5.0	718
3.0	227	7.0	1,550	2.0	110	6.0	1,100
4.0	407	9.0	2,750	3.0	236	8.0	2,030
5.0	680			4.0	413	10.0	3,310

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	214	270	450	300	1,120	418	1,780	811	714	277	131	112
2	208	240	420	280	1,200	398	1,620	760	707	257	151	110
3	185	290	390	265	1,200	390	1,460	710	699	248	128	110
4	178	290	370	265	1,060	386	1,410	660	640	245	126	126
5	172	240	340	261	1,200	380	1,360	620	600	238	123	128
6	170	220	320	256	1,670	366	1,330	751	580	*232	122	120
7	195	210	300	251	*3,310	390	1,250	840	550	221	120	112
8	290	200	290	248	2,820	420	1,180	751	520	214	117	106
9	900	190	270	240	2,450	409	1,060	700	500	208	113	101
10	650	180	300	230	1,900	*396	969	660	480	201	112	100
11	900	180	700	220	1,600	380	899	661	460	197	109	96
12	1,200	170	*1,880	220	1,430	372	880	678	450	189	108	95
13	804	160	1,500	210	1,450	364	*899	670	450	184	109	95
14	632	150	1,150	210	1,580	355	1,060	640	460	180	108	95
15	535	150	1,350	200	1,800	800	1,010	600	490	176	112	93
16	474	145	1,200	200	1,570	650	919	620	540	172	110	92
17	414	140	1,000	190	1,320	620	903	700	500	167	108	91
18	350	250	900	190	1,120	620	919	770	460	166	104	90
19	*336	*596	750	180	911	700	1,100	774	430	162	102	91
20	*381	700	650	180	845	800	1,700	1,300	450	159	102	92
21	380	1,400	600	180	785	900	1,700	1,260	410	157	106	90
22	850	1,800	540	180	689	1,050	1,300	1,070	390	153	116	87
23	980	2,400	500	180	633	1,050	1,140	946	370	149	134	88
24	720	1,600	480	190	580	1,050	1,080	*845	350	148	163	92
25	600	1,100	470	200	529	1,110	1,000	830	330	145	156	95
26	520	900	430	300	483	1,210	891	981	320	143	145	86
27	450	750	400	630	456	1,320	880	950	310	142	*140	87
28	400	650	370	1,080	456	1,420	872	884	300	142	*128	85
29	350	550	350	1,500	434	2,480	872	807	290	*135	121	82
30	320	500	330	1,500	-----	2,660	845	781	280	135	117	82
31	290	-----	320	1,260	-----	1,990	-----	759	-----	132	113	-----
Total	15,048	16,621	19,320	11,996	36,601	25,874	34,288	24,789	14,020	5,674	3,734	2,933
Mean	485	554	623	367	1,262	835	1,143	800	467	183	120	97.8
Cfs/m	4.43	5.13	5.77	3.58	11.7	7.73	10.6	7.41	4.32	1.69	1.11	0.906
In.	5.18	5.72	6.65	4.13	12.60	6.91	11.81	8.54	4.83	1.95	1.29	1.01
Ac-ft	29,850	32,970	36,320	23,790	72,600	51,320	68,010	49,170	27,810	11,250	7,410	5,820

Calendar year 1959: Max 3,750 Min 82 Mean 570 Cfs/m 5.28 In. 71.68 Ac-ft 412,800  
Water year 1959-60: Max 3,310 Min 82 Mean 576 Cfs/m 5.33 In. 72.62 Ac-ft 418,300

Peak discharge (base, 3,000 cfs).--Probably Nov. 23 (time and discharge unknown); Feb. 7 (time unknown) 4,460 cfs (11.44 ft); Mar. 29 (time unknown) 3,390 cfs (10.50 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 18, Oct. 21 to Nov. 18, Nov. 20 to Dec. 11, Dec. 13-31, June 4-30; doubtful gage-height record Oct. 7-10, 12, Jan. 1, 2, 9-26, 29, 30, Feb. 2, 3, Mar. 15-24, Apr. 12, 20-22, 24, 25, May 2-5, 7, 9, 10, 13-17; discharge estimated on basis of 2 discharge measurements and records for Wind River near Carson.

## 1285. Wind River near Carson, Wash.

Location.--Lat 45°44'10", long 121°48'10", in SW 1/4 sec. 21, T.3 N., R.8 E., on right bank three-quarters of a mile upstream from Little Wind River, 1 mile northeast of Carson, and 2 1/2 miles upstream from mouth. Records include flow of Little Wind River.

Drainage area.--225 sq mi, includes that of Little Wind River.

Records available.--October 1934 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 112.6 ft above mean sea level (river-profile survey).

Average discharge.--26 years, 1,174 cfs (849,900 acre-ft per year).

Extremes.--Maximum discharge during year, 11,500 cfs probably Feb. 7 (gage height, 14.0 ft, from floodmark); minimum, 185 cfs Sept. 30 (gage height, 5.03 ft).  
1934-60: Maximum discharge, 20,000 cfs Dec. 29, 1937 (gage height, 17.30 ft), from rating curve extended above 15,000 cfs by logarithmic plotting; minimum, 123 cfs Nov. 30, 1952; minimum gage height, 2.21 ft Nov. 29, Dec. 1, 1936.

Remarks.--Records fair. Low flow occasionally affected by pondage at Forest Service powerplant on Trout Creek. No diversion above station.

Revisions (water years).--WSP 964: Drainage area. WSP 1348: 1935-37, 1938(M), 1942-43(M), 1945-46(M).

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Oct. 13 to Nov. 21, Nov. 24 to Dec. 11, Dec. 13 to Feb. 4)

Day	Oct. 1 to Mar. 29						Mar. 30 to Sept. 30					
	5.8	305	8.0	1,800	5.0	180	8.0	1,800	6.3	495	10.0	4,110
	7.0	920	13.0	9,290	7.0	980	12.0	7,310				
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	572	600	1,050	679	2,530	801	3,850	1,530	1,230	504	*275	248
2	505	556	955	*650	3,340	767	3,470	1,460	1,190	492	281	240
3	459	644	906	611	3,280	728	3,110	1,370	1,170	472	278	238
4	430	638	836	584	3,110	728	2,790	1,270	1,130	464	270	262
5	406	556	780	567	3,590	715	2,660	1,170	1,070	453	265	278
6	389	515	741	584	5,450	709	2,470	1,230	1,020	439	260	265
7	422	490	734	556	*9,900	622	2,400	1,630	962	425	255	248
8	721	464	679	589	6,000	1,090	2,300	1,520	908	416	250	240
9	2,190	442	650	530	5,200	1,030	2,100	1,370	866	410	242	230
10	1,540	422	715	505	4,390	941	1,800	1,340	849	401	242	228
11	5,010	403	1,820	510	3,360	*892	1,640	1,340	818	395	240	222
12	3,280	386	5,180	486	2,820	857	1,680	1,370	800	386	238	220
13	2,210	358	3,190	464	2,640	878	*1,660	1,400	776	377	235	218
14	1,630	347	2,470	459	3,460	927	2,130	1,290	800	368	232	215
15	1,280	344	3,010	450	4,840	2,090	2,470	1,180	884	359	242	212
16	983	316	2,970	438	3,430	1,700	2,090	1,180	968	353	238	208
17	829	305	2,580	422	2,700	1,410	1,910	1,320	860	347	232	205
18	728	430	2,030	403	2,240	1,440	1,890	1,480	776	341	228	202
19	*655	*1,010	1,740	392	1,910	1,620	2,190	1,420	740	335	222	202
20	*774	1,270	1,520	386	1,640	2,000	3,510	2,910	788	329	220	205
21	722	3,240	1,350	386	1,560	2,350	3,460	2,700	724	326	225	200
22	2,100	4,280	1,230	392	1,370	2,530	2,660	2,180	690	320	249	198
23	2,320	6,090	1,140	356	1,240	2,530	2,330	1,830	670	314	272	198
24	1,680	3,630	1,120	392	1,160	2,460	2,090	*1,660	*635	308	347	205
25	1,460	2,650	1,070	389	1,100	2,450	1,910	1,570	605	305	338	215
26	1,210	2,060	962	525	1,010	2,500	1,750	1,860	580	302	323	202
27	1,030	1,720	906	667	934	2,840	1,670	1,820	562	296	305	198
28	920	1,500	857	1,200	878	3,050	1,700	1,660	540	290	*281	194
29	808	1,310	808	3,540	836	5,240	1,660	1,510	532	281	265	198
30	715	1,170	774	3,590	774	6,590	1,580	1,410	516	281	258	188
31	655	1,170	728	2,880	-----	4,630	-----	1,340	-----	278	250	-----
Total	38,633	38,136	45,301	24,592	84,918	59,315	68,930	48,320	24,658	11,367	8,057	6,574
Mean	1,246	1,271	1,461	793	2,928	1,913	2,298	1,559	822	367	280	219
Cfsm	5.54	5.65	6.49	3.52	13.01	8.50	10.21	6.93	3.65	1.63	1.16	0.973
In.	6.39	6.30	7.49	4.06	14.04	9.80	11.39	7.99	4.08	1.89	1.33	1.09
Ac-ft	76,630	75,640	89,850	48,780	168,400	117,600	136,700	95,840	48,910	22,550	15,980	13,040
Calendar year 1959: Max	7,840	Min	188	Mean	1,216	Cfsm	5.40	In.	73.36	Ac-ft	880,500	
Water year 1959-60: Max	8,900	Min	188	Mean	1,254	Cfsm	5.57	In.	75.84	Ac-ft	909,900	

Peak discharge (base, 5,700 cfs).--Oct. 11 (10 a.m.) 6,820 cfs (11.73 ft); Nov. 23 (4 a.m.) 7,420 cfs (12.06 ft); Dec. 12 (7 a.m.) 6,160 cfs (11.35 ft); probably Feb. 7 (time unknown) 11,500 cfs (14.0 ft); Mar. 29 (7:30 p.m.) 8,070 cfs (12.40 ft).

\* Discharge measurement made on this day.

## 1340. Salmon River near Government Camp, Oreg.

Location.--Lat 45°16'00", long 121°43'00", in N½ sec.31, T.3 S., R.9 E., on right bank near lower end of Red Top Meadows, 3 miles southeast of Government Camp.

Drainage area.--8.7 sq mi, approximately.

Records available.--May 1910 to May 1912, April 1926 to September 1960. Published as "near Rowe" 1910-12.

Gage.--Water-stage recorder. Datum of gage is 3,446.53 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Nov. 21, 1910, staff gage at site a quarter of a mile upstream at different datum. Nov. 21, 1910, to May 31, 1912, and Apr. 21, 1926, to Sept. 30, 1933, water-stage recorder at site 75 ft upstream from former site at different datums.

Average discharge.--35 years (1910-11, 1926-60), 44.1 cfs (31,930 acre-ft per year).

Extremes.--Maximum discharge during year, 212 cfs Nov. 22 (gage height, 2.00 ft); minimum, 19 cfs Sept. 29, 30.

1910-12, 1926-60: Maximum discharge, 682 cfs Dec. 11, 1956 (gage height, 3.95 ft); minimum, 10 cfs Nov. 27, 1952.

Remarks.--Records good except those for periods of shifting control, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 769: Drainage area. WSP 1398: 1911-12, 1926-27, 1933(M), 1949.

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

Oct. 1-8			Oct. 9 to Sept. 30		
0.1	27		-0.2	19	1.1 99
.2	32		.1	31	1.6 156
.6	58		.6	58	

Discharge, in cubic 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	43	45	33	33	27	58	59	89	53	32	29	
2	31	*41	46	32	33	27	71	63	94	52	32	27	
3	30	58	45	31	30	29	66	56	97	51	31	26	
4	29	46	42	31	30	29	70	53	96	50	31	28	
5	28	42	40	31	36	31	78	58	93	*50	31	29	
6	30	40	40	32	48	33	82	63	90	48	30	26	
7	35	40	42	31	69	38	90	74	82	47	29	24	
8	58	38	39	31	73	34	91	67	78	46	31	22	
9	79	37	38	30	53	31	82	69	78	45	29	22	
10	62	36	41	30	45	29	70	78	75	44	28	23	
11	84	36	49	30	40	28	*66	86	74	43	28	23	
12	54	37	44	29	38	28	62	94	73	43	28	23	
13	48	34	40	29	37	27	64	88	72	43	28	23	
14	44	34	*48	29	40	27	61	84	85	42	27	23	
15	44	40	65	28	43	27	56	76	84	40	34	23	
16	40	34	56	28	37	27	54	78	84	40	29	22	
17	38	34	47	28	35	30	53	71	71	41	29	22	
18	36	40	44	28	34	31	51	69	67	40	28	21	
19	35	45	42	28	33	32	50	67	69	40	27	22	
20	44	43	41	28	32	36	56	104	72	39	25	22	
21	42	60	40	27	32	42	50	76	64	38	28	21	
22	123	150	39	27	31	45	46	67	62	37	29	21	
23	133	147	38	27	30	*48	44	*66	62	*36	22		
24	65	81	41	28	30	50	42	66	61	36	36	23	
25	62	71	39	*28	30	54	43	65	59	36	29	22	
26	52	59	36	28	28	59	46	77	57	36	46	21	
27	50	54	36	28	28	64	51	76	56	36	35	21	
28	53	54	35	31	28	57	54	71	55	34	30	20	
29	50	49	34	37	*27	61	56	75	56	34	28	20	
30	45	47	34	35		60	57	80	54	34	28	20	
31	44	---	34	31		53	---	91	---	33	28	---	
Total	1,560	1,550	1,300	922	1,083	1,194	1,820	2,267	2,209	1,287	940	691	
Mean	50.3	51.7	41.9	29.7	37.3	38.5	60.7	73.1	73.6	41.5	30.3	23.0	
Cfs	5.78	5.94	4.82	3.41	4.29	4.43	6.98	8.40	8.46	4.77	3.48	2.64	
In.	6.67	6.63	5.56	3.94	4.63	5.10	7.78	9.69	9.44	5.50	4.02	2.95	
Ac-ft	3,090	3,070	2,580	1,830	2,150	2,370	3,610	4,500	4,390	2,550	1,860	1,370	
Calendar year 1959: Max			147	Min									
Water year 1959-60: Max			147	Min	21	Mean	49.3	Cfs	5.67	In.	76.95	Ac-ft	35,710
					20	Mean	46.0	Cfs	5.29	In.	71.91	Ac-ft	33,360

Peak discharge (base, 150 cfs).--Oct. 22 (8:30 p.m.) 190 cfs (1.84 ft); Nov. 22 (4:30 p.m.) 212 cfs (2.00 ft).

\* Discharge measurement made on this day.

Note.--Shifting-control method used Oct. 1-8, June 14 to Aug. 26.

## 1370. Sandy River near Marmot, Oreg.

Location.--Lat 45°23'30", long 122°07'40", in SE $\frac{1}{4}$  sec.13, T.2 S., R.5 E., on right bank 0.7 mile southwest of Marmot, 0.8 mile upstream from Sandy River Dam of Portland General Electric Co., and 6.5 miles downstream from Salmon River.

Drainage area.--262 sq mi.

Records available.--August 1911 to September 1960. Published as "at Marmot" October 1912 to September 1913. Records for January 1916 to June 1919, published as "below dam, near Marmot", obtained by combining records for Sandy River below dam, near Marmot, with records for Sandy River Canal near Marmot.

Gage.--Water-stage recorder. Altitude of gage is 730 ft (from river-profile map). Aug. 15, 1911, to Dec. 20, 1915, and July 2, 1919, to Oct. 19, 1933, at site 1 mile upstream at different datum. Oct. 20, 1933, to Sept. 30, 1958, at site 0.6 mile upstream at different datum.

Average discharge.--49 years, 1,357 cfs (982,400 acre-ft per year).

Extremes.--Maximum discharge during year, 8,800 cfs Oct. 22 (gage height, 10.12 ft); minimum, 312 cfs Sept. 30.

1911-60: Maximum discharge, 29,200 cfs Jan. 6, 1923 (gage height, 17.5 ft, site and datum then in use), by computation of peak flow over dam; minimum, 195 cfs Nov. 27, 28, 1952.

Remarks.--Records good except those for periods of shifting control, which are fair. No regulation or diversion above station.

Revisions (water years).--WSP 594: Drainage area. WSP 1288: 1912(M), 1915, 1922, 1924, 1934(M). WSP 1318: 1932(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 to Mar. 29

Mar. 30 to Sept. 30

2.1	495	6.0	5,420	1.8	320	4.0	2,210
3.0	1,150	7.0	7,750	2.4	645	5.0	3,810
4.0	2,100			3.0	1,100	6.0	5,950

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	1,490	1,560	1,230	870	1,440	774	3,920	1,850	2,020	810	425	445
2	1,290	1,450	1,170	870	1,540	732	4,170	2,080	1,960	766	420	425
3	1,150	*1,620	1,170	767	1,290	732	3,500	1,940	1,940	752	415	425
4	1,040	1,470	*998	795	1,250	760	3,210	1,760	1,830	745	410	498
5	958	1,470	910	802	1,480	1,200	*3,160	1,600	1,690	*724	400	482
6	926	1,380	854	870	2,060	1,580	3,060	1,790	1,570	766	395	445
7	1,050	1,210	934	838	4,810	1,850	3,050	2,540	1,430	739	405	405
8	1,250	1,150	926	870	4,450	2,760	2,920	2,280	1,340	697	*405	385
9	3,440	1,010	838	739	4,540	2,360	2,670	2,070	1,270	664	420	370
10	2,720	942	918	711	3,930	1,830	2,180	2,140	1,230	638	420	375
11	5,380	910	1,920	760	3,080	1,590	2,020	2,280	1,170	606	410	390
12	4,140	*878	2,480	725	2,730	1,470	1,930	2,490	1,130	626	380	*400
13	3,030	816	2,320	627	2,790	1,540	2,030	2,500	1,080	645	370	395
14	2,420	788	2,160	655	3,120	1,490	2,250	2,320	1,290	632	360	375
15	2,050	862	2,380	*662	3,460	2,000	2,200	2,020	1,720	600	425	365
16	1,530	878	2,490	627	4,140	1,870	1,940	2,130	1,800	600	380	352
17	1,360	850	2,050	648	3,230	1,700	1,980	2,310	1,490	600	415	347
18	1,190	918	1,800	588	2,600	1,760	2,050	2,640	1,280	586	415	342
19	1,040	1,180	1,620	537	2,140	2,040	2,000	2,390	1,200	562	390	356
20	990	1,170	1,480	558	1,820	2,840	3,040	*4,880	1,330	538	365	360
21	1,010	1,740	1,400	588	1,770	3,470	3,130	4,210	1,160	514	360	334
22	3,850	3,120	1,230	574	1,620	3,550	2,390	3,230	1,060	498	405	329
23	5,720	5,210	1,210	562	1,420	3,090	2,070	2,640	1,000	476	465	347
24	3,570	*3,820	1,290	600	1,270	2,670	1,830	2,360	994	465	638	365
25	3,170	3,080	1,300	739	1,240	2,580	1,720	2,180	970	470	544	390
26	2,420	2,220	1,230	1,010	1,090	2,740	1,690	2,450	908	470	645	360
27	*2,050	1,770	1,110	1,020	942	3,150	1,830	2,780	885	482	632	342
28	*1,880	1,710	1,040	1,100	870	3,030	1,900	2,450	878	476	498	342
29	1,710	1,580	1,010	2,060	*85	3,310	1,830	2,220	870	470	450	329
30	1,670	1,340	1,020	1,940	85	3,250	1,790	2,160	840	476	425	320
31	1,740		934	1,620		4,080		2,210		450	450	
Total	67,214	48,082	43,482	26,342	66,952	69,778	73,460	74,900	39,335	18,542	13,537	11,395
Mean	2,168	1,603	1,403	850	2,309	2,251	2,449	2,416	1,311	598	437	380
Cfsm	6.27	6.12	5.35	3.24	8.81	8.59	9.35	9.22	5.00	2.28	1.67	1.45
In.	9.54	6.83	6.17	3.74	9.50	9.90	10.45	10.85	5.58	2.63	1.92	1.62
Ac-ft	133,300	95,370	86,250	52,250	132,800	138,400	145,700	148,600	78,020	36,780	26,650	22,600

Calendar year 1959: Max 5,920 Min 370 Mean 1,532 Cfsm 5.85 In. 79.36 Ac-ft 1,109,000  
 Water year 1959-60: Max 5,720 Min 320 Mean 1,511 Cfsm 5.77 In. 78.49 Ac-ft 1,097,000

Peak discharge (base, 7,700 cfs).--Oct. 22 (12 p.m.) 8,800 cfs (10.12 ft).

\* Discharge measurement made on this day.

Note.--Shifting-control method used Oct. 12 to Mar. 8, July 17 to Aug. 23.

## 1390. Lake Ben Morrow near Bull Run, Oreg.

Location (revised).--Lat 45°28'50", long 122°04'50", in NW<sup>1</sup>/<sub>4</sub> sec.16, T.1 S., R.6 E., in control house at Bear Creek Dam on Bull Run River, 8.2 miles northeast of Bull Run.

Drainage area.--74 sq mi, approximately.

Records available.--October 1928 to September 1960. Prior to October 1937, published as Bull Run Reservoir near Bull Run.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (levels by Portland Water Bureau). Prior to Oct. 9, 1930, staff gage at same site and datum.

Extremes.--Maximum contents during year, 30,600 acre-ft June 27 (elevation, 1,045.08 ft); minimum observed, 169 acre-ft Jan. 10 (elevation, 887.5 ft).  
1928-60: Maximum contents, 31,600 acre-ft Mar. 31, 1931 (elevation, 1,047.40 ft); minimum observed, that of Jan. 10, 1960.

Remarks.--Records excellent. Lake is formed by concrete dam completed in March 1929 for water supply of city of Portland. Storage began about Apr. 29, 1929; first filling occurred May 15, 1929. Capacity of reservoir, 26,930 acre-ft at crest of spillway (elevation, 1,036.0 ft); capacity increased to 30,140 acre-ft at elevation 1,044.0 ft by installation of three 40- by 8-foot gates in October 1954. No dead storage.

Cooperation.--Water-stage recorder inspected and capacity table furnished by Portland Water Bureau.

Revisions (water years).--WSP 814: 1935(M).

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

Date	Elevation (feet) <sup>†</sup>	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,035.51	26,740	-
Oct. 31.....	1,018.90	20,810	-5,930
Nov. 30.....	1,001.00	15,280	-5,530
Dec. 31.....	g950.3	4,940	-10,340
Calendar year 1959.....	-	-	-11,830
Jan. 31.....	g954.5	5,550	+610
Feb. 29.....	g972.25	8,480	+2,930
Mar. 31.....	1,037.40	27,480	+19,000
Apr. 30.....	1,026.00	23,250	-4,230
May 31.....	1,021.40	21,660	-1,590
June 30.....	1,044.60	30,400	+8,740
July 31.....	1,033.75	26,080	-4,320
Aug. 31.....	1,023.38	22,330	-3,750
Sept. 30.....	999.30	14,800	-7,530
Water year 1959-60.....	-	-	-11,940

<sup>†</sup> Elevation at 12 p.m.

g From graph based on staff-gage readings at 8 a.m.

## 1400. Bull Run River near Bull Run, Oreg.

Location.--Lat 45°26'15", long 122°10'40", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.34, T.1 S., R.5 E., on left bank 1.6 miles downstream from intake of pipeline for water supply of city of Portland and 2.7 miles northeast of Bull Run. Prior to Oct. 1, 1959, at site 2.5 miles upstream.

Drainage area.--107 sq mi.

Records available.--September 1907 to September 1960. Records for January 1895 to August 1907, published in WSP 370, have been found to unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 567.90 ft above mean sea level (levels by Portland Water Bureau). Prior to July 27, 1909, staff gage at site 1.5 miles upstream at different datum. July 27, 1909, to Sept. 30, 1959, water-stage recorder at site 2.5 miles upstream at different datums.

Average discharge.--53 years, 755 cfs, adjusted for storage since 1929 (546,600 acre-ft per year).

Extremes.--Maximum discharge during year, 16,100 cfs May 20; minimum daily, 148 cfs

Sept. 28.

1907-60: Maximum discharge, 20,600 cfs Mar. 31, 1931 (gage height, 13.8 ft, site and datum then in use), by computation of peak flow over dam; minimum daily, 63 cfs Aug. 13-16, 1926.

Remarks.--Records good. Flow regulated by Bull Run Lake and by Lake Ben Morrow (see p. 100); adjustment applied only for storage in Lake Ben Morrow. All records given herein include flow diverted 1.6 miles upstream through pipeline for water supply of city of Portland and that used by Portland General Electric Co. for power generation, which is returned to Bull Run River below station. Total diversion, 175,100 acre-ft, of which 80,720 acre-ft was used for power generation and returned to Bull Run River. During 1957 the outlet works at Bull Run Lake were repaired to provide usable storage capacity of several thousand acre-feet, but during 1960, as in past years, flow from the lake was not artificially regulated, reaching the river through surface and underground channels. During 1958 a small earth-fill dam was constructed on North Fork Bull Run River to provide several hundred acre-feet of storage capacity.

Cooperation.--Records of daily diversion furnished by Portland Water Bureau.

Revisions (water years).--WSP 1288: 1910-11, 1913, 1920-23, 1926, 1929. WSP 1318: 1919(M). WSP 1568: 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	1,010	1,260	1,270	890	886	*440	2,620	962	906	274	203	434
2	635	1,240	1,240	826	976	455	3,100	994	757	244	184	444
3	714	1,280	1,020	648	939	499	2,270	1,000	589	238	205	440
4	770	1,240	674	393	963	531	*1,840	1,080	601	231	207	485
5	713	1,220	492	396	1,060	667	1,680	592	603	229	206	497
6	460	1,180	471	401	1,630	788	1,630	827	482	262	158	475
7	529	1,140	*515	483	2,190	909	1,520	1,100	282	365	272	468
8	866	1,110	256	708	1,990	1,110	1,480	1,120	211	206	243	430
9	2,390	944	178	948	1,980	1,390	1,530	1,080	167	249	*273	*432
10	2,240	592	203	476	1,980	1,320	1,470	1,060	151	189	321	439
11	6,890	486	337	314	1,730	1,150	1,020	1,040	206	233	229	359
12	3,370	372	629	292	1,620	1,140	883	969	170	260	206	358
13	2,030	441	755	270	1,570	1,010	1,180	1,180	201	214	213	358
14	1,540	435	804	211	1,700	599	1,570	1,220	252	293	196	328
15	689	415	1,020	*244	1,860	748	1,600	1,190	194	232	180	343
16	534	407	1,440	277	1,740	875	972	1,190	277	272	149	197
17	1,240	380	1,390	257	1,610	789	1,560	1,260	293	245	158	181
18	1,340	365	1,340	265	1,530	694	1,570	1,530	505	245	233	177
19	750	439	1,290	254	1,470	466	1,060	1,590	477	310	210	176
20	572	428	1,260	390	1,400	808	1,160	*5,230	638	186	209	261
21	582	604	1,200	338	1,370	501	1,720	3,420	662	*291	208	277
22	5,400	1,220	718	251	1,320	527	1,660	2,200	552	256	180	270
23	*5,450	2,000	711	249	1,290	516	1,580	1,670	527	238	183	274
24	2,640	1,880	737	271	1,220	473	1,540	1,560	*436	216	347	270
25	2,070	1,630	1,220	341	1,240	399	1,510	1,510	322	218	356	277
26	1,590	1,520	1,150	405	1,200	465	1,100	1,530	255	278	496	268
27	1,460	1,440	1,110	519	1,140	1,620	963	1,520	208	264	457	261
28	1,430	1,400	646	557	930	1,650	693	1,470	256	306	440	146
29	1,400	1,370	765	835	461	1,760	309	1,410	280	280	425	157
30	1,310	1,290	924	1,250	-----	2,310	422	1,380	258	267	436	149
31	1,310	-----	801	1,230	-----	2,680	-----	1,220	-----	217	400	-----
Total	53,924	29,528	26,566	15,189	40,995	29,289	43,212	45,104	11,718	7,808	8,163	9,633
Mean	1,739	984	857	490	1,414	945	1,440	1,455	391	252	263	321
Ac-ft	107,000	58,570	52,690	30,130	81,310	58,090	85,710	89,460	23,240	15,490	16,190	19,110

## Adjusted for change in contents in Lake Ben Morrow

Mean	1,644	891	689	500	1,465	1,254	1,369	1,429	537	182	202	195
Cfsm	15.4	8.33	6.44	4.67	13.7	11.7	12.8	13.4	5.02	1.70	1.89	1.82
In.	17.72	9.29	7.42	5.39	14.76	13.51	14.28	15.40	5.60	1.96	2.18	2.03
Ac-ft	101,100	53,040	42,350	30,740	84,240	77,090	81,480	87,870	31,980	11,170	12,440	11,580

## Observed

Calendar year 1959: Max	6,890	Min	126	Mean	897	Ac-ft	649,600
Water year 1959-60: Max	6,890	Min	148	Mean	877	Ac-ft	637,000

## Adjusted

Calendar year 1959: Mean	881	Cfsm	8.23	In.	115.56	Ac-ft	637,800
Water year 1959-60: Mean	861	Cfsm	8.05	In.	109.54	Ac-ft	625,100

Peak discharge (base, 6,300 cfs).--Oct. 11 (9:30 a.m.) 9,570 cfs; Oct. 22 (5:30 p.m.) 10,900 cfs; May 20 (11 a.m.) 16,100 cfs.

\* Discharge measurement made on this day.

1415. Little Sandy River near Bull Run, Oreg.

Location (revised).--Lat 45°24'55", long 122°10'20", in NE $\frac{1}{4}$  sec.10, T.2 S., R.5 E., on right bank 0.2 mile upstream from Portland General Electric Co. dam and tunnel from Sandy River and 3.0 miles east of Bull Run.

Drainage area.--22.3 sq mi.

Records available.--May to July 1911, October 1911 to March 1912, June 1912 to April 1913, July 1919 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 712 ft above mean sea level (topographic survey of 1954). May 23, 1911, to Apr. 29, 1913, staff gage at site 0.8 mile downstream at different datum. July 1, 1919, to Sept. 30, 1931, water-stage recorder at present site at datum 0.28 ft higher.

Average discharge.--41 years (1919-60), 144 cfs (104,300 acre-ft per year).

Extremes.--Maximum discharge during year, 3,000 cfs Oct. 22 (gage height, 6.43 ft); minimum, 18 cfs Aug. 10-14, 19-21.

1911-13, 1919-60: Maximum discharge, 5,320 cfs Nov. 20, 1921 (gage height, 9.18 ft, present datum), from rating curve extended above 2,200 cfs by logarithmic plotting; minimum, 8 cfs Aug. 20, Sept. 16, 17, 1940.

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

Cooperation.--Water-stage recorder inspected by employee of Portland General Electric Co.

Revisions (water years).--WSP 1154: 1949. WSP 1248: Drainage area. WSP 1288: 1912, 1920-21(M), 1922-23, 1931, 1945. WSP 1318: 1920.

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

Oct. 1-22

Oct. 23 to Sept. 30

2.3	46	3.9	440	1.9	18	3.5	295
2.7	96	4.5	780	2.2	38	4.0	490
3.3	217	5.3	1,610	2.5	69	5.0	1,260
				3.0	156		

Discharge, in cubic 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	98	94	70	241	77	505	174	163	51	23	32
2	92	92	94	67	250	72	525	235	150	49	23	30
3	78	141	106	61	221	69	354	194	139	48	22	30
4	67	123	*90	59	250	82	306	163	123	45	22	58
5	58	98	83	57	337	186	*282	146	112	*42	21	58
6	56	89	79	75	490	210	259	204	100	39	21	46
7	78	82	92	79	322	265	256	369	90	37	21	38
8	98	75	79	95	510	298	235	265	84	36	*19	33
9	478	68	75	82	476	232	218	224	77	36	19	30
10	346	63	80	77	472	186	165	212	72	35	19	28
11	980	58	172	79	306	158	170	207	67	35	19	26
12	460	57	285	73	241	146	174	241	62	34	19	*26
13	255	53	221	68	210	158	210	330	57	34	19	26
14	179	51	199	65	318	152	253	302	115	33	18	26
15	162	54	210	64	385	202	226	210	280	32	25	25
16	128	53	238	70	275	207	204	259	312	30	23	24
17	106	49	172	70	221	194	224	269	212	30	21	24
18	93	73	146	*62	184	189	232	337	150	29	19	23
19	83	98	125	58	156	196	244	292	129	29	19	24
20	96	83	110	58	135	244	351	756	172	28	18	28
21	98	204	100	57	137	282	306	476	127	28	19	24
22	1,610	470	89	55	125	278	235	344	106	27	26	22
23	993	578	64	59	112	253	218	272	94	26	36	25
24	409	333	121	76	106	226	194	*247	84	26	80	29
25	337	306	127	90	115	226	196	250	76	26	55	30
26	226	204	105	121	100	262	186	295	69	25	96	26
27	*177	156	98	139	92	393	204	295	63	24	70	24
28	168	135	92	170	86	350	192	232	59	24	45	22
29	152	119	86	330	*86	478	174	204	56	23	36	22
30	125	103	84	295	---	500	163	186	54	23	33	21
31	112	---	79	250	---	397	---	199	---	23	51	---
Total	8,408	4,166	3,815	3,031	7,555	7,148	7,461	8,389	3,454	1,007	937	880
Mean	271	139	123	97.8	261	231	249	271	115	32.5	30.2	29.3
Cfs/m	12.2	6.23	5.52	4.39	11.7	10.4	11.2	12.2	5.16	1.46	1.35	1.31
In.	14.02	6.95	6.36	5.05	12.60	11.92	12.44	13.99	5.76	1.68	1.56	1.47
Ac-ft	16,680	8,260	7,570	6,010	14,930	14,180	14,800	16,840	6,850	2,000	1,860	1,750

Calendar year 1959: Max 1,610 Min 17 Mean 160 Cfs/m 7.17 In. 97.69 Ac-ft 116,200  
 Water year 1959-60: Max 1,610 Min 18 Mean 154 Cfs/m 6.91 In. 93.80 Ac-ft 111,600

Peak discharge (base, 1,400 cfs).--Oct. 11 (9 a.m.) 1,410 cfs (5.13 ft); Oct. 22 (4 p.m.) 3,000 cfs (6.43 ft); Feb. 7 (2 a.m.) 1,800 cfs (5.46 ft).

\* Discharge measurement made on this day.

1425. Sandy River below Bull Run River, near Bull Run, Oreg.

Location (revised).--Lat 45°27'20", long 122°14'45", in SE¼NW¼ sec.30, T.1 S., R.5 E., on left bank 1 mile downstream from Bull Run River and 2 miles northwest of Bull Run.

Drainage area.--440 sq mi.

Records available.--April 1910 to September 1914, October 1929 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Altitude of gage is 200 ft (from river-profile map). Apr. 27, 1910, to Sept. 30, 1914, staff gage at site three-quarters of a mile upstream at different datum.

Average discharge.--35 years, 2,350 cfs (1,701,000 acre-ft per year).

Extremes.--Maximum discharge during year, 21,600 cfs Oct. 22 (gage height, 12.60 ft); minimum not determined.

1910-14, 1929-60: Maximum discharge, 58,000 cfs Mar. 31, 1931 (gage height, 20.6 ft); minimum, 53 cfs Oct. 4, 1931.

Remarks.--Records excellent except those for period of no gage-height record, which are good. Flow slightly regulated by Bull Run Lake and Lake Ben Morrow of Portland Water Bureau, with considerable diurnal fluctuation from Bull Run powerplant of Portland General Electric Co. No diversion above station for irrigation during year; 175,100 acre-ft was diverted from Bull Run River by Portland Water Bureau, of which 80,720 acre-ft was used for power generation by Portland General Electric Co. and returned to Bull Run River.

Revisions (water years).--WSP 1288: 1910-12, 1941(M), 1948. WSP 1638: 1953(P).

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

Oct. 1-22				Oct. 23 to Sept. 30			
3.0	1,050	7.0	6,020	1.1	145	4.0	1,910
4.0	1,860	10.0	13,400	1.5	260	6.0	4,600
5.0	2,950			2.0	455	8.0	8,500
				3.0	1,060	10.0	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	2,170	2,600	2,620	1,730	3,090	*1,540	7,200	2,990	3,000	1,120	560	894
2	1,560	2,430	2,560	1,660	3,380	1,480	7,840	3,440	2,800	1,010	605	898
3	1,640	2,880	2,430	1,470	3,070	1,690	6,500	3,260	2,600	946	584	824
4	1,570	*2,810	1,810	1,220	3,310	1,480	*5,980	3,140	2,400	764	526	937
5	1,430	2,520	1,550	1,070	3,390	2,230	5,520	2,330	2,200	910	*568	673
6	1,080	2,350	1,430	1,160	4,220	3,160	5,050	2,790	2,000	884	436	1,040
7	1,330	2,200	*1,610	1,240	8,530	3,520	4,840	4,240	1,700	868	280	845
8	1,700	2,090	1,580	1,740	7,440	4,510	4,740	3,960	1,500	824	532	818
9	6,570	1,900	1,110	1,900	6,820	4,330	4,850	3,580	1,400	768	552	773
10	4,990	1,470	1,080	1,310	6,600	3,760	4,340	3,580	1,400	669	574	654
11	13,200	1,300	1,720	1,210	5,550	3,280	3,650	3,620	1,300	765	510	492
12	8,020	1,210	2,920	1,130	5,120	2,880	3,360	3,870	1,300	680	518	710
13	4,960	1,160	3,180	1,100	4,960	2,990	3,680	4,110	1,200	736	526	700
14	3,710	1,170	3,020	883	5,420	2,480	4,720	4,140	1,500	804	182	679
15	2,450	1,150	3,520	1,020	5,940	3,220	4,710	3,550	2,200	800	522	*562
16	2,070	1,170	4,210	996	5,930	3,490	3,600	3,770	2,400	489	517	468
17	2,520	980	3,990	981	5,330	3,080	4,320	4,080	2,000	624	527	490
18	2,480	1,110	3,650	*1,000	4,820	2,910	4,450	4,940	1,900	780	536	147
19	1,850	1,330	3,240	1,090	4,380	2,750	3,780	4,640	1,800	698	523	602
20	1,720	1,350	2,930	1,130	3,960	4,110	4,960	9,730	2,200	672	500	662
21	1,720	2,210	2,740	869	3,880	4,320	5,900	8,570	2,000	708	265	438
22	11,600	4,820	2,070	852	3,620	4,390	5,070	6,400	1,900	636	544	496
23	13,000	6,130	2,040	954	3,290	4,190	4,540	5,170	1,700	504	644	661
24	6,820	6,020	2,120	958	3,070	3,820	4,100	*4,740	*1,500	429	893	581
25	5,830	4,570	2,500	1,270	3,070	3,570	3,640	4,470	1,310	643	834	371
26	*4,300	3,860	2,370	1,590	2,810	3,840	3,200	4,200	1,170	592	1,020	588
27	3,680	3,500	2,210	1,850	2,560	5,580	3,140	5,820	1,070	600	1,220	482
28	3,510	3,320	1,750	2,250	5,920	5,920	2,920	4,360	1,140	639	538	*436
29	3,400	970	1,750	3,280	1,620	6,330	2,360	4,000	1,140	654	857	457
30	3,010	2,840	1,900	4,060	-----	8,020	2,340	3,800	1,090	694	818	420
31	2,790	-----	1,730	3,570	-----	7,440	-----	3,600	-----	410	760	-----
Total	126,680	77,420	73,120	46,123	127,430	116,310	135,500	134,950	52,820	22,320	18,869	16,798
Mean	4,086	2,581	2,359	1,488	4,394	3,752	4,517	4,353	1,761	720	609	627
Cfsm	9.29	5.87	5.36	3.58	9.99	8.53	10.3	9.69	4.00	1.64	1.38	1.42
In.	10.71	6.54	6.18	3.90	10.77	9.85	11.45	11.41	4.46	1.89	1.59	1.59
Ac-ft	251,300	153,600	145,000	91,480	252,800	230,700	268,800	267,700	104,800	44,270	37,430	37,290
Calendar year 1959: Max	13,200			46,123	127,430	116,310	135,500	134,950	52,820	22,320	18,869	16,798
Water year 1959-60: Max	13,200			Min 147	Mean 2,597	Cfsm 5.90	In. 62.07	Ac-ft 1,926,000				
									60.32			1,885,000

Peak discharge (base, 17,000 cfs).--Oct. 22 (6:30 p.m.) 21,600 cfs (12.60 ft); May 20 (12 m.) 17,600 cfs (11.40 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record May 27 to June 24; discharge estimated on basis of recorded range in stage and records for upstream stations.

## 1435. Washougal River near Washougal, Wash.

Location.--Lat 45°37'20", long 122°18'00", in SE¼ sec.27, T.2 N., R.4 E., on right bank half a mile upstream from Cougar Creek and 4 miles northeast of Washougal.

Drainage area.--108 sq mi.

Records available.--September 1944 to September 1960.

Gage.--Staff gage and crest-stage indicator; gage read twice daily. Altitude of gage is 175 ft (from topographic map).

Average discharge.--16 years, 900 cfs (651,600 acre-ft per year).

Extremes.--Maximum discharge during year, 10,100 cfs Oct. 22 (gage height, 11.07 ft); minimum observed, 62 cfs Aug. 16 (gage height, 1.50 ft).  
1944-60: Maximum discharge, 17,700 cfs Dec. 9, 1953 (gage height, 15.56 ft); minimum observed, 41 cfs Sept. 10, 1958; minimum gage height observed, 1.38 ft Oct. 7, 1952, Sept. 10, 1958.

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

Revisions (water years).--WSP 1248: 1945-47, 1949-50, 1951(P). WSP 1638: 1948(M).

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

1.5	62	3.0	600
1.7	104	4.0	1,260
2.0	182	6.0	3,270
2.5	355	9.0	7,160

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	528	531	600	*435	1,520	439	2,400	728	611	203	91	136
2	444	464	600	407	2,140	421	2,830	650	547	197	95	121
3	381	890	563	381	1,900	389	1,950	589	515	191	91	116
4	351	925	547	364	1,780	418	1,480	547	454	185	86	327
5	308	728	499	351	1,950	416	1,250	499	421	176	86	275
6	289	622	515	464	2,760	515	1,070	574	385	165	82	238
7	319	547	515	368	*5,280	677	974	372	372	151	78	194
8	1,900	489	449	479	3,000	1,320	878	800	351	151	74	162
9	3,580	449	444	403	3,000	1,040	776	694	335	149	72	141
10	1,430	407	499	385	2,590	818	666	638	315	149	66	126
11	5,240	381	1,620	361	1,830	716	694	579	300	144	72	114
12	2,450	368	4,400	355	1,450	699	722	595	289	136	70	109
13	1,560	331	1,750	315	1,570	758	806	878	268	133	74	111
14	1,040	319	1,110	323	4,260	*848	*1,190	897	489	136	70	109
15	654	319	1,700	315	4,010	3,270	1,760	782	430	133	86	102
16	694	289	1,660	347	2,020	1,660	1,300	1,000	430	123	72	100
17	589	385	1,250	327	1,920	1,280	1,200	1,070	372	118	74	95
18	520	650	960	308	1,140	1,240	1,230	1,850	355	118	70	93
19	464	1,340	812	308	967	1,250	1,590	1,380	339	114	70	97
20	*547	1,000	699	293	818	1,660	2,400	3,860	385	114	66	106
21	515	*2,350	722	285	842	1,660	1,910	2,640	347	109	80	82
22	5,970	3,170	579	275	734	1,490	1,460	1,900	323	109	141	86
23	3,350	4,320	536	275	672	1,290	1,320	1,420	300	104	185	106
24	2,250	2,140	677	296	633	1,130	1,220	*1,200	282	106	444	116
25	1,410	1,660	878	584	644	1,080	1,080	1,130	*268	100	368	123
26	1,140	1,190	764	660	579	1,070	995	1,330	254	100	278	102
27	911	981	682	860	531	1,150	946	1,170	241	100	258	84
28	812	890	616	1,700	499	1,550	974	1,000	228	95	*176	82
29	888	552	522	2,850	464	3,280	842	842	218	*95	165	82
30	622	677	526	2,450	4,040	800	758	212	93	165	78	
31	552	-----	489	1,800	-----	2,810	-----	694	-----	91	141	-----
Total	41,606	29,564	28,213	19,324	51,103	40,182	38,713	34,233	10,636	4,088	3,946	3,813
Mean	1,342	985	810	623	1,762	1,296	1,290	1,104	355	132	127	127
Cfsm	12.4	9.12	8.45	5.77	16.3	12.0	11.9	10.2	3.29	1.22	1.18	1.18
In.	14.33	10.18	9.72	6.85	17.60	13.84	13.53	11.79	3.66	1.41	1.36	1.31
Ac-ft	82,520	58,640	55,960	38,330	101,400	79,700	76,790	67,900	21,100	8,110	7,830	7,560
Calendar year 1959: Max	5,970	Min	58	Mean	903	Cfsm	8.36	In.	113.49	Ac-ft	653,700	
Water year 1959-60: Max	5,970	Min	58	Mean	834	Cfsm	7.72	In.	105.18	Ac-ft	605,800	

Peak discharge (base, 8,000 cfs).--Oct. 22 (time unknown) 10,100 cfs (11.07 ft); probably Feb. 7 (time unknown) 8,630 cfs (10.02 ft).

\* Discharge measurement made on this day.

1448. Middle Fork Willamette River near Oakridge, Oreg.

Location.--Lat 43°35'35", long 122°27'10", in NE $\frac{1}{4}$  sec. 9, T. 23 S., R. 3 E., on right bank 0.2 mile downstream from Cone Creek, 1.1 miles upstream from Hills Creek Reservoir, and 10 miles south of Oakridge. Records include flow of Gold and Buck Creeks, 0.3 and 0.6 mile downstream, respectively.

Drainage area.--258 sq mi, includes those of Gold and Buck Creeks.

Records available.--October 1958 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,584.28 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Extremes.--Maximum discharge during year, 4,170 cfs Feb. 8 (gage height, 6.93 ft); minimum, 214 cfs Sept. 30.  
1958-60: Maximum discharge, 5,660 cfs Jan. 27, 1959 (gage height, 7.68 ft); minimum, that of Sept. 30, 1960.

Records.--Records excellent. No regulation or diversion above station. Records of 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 Mar. 7		Mar. 8 to Sept. 30	
3.2	230	3.2	218
4.0	650	4.0	620
5.0	1,480	5.0	1,480
6.0	2,720	6.0	2,720
7.0	4,500		

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	270	266	293	298	720	426	2,550	850	1,590	518	332	260
2	257	257	284	288	860	426	2,510	922	1,640	490	*305	264
3	252	311	280	294	769	554	2,360	922	1,580	480		260
4	248	350	270	275	876	1,370	*2,310	1,020	1,620	470	292	278
5	244	306	262	270	964	1,700	2,380	986	1,510	465	292	264
6	244	293	262	280	980	1,820	2,260	994	1,430	460	287	256
7	257	280	257	325	1,990	3,000	2,120	1,440	1,280	450	282	252
8	530	266	*252	502	3,570	2,510	1,860	1,450	1,140	440	282	243
9	916	262	252	448	3,080	1,930	1,660	1,330	1,030	425	278	245
10	584	252	248	395	2,010	1,320	1,420	1,380	1,000	415	278	235
11	497	252	260	*431	1,340	1,090	1,280	1,550	978	405	278	235
12	436	248	360	395	1,090	1,060	1,150	2,100	962	400	278	235
13	380	244	355	360	948	1,240	1,100	1,390	954	390	278	231
14	340	244	311	340	900	1,140	1,150	1,630	946	385	274	231
15	316	244	320	320	1,140	1,080	1,140	1,420	1,020	380	274	231
16	298	244	320	316	1,000	1,020	1,060	*1,320	970	370	274	226
17	284	239	320	350	868	954	1,030	1,240	882	365	264	226
18	275	244	320	370	797	1,030	1,140	1,190	802	360	264	226
19	275	252	306	360	720	1,240	1,280	1,110	754	355	260	226
20	298	248	293	370	650	1,500	1,450	1,760	690	350	260	226
21	325	442	280	375	620	1,630	1,660	2,120	655	341	264	*222
22	502	470	275	390	578	1,710	1,380	1,680	614	336	282	218
23	420	608	275	431	542	1,730	1,200	1,420	602	328	318	218
24	370	497	420	514	*514	1,700	1,070	1,280	608	323	375	218
25	335	420	453	584	508	1,640	994	1,330	602	318	305	218
26	*311	380	365	685	497	1,600	962	1,680	584	318	287	218
27	293	345	350	650	470	1,640	930	1,950	554	314	278	218
28	380	325	345	664	448	1,590	890	1,730	530	310	269	218
29	293	306	335	804	436	1,620	858	1,610	530	305	264	218
30	280	302	335	860	2,540	2,540	842	1,570	*530	350	260	218
31	270	320	320	762	2,240	2,240	1,580			360	256	--
Total	10,896	9,397	9,618	13,696	29,885	46,050	43,996	44,554	28,687	11,976	8,786	7,032
Mean	352	313	310	442	1,031	1,485	1,467	1,437	956	386	283	234
Cfs/m	1.36	1.21	1.20	1.71	4.00	5.76	5.69	5.57	3.71	1.50	1.10	0.907
In.	1.57	1.35	1.39	1.97	4.31	6.64	6.34	6.42	4.14	1.73	1.27	1.01
Ac-ft	21,620	18,640	19,080	27,170	59,280	91,340	87,260	88,370	56,900	23,750	17,430	13,950

Calendar year 1959: Max 3,740 Min 230 Mean 576 Cfs/m 2.23 In. 30.30 Ac-ft 418,900  
Water year 1959-60: Max 3,570 Min 218 Mean 723 Cfs/m 2.80 In. 38.14 Ac-ft 524,800

Peak discharge (base, 3,500 cfs).--Feb. 8 (12 m.) 4,170 cfs (6.93 ft); Mar. 7 (10 a.m.) 3,560 cfs (6.57 ft).

\* Discharge measurement made on this day.

1449. Hills Creek above Hills Creek Reservoir, near Oakridge, Oreg.

Location.--Lat 43°40'50", long 122°22'10", in NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec.8, T.22 S., R.4 E., on right bank 0.2 mile downstream from Tufti Creek, 0.7 mile upstream from Hills Creek Reservoir, and 6 $\frac{1}{2}$  miles southeast of Oakridge.

Drainage area.--52.7 sq mi.

Records available.--October 1958 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,630.80 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Extremes.--Maximum discharge during year, 1,410 cfs Feb. 8 (gage height, 5.92 ft, from Floodmark); minimum, 18 cfs Sept. 19, 28-30.

1958-60: Maximum discharge, that of Feb. 8, 1960; minimum, 14 cfs Nov. 1, 1958, affected by bridge construction upstream; minimum daily, 18 cfs Oct. 16, 17, 1958, Sept. 12-14, 1959, Sept. 19, 28-30, 1960.

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

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 Mar. 6

Mar. 7 to Sept. 30

1.9	18	3.5	272	1.8	14	3.0	169
2.1	31	4.0	430	2.0	25	4.0	450
2.4	62	5.0	860	2.2	41	5.0	870
3.0	158	6.0	1,460	2.5	80		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	31	32	39	158	58	498	169	312	64	31	24
2	30	29	31	36	178	57	506	202	324	61	*30	24
3	28	34	35	35	153	79	458	205	321	58	29	24
4	26	36	30	35	176	264	*450	220	300	56	28	31
5	25	32	28	34	180	351	466	210	276	55	28	26
6	25	30	28	34	196	374	432	215	252	51	28	24
7	28	28	27	43	509	670	402	345	218	49	27	23
8	84	28	*27	93	a <sub>1</sub> 100	334	348	330	186	46	26	23
9	178	27	25	73	661	411	321	294	175	45	26	23
10	101	25	25	60	412	300	252	306	169	44	25	23
11	77	25	31	*61	275	243	230	333	165	43	25	22
12	62	25	42	55	218	238	205	510	161	41	25	21
13	54	24	44	46	185	237	195	438	158	40	25	21
14	45	23	37	45	166	273	202	368	161	39	24	21
15	40	23	44	42	198	249	200	309	167	38	25	20
16	37	23	43	41	193	235	195	*288	152	37	26	20
17	35	22	42	55	164	225	205	258	135	36	26	20
18	32	22	42	68	144	252	230	261	120	36	26	20
19	31	23	38	60	126	312	249	246	110	35	25	18
20	35	23	36	60	111	369	300	487	98	34	24	21
21	39	53	35	62	106	387	354	522	92	34	25	*20
22	55	70	33	68	95	387	303	399	89	32	28	19
23	43	98	32	82	87	378	252	327	86	32	36	19
24	37	68	62	93	*82	357	220	282	84	31	38	19
25	36	55	65	133	80	339	198	300	83	31	32	19
26	*35	46	51	156	75	327	184	429	76	31	28	19
27	34	41	46	136	68	356	175	502	72	30	26	19
28	36	59	46	136	62	327	169	411	70	30	25	18
29	37	36	46	196	60	354	165	366	68	29	24	16
30	34	33	46	209	---	602	163	333	*65	31	24	18
31	33	---	42	170	---	474	---	321	---	31	23	---
Total	1,425	1,072	1,191	2,456	6,218	10,059	8,527	10,187	4,745	1,250	838	637
Mean	46.0	35.7	38.4	79.2	214	324	284	329	158	40.3	27.0	21.2
Cfsm	0.875	0.677	0.729	1.50	4.06	6.15	5.39	6.24	3.00	0.765	0.512	0.402
In.	1.01	0.76	0.84	1.73	4.39	7.10	6.02	7.19	3.35	0.88	0.59	0.45
Ac-ft	2,830	2,130	2,360	4,870	12,330	19,950	16,910	20,210	9,410	2,480	1,660	1,260

Calendar year 1959: Max 778 Min 18 Mean 97.8 Cfsm 1.86 In. 25.20 Ac-ft 70,790  
 Water year 1959-60: Max 1,100 Min 18 Mean 135 Cfsm 2.52 In. 34.31 Ac-ft 96,400

Peak discharge (base, 700 cfs).--Feb. 8 (about 7 a.m.) 1,410 cfs (5.92 ft); Mar. 7 (9 a.m.) 810 cfs (4.88 ft).

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Salmon Creek near Oakridge.

Note.--Shifting-control method used Feb. 9 to Mar. 6.

1455. Middle Fork Willamette River above Salt Creek, near Oakridge, Oreg.

Location.--Lat 43°43'20", long 122°26'15", in NW¼NE¼ sec.27, T.21 S., R.3 E., on right bank 90 ft upstream from highway bridge, 0.3 mile upstream from Salt Creek, 1.1 miles downstream from Hills Creek Dam, and 2.3 miles southeast of Oakridge. Prior to Aug. 19, 1960, at site 1,000 ft downstream.

Drainage area.--392 sq mi.

Records available.--October 1913 to September 1914, September 1935 to September 1960. Monthly discharge only for September 1935, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 1,208.01 ft above mean sea level (levels by Corps of Engineers). Oct. 3, 1913, to Sept. 30, 1914, staff gage and Sept. 1, 1935, to Aug. 18, 1960, water-stage recorder, at sites 400 and 1,000 ft downstream, respectively, at different datums.

Average discharge.--26 years, 1,138 cfs (823,900 acre-ft per year).

Extremes.--Maximum discharge during year, 7,330 cfs Feb. 8 (gage height, 6.51 ft, site and datum then in use); minimum, 225 cfs Sept. 30, 1913-14, 1935-60: Maximum discharge, 34,000 cfs Dec. 28, 1945 (gage height, 12.06 ft, site and datum then in use), from rating curve extended above 13,000 cfs by logarithmic plotting; minimum, 201 cfs Nov. 27 to Dec. 2, 1936.

Remarks.--Records excellent except those for periods of shifting control or no gage-height record, which are good. Slight regulation at times resulting from construction work on Hills Creek Dam. No diversion above station.

Revisions (water years).--WSP 1248: 1914.

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 Mar. 5

Mar. 6 to Aug. 18

Aug. 19 to Sept. 30

2.1	240	4.0	1,740	2.2	280	4.0	1,800	2.3	225
2.5	420	5.0	3,400	2.5	445	5.0	3,400	2.8	550
3.0	730	6.0	5,800	3.0	820	6.0	5,800		
3.5	1,150	7.0	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	302	307	343	385	988	530	4,100	1,300	628	397	309	
2	294	302	334	366	1,290	524	4,000	2,040	604	*352	315	
3	289	320	334	356	1,140	667	3,460	1,400	2,040	580	340	315
4	284	370	325	343	1,360	2,270	*3,160	1,600	1,970	566	320	345
5	280	334	316	334	1,480	3,220	3,100	1,500	1,880	559	320	321
6	276	320	312	338	1,440	3,520	2,930	1,500	1,760	552	320	297
7	289	312	307	395	3,180	5,090	2,680	2,200	1,600	524	320	285
8	557	302	*302	693	6,070	4,580	2,340	2,200	1,440	504	320	273
9	1,130	298	302	695	5,830	3,620	2,080	2,000	1,330	490	320	267
10	765	289	302	554	3,850	2,400	1,810	2,200	1,290	478	320	267
11	590	284	330	590	2,290	1,900	1,660	2,400	1,280	464	320	255
12	524	280	420	*560	1,710	1,740	1,510	3,200	1,230	452	320	249
13	445	280	470	494	1,440	2,070	1,440	3,000	1,220	439	320	249
14	395	276	410	460	1,320	1,930	1,520	2,400	1,190	439	320	249
15	366	276	410	430	1,710	1,780	1,370	2,000	1,280	433	320	249
16	348	276	410	415	1,640	1,760	1,540	*1,840	1,220	421	320	249
17	334	276	410	506	1,360	1,620	1,540	1,700	1,130	415	320	243
18	320	276	400	590	1,180	1,680	1,670	1,740	1,020	403	320	243
19	316	284	380	554	1,020	1,970	1,870	1,660	954	397	309	249
20	334	284	366	548	880	2,280	2,050	2,520	884	391	309	255
21	356	455	352	542	824	2,460	2,530	3,480	828	385	315	*255
22	530	554	343	566	765	2,480	2,080	2,710	772	380	345	255
23	488	730	334	618	*716	2,460	1,790	2,220	764	374	417	249
24	425	604	472	779	681	2,370	1,600	1,970	764	368	487	249
25	395	512	611	872	660	2,240	1,490	1,980	756	358	410	249
26	*370	450	512	1,050	639	2,140	1,430	2,560	732	358	352	249
27	348	410	460	988	578	2,190	1,350	3,040	358	358	327	249
28	348	385	440	916	584	2,240	1,330	2,590	660	352	321	243
29	338	366	425	1,170	536	2,170	1,290	2,280	660	346	*309	243
30	320	352	420	1,320	---	4,420	1,260	---	*644	385	303	237
31	312	---	410	1,100	---	3,740	---	2,050	---	385	291	---
Total	12,668	10,764	11,962	19,537	47,131	74,061	62,210	66,780	36,010	13,788	10,384	7,962
Mean	409	359	386	630	1,625	2,389	2,074	2,154	1,200	445	335	265
Cfs/m	1.04	0.916	0.995	1.61	4.15	6.09	5.29	5.49	3.06	1.14	0.855	0.676
In.	1.20	1.02	1.13	1.85	4.47	7.03	5.90	6.34	3.42	1.31	0.99	0.76
Ac-ft	25,130	21,350	23,730	38,750	93,480	146,900	123,400	132,500	71,420	27,350	20,600	15,780

Calendar year 1959: Max 6,280 Min 248 Mean 782 Cfs/m 1.99 In. 27.09 Ac-ft 566,200  
 Water year 1959-60: Max 6,070 Min 237 Mean 1,020 Cfs/m 2.60 In. 35.42 Ac-ft 740,400

Peak discharge (base, 5,500 cfs).--Feb. 8 (3:30 p.m.) 7,330 cfs (6.51 ft); Mar. 7 (3 p.m.) 6,220 cfs (6.14 ft).

\* Discharge measurement made on this day.

Note.--Shifting-control method used Mar. 30 to Apr. 19. No gage-height record May 1-15, Aug. 3-18; discharge estimated on basis of records for station near Oakridge.

## 1465. Salmon Creek near Oakridge, Oreg.

Location.--Lat 43°45'30", long 122°23'00", in SW $\frac{1}{4}$  sec. 7, T.21 S., R.4 E., on right bank 0.2 mile (revised) upstream from Slide Creek and 4 miles east of Oakridge.

Drainage area.--117 sq mi, at cable 0.2 mile (revised) above gage, where all discharge measurements are made.

Records available.--October to November 1909 (gage heights and one discharge measurement only), February 1913 to October 1919, October 1933 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Published as Kelsey River near Hazeldell and Salmon Creek near Hazeldell, 1909.

Gage.--Water-stage recorder. Datum of gage is 1,421.83 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 1, 1914, staff gages at several sites within 3 miles of present site at various datums. Oct. 1, 1914, to Oct. 14, 1919, water-stage recorder at site 1 mile downstream at different datum.

Average discharge.--33 years (1913-19, 1933-60), 422 cfs (305,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,500 cfs Feb. 8 (gage height, 3.64 ft); minimum, 126 cfs Sept. 30.

1913-19, 1933-60: Maximum discharge, 10,400 cfs Dec. 11, 1956 (gage height, 11.18 ft), from rating curve extended above 4,000 cfs on basis of slope-area measurement of peak flow; minimum, 63 cfs Jan. 8, 1937, result of freezeup; minimum daily, 78 cfs Jan. 8, 1937.

Remarks.--Records excellent. No regulation above station. About 1,100 acre-ft diverted above station during year by city of Oakridge. Tunnel and control gates that were built to divert part of outflow from Waldo Lake into Salmon Creek basin were not used during year but there is leakage under control gates; 12.3 cfs measured July 19, 1957. The tunnel and control gates were permanently sealed Aug. 29, 1960.

Revisions (water years).--WSP 794: 1934(M). WSP 814: Drainage area. WSP 1124: 1935, 1942(M), 1943, 1946(M). WSP 1248: 1915, 1918.

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

1.4	135	2.5	580
1.7	225	3.0	940
2.0	345		

1.2	111	2.5	570
1.5	177	3.0	940
2.0	335	4.0	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	178	190	248	202	455	274	1,300	528	828	*264	188	160
2	172	184	239	197	470	271	1,380	558	836	258	185	160
3	166	236	233	194	425	235	1,310	552	836	255	*183	160
4	160	241	*222	191	406	520	1,290	546	812	248	180	185
5	155	211	216	191	430	766	*1,290	522	759	242	180	164
6	152	200	213	197	440	924	1,200	570	717	236	177	157
7	169	194	208	219	812	1,200	1,120	964	647	233	177	152
8	381	187	205	288	1,320	1,220	1,020	948	570	230	174	148
9	766	181	199	274	1,380	1,050	924	860	528	225	174	145
10	530	175	197	255	1,160	852	804	852	505	222	172	143
11	510	172	205	*258	892	717	724	908	495	219	170	141
12	416	169	227	242	738	675	647	1,270	480	216	170	141
13	349	166	227	227	640	745	626	1,210	465	213	170	141
14	301	163	216	222	619	710	654	1,050	490	213	170	139
15	261	166	216	215	703	751	654	908	619	208	170	139
16	233	166	216	215	640	731	633	860	522	205	170	137
17	211	160	213	227	564	668	647	*804	465	205	167	137
18	197	160	211	233	505	682	675	820	415	205	167	137
19	190	169	208	227	450	788	689	780	386	202	164	137
20	197	166	202	225	406	932	788	1,080	363	199	164	137
21	222	255	199	233	390	1,020	860	1,220	348	199	167	137
22	377	456	197	239	370	1,040	773	1,050	334	197	199	*132
23	345	780	194	252	*348	1,040	675	916	327	194	227	132
24	305	633	227	291	330	996	612	820	320	194	255	132
25	285	485	239	327	330	940	558	773	316	191	199	130
26	257	594	222	374	323	900	528	796	302	191	185	150
27	*237	545	216	374	305	916	522	908	295	188	177	130
28	229	312	216	359	288	892	516	892	284	188	177	130
29	214	284	213	398	281	860	510	868	278	185	164	128
30	204	264	213	450	---	1,130	510	835	271	202	162	126
31	200	---	211	445	---	1,120	---	856	---	194	160	---
Total	8,569	7,844	6,668	8,237	16,400	25,615	24,439	26,505	14,813	6,621	5,537	4,267
Mean	276	261	215	266	566	826	815	855	494	214	179	142
Cfsm	2.36	2.23	1.84	2.27	4.94	7.06	6.97	7.31	4.22	1.85	1.53	1.21
In.	2.72	2.49	2.12	2.62	5.21	8.14	7.77	8.42	4.71	2.10	1.76	1.36
Ac-ft	17,000	15,560	13,230	16,340	32,530	50,810	48,470	52,570	29,380	13,130	10,960	8,460

Calendar year 1959: Max 1,450 Min 135 Mean 342 Cfsm 2.92 In. 39.61 Ac-ft 247,300  
 Water year 1959-60: Max 1,380 Min 126 Mean 425 Cfsm 3.63 In. 49.42 Ac-ft 308,500

Peak discharge (base, 1,700 cfs).--No peak above base.

\* Discharge measurement made on this day.

1475. North Fork of Middle Fork Willamette River near Oakridge, Oreg.

Location.--Lat 43°45'30", long 122°30'30", in SW¼ sec.7, T.21 S., R.3 E., on left bank 1 mile upstream from mouth and 2½ miles northwest of Oakridge.

Drainage area.--246 sq mi.

Records available.--October 1909 to March 1916, September 1935 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Prior to October 1912, published as "near Hazeldell."

Gage.--Water-stage recorder. Datum of gage is 1,029.6 ft above mean sea level (river-profile survey). Prior to Feb. 26, 1916, water-stage recorder or staff gages at several sites within three-quarters of a mile of present site at various datums. Sept. 16, 1935, to Oct. 3, 1938, staff gage at present site and datum.

Average discharge.--31 years (1909-15, 1935-60), 784 cfs (567,600 acre-ft per year).

Extremes.--Maximum discharge during year, 3,970 cfs Feb. 8 (gage height, 7.50 ft); minimum, 120 cfs Sept. 30.

1909-16, 1935-60: Maximum discharge, 17,000 cfs Dec. 28, 1945 (gage height, 16.6 ft), from rating curve extended above 8,000 cfs by logarithmic plotting; minimum, 26 cfs Oct. 14, 1939.

Remarks.--Records excellent. Leakage (12.3 cfs measured July 19, 1957) around the control gates at Waldo Lake, that in the past flowed down Salmon Creek, was permanently sealed Aug. 29, 1960, by U. S. Forest Service. All flow from Waldo Lake basin now follows the natural course down the North Fork of Middle Fork Willamette River. Occasional diurnal fluctuations during low-water periods caused by logponds above station.

Revisions (water years).--WSP 1248: 1914-16:

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

Oct. 1 to Feb. 8

Feb. 9 to Sept. 30

2.2	158	4.0	870	2.0	111	4.0	870
2.5	229	5.0	1,610	2.5	215	5.0	1,610
3.0	385	7.0	3,470	3.0	375	7.0	3,470
3.5	590			3.5	590		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	221	271	382	332	882	491	2,700	942	1,380	*328	190	156
2	201	260	360	315	1,070	473	2,880	978	1,370	318	183	160
3	192	303	354	312	978	536	2,710	966	1,350	307	*177	156
4	182	364	*329	297	1,030	1,030	2,620	990	1,290	297	172	177
5	178	309	309	231	1,100	1,630	*2,570	912	1,180	291	170	168
6	178	291	297	303	1,090	2,050	2,380	906	1,100	279	168	160
7	182	274	285	364	2,120	2,820	2,220	1,330	1,010	270	164	152
8	480	263	277	460	3,410	2,820	1,970	1,560	912	267	162	148
9	1,070	251	268	456	3,440	2,370	1,780	1,370	828	261	158	142
10	712	240	263	406	2,810	1,840	1,480	1,320	786	258	156	138
11	684	229	285	424	2,030	1,500	1,330	1,370	734	252	154	138
12	630	224	368	*392	1,640	1,370	1,210	1,940	712	246	154	137
13	492	219	362	364	1,390	1,440	1,160	2,110	678	240	150	135
14	420	213	332	346	1,350	1,370	1,230	1,920	668	235	150	135
15	368	213	346	329	1,650	1,370	1,240	1,610	810	232	152	133
16	326	216	364	332	1,470	1,360	1,180	1,530	734	228	154	133
17	294	208	364	378	1,250	1,230	1,180	*1,450	682	220	150	131
18	278	203	350	388	1,110	1,250	1,240	1,580	590	215	146	131
19	263	229	336	360	972	1,410	1,310	1,430	550	212	146	127
20	282	224	318	346	852	1,720	1,510	2,020	509	205	144	127
21	306	437	312	350	798	1,920	1,830	2,490	491	205	146	127
22	581	825	300	364	734	1,970	1,580	2,100	464	200	177	*127
23	545	1,610	294	382	*690	1,930	1,370	1,820	423	198	267	127
24	472	1,210	368	444	635	1,850	1,190	1,610	427	192	285	129
25	420	912	480	514	640	1,740	1,100	1,560	411	190	228	129
26	364	700	428	635	605	1,660	1,020	1,660	395	190	188	127
27	*343	576	396	656	550	1,650	996	1,760	375	190	179	124
28	329	500	374	605	536	1,740	978	1,660	367	183	166	125
29	322	456	371	768	509	1,590	948	1,560	351	181	160	124
30	297	410	368	990	-----	2,320	924	1,480	335	195	156	124
31	285	-----	354	942	-----	2,280	-----	1,410	-----	200	154	-----
Total	11,896	12,640	10,634	13,845	37,321	50,730	47,836	47,524	21,892	7,285	5,306	4,149
Mean	384	421	343	447	1,287	1,636	1,595	1,533	730	235	171	158
Cfsm	1.56	1.71	1.39	1.82	5.23	6.85	6.48	6.23	2.97	0.958	0.695	0.561
In.	1.80	1.91	1.61	2.09	5.64	7.87	7.23	7.18	5.31	1.10	0.80	0.63
Ac-ft	23,600	25,070	21,090	27,460	74,030	100,600	94,980	94,260	43,420	14,450	10,520	8,230

Calendar year 1959: Max 3,880 Min 131 Mean 563 Cfsm 2.29 In. 31.09 Ac-ft 407,900  
 Water year 1959-60: Max 3,440 Min 124 Mean 741 Cfsm 3.01 In. 40.97 Ac-ft 537,600

Peak discharge (base, 3,500 cfs).--Feb. 8 (2 p.m.) 3,970 cfs (7.50 ft).

\* Discharge measurement made on this day.

1480. Middle Fork Willamette River below North Fork, near Oakridge, Oreg.

Location.--Lat 43°48'05", long 122°33'35", in SW $\frac{1}{4}$  sec. 27, T.20 S., R.2 E., on left bank 0.5 mile downstream from Whitehead Creek, 4.2 miles downstream from North Fork of Middle Fork Willamette River, and 7 miles northwest of Oakridge.

Drainage area.--924 sq mi.

Records available.--March 1911 to September 1912, July 1923 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Published as "near Hazeldell" 1911-12 and as "at Eula" 1923-50.

Gage.--Water-stage recorder. Datum of gage is 934.76 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Mar. 22, 1911, to Sept. 30, 1912, staff gage at site 4 miles upstream, just below North Fork, at different datum. July 1, 1923, to Aug. 11, 1935, staff gage and Aug. 12, 1935, to Sept. 30, 1950, water-stage recorder, at site 4 miles downstream at different datum.

Average discharge.--38 years, 2,724 cfs (1,972,000 acre-ft per year).

Extremes.--Maximum discharge during year, 14,900 cfs Feb. 8 (gage height, 6.14 ft); minimum, 610 cfs Sept. 30.

1911-12, 1923-60: Maximum discharge, 81,800 cfs Dec. 28, 1945 (gage height, 18.8 ft, from floodmark, site and datum then in use), from rating curve extended above 39,000 cfs by logarithmic plotting; minimum observed, 450 cfs Nov. 24, 25, Dec. 5, 6, 1929, Sept. 4-6, 16, 17, 1931.

Maximum stage known since 1861 and prior to beginning of record, 17.0 ft in February 1890 at site used 1923-50, from information by local resident (discharge, about 55,000 cfs).

Remarks.--Records excellent. Slight regulation by logponds. No diversion above station.

Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 694: 1925-28. WSP 814: Drainage area for site at Eula.

WSP 1248: 1924, 1925(M), 1926-28, 1929(M), 1930, 1933, 1946(M). WSP 1398: 1927(M).

WSP 1638: 1936(M)

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

Oct. 1 to Feb. 8

Feb. 9 to Sept. 30

1.2	720	3.0	3,610	1.1	600	3.0	3,650
1.5	1,020	4.0	6,200	1.5	1,050	4.0	6,400
2.0	1,700	6.0	14,200	2.0	1,750	6.0	14,200

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	921	987	1,220	1,180	2,750	1,690	9,920	3,190	4,900	*1,500	954	766
2	860	954	1,180	1,140	3,320	1,640	10,000	3,350	5,050	1,440	894	788
3	820	1,050	1,170	1,100	3,020	1,690	8,800	3,350	5,050	1,410	*870	786
4	801	1,270	*1,100	1,030	3,240	2,940	8,170	3,490	4,880	1,380	858	858
5	783	1,120	1,040	1,020	3,520	6,520	*7,960	3,370	4,600	1,340	858	822
6	774	1,030	1,020	1,030	3,480	7,680	7,580	3,370	4,320	1,300	854	777
7	810	998	987	1,240	6,440	10,300	6,980	5,050	4,000	1,270	810	755
8	1,770	954	965	1,780	12,000	10,100	6,250	5,380	3,510	1,260	810	733
9	3,630	943	954	1,870	12,600	8,480	5,680	4,780	3,270	1,210	799	722
10	2,570	900	921	1,580	9,400	6,250	4,820	4,680	3,150	1,180	768	711
11	2,210	880	998	1,680	6,340	4,990	4,400	4,930	3,070	1,160	777	700
12	1,980	870	1,270	*1,600	4,960	4,500	4,000	7,020	2,970	1,150	766	700
13	1,660	850	1,420	1,450	4,300	5,140	3,780	7,300	2,910	1,120	766	700
14	1,410	840	1,240	1,370	3,980	4,850	4,100	6,340	2,890	1,110	766	700
15	1,270	830	1,270	1,280	4,880	4,620	4,200	5,380	3,290	1,090	766	680
16	1,150	840	1,270	1,260	4,600	4,680	4,050	5,110	3,090	1,050	777	670
17	1,070	820	1,260	1,520	3,950	4,250	4,000	*4,780	2,810	1,040	766	660
18	910	810	1,230	1,760	3,470	4,300	4,200	5,050	2,540	1,010	755	660
19	976	860	1,180	1,580	3,090	4,820	4,480	4,720	2,330	1,000	755	660
20	1,030	860	1,140	1,520	2,770	5,620	4,930	6,660	2,170	978	744	660
21	1,080	1,400	1,100	1,520	2,610	6,070	6,010	8,730	2,060	954	755	660
22	1,800	2,180	1,040	1,580	2,410	6,130	5,290	7,020	1,940	942	858	*680
23	1,720	3,900	1,020	1,670	2,260	6,040	4,550	5,920	1,840	950	1,080	660
24	1,480	3,040	1,340	1,980	*2,140	5,830	4,080	5,200	1,840	918	1,200	660
25	1,380	2,350	1,700	2,230	2,120	5,530	3,650	4,960	1,820	918	1,030	660
26	1,240	1,950	1,480	2,650	2,080	5,260	3,490	5,620	1,750	918	894	650
27	*1,170	1,680	1,370	2,590	1,890	5,320	3,370	6,460	1,650	918	834	650
28	1,150	1,520	1,310	2,370	1,780	5,620	3,310	5,880	1,590	882	788	640
29	1,130	1,400	1,270	2,770	1,720	5,170	3,210	5,500	1,560	870	777	640
30	1,070	1,300	1,270	3,280	-----	9,120	3,170	5,200	1,530	942	755	630
31	1,020	-----	1,240	2,390	-----	8,620	-----	5,050	-----	954	755	-----
Total	41,745	39,396	36,975	53,620	121,120	173,970	158,430	162,920	88,360	34,144	25,849	20,998
Mean	1,347	1,313	1,193	1,730	4,177	5,612	5,281	5,252	2,945	1,101	834	700
Cfs/m	1.46	1.42	1.29	1.87	4.52	6.07	5.72	5.68	3.19	1.19	0.903	0.758
In.	1.68	1.59	1.49	2.16	4.87	7.00	6.38	6.55	3.56	1.37	1.04	0.85
Ac-ft	82,800	78,140	73,340	106,400	240,200	345,100	314,200	322,900	175,300	67,720	51,270	41,650

Calendar year 1959: Max 13,600 Min 650 Mean 2,051 Cfs/m 2.22 In. 30.14 Ac-ft 1,485,000  
Water year 1959-60: Max 12,600 Min 650 Mean 2,616 Cfs/m 2.83 In. 38.54 Ac-ft 1,999,000

Peak discharge (base, 12,000 cfs).--Feb. 8 (3 to 4:30 p.m.) 14,900 cfs (6.14 ft); Mar. 7 (4:30 p.m.) 12,200 cfs (5.54 ft).

\* Discharge measurement made on this day.

1490. Lookout Point Reservoir near Lowell, Oreg.

Location.--Lat 43°54'50", long 122°45'00", in SE $\frac{1}{4}$  sec.13, T.19 S., R.1 W., in elevator house at right end of spillway section of dam across Middle Fork Willamette River,  $\frac{1}{2}$  miles east of Lowell.

Drainage area.--991 sq mi.

Records available.--November 1953 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers). Nov. 7, 1953, to Dec. 4, 1954, approximate elevations obtained from reference marks and Dec. 5, 1954, to Feb. 4, 1955, staff gage, at same site and datum.

Extremes.--Maximum contents during year, 451,600 acre-ft May 23 (elevation, 927.98 ft); minimum, 116,200 acre-ft Dec. 11 (elevation, 823.77 ft).  
1953-60: Maximum contents, that of May 23, 1960; minimum observed, 91,200 acre-ft Dec. 1, 1954 (elevation, 811 ft).

Remarks.--Reservoir is formed by earth-fill dam with concrete gate and spillway section, completed in 1954 by Corps of Engineers. Planned storage began in November 1953. Total capacity is 456,000 acre-ft and usable capacity is 349,400 acre-ft between elevations 819 (proposed lower limit of operation) and 929 ft (top of spillway gates). Reservoir used for flood control, improvement of navigation, power generation, pollution abatement, and other purposes. Capacity table computed by Corps of Engineers. Figures given herein represent total contents.

Capacity table, water year 1959-60 (elevation, in feet, and contents in acre-feet)

823	114,600	880	267,800
830	129,600	890	302,500
840	152,600	900	338,800
850	178,000	910	377,300
860	205,700	920	417,800
870	235,600	930	460,300

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	311,700	172,100	118,300	121,600	153,800	209,300	343,300	419,500	439,800	447,200	421,000	366,600
2	305,500	187,300	118,300	121,600	159,000	210,300	343,800	422,400	441,000	448,100	419,600	364,500
3	300,700	183,400	118,400	122,000	163,300	211,900	347,100	424,900	442,200	448,900	418,200	362,400
4	301,800	159,100	118,100	117,400	168,100	218,000	348,900	426,100	446,700	449,700	416,800	360,400
5	295,800	154,400	117,900	117,500	173,300	231,900	350,200	426,900	447,600	449,700	415,500	358,300
6	289,300	150,200	119,800	117,600	178,400	249,700	350,600	428,400	447,200	449,700	414,300	356,000
7	283,100	146,900	117,700	118,400	192,600	271,600	349,600	436,200	447,400	449,500	412,900	353,800
8	278,700	145,100	117,800	119,500	215,000	289,500	347,200	441,700	446,600	449,400	411,500	351,500
9	277,500	141,200	117,200	120,600	236,400	299,600	351,400	443,100	445,200	449,300	410,100	349,100
10	274,400	136,700	116,800	124,000	242,000	303,400	356,100	442,600	443,500	449,100	408,000	346,600
11	275,300	134,700	116,600	123,300	234,300	298,400	355,500	442,600	443,800	448,800	405,700	344,200
12	270,200	130,600	117,300	121,300	222,200	292,300	358,200	446,700	447,400	447,600	403,500	341,800
13	264,600	126,600	120,400	121,200	209,900	287,400	360,900	447,400	447,400	446,200	401,300	339,500
14	258,100	123,600	118,500	118,200	196,500	281,900	364,400	445,000	447,600	445,000	398,900	337,000
15	251,300	123,200	118,000	117,800	202,200	278,700	368,200	440,700	448,500	443,300	396,700	334,500
16	244,000	120,100	118,300	118,300	205,200	277,300	372,600	435,000	448,300	441,800	394,600	332,100
17	236,600	119,800	118,500	122,000	206,600	277,200	377,700	433,100	447,400	440,300	392,500	329,600
18	232,900	119,600	118,400	122,400	206,900	277,200	378,000	432,400	446,100	438,800	390,500	327,000
19	227,900	118,100	118,500	123,600	206,300	284,500	382,000	430,100	444,200	437,700	388,500	324,500
20	222,900	116,600	120,400	124,500	207,700	294,100	386,500	435,200	442,100	436,500	386,400	321,600
21	217,100	117,700	117,500	125,600	208,900	297,500	393,100	444,100	442,700	435,300	384,300	319,600
22	211,400	121,900	117,600	126,600	204,700	301,800	398,000	448,900	443,900	434,000	382,500	317,400
23	205,700	126,300	117,800	127,700	202,100	307,400	402,500	449,100	444,600	432,800	381,100	315,500
24	202,000	125,100	118,700	131,700	202,100	311,400	407,100	448,500	445,500	431,200	380,100	313,400
25	202,700	122,400	122,500	131,400	202,200	315,200	405,900	443,100	448,000	430,100	378,900	311,400
26	197,500	121,800	123,500	134,300	203,400	319,300	406,400	441,300	449,600	428,800	377,400	309,300
27	192,800	119,200	124,800	137,100	204,200	325,200	411,800	441,000	448,100	427,500	375,900	306,600
28	187,800	119,100	124,900	139,400	207,800	329,200	412,000	439,700	448,000	426,200	374,500	304,000
29	182,900	120,600	125,100	142,500	208,300	331,800	410,200	437,600	447,800	424,700	372,600	301,500
30	178,000	118,300	121,500	146,700	-----	341,900	414,900	436,600	447,500	423,500	370,900	298,800
31	174,100	-----	119,500	152,800	-----	342,900	-----	436,900	-----	422,200	368,800	-----

(†)	848.50	824.74	825.23	840.10	860.91	901.08	919.30	924.54	927.03	921.05	907.83	889.00
(*)	-145,500	-55,800	+1,000	+33,500	+55,500	+134,500	+72,000	+22,000	+10,600	-25,300	-53,400	-70,000

Calendar year 1959..... \* -5,700

Water year 1959-60..... \* -18,800

† Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.

1500. Middle Fork Willamette River near Dexter, Oreg.

Location.--Lat 43°56'45" (revised), long 122°50'10", near center of sec.5, T.19 S., R.1 W., on right bank 0.6 mile upstream from Lost Creek, 2 miles northwest of Dexter, and 2.7 miles downstream from Dexter Dam.

Drainage area.--1,001 sq mi.

Records available.--October 1946 to September 1954 (published as "at Lowell"), June 1955 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 600 ft (from river-profile map). Prior to Aug. 23, 1950, staff gage and Aug. 23, 1950, to Sept. 30, 1954, water-stage recorder, at site 4 miles upstream at different datum.

Average discharge.--13 years, 3,465 cfs (2,509,000 acre-ft per year), adjusted for storage.

Extremes.--Maximum discharge during year, 12,300 cfs Feb. 11 (gage height, 7.08 ft); minimum daily, 200 cfs Mar. 6.

1946-54, 1955-60: Maximum discharge, 62,600 cfs Jan. 18, 1953 (gage height, 12.46 ft, site and datum then in use), from rating curve extended above 33,000 cfs by logarithmic plotting; minimum daily, 200 cfs Dec. 20, 21, 1957, Feb. 16, 17, 1958, Mar. 6, 1960.

Maximum stage known, 13.9 ft Dec. 28, 1945 (former site and datum).

Remarks.--Records excellent except those for periods of no gage-height record, which are fair. Flow regulated since November 1953 by Lookout Point Reservoir (see preceding page). Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1638: 1948(P).

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

0.58	200	4.0	4,060
1.0	540	5.0	6,100
2.0	1,370	7.0	12,000
3.0	2,500		

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	3,650	2,700	1,320	1,320	1,160	1,270	11,000	1,250	4,100	1,580	1,550	1,810
2	3,840	2,610	1,240	1,250	1,310	1,260	11,100	1,450	*4,580	1,260	1,550	1,820
3	3,000	3,300	1,240	1,240	1,250	1,270	7,980	2,200	3,880	1,190	1,560	1,820
4	1,840	3,160	1,220	1,250	1,210	*1,270	7,850	3,180	3,300	1,240	1,560	1,950
5	2,500	3,600	1,190	1,370	1,200	900	7,950	3,180	3,410	1,240	1,540	1,870
6	3,880	3,000	1,380	1,160	1,240	a200	7,850	2,510	4,060	1,240	1,500	1,770
7	4,280	2,640	1,450	1,000	1,280	1,210	7,900	2,130	4,600	1,260	1,410	1,770
8	4,280	2,580	1,130	1,370	1,370	2,290	7,850	3,400	3,720	*1,260	1,420	1,870
9	4,370	2,340	*1,020	1,420	3,170	3,950	3,460	3,510	3,810	1,340	1,500	1,880
10	4,280	2,640	1,090	1,350	7,980	5,750	3,650	5,160	4,040	1,360	1,790	1,880
11	3,050	2,500	1,110	1,460	11,200	9,240	3,810	5,000	2,710	1,370	1,800	1,880
12	4,060	2,500	1,120	2,360	12,000	8,480	2,700	5,400	1,940	1,380	1,800	1,870
13	4,380	2,650	1,080	2,640	12,000	8,460	*2,460	7,250	2,000	1,530	1,810	1,850
14	4,740	2,270	1,230	1,960	11,800	8,490	2,510	8,820	2,460	1,580	1,810	1,850
15	4,660	1,840	1,550	1,650	2,920	6,450	2,490	8,250	2,770	1,550	1,810	1,880
16	4,900	1,750	1,440	1,370	2,810	6,030	2,510	7,680	2,980	1,560	1,820	1,900
17	4,700	1,240	1,280	1,190	a3,000	4,780	2,300	6,180	3,060	1,560	1,850	1,920
18	3,650	1,030	1,050	1,090	a3,400	2,960	2,470	6,120	2,980	1,560	1,860	1,880
19	3,380	1,580	1,250	1,190	3,510	2,040	3,080	6,060	3,100	1,560	1,630	1,860
20	3,490	1,500	1,560	*1,260	2,530	1,900	2,960	5,200	3,020	1,560	1,730	1,860
21	3,880	1,340	1,380	1,180	2,640	2,750	2,930	5,140	1,590	1,570	1,760	1,880
22	4,560	1,320	1,180	1,230	3,200	4,130	2,680	5,060	1,470	1,570	1,760	*1,840
23	5,200	1,180	1,030	1,240	3,700	4,220	2,640	5,810	1,340	1,580	1,780	1,700
24	2,900	3,050	1,140	1,260	2,450	4,040	2,570	7,450	1,320	1,530	*1,680	1,680
25	2,050	3,510	1,060	1,190	1,860	3,040	2,840	7,520	1,240	1,530	1,580	1,770
26	2,860	2,960	1,010	1,370	1,370	2,940	3,460	6,680	1,200	1,500	1,560	1,820
27	3,790	2,520	1,020	1,280	1,240	3,050	2,500	6,700	1,270	1,560	1,560	1,980
28	*3,620	1,850	1,050	1,330	1,220	3,170	2,240	6,980	1,550	1,560	1,560	1,950
29	3,700	1,500	1,470	1,320	1,280	4,260	3,290	6,920	1,610	1,560	1,560	1,960
30	3,300	1,500	1,980	1,260	-----	5,220	1,320	5,900	1,600	1,560	1,550	1,940
31	2,680	-----	2,120	1,130	-----	9,270	-----	5,180	-----	1,520	1,850	-----
Total	115,650	67,540	39,210	43,180	105,300	124,270	130,550	163,270	80,690	45,220	51,280	55,700
Mean	3,731	2,251	1,265	1,392	3,631	4,009	4,352	5,267	2,695	1,459	1,654	1,857
Ac-ft	229,400	134,000	77,770	85,610	208,900	246,500	258,900	323,800	160,000	89,690	101,700	110,500

Adjusted for change in contents in Lookout Point Reservoir

	Mean	1.397	1.514	1.281	1.937	4.597	6.198	5.561	5.624	2.867	1.047	786	681
Cfs/m	1.40	1.31	1.28	1.94	4.59	6.19	5.56	5.62	2.86	1.05	0.785	0.680	
In.	1.61	1.46	1.48	2.23	4.95	7.14	6.20	6.48	3.20	1.21	0.90	0.76	
Ac-ft	85,900	78,200	78,770	119,100	264,400	381,100	330,900	345,800	170,600	64,390	48,300	40,500	

#### Observed

Calendar year 1959: Max	12,000	Min	1,010	Mean	2,202	Ac-ft	1,594,000
Water year 1959-60: Max	12,000	Min	200	Mean	2,792	Ac-ft	2,027,000

#### Adjusted

Calendar year 1959: Mean	2,193	Cfs/m	2.19	In.	29.76	Ac-ft	1,588,000
Water year 1959-60: Mean	2,766	Cfs/m	2.76	In.	37.62	Ac-ft	2,008,000

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for station at Jasper and records of release from Dexter Reservoir.

1510. Fall Creek below Winberry Creek, near Fall Creek, Oreg.

Location (revised).--Lat 43°56'40", long 122°46'25", in NW¼SE¼ sec.2, T.19 S., R.1 W., on left bank 10 ft upstream from highway bridge, 1.6 miles downstream from Winberry Creek, 2.3 miles southeast of town of Fall Creek, and 6.1 miles upstream from mouth.

Drainage area.--186 sq mi.

Records available.--October to December 1911 (published as Big Fall Creek near Fall Creek; gage heights and discharge measurements only), September 1935 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 637.81 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Oct. 1 to Dec. 31, 1911, staff gage at site a quarter of a mile downstream at different datum. Sept. 9, 1935, to Aug. 3, 1950, staff gage at present site and datum.

Average discharge.--25 years, 580 cfs (419,900 acre-ft per year).

Extremes.--Maximum discharge during year, 4,230 cfs May 20 (gage height, 7.73 ft); minimum, 34 cfs Sept. 30.

1935-60: Maximum discharge, 24,700 cfs Dec. 11, 1956 (gage height, 18.80 ft), from rating curve extended above 10,000 cfs by logarithmic plotting; minimum observed, 19 cfs Dec. 1, 1936.

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 1094: 1946(M). WSP 1248: Drainage area.

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

Oct. 1 to Feb. 9

Feb. 10 to Sept. 30

1.5	62	3.0	500	1.2	30	3.0	510
1.7	93	4.0	1,070	1.5	58	4.0	1,050
2.0	160	7.0	3,500	2.0	165	5.0	1,720
2.5	295			2.5	310	8.0	4,500

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	113	142	210	241	525	352	3,420	525	500	117	54	60
2	95	133	195	218	674	338	2,750	500	*140	113	53	62
3	86	185	208	208	620	480	1,940	490	396	109	51	61
4	78	241	172	190	776	*1,510	1,410	630	359	107	50	87
5	72	185	152	182	776	3,120	1,100	580	328	103	50	83
6	70	162	145	210	722	3,650	876	570	303	99	48	60
7	79	145	135	410	1,550	3,550	755	1,300	275	*95	47	54
8	420	131	126	980	2,830	2,830	635	1,130	251	89	43	51
9	1,430	122	*122	758	3,510	2,680	600	906	239	87	41	48
10	640	115	113	570	2,880	1,860	495	715	227	85	41	44
11	555	111	162	680	1,720	1,410	540	605	215	83	40	43
12	460	105	510	615	1,240	1,410	590	1,060	208	82	40	43
13	316	99	656	500	1,060	2,000	*585	1,510	190	80	40	41
14	247	97	424	424	1,210	1,840	1,020	1,310	208	80	40	40
15	205	97	378	362	1,890	1,620	1,100	990	314	78	40	39
16	175	111	346	366	1,720	1,620	1,070	1,030	224	73	43	39
17	155	97	306	1,020	1,250	1,310	1,060	1,180	205	71	41	38
18	135	91	259	1,230	990	1,280	1,060	1,560	185	70	40	38
19	124	113	230	914	790	1,230	1,020	1,280	170	67	39	37
20	165	113	210	*806	650	1,130	1,100	2,420	161	65	37	37
21	160	413	192	722	625	984	1,440	3,420	153	64	38	36
22	610	1,200	182	580	580	846	1,240	2,270	149	62	57	*35
23	478	1,110	170	722	510	755	996	1,580	145	62	195	35
24	342	1,140	365	830	456	645	816	1,240	141	61	*202	36
25	302	692	610	848	480	565	755	1,110	135	61	143	36
26	247	486	500	926	515	520	685	1,280	129	61	89	36
27	218	334	406	854	452	595	645	1,260	127	61	78	36
28	*208	306	370	698	416	894	700	1,020	125	57	62	36
29	192	256	736	722	376	954	645	822	121	54	54	36
30	170	228	285	734	---	2,830	575	680	119	54	54	35
31	158	---	274	600	---	2,480	---	585	---	55	53	---
Total	8,705	9,760	8,749	19,232	31,593	47,368	31,563	35,618	6,742	2,403	1,907	1,362
Mean	281	325	282	620	1,089	1,528	1,052	1,149	225	77.5	61.5	45.4
Cfsm	1.51	1.75	1.52	3.33	5.85	8.22	5.66	6.18	1.21	0.417	0.331	0.244
In.	1.74	1.95	1.75	3.85	6.32	9.47	6.31	7.12	1.35	0.48	0.38	0.27
Ac-ft	17,270	19,360	17,350	38,150	62,660	93,950	62,600	70,650	13,370	4,770	3,780	2,700
Calendar year 1959: Max	5,190	Min	29	Mean	446	Cfsm	2.40	In.	32.57	Ac-ft	323,100	
Water year 1959-60: Max	3,650	Min	35	Mean	560	Cfsm	3.01	In.	40.99	Ac-ft	406,600	

Peak discharge (base, 6,300 cfs).--No peak above base.

\* Discharge measurement made on this day.

1520. Middle Fork Willamette River at Jasper, Oreg.

Location (revised).--Lat 43°59'55", long 122°54'20", in SW<sup>1</sup>/<sub>4</sub>SW<sup>1</sup>/<sub>4</sub> sec.14, T.18 S., R.2 W., on right bank 25 ft downstream from highway bridge at Jasper and 650 ft downstream from Hills Creek.

Drainage area.--1,340 sq mi.

Records available.--September 1905 to February 1912, July 1913 to March 1917, October 1952 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 513.45 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. September 1905 to February 1912 and July 1913 to March 1917, staff gage at approximately same site at different datum. Oct. 22, 1952, to Oct. 1, 1953, wire-weight gage at site 25 ft upstream at same datum.

Average discharge.--17 years (1905-11, 1913-16, 1952-60), 4,052 cfs (2,934,000 acre-ft per year).

Extremes.--Maximum discharge during year, 17,300 cfs Mar. 31 (gage height, 8.28 ft); minimum, 1,120 cfs Nov. 18.

1905-12, 1913-17, 1952-60: Maximum discharge, 94,000 cfs Nov. 23, 1909 (gage height, 17.4 ft, datum then in use, from graph based on gage readings), from rating curve extended above 10,000 cfs by logarithmic plotting; minimum, 366 cfs Dec. 5, 1954.

Remarks.--Records excellent. Flow regulated by Lookout Point Reservoir (see p. 111). Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1288: 1907-8, 1910-12, 1914-16, drainage area.

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

Oct. 1 to May 20				May 21 to Sept. 30			
2.1	1,120	5.0	6,100	2.3	1,230	5.0	6,050
3.0	2,170	7.0	12,200	3.0	2,090	7.0	12,200
4.0	3,850	9.0	20,800	4.0	3,700		

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	3,850	3,050	1,710	1,910	2,210	1,960	16,800	2,310	5,320	1,810	1,610	1,950
2	4,030	2,920	1,610	1,720	2,720	1,930	15,500	2,440	*5,300	1,450	1,610	1,990
3	3,270	3,650	1,600	1,680	2,600	2,250	11,300	3,070	4,700	1,300	1,640	1,980
4	2,180	3,710	1,530	2,200	2,840	*3,780	10,100	4,410	4,080	1,360	1,630	2,160
5	2,580	4,050	1,480	1,740	2,930	7,420	9,680	4,350	4,100	1,370	1,620	2,090
6	3,890	3,450	1,620	1,580	2,720	7,280	9,190	3,730	4,620	1,370	1,610	1,950
7	4,370	3,050	1,710	1,830	3,810	8,110	8,980	4,290	5,080	*1,410	1,450	1,920
8	4,850	2,900	1,390	3,310	6,540	8,110	8,770	5,520	4,080	1,370	1,470	1,980
9	6,380	2,770	*1,240	2,950	9,280	9,780	5,000	5,050	4,220	1,470	1,560	2,020
10	5,320	2,950	1,280	2,550	13,600	9,310	4,670	6,220	4,420	1,510	1,880	2,010
11	4,050	2,800	1,400	2,900	14,400	11,900	4,790	6,120	3,300	1,510	1,920	1,980
12	4,690	2,790	1,910	3,850	14,500	11,300	3,930	6,820	2,480	1,510	1,940	1,980
13	4,880	2,970	2,420	3,850	14,000	11,600	*3,630	9,010	2,420	1,670	1,940	1,950
14	5,120	2,710	2,090	2,980	14,000	11,500	4,310	10,900	2,890	1,740	1,920	1,950
15	5,150	2,110	2,350	2,520	6,450	9,340	4,510	10,000	3,380	1,690	1,920	1,960
16	5,150	2,060	2,160	2,280	5,980	8,770	4,510	9,310	3,470	1,690	1,950	1,990
17	4,880	1,430	1,910	3,630	5,420	7,380	4,270	8,440	3,510	1,680	1,950	2,050
18	4,010	1,180	1,580	3,430	5,280	5,420	4,310	8,560	3,400	1,670	1,770	1,960
19	3,710	1,550	1,710	2,950	5,080	4,370	4,880	8,110	3,470	1,670	1,690	1,950
20	3,670	1,550	1,640	2,790	4,070	3,870	4,900	8,850	3,380	1,670	1,780	1,980
21	4,190	1,890	1,800	*2,550	3,990	4,470	5,550	11,000	2,020	1,670	1,830	1,960
22	5,500	2,700	1,550	2,510	4,270	5,520	5,220	8,950	1,780	1,670	1,850	*1,900
23	6,000	3,990	1,350	2,530	4,710	5,580	4,610	8,440	1,610	1,680	2,050	1,790
24	3,630	4,830	1,880	2,680	3,610	5,250	4,230	9,470	1,570	1,630	*2,010	1,780
25	2,710	4,710	2,390	2,590	2,880	4,350	4,370	9,400	1,420	1,630	1,830	1,870
26	3,310	4,070	2,030	2,930	2,450	4,030	4,810	9,340	1,380	1,590	1,720	1,950
27	4,110	3,210	1,850	2,820	2,160	4,170	4,050	9,100	1,430	1,620	1,690	2,090
28	*4,050	2,550	1,780	2,700	2,020	4,690	3,870	8,890	1,730	1,640	1,680	2,090
29	4,090	2,040	2,160	2,680	2,030	5,700	4,510	8,410	1,850	1,630	2,050	2,090
30	3,610	1,940	2,620	2,620	-----	9,610	2,680	7,390	1,820	1,640	1,650	2,090
31	3,120	-----	2,770	2,320	-----	12,800	-----	6,280	-----	1,610	1,940	-----
Total	130,950	85,580	56,720	81,380	166,550	211,550	187,510	224,180	94,450	48,930	54,780	59,410
Mean	4,224	2,653	1,850	2,625	5,743	6,824	6,250	7,231	3,148	1,578	1,768	1,980
Ac-ft	259,700	169,700	112,500	161,400	330,300	419,600	371,900	444,600	187,500	97,050	108,600	117,800
Calendar year 1959: Max			14,100	Min	1,150	Mean	3,041	Ac-ft	2,201,000			
Water year 1959-60: Max			16,600	Min	1,180	Mean	3,830	Ac-ft	2,780,000			

\* Discharge measurement made on this day.

1525. Coast Fork Willamette River at London, Oreg.

Location.--Lat 43°38'30", long 123°05'05", in SW<sup>1</sup>/<sub>4</sub> sec.20, T.22 S., R.3 W., on left bank 0.6 mile north of London and 11 miles south of Cottage Grove.

Drainage area.--69 sq mi, approximately.

Records available.--September 1935 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 852.58 ft above mean sea level, datum of 1929 (levels by Corps of Engineers) Prior to Oct. 18, 1935 (corrected), staff gage at same site and datum.

Average discharge.--25 years, 208 cfs (150,600 acre-ft per year).

Extremes.--Maximum discharge during year, 2,190 cfs Feb. 9 (gage height, 5.93 ft); minimum, 12 cfs Sept. 30.

1935-60: Maximum discharge, 8,800 cfs Dec. 28, 1945 (gage height, 13.25 ft), from rating curve extended above 4,000 cfs; minimum, 10 cfs for several days in 1936, 1938-40.

Remarks.--Records excellent except those for periods of backwater from debris or no gage-height record, which are good. No regulation or diversion above station. Records of water temperatures for the water year 1960 are given in WSP 1744.

Rating tables, water year 1959-60, except period of backwater from debris (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-8			Oct. 9 to Sept. 30		
1.1	16		1.1	12	2.0 120
1.3	28		1.2	16	2.5 280
1.5	44		1.4	30	3.0 490
1.8	82		1.6	53	6.0 2,230

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	c23	24	31	60	158	100	952	154	208	48	19	*21
2	c21	23	30	54	505	100	720	*138	154	a46	19	20
3	c21	31	33	52	352	208	530	151	183	a44	18	20
4	c20	46	28	47	*505	755	404	190	142	a44	18	35
5	c21	33	28	44	463	1,200	328	163	130	a42	18	25
6	c22	28	27	48	388	880	268	169	116	a38	18	20
7	25	26	27	104	565	1,290	226	427	*108	34	18	19
8	80	24	27	352	1,870	1,160	199	348	104	34	16	18
9	211	23	26	230	*2,010	1,150	187	264	96	34	16	16
10	93	22	25	157	1,140	725	160	212	95	34	16	16
11	70	21	116	230	640	565	216	175	89	33	16	17
12	57	*20	200	205	472	500	216	193	86	32	16	16
13	48	20	172	157	392	555	216	230	79	31	16	16
14	42	20	95	128	352	500	400	216	79	31	16	16
15	36	20	73	106	510	520	590	184	80	29	16	16
16	34	21	63	112	463	495	495	216	76	28	16	15
17	31	20	56	481	372	422	409	252	73	27	16	15
18	27	20	49	510	312	376	380	348	67	25	15	15
19	25	21	43	352	248	340	372	312	64	24	15	15
20	31	22	38	276	205	296	392	760	61	*22	15	14
21	34	104	*36	222	184	*252	472	a850	59	22	16	14
22	72	86	34	196	169	216	418	a850	57	22	20	14
23	53	108	34	178	151	193	348	505	56	21	14	14
24	42	82	249	166	158	169	284	468	54	21	27	14
25	39	63	260	154	135	154	252	422	53	20	23	14
26	35	53	154	151	132	145	230	910	52	22	20	14
27	32	46	108	145	116	166	205	700	50	21	18	14
28	30	40	89	132	110	212	187	490	49	20	18	14
29	27	36	76	138	104	343	167	380	48	19	17	14
30	28	33	75	151	104	1,010	166	304	48	18	16	13
31	24	---	67	138	---	868	---	248	---	18	16	---
Total	1,352	1,134	2,367	5,476	12,941	15,845	10,409	11,029	2,628	904	555	504
Mean	43.6	37.8	76.4	177	446	511	347	356	87.6	29.2	17.9	16.8
Cfsm	0.632	0.548	1.11	2.57	6.46	7.41	5.03	5.16	1.27	0.423	0.259	0.243
In.	0.73	0.61	1.28	2.95	6.98	8.54	5.61	5.94	1.42	0.49	0.30	0.27
Ac-ft	2,680	2,250	4,690	10,860	25,670	31,430	20,650	21,680	5,210	1,790	1,100	1,000

Calendar year 1959: Max 1,810 Min 18 Mean 147 Cfsm 2.13 In. 28.83 Ac-ft 106,100  
 Water year 1959-60: Max 2,010 Min 13 Mean 178 Cfsm 2.58 In. 35.12 Ac-ft 129,200

Peak discharge (base, 2,100 cfs).--Feb. 9 (9 a.m.) 2,190 cfs (5.93 ft).

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Mosby Creek at mouth, near Cottage Grove and Row River above Pitcher Creek, near Dorena.

c Backwater from debris.

## 1530. Cottage Grove Reservoir near Cottage Grove, Oreg.

Location.--Lat 43°43'00", long 123°02'55", in NE<sup>1</sup> sec.28, T.21 S., R.3 W., in east abutment of dam on Coast Fork Willamette River, 5½ miles south of Cottage Grove.

Drainage area.--104 sq mi.

Records available.--October 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers).

Extremes.--Maximum contents during year, 32,440 acre-ft June 16, 17 (elevation, 790.57 ft); minimum, 2,550 acre-ft Nov. 20 (elevation, 748.84 ft).

1942-60: Maximum contents, 34,750 acre-ft May 3, 1949 (elevation, 792.42 ft); minimum since first filling, about 580 acre-ft Nov. 13, 1950 (elevation, about 738.2 ft), from graph based on records of inflow and outflow.

Remarks.--Reservoir is formed by earth-fill dam with concrete spillway completed by Corps of Engineers in 1942; storage began Oct. 31, 1942. Capacity, 32,940 acre-ft between elevations 719.0 (outlet conduit) and 791.0 ft (crest of spillway). Dead storage negligible. Reservoir used for flood control and improvement of navigation below Albany.

Revisions (water years).--WSP 1218: 1950.

Capacity table, water year 1959-60 (elevation, in feet, and contents, in acre-feet)

748	2,330	765	9,820	785	26,330
750	2,890	770	13,120	790	31,790
755	4,590	775	16,870	795	37,700
760	6,960	780	21,380		

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	6,090	3,390	2,970	3,060	5,550	12,160	21,850	27,040	32,180	32,130	29,490	24,470
2	6,010	3,200	2,960	3,060	5,750	12,300	20,940	27,510	32,240	32,130	29,370	24,240
3	5,920	3,100	2,940	3,060	7,180	12,750	20,770	27,640	32,240	32,110	29,260	24,060
4	5,830	3,030	2,920	3,030	7,720	13,720	21,100	28,020	32,240	32,100	29,130	23,930
5	5,730	2,940	2,890	3,010	8,010	16,240	21,380	28,310	32,220	32,060	29,000	23,780
6	5,640	2,890	2,860	2,990	7,900	17,120	21,780	28,740	32,240	32,030	28,870	23,600
7	5,570	2,880	2,840	3,110	8,320	17,970	22,210	29,190	32,270	31,950	28,750	23,400
8	5,440	2,860	2,820	3,350	11,450	18,760	22,600	29,190	32,260	31,860	28,610	23,200
9	6,000	2,840	2,790	3,160	15,900	19,750	22,940	29,210	32,280	31,770	28,480	22,970
10	6,100	2,820	2,760	2,990	16,610	17,570	23,200	29,470	32,340	31,670	28,330	22,560
11	6,140	2,790	2,790	3,180	13,370	15,330	23,620	29,830	32,360	31,590	28,180	22,170
12	6,150	2,770	3,200	3,190	10,750	15,590	23,990	30,270	32,390	31,510	28,070	21,690
13	6,130	2,750	3,410	2,980	10,080	15,920	23,880	30,750	32,390	31,430	27,930	21,160
14	6,090	2,720	3,270	2,910	9,280	16,130	23,600	31,160	32,420	31,330	27,780	20,630
15	6,040	2,690	3,060	2,890	9,330	16,400	23,770	31,540	32,430	31,250	27,660	20,100
16	5,990	2,660	3,000	2,910	9,520	16,610	24,180	31,700	32,440	31,140	27,520	19,590
17	5,900	2,630	3,010	3,290	9,480	16,890	24,720	31,780	32,430	31,050	27,340	19,060
18	5,840	2,600	3,010	3,490	9,490	17,190	24,900	32,030	32,410	30,950	27,140	18,540
19	5,790	2,580	3,000	3,280	9,720	17,370	24,430	32,200	32,360	30,840	26,920	18,020
20	5,730	2,570	2,970	3,080	9,920	17,610	24,170	31,900	32,360	30,700	26,690	17,520
21	5,690	2,690	2,940	3,130	10,150	17,830	24,550	30,850	32,360	30,580	26,490	16,990
22	5,720	2,810	2,890	3,100	10,460	18,060	24,720	31,020	32,360	30,480	26,310	16,480
23	5,650	2,970	2,880	3,280	10,690	18,260	24,840	31,570	32,360	30,390	26,160	15,890
24	5,520	3,060	3,020	3,550	10,930	18,510	25,000	31,790	32,340	30,290	26,000	15,190
25	5,370	3,060	2,880	3,800	11,200	18,750	25,230	31,820	32,310	30,200	25,820	14,510
26	5,200	3,030	2,870	4,040	11,450	18,990	25,480	32,000	32,290	30,090	25,610	13,810
27	4,930	3,010	2,920	4,300	11,640	19,280	25,780	31,710	32,260	29,990	25,410	13,020
28	4,620	3,010	2,910	4,540	11,830	19,670	26,090	31,730	32,230	29,900	25,210	12,290
29	4,300	3,000	2,940	4,770	11,990	20,450	26,440	31,940	32,190	29,790	25,020	11,540
30	3,990	2,990	2,990	5,040	-----	22,020	26,750	31,950	32,150	29,690	24,820	10,800
31	3,670	-----	3,030	5,280	-----	22,070	-----	32,040	-----	29,580	24,640	-----
(†)	752.54	750.38	750.52	756.60	768.37	780.73	785.40	790.22	790.32	788.03	783.35	766.55
(*)	-2,520	-680	+40	+2,250	+6,710	+10,080	+4,680	+5,290	+110	-2,570	-4,940	-13,840

Calendar year 1959..... † +50

Water year 1959-60..... \* +4,610

† Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.

1535. Coast Fork Willamette River below Cottage Grove Dam, Ore.

Location.--Lat 43°43'15", long 123°02'55", in NE $\frac{1}{4}$  sec. 28, T. 21 S., R. 3 W., on right bank at bridge, a quarter of a mile downstream from Cottage Grove Dam and  $\frac{5}{8}$  miles south of Cottage Grove.

Drainage area.--104 sq mi.

Records available.--January 1939 to September 1960. Prior to October 1944, published as "near Cottage Grove."

Gage.--Water-stage recorder. Datum of gage is 711.00 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Jan. 1 to Oct. 12, 1939, staff gage and Oct. 13, 1939, to Sept. 30, 1944, water-stage recorder, at several sites and datums 0.8 mile downstream.

Average discharge.--21 years, 287 cfs (207,800 acre-ft per year), adjusted for storage.

Extremes.--Maximum discharge during year, 3,180 cfs Feb. 11 (gage height, 9.30 ft); minimum, 36 cfs Nov. 8-20.

1939-60: Maximum discharge, 3,460 cfs May 4, 1949 (gage height, 9.75 ft); practically no flow July 5-7, 1945, Aug. 24, 1947.

Remarks.--Records excellent except those for period of backwater from brush, which are good. Flow regulated since 1942 by Cottage Grove Reservoir (see preceding page). No diversion above station.

Revisions (water years).--WSP 1448: 1949(M).

Rating tables, water year 1959-60, except period of backwater from brush (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 11

Feb. 12 to Sept. 30

2.7	33	4.0	295	2.9	50	4.0	295
3.0	69	6.0	1,120	3.1	73	6.0	1,120
3.5	155	9.0	2,980	3.5	144	9.0	2,980

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	171	43	68	72	64	1,480	59	209	58	65	*105
2	65	124	43	68	72	64	1,480	*59	209	51	65	105
3	65	88	43	68	260	64	830	59	206	51	69	105
4	65	88	43	68	362	494	407	60	206	51	74	105
5	65	86	43	68	*459	607	302	61	162	51	74	105
6	65	55	43	69	579	1,070	167	63	133	57	74	105
7	65	37	42	69	583	1,500	90	354	*133	68	73	105
8	65	36	41	270	611	1,500	90	503	133	69	73	105
9	65	36	41	400	659	1,520	90	365	107	69	73	131
10	65	36	41	306	1,260	2,350	90	144	90	69	73	230
11	65	36	41	198	2,610	1,970	89	65	90	68	73	230
12	65	*36	41	278	2,080	619	90	65	90	68	73	278
13	65	36	112	334	926	619	387	65	90	68	73	309
14	65	36	209	212	912	619	727	65	92	68	73	308
15	65	36	206	153	667	623	727	65	93	68	73	302
16	65	36	117	153	551	623	475	224	92	68	73	298
17	65	36	64	376	551	467	316	309	90	68	93	298
18	65	36	64	587	432	379	410	309	90	68	107	295
19	65	36	64	583	230	379	739	309	90	69	109	295
20	65	36	64	451	191	292	655	1,050	76	69	109	292
21	65	38	*64	264	142	*233	495	1,580	66	65	109	292
22	65	38	64	260	86	176	495	870	66	*63	109	292
23	97	38	52	132	84	142	418	351	66	63	109	340
24	115	50	186	70	76	105	320	475	66	64	109	396
25	113	70	393	70	61	89	236	555	65	64	109	396
26	113	70	209	70	61	89	191	1,180	64	65	107	421
27	160	60	115	70	61	89	118	1,060	64	65	107	451
28	180	44	113	70	63	89	89	643	64	65	107	447
29	180	44	85	70	63	90	70	410	65	65	107	443
30	178	43	66	72	-----	668	50	410	65	65	107	435
31	173	-----	68	72	-----	1,300	-----	281	-----	65	107	-----
Total	2,739	1,612	2,618	5,999	14,764	18,893	12,113	11,868	3,132	1,985	2,756	8,017
Mean	88.4	53.7	90.9	194	509	609	404	383	104	64.0	88.9	267
Ac-ft	5,430	3,200	5,590	11,900	29,280	37,470	24,030	23,540	6,210	3,940	5,470	15,900

Adjusted for change in contents of Cottage Grove Reservoir

Mean	47.3	42.3	91.6	230	626	773	482	469	106	22.3	8.62	34.6
Cfsm	0.455	0.407	0.881	2.21	6.02	7.43	4.63	4.51	1.02	0.214	0.083	0.333
In.	0.52	0.45	1.02	2.55	6.49	8.57	5.18	5.20	1.14	0.25	0.10	0.37
Ac-ft	2,910	2,520	5,630	14,150	35,990	47,550	28,710	28,830	6,320	1,370	530	2,060

Observed

Calendar year 1959: Max	2,400	Min	36	Mean	201	Ac-ft	145,700
Water year 1959-60: Max	2,610	Min	36	Mean	237	Ac-ft	172,000

Adjusted

Calendar year 1959: Mean	201	Cfsm	1.93	In.	26.25	Ac-ft	145,700
Water year 1959-60: Mean	243	Cfsm	2.34	In.	31.84	Ac-ft	176,600

\* Discharge measurement made on this day.

Note.--Backwater from brush Oct. 1 to Feb. 10.

1545. Row River above Pitcher Creek, near Dorena, Oreg.

Location.--Lat 43°44'10", long 122°52'20", in NE $\frac{1}{4}$  sec.24, T.21 S., R.2 W., on right bank 0.5 mile upstream from Pitcher Creek and 1.2 miles northwest of Dorena.

Drainage area.--211 sq mi.

Records available.--September 1935 to September 1960. Prior to October 1949, published as Row River at Star.

Gage.--Water-stage recorder. Datum of gage is 856.16 ft above mean sea level, datum of 1929. Prior to Oct. 18, 1938, staff gage at site 450 ft upstream at datum 1.00 ft higher.

Average discharge.--25 years, 599 cfs (433,700 acre-ft per year).

Extremes.--Maximum discharge during year, 6,220 cfs Feb. 8 (gage height, 8.86 ft); minimum, 14 cfs Sept. 30.

1935-60: Maximum discharge, 19,600 cfs Dec. 28, 1945 (gage height, 14.33 ft), from rating curve extended above 9,300 cfs; minimum, 10 cfs Sept. 24, 25, 1951, Oct. 7, 8, 1958.

Remarks.--Records excellent except those for period of shifting control, which are good. Occasional regulation caused by upstream logponds. No diversion above station.

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 Feb. 8

Feb. 9 to Sept. 30

1.9	35	5.0	1,080	1.6	10	4.0	530
2.5	109	6.0	1,880	1.9	34	5.0	1,110
3.0	195	7.0	3,050	2.4	94	6.0	1,930
3.5	330	9.0	6,500	3.0	210	7.0	3,050
4.0	520			3.5	350	9.0	6,500

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	67	73	98	182	595	293	3,980	625	518	77	33	30
2	56	69	90	160	1,120	287	3,250	675	470	71	31	*34
3	50	82	96	146	912	486	2,300	625	*422	67	29	32
4	47	130	85	130	1,230	2,780	1,680	734	377	65	29	50
5	44	97	80	126	*1,280	3,520	1,280	716	344	66	29	52
6	42	82	73	132	1,090	3,020	1,020	655	314	63	30	37
7	49	77	70	325	2,260	4,760	848	1,280	281	59	28	31
8	366	68	68	1,000	4,990	3,430	728	1,190	252	56	27	29
9	1,020	64	64	685	4,630	2,830	610	920	232	55	27	25
10	448	61	63	471	2,940	1,780	490	758	220	54	26	24
11	315	57	76	550	1,630	1,380	498	665	208	54	26	25
12	259	56	289	475	1,170	1,310	498	938	190	53	26	23
13	187	*54	411	367	980	1,940	506	1,170	179	52	26	23
14	143	50	273	312	1,020	1,700	908	1,030	177	50	25	20
15	112	49	294	265	1,860	1,440	1,200	824	235	47	25	21
16	94	54	279	256	1,590	1,540	1,190	866	183	46	25	23
17	82	52	285	919	1,140	1,310	1,240	968	167	44	24	21
18	73	49	223	1,570	898	1,420	1,280	1,400	149	42	24	21
19	69	52	180	1,030	704	1,510	1,240	1,510	139	42	24	19
20	74	53	156	858	575	1,430	1,260	2,450	123	41	24	19
21	85	240	137	804	522	1,280	1,650	2,980	115	*41	24	19
22	356	462	124	798	502	*1,110	1,290	1,960	108	39	32	16
23	246	870	114	816	454	944	1,010	1,500	103	38	56	16
24	174	498	329	906	414	818	830	1,180	98	37	72	19
25	156	324	805	906	404	704	746	1,030	94	36	61	19
26	135	228	403	990	407	635	686	1,560	91	36	39	20
27	114	178	306	840	368	670	*670	1,600	84	35	33	19
28	114	148	279	700	344	830	764	1,130	80	34	30	18
29	96	127	*259	864	320	1,060	740	890	77	32	28	16
30	82	112	251	918	-----	3,320	675	722	76	33	24	15
31	77	-----	218	695	-----	2,750	-----	610	-----	33	23	-----
Total	5,212	4,516	6,258	19,196	36,347	52,287	35,027	34,961	6,106	1,498	960	736
Mean	168	151	202	619	1,233	1,687	1,168	1,128	204	48.3	31.0	24.5
Cfs/m	0.796	0.716	0.957	2.93	5.94	8.00	5.54	5.35	0.967	0.229	0.147	0.116
In.	0.92	0.80	1.10	3.38	6.41	9.22	6.17	6.16	1.08	0.26	0.17	0.13
Ac-ft	10,340	8,960	12,410	38,070	72,080	103,700	69,480	69,340	12,110	2,970	1,900	1,460

Calendar year 1959: Max 5,160 Min 19 Mean 401 Cfs/m 1.90 In. 25.82 Ac-ft 290,600  
 Water year 1959-60: Max 4,990 Min 15 Mean 555 Cfs/m 2.63 In. 35.80 Ac-ft 402,800

Peak discharge (base, 7,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Shifting-control method used Aug. 23 to Sept. 30.

1550. Dorena Reservoir near Cottage Grove, Oreg.

Location.--Lat 43°47'10", long 122°57'15", in SE 1/4 sec.32, T.20 S., R.2 W., on left side of Dorena Dam on Row River, 5 miles east of Cottage Grove.

Drainage area.--265 sq mi.

Records available.--October 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers).

Extremes.--Maximum contents during year, 75,380 acre-ft May 21 (elevation, 833.87 ft); minimum, 6,550 acre-ft Jan. 10 (elevation, 769.63 ft).  
1949-60: Maximum contents, 84,060 acre-ft Dec. 23, 1955 (elevation, 838.37 ft); minimum since first filling, 635 acre-ft Sept. 23, 1958 (elevation, 749.00 ft).

Remarks.--Reservoir is formed by earth-fill dam with concrete outlet and spillway, completed in 1949 by Corps of Engineers; storage began Oct. 11, 1949. Capacity, 77,510 acre-ft between elevations 739.0 (sill of outlet gates) and 835.0 ft (crest of spillway). Dead storage, 8 acre-ft below elevation 739.0 ft. Reservoir used for flood control and improvement of navigation. Capacity table furnished by Corps of Engineers. Figures given herein represent total contents.

Capacity table, water year 1959-60 (elevation, in feet, and contents, in acre-feet)

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	Sept.
1	14,750	9,310	7,580	7,830	13,340	29,320	52,160	61,520	72,280	72,390	57,610
2	14,680	8,630	7,400	7,870	14,150	28,870	51,080	62,210	72,650	72,340	56,370
3	14,560	8,580	7,240	7,470	14,580	29,480	48,960	62,890	73,150	72,230	55,180
4	14,440	8,240	7,170	7,250	15,740	31,140	48,430	63,770	73,570	72,170	53,820
5	14,310	8,050	7,160	7,160	16,490	36,140	49,470	64,580	73,910	72,080	52,650
6	14,200	7,890	7,140	7,190	16,580	39,680	49,360	65,430	74,170	71,950	51,680
7	14,190	7,870	7,100	7,660	17,100	44,890	51,620	67,120	74,300	71,840	50,700
8	14,910	7,630	7,050	8,370	22,950	47,330	52,210	67,980	74,450	71,730	49,710
9	18,540	7,750	7,000	7,070	30,850	48,510	52,590	67,810	74,540	71,580	48,700
10	17,690	7,680	6,940	6,870	30,480	45,060	53,100	66,860	74,630	71,480	47,750
11	18,190	7,590	6,950	7,370	28,280	39,820	53,910	67,140	74,690	71,370	46,780
12	18,540	7,500	7,790	7,370	24,090	35,680	54,680	68,210	74,750	71,220	45,820
13	18,750	7,400	8,260	7,280	22,620	36,010	54,400	69,240	74,750	71,090	44,850
14	18,860	7,300	7,950	7,330	21,810	36,790	53,680	69,720	74,760	70,950	43,880
15	18,900	7,190	7,670	7,240	22,470	37,970	54,100	69,740	74,880	70,690	42,940
16	18,910	7,130	7,330	7,240	22,590	39,660	56,010	70,220	74,900	70,420	42,040
17	18,900	7,100	7,180	8,710	21,900	40,660	57,330	71,180	74,860	70,080	41,140
18	18,790	7,070	7,040	10,140	22,030	41,810	56,830	72,810	74,760	69,670	40,270
19	18,550	7,050	7,140	10,070	22,570	43,040	55,510	74,020	74,620	69,190	39,590
20	18,290	7,070	7,340	9,490	23,140	44,080	55,520	75,310	74,500	68,640	38,550
21	17,970	7,070	7,480	8,700	23,570	44,730	57,090	74,200	74,350	67,750	37,650
22	17,690	6,280	7,580	7,940	24,100	44,980	57,330	73,280	74,190	67,330	36,910
23	17,220	6,630	7,680	8,120	24,780	44,910	56,890	72,240	74,020	66,800	36,140
24	16,660	10,120	8,180	8,880	25,390	44,510	56,510	70,460	73,810	65,880	35,460
25	15,940	10,060	8,910	9,570	26,030	44,220	57,080	69,280	73,610	65,110	34,730
26	15,180	9,730	8,950	9,940	26,680	44,430	58,060	70,320	73,370	64,300	33,930
27	14,210	9,270	8,690	10,150	27,180	44,970	59,210	71,110	73,160	63,390	33,130
28	13,360	8,750	8,350	10,740	27,650	45,850	60,000	71,240	72,920	62,310	32,520
29	12,390	8,180	7,930	11,800	28,000	47,280	60,520	71,460	72,740	61,150	31,510
30	11,330	7,750	7,680	12,560	-----	51,320	60,990	71,550	72,500	59,940	30,710
31	10,340	-----	7,900	12,770	-----	51,220	-----	71,910	-----	58,760	29,910
(†)	776.62	772.00	772.28	780.60	799.60	819.24	825.67	832.00	832.32	824.28	801.50
(‡)	-4,490	-2,590	+150	+4,870	+15,230	+23,220	+8,770	+10,920	+590	-13,740	-28,650
Calendar year 1959..... ‡ -850											
Water year 1959-60..... ‡ -1,030											

† Elevation, in feet, at end of month.

‡ Change in contents, in acre-feet.

1555. Row River near Cottage Grove, Oreg.

Location.--Lat 43°47'35", long 122°59'25", in NE $\frac{1}{4}$  sec.36, T.20 S., R.3 W., on right bank 1.7 miles upstream from Mosby Creek, 2.1 miles downstream from Dorena Dam, and 3.5 miles east of Cottage Grove.

Drainage area.--270 sq mi.

Records available.--January 1939 to September 1960. Prior to October 1947, published as "near Dorena."

Gage.--Water-stage recorder. Datum of gage is 685.24 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Oct. 13, 1939, staff gage at site 180 ft upstream at datum 1.00 ft higher.

Average discharge.--21 years, 762 cfs (551,700 acre-ft per year), adjusted for storage.

Extremes.--Maximum discharge during year, 5,140 cfs Mar. 10 (gage height, 8.52 ft); minimum daily, 75 cfs Nov. 17, 18.  
1939-60: Maximum discharge, 21,400 cfs Dec. 28, 1945 (gage height, 18.20 ft); minimum daily, 0.2 cfs Sept. 25 to Oct. 7, 1958.

Remarks.--Records excellent except those for period of shifting control, which are good. Flow regulated since October 1949 by Dorena Reservoir (see preceding page). No diversion above station.

Rating table, water year 1959-60, except period of shifting control (gage height, in feet, and discharge, in cubic feet per second)

1.7	57	4.0	1,120
2.0	135	5.0	1,750
2.5	320	7.0	3,450
3.0	560	9.0	5,800

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	115	650	207	293	435	204	4,320	465	450	147	620	440
2	115	414	204	288	e852	207	4,460	425	392	124	630	*435
3	115	228	204	284	e863	207	3,750	425	*267	124	630	435
4	115	228	144	284	e766	2,230	2,270	425	228	121	680	430
5	113	224	110	221	*e1,020	2,090	1,020	425	228	121	610	430
6	110	160	110	178	e1,230	2,170	535	430	228	121	525	425
7	110	110	110	288	e2,270	3,080	535	790	228	121	520	425
8	113	110	110	1,000	2,700	3,150	535	1,010	218	115	520	420
9	115	110	110	1,560	1,680	3,180	535	1,320	214	113	520	396
10	118	110	110	613	2,770	4,200	351	1,310	214	113	515	132
11	118	107	110	575	4,320	4,620	235	650	214	113	515	127
12	118	*107	118	710	3,740	3,820	235	565	214	113	510	221
13	118	107	406	625	1,960	2,410	718	826	214	113	510	329
14	118	107	550	440	1,700	1,730	1,460	958	214	113	505	324
15	118	107	545	440	1,810	1,310	1,310	958	214	156	505	324
16	118	96	545	445	1,830	1,090	549	784	214	179	505	320
17	118	75	415	982	1,730	1,130	820	705	207	204	485	320
18	118	75	356	1,490	1,030	1,110	1,700	892	207	221	475	316
19	124	78	186	1,500	625	1,120	2,140	976	207	267	475	316
20	211	78	107	1,460	545	1,120	1,460	2,270	297	302	470	316
21	367	80	107	1,460	450	1,130	1,190	4,130	207	*338	470	306
22	555	270	107	1,430	352	*1,130	1,430	2,910	210	356	470	306
23	595	363	107	967	239	1,130	1,520	2,290	210	370	465	247
24	590	396	216	740	200	1,130	1,120	2,280	210	383	465	190
25	575	450	455	760	200	958	645	1,840	210	420	460	190
26	570	465	555	1,010	200	640	347	1,550	210	435	450	190
27	645	480	555	940	200	520	*439	1,550	204	480	450	190
28	680	456	550	585	200	520	430	1,370	200	545	450	190
29	670	455	*545	490	200	530	605	970	200	595	450	190
30	660	347	374	693	-----	1,760	580	832	200	610	445	190
31	645	-----	293	747	-----	3,460	-----	585	-----	610	440	-----
Total	8,990	7,022	8,623	23,716	36,117	53,086	37,124	36,916	6,840	8,143	15,740	9,070
Cfsm	290	234	278	765	1,245	1,712	1,237	1,911	228	263	508	302
Ac-ft	17,830	13,930	17,100	47,040	71,640	105,300	73,630	73,220	13,570	16,150	31,220	17,990

Adjusted for change in contents in Dorena Reservoir

Mean	217	191	281	844	1,510	2,090	1,402	1,368	238	39.2	38.5	31.6
Cfsm	0.804	0.707	1.04	3.13	5.59	7.74	5.19	5.07	0.881	0.145	0.143	0.117
In.	0.93	0.79	1.20	3.60	6.03	8.92	5.79	5.84	0.98	0.17	0.16	0.13
Ac-ft	13,340	11,340	17,250	51,910	86,870	128,500	83,400	84,140	14,160	2,410	2,370	1,880

Observed

Calendar year 1959: Max	4,700	Min	75	Mean	517	Ac-ft	374,000
Water year 1959-60: Max	4,620	Min	75	Mean	687	Ac-ft	498,600

Adjusted

Calendar year 1959: Mean	515	Cfsm	1.91	In.	25.93	Ac-ft	373,200
Water year 1959-60: Mean	685	Cfsm	2.54	In.	34.54	Ac-ft	497,600

\* Discharge measurement made on this day.

e Shifting-control method used.

1565. Mosby Creek at mouth, near Cottage Grove, Oreg.

Location--Lat 43°46'35", long 122°59'55", in N $\frac{1}{2}$  sec.1, T.21 S., R.3 W., on left bank 1.0 mile upstream from mouth and 3.5 miles southeast of Cottage Grove.

Drainage area--96 sq mi, approximately.

Records available--September 1946 to September 1960. Monthly discharge only for September 1946, published in WSP 1318.

Gage--Water-stage recorder. Datum of gage is 676.62 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (Corps of Engineers bench mark).

Average discharge--14 years, 254 cfs (183,900 acre-ft per year).

Extremes--Maximum discharge during year, 2,510 cfs Feb. 8 (gage height, 5.56 ft); minimum, 4.7 cfs Sept. 24, 29, 30.

1946-60: Maximum discharge, 7,160 cfs Oct. 28, 1950 (gage height, 10.82 ft), from rating curve extended above 4,100 cfs by logarithmic plotting; minimum, 4 cfs Sept. 13-15, 1951.

Remarks--Records excellent except those for periods of backwater, which are good. No regulation. Small diversions for irrigation above station.

Rating tables, water year 1959-60, except periods of backwater from cobblestone dam, debris, or moss (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 21

Nov. 22 to Feb. 8

Feb. 9 to Sept. 30

1.1	10	1.5	55	1.27	19	2.0	173	1.0	4.7	1.7	88
1.2	18	1.8	124	1.3	22	2.5	380	1.1	9.4	2.0	173
1.3	27	2.2	253	1.5	49	3.0	660	1.2	16	2.5	380
				1.7	88	6.0	2,860	1.3	25	3.0	660
								1.5	51	6.0	2,860

Discharge, in cubic 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	22	31	65	153	88	1,330	137	160	40	8.8	13
2	12	21	30	58	532	84	983	126	134	38	8.3	*15
3	13	23	31	56	430	173	678	*126	118	36	8.3	14
4	12	53	28	49	*556	1,060	490	180	102	36	8.3	20
5	12	35	24	46	584	1,680	350	170	93	35	8.3	21
6	12	28	23	48	490	1,370	269	156	*82	32	8.3	15
7	*13	25	22	130	774	1,800	219	424	78	29	8.3	13
8	80	21	21	518	2,040	1,490	176	391	73	28	7.8	12
9	246	20	20	330	*2,250	1,640	153	285	69	28	7.3	11
10	127	19	19	219	1,340	983	134	223	67	26	7.3	9.4
11	80	18	30	312	720	660	150	173	65	25	7.3	9.4
12	65	*17	217	294	496	550	170	190	64	24	7.8	9.4
13	49	17	253	219	396	600	170	269	62	24	7.8	9.4
14	35	17	140	166	350	562	413	265	61	23	7.3	8.3
15	30	17	107	132	572	518	630	226	65	23	7.8	7.8
16	28	17	88	137	572	523	606	234	62	22	8.3	5.8
17	23	17	75	725	424	430	484	261	61	21	8.3	5.8
18	21	17	62	886	316	370	418	380	57	20	7.8	5.8
19	20	18	49	505	241	340	402	360	56	20	7.8	5.8
20	24	20	43	345	187	290	430	708	53	15	7.3	5.4
21	30	117	38	273	166	*253	572	1,040	51	*15	7.8	5.0
22	82	129	34	234	147	215	534	726	50	15	10	5.0
23	69	170	*33	198	132	180	408	540	48	14	14	5.0
24	50	118	169	187	118	153	298	430	48	13	19	5.0
25	44	84	303	176	115	134	253	370	47	13	20	5.4
26	41	65	204	180	118	123	238	781	47	13	15	5.8
27	32	54	134	176	107	137	208	810	45	12	13	6.8
28	30	46	105	170	98	204	180	528	43	11	11	7.3
29	29	38	86	170	93	273	170	360	41	10	11	5.0
30	26	34	82	204	-----	1,370	153	265	40	9.4	10	5.0
31	23	75	180	-----	-----	1,170	-----	208	-----	9.4	9.4	-----
Total	1,372	1,297	2,576	7,389	14,517	19,423	11,342	2,042	679.8	298.7	271.6	
Mean	44.3	43.2	83.1	238	501	627	389	68.1	21.9	9.64	9.05	
Cfsm	0.461	0.450	0.866	2.48	5.22	6.53	4.05	3.66	0.709	0.228	0.100	0.094
In.	0.53	0.50	1.00	2.86	5.62	7.52	4.52	4.39	0.79	0.26	0.12	0.11
Ac-ft	2,720	2,570	5,110	14,660	28,790	38,520	23,150	22,500	4,050	1,350	592	539

Calendar year 1959: Max 2,300 Min 5.6 Mean 160 Cfsm 1.67 In. 22.66 Ac-ft 116,100  
 Water year 1959-60: Max 2,250 Min 5.0 Mean 199 Cfsm 2.07 In. 28.22 Ac-ft 144,600

Peak discharge (base, 2,500 cfs)--Feb. 8 (3:30 p.m.) 2,510 cfs (5.56 ft).

\* Discharge measurement made on this day.

Note.--Backwater from cobblestone dam or debris Oct. 1 to Nov. 21, and from moss June 1 to Aug. 23.

1575. Coast Fork Willamette River near Goshen, Oreg.

Location (revised).--Lat 43°58'50", long 122°57'55", in NW $\frac{1}{4}$  sec. 29, T.18 S., R.2 W., on right bank at downstream side of bridge on State Highway 58, 2.5 miles southeast of Goshen and  $\frac{6}{8}$  miles upstream from confluence with Middle Fork.

Drainage area.--642 sq mi.

Records available.--August 1905 to February 1912, October 1950 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 473.80 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Feb. 7, 1912, staff gage at site 600 ft upstream at different datum.

Average discharge.--16 years (1905-11, 1950-60), 1,761 cfs (1,275,000 acre-ft per year).

Extremes.--Maximum discharge during year, 11,900 cfs Feb. 8 (gage height, 11.52 ft); minimum, 143 cfs Nov. 18, 20.

1905-12, 1950-60: Maximum discharge, 58,500 cfs Nov. 22, 1909 (gage height, 19.5 ft, site and datum then in use, from graph based on gage readings), from rating curve extended above 15,000 cfs by logarithmic plotting; minimum, 36 cfs Sept. 29, 30, Oct. 11, 12, 1908.

Remarks.--Records excellent except those for period of backwater from moss, which are good. Flow regulated by Cottage Grove Reservoir (see p. 116) and Dorena Reservoir (see p. 119). Only small diversions for irrigation above station.

Revisions (water years).--WSP 1218: Drainage area. WSP 1248: 1905-12.

Rating tables, water year 1959-60, except period of backwater from moss (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 1

Apr. 2 to Sept. 30

1.9	115	5.0	2,200	2.1	190	6.0	3,150
2.4	350	7.0	4,370	3.0	680	10.0	8,940
3.0	650	11.0	10,800	4.0	1,390		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	202	860	320	500	1,060	530	8,690	1,040	1,230	320	687	614
2	202	769	285	485	2,090	520	8,170	897	1,130	245	708	614
3	194	400	285	470	2,430	937	6,740	911	1,020	225	715	626
4	194	390	270	455	2,880	3,480	4,270	1,090	820	225	743	626
5	194	385	202	450	2,940	8,530	2,520	1,000	743	*220	785	626
6	194	355	190	345	3,130	7,600	1,610	981	638	215	620	620
7	198	226	190	519	4,450	*10,100	1,310	2,240	608	225	614	614
8	245	202	*186	2,060	8,860	9,230	1,240	2,580	578	225	602	608
9	410	202	186	3,010	9,590	10,700	1,190	2,380	554	225	596	602
10	400	194	182	2,050	7,770	8,800	1,030	2,310	506	220	596	512
11	300	190	198	1,480	8,450	9,640	848	1,380	476	225	596	400
12	265	186	346	1,830	8,850	6,400	890	1,170	470	230	596	430
13	240	186	797	1,650	4,570	5,210	1,050	1,410	458	235	596	874
14	222	186	1,040	1,250	3,980	3,890	2,970	1,660	452	240	596	674
15	214	186	965	1,000	3,780	3,600	3,340	1,570	464	240	590	668
16	206	182	898	1,120	3,900	3,150	2,550	1,550	458	280	584	662
17	206	158	671	3,120	3,370	2,860	1,980	1,610	464	290	584	656
18	202	146	530	4,460	2,780	2,500	2,620	1,900	440	305	596	644
19	198	154	460	3,500	1,810	2,410	*3,720	1,970	440	310	596	638
20	226	146	270	*3,000	1,350	2,280	3,420	3,370	435	370	596	*626
21	390	182	260	2,510	1,250	2,070	2,960	7,920	410	390	596	620
22	596	340	255	2,340	1,030	1,990	3,090	5,690	410	430	*596	614
23	727	560	250	1,950	839	1,860	2,890	3,920	410	440	608	608
24	748	545	450	1,380	892	1,800	2,450	3,720	410	458	620	590
25	727	548	1,400	1,330	644	1,610	1,860	3,530	405	464	620	578
26	713	584	1,300	1,490	644	1,290	1,370	5,190	405	512	608	584
27	*769	565	979	1,740	596	1,090	1,070	5,300	400	518	608	638
28	923	530	895	1,440	572	1,210	1,150	3,560	380	584	596	626
29	916	520	839	1,130	548	1,290	1,290	2,370	355	632	590	620
30	888	500	685	1,210	-----	5,840	1,230	*2,060	340	674	590	602
31	874	-----	542	1,470	-----	7,020	-----	1,670	-----	680	596	-----
Total	12,983	10,581	16,316	50,704	94,855	129,437	79,618	77,949	16,309	10,852	19,218	18,214
Mean	419	353	526	1,636	3,271	4,175	2,654	2,514	544	350	620	607
Ac-ft	25,750	20,990	32,360	100,600	188,100	256,700	157,900	154,600	32,350	21,520	38,120	36,130
Calendar year 1959: Max				11,200	Min	146	Mean	1,168	Ac-ft	845,900		
Water year 1959-60: Max				10,700	Min	146	Mean	1,467	Ac-ft	1,065,000		

\* Discharge measurement made on this day.

Note.--Backwater from moss Oct. 1-21.

1585. McKenzie River at outlet of Clear Lake, Oreg.

Location.--Lat 42°21'40", long 121°59'40", in SE $\frac{1}{4}$  sec. 8, T.14 S., R.7 E., on west bank of Clear Lake in narrow channel, 150 ft upstream from outlet and at mile 85.9 (river-profile survey).

Drainage area.--101 sq mi.

Records available.--June 1912 to September 1915, October 1947 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 3,015.32 ft above mean sea level (levels by Eugene Water and Electric Board). June 20, 1912, to July 31, 1915, float gage at site 1 mile north at different datum.

Average discharge.--16 years, 490 cfs (354,700 acre-ft per year).

Extremes.--Maximum discharge during year, 1,550 cfs Apr. 7 (gage height, 5.24 ft), affected by release of logjam at lake outlet; minimum, 206 cfs Jan. 24-28, 1912-15, 1947-60: Maximum discharge, 2,970 cfs Dec. 22, 1955 (gage height, 7.66 ft), from rating curve extended above 1,500 cfs by logarithmic plotting; minimum daily, 160 cfs Sept. 29, 30, 1915.

Remarks.--Records excellent except those for period of backwater from debris, which are fair. Flow regulated by natural storage in lake. At high stages an undetermined flow enters numerous sinkholes in lava rock along south edge of lake above station.

Revisions (water years).--WSP 1124: Drainage area. WSP 1288: 1949. WSP 1318: 1915(m).

Rating tables, water year 1959-60, except period of backwater from debris (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 7		Apr. 7 to Sept. 30	
1.5	200	1.5	200
2.0	275	2.0	305
3.5	600	3.0	590
5.2	1,150	4.0	970
		4.5	1,180

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	304	360	400	251	224	*346	892	551	790	404	305	254
2	300	354	398	248	236	338	923	572	782	401	302	252
3	294	356	394	244	239	334	958	575	786	398	298	250
4	282	348	386	240	245	328	976	569	770	395	295	250
5	272	340	380	*238	250	326	1,020	560	742	392	292	248
6	266	332	372	258	254	324	1,050	566	722	*392	290	246
7	260	326	364	256	275	328	1,120	638	690	389	288	244
8	264	320	358	258	320	334	1,060	682	650	389	285	242
9	272	314	348	232	370	334	942	662	629	386	280	240
10	275	304	340	250	414	328	874	686	611	383	278	240
11	296	294	338	230	446	326	*838	754	593	380	276	238
12	312	286	338	227	470	330	810	850	575	375	*272	236
13	322	278	320	224	488	332	790	870	557	372	270	234
14	330	270	306	222	542	334	806	826	548	370	268	232
15	340	266	296	221	595	336	774	794	551	368	268	230
16	350	262	287	220	585	334	726	798	542	365	266	230
17	354	254	281	218	565	330	702	790	524	362	264	228
18	352	251	278	216	558	326	682	774	506	358	264	226
19	348	251	276	218	540	324	662	750	491	355	264	*224
20	*356	246	274	212	512	322	666	810	485	350	264	224
21	348	257	272	210	488	324	678	874	473	348	264	222
22	344	263	269	209	458	328	641	826	467	345	264	220
23	338	284	268	208	438	342	614	*794	458	340	264	220
24	342	304	272	208	426	366	593	778	452	338	262	218
25	354	340	269	206	418	394	578	762	452	335	260	216
26	360	368	264	206	400	460	566	790	434	330	260	216
27	364	384	263	206	384	650	557	834	425	325	260	214
28	368	396	260	208	360	821	551	818	419	320	258	214
29	368	398	258	208	358	884	545	802	413	318	256	212
30	366	*400	257	210	-----	1,030	542	798	407	312	256	210
31	362	-----	254	216	-----	944	-----	798	-----	310	256	-----
Total	10,083	9,406	9,640	6,898	11,858	13,157	23,138	22,951	16,944	11,205	8,449	6,930
Mean	325	314	311	223	409	424	771	740	565	361	273	231
Cfs/m	3.22	3.11	3.08	2.21	4.05	4.20	7.65	7.33	5.59	3.57	2.70	2.29
In.	3.71	3.46	3.55	2.54	4.37	4.84	8.52	8.45	6.24	4.13	3.11	2.55
Ac-ft	19,960	18,660	19,120	13,680	23,520	26,100	45,890	45,520	33,610	22,220	16,760	13,750

Calendar year 1959: Max 982 Min 208 Mean 411 Cfs/m 4.07 In. 55.22 Ac-ft 297,400  
 Water year 1959-60: Max 1,120 Min 226 Mean 412 Cfs/m 4.08 In. 55.47 Ac-ft 298,800

\* Discharge measurement made on this day.

Note.--Backwater from debris Feb. 7 to Mar. 28.

1587. McKenzie River near Belknap Springs, Oreg.

Location.--Lat 44°20'15", long 122°00'20", in SW $\frac{1}{4}$  sec.20, T.14 S., R.7 E., on left bank at outlet of Beaver Marsh, 2 miles upstream from Lower Falls, 10 miles north of town of Belknap Springs, and at mile 84.0 (river profile survey).

Drainage area.--143 sq mi.

Records available.--October 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,602.36 ft above mean sea level (levels by Eugene Water and Electric Board).

Extremes.--Maximum discharge during year, 1,520 cfs Apr. 8 (gage height, 3.15 ft), affected by release of log jam at outlet of Clear Lake; minimum daily, 367 cfs Jan. 22-23.  
1957-60: Maximum discharge, 1,620 cfs Feb. 16, 1958 (gage height, 3.34 ft); minimum, 359 cfs Nov. 3, 1958.

Remarks.--Records excellent except those for period of shifting control, which are good. No regulation or diversion above station.

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 Apr. 7				Apr. 8 to Sept. 30			
0.6	360	0.6	390				
1.0	510	1.0	520				
2.5	1,200	2.7	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	474	550	550	416	381	*522	980	732	990	596	516	462
2	470	528	550	412	395	514	1,010	752	980	592	512	462
3	466	528	546	409	398	510	1,040	760	985	592	508	462
4	454	518	542	406	402	510	1,060	752	975	588	504	459
5	446	510	534	*406	409	510	1,080	740	945	588	500	450
6	438	506	530	402	416	510	1,140	748	920	*584	500	447
7	430	498	522	398	438	510	1,200	820	885	580	500	444
8	438	494	518	398	478	514	1,280	870	840	580	496	444
9	450	486	510	395	514	510	1,180	860	815	576	496	444
10	450	478	502	388	546	510	1,110	875	788	576	496	438
11	478	470	498	392	566	510	*1,050	940	772	576	496	438
12	486	462	498	388	578	510	1,020	1,040	756	572	*496	438
13	494	454	486	384	594	514	990	1,060	740	568	496	438
14	502	442	474	384	630	514	1,020	1,030	728	564	492	435
15	510	438	466	381	674	514	980	995	736	564	492	429
16	514	430	458	378	670	514	925	995	724	564	492	429
17	514	423	450	378	654	510	900	990	712	564	484	426
18	514	420	450	378	650	510	880	975	692	560	480	426
19	514	420	446	378	638	506	865	950	676	556	477	*426
20	*518	416	442	370	622	506	870	1,020	672	556	477	423
21	514	426	442	370	606	510	880	1,090	664	556	477	420
22	522	438	438	367	590	514	835	1,040	656	552	480	420
23	518	458	434	367	578	522	805	*1,000	652	548	474	420
24	518	478	442	367	570	538	780	985	644	544	474	417
25	526	506	438	367	566	550	764	970	636	540	471	414
26	534	530	430	367	558	590	752	990	628	536	471	414
27	538	548	430	367	546	898	740	1,040	620	532	471	414
28	542	554	426	367	538	820	736	1,030	616	528	471	414
29	542	554	423	367	530	885	728	1,000	608	520	471	411
30	538	*554	420	370	-----	1,090	724	1,000	600	520	471	411
31	534	-----	420	374	-----	1,040	-----	1,000	-----	516	468	-----
Total	15,386	14,491	14,715	11,891	15,735	17,985	28,304	29,069	22,655	17,388	15,109	12,975
Mean	496	463	475	384	543	580	945	938	755	551	487	452
Cfs/m	3.47	3.38	3.32	2.69	3.80	4.06	6.59	6.56	5.28	3.92	3.41	3.02
In.	4.00	3.77	3.83	3.09	4.09	4.68	7.36	7.56	5.89	4.52	3.93	3.37
Ac-ft	30,520	28,740	29,190	23,590	31,210	35,670	56,140	57,660	44,940	34,490	29,970	25,740
Calendar year 1959: Max	1,140	Min	395	Mean	575	Cfs/m	4.02	In.	54.59	Ac-ft	416,200	
Water year 1959-60: Max	1,280	Min	367	Mean	589	Cfs/m	4.12	In.	56.09	Ac-ft	427,900	

\* Discharge measurement made on this day.

Note.--Shifting-control method used July 11 to Sept. 14.

1588. Smith River near Belknap Springs, Oreg.

Location.--Lat 44°16'35", long 122°02'55", T.15 S., R.6 E. (unsurveyed), on right bank 1,000 ft upstream from mouth and 6 miles north of town of Belknap Springs.

Drainage area.--23.7 sq mi.

Records available.--October 1957 to September 1960 (discontinued).

Gage.--Water-stage recorder. Datum of gage is 2,040.42 ft above mean sea level (levels by Eugene Water and Electric Board).

Extremes.--Maximum discharge during year, 1,140 cfs Mar. 29 (gage height, 3.63 ft); minimum daily, 14 cfs Sept. 23-30.

1957-60: Maximum discharge, 3,120 cfs Dec. 20, 1957 (gage height, 5.12 ft), from rating curve extended above 930 cfs by logarithmic plotting; minimum, 12 cfs Nov. 3-9, 1957.

Remarks.--Records good except those for periods of no gage-height record, ice effect, shifting-control, or backwater from debris, which are fair. No regulation or diversion above station.

Rating table, water year 1959-60, except periods of ice effect, shifting control, or backwater from debris (gage height, in feet, and discharge, in cubic feet per second)

0.5	12	1.5	100
7	20	2.0	215
9	31	2.5	405
1.2	58	3.1	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	47	62	86	49	114	62	c324	180	268	c39	c19	c17
2	42	55	*77	47	126	59	c382	191	296	c38	c19	c17
3	37	73	73	46	116	82	c396	176	284	c36	c18	c16
4	34	66	68	45	128	81	c428	158	248	c34	*c18	a18
5	31	60	63	44	170	143	c460	150	227	*c33	c18	a17
6	31	55	59	44	217	210	*c432	173	196	c31	a18	c17
7	35	52	56	44	577	314	c511	320	163	c29	a18	a17
8	96	50	54	44	709	288	c414	259	138	a29	c18	a17
9	304	46	51	39	511	210	c332	236	126	a29	c17	c17
10	173	44	49	40	360	168	c239	280	118	a29	c17	a16
11	218	42	58	39	252	138	c196	328	113	c29	c17	a15
12	170	39	70	37	207	124	c173	423	107	a28	c17	a15
13	128	37	62	35	176	122	c176	405	98	c28	a17	c15
14	97	36	59	*35	176	113	c188	332	108	c28	a17	c15
15	81	36	65	*33	266	111	c166	259	126	c26	c17	c15
16	70	34	73	33	210	105	c150	252	107	c25	c16	a15
17	60	33	73	33	176	105	c150	230	92	a25	c17	a15
18	54	33	70	32	153	122	c158	*212	81	c25	c16	a15
19	50	44	69	30	128	170	c173	199	c71	c24	c16	a15
20	77	41	65	30	111	262	c306	476	c68	c24	c16	*c15
21	74	116	63	30	104	360	324	450	c59	c24	a17	a15
22	207	242	57	30	94	400	233	344	c57	c24	c25	c15
23	*224	538	56	32	89	414	191	288	c54	c22	c25	a14
24	168	332	78	35	84	396	158	259	a50	a22	a22	a14
25	138	221	71	40	*83	382	143	262	a48	c22	c22	a14
26	111	173	65	49	74	396	132	374	a48	a22	c20	a14
27	94	134	60	50	b70	455	140	382	c46	c20	a19	c14
28	89	122	58	53	b65	410	156	332	c44	c20	a18	a14
29	81	102	56	82	b65	c592	158	316	c42	c19	c18	a14
30	74	94	55	130	-----	c650	163	300	c40	a19	c18	a14
31	66	-----	53	120	-----	c369	-----	308	-----	a22	a17	-----
Total	3,159	3,012	1,972	1,430	5,611	7,793	7,552	8,854	3,543	825	567	461
Mean	102	100	63.6	46.1	193	251	252	286	118	26.6	18.3	15.4
Cfs/m	4.30	4.22	2.68	1.95	8.14	10.6	10.6	12.1	4.98	1.12	0.772	0.650
In.	4.96	4.73	3.09	2.24	8.80	12.23	11.85	13.89	5.56	1.29	0.89	0.72
Ac-ft	6,270	5,970	3,910	2,840	11,130	15,460	14,980	17,560	7,030	1,640	1,120	914

Calendar year 1959: Max 791 Min 16 Mean 107 Cfs/m 4.51 In. 61.46 Ac-ft 77,680  
 Water year 1959-60: Max 709 Min 14 Mean 122 Cfs/m 5.15 In. 70.25 Ac-ft 88,820

Peak discharge (base, 800 cfs).--Feb. 8 (8 a.m.) 895 cfs (3.32 ft); Mar. 29 (8:30 p.m.) 1,140 cfs (3.63 ft).

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Blue River near Blue River.

b Stage-discharge relation affected by ice.

c Backwater from debris.

Note.--Shifting-control method used Nov. 25 to Jan. 5, Feb. 11 to Mar. 7.

1588.5. McKenzie River below Trail Bridge Dam, near Belknap Springs, Oreg.

Location.--Lat 44°16'05", long 122°02'55", T.15 S., R.6 E. (unsurveyed), on left bank 0.4 mile downstream from Trail Bridge Dam (under construction), 0.5 mile upstream from Anderson Creek, and 5 miles north of town of Belknap Springs.

Drainage area.--184 sq mi.

Records available.--October 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,985.60 ft above mean sea level (levels by Eugene Water and Electric Board).

Extremes.--Maximum discharge during year, 2,080 cfs Mar. 29 (gage height, 2.62 ft); minimum, 626 cfs Jan. 21-25.

Remarks.--Records excellent except those for periods of shifting control or backwater from log jam, which are good. Slight regulation at times resulting from construction work on Trail Bridge Dam. No diversion above station.

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

Oct. 1 to Mar. 29

Mar. 30 to Sept. 30

0.9	620	0.6	580
1.0	680	1.0	850
2.0	1,380	2.0	1,600
2.6	1,860	2.5	2,000

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	752	835	884	704	746	849	1,780	1,300	1,620	928	767	682
2	746	828	*870	698	764	842	1,810	1,340	1,620	928	767	676
3	740	849	856	692	758	842	1,820	1,340	1,620	921	767	670
4	734	835	842	680	782	863	1,820	1,310	1,590	914	*767	682
5	722	821	835	680	842	954	1,850	1,300	1,560	*900	767	670
6	716	807	821	674	898	1,020	*1,840	1,340	1,530	900	760	670
7	722	794	814	690	1,250	1,140	1,850	1,520	1,480	886	760	664
8	794	782	800	680	1,440	1,140	1,880	1,520	1,440	886	760	664
9	1,010	776	794	668	*1,350	1,070	1,600	1,490	1,390	886	760	664
10	877	764	782	668	1,240	1,010	1,700	1,530	1,340	879	760	664
11	933	758	794	668	1,150	975	1,640	1,590	1,290	865	760	664
12	905	746	821	662	1,110	961	1,600	1,700	1,270	851	760	658
13	856	734	794	656	1,090	954	1,550	1,740	1,240	844	754	658
14	835	722	776	*650	1,110	933	1,510	1,700	1,240	837	748	658
15	821	716	776	644	1,250	940	1,490	1,640	1,250	830	740	658
16	814	710	770	644	1,200	926	1,440	1,630	1,220	816	724	658
17	807	704	770	644	1,150	926	1,420	1,610	1,180	809	718	652
18	800	698	758	*638	1,140	940	1,420	*1,600	1,150	809	712	652
19	794	704	752	632	1,080	989	*1,420	1,560	1,140	802	712	652
20	835	704	746	632	1,040	1,080	1,530	1,740	1,120	802	706	*652
21	835	794	740	626	1,020	1,160	1,540	1,770	1,080	802	700	646
22	*989	940	734	626	989	1,190	1,460	1,700	1,040	802	712	640
23	1,010	1,220	728	626	968	1,210	1,400	1,650	1,030	795	718	640
24	947	1,070	752	626	940	1,210	1,360	1,630	1,020	795	712	640
25	919	982	752	632	*933	1,210	1,320	1,610	1,000	795	706	640
26	905	947	740	644	912	1,250	1,300	1,680	991	788	694	640
27	891	926	734	644	891	1,400	1,290	1,700	977	788	694	640
28	891	919	728	662	884	1,480	1,300	1,670	963	781	688	634
29	870	905	722	698	870	1,820	1,280	1,640	949	774	682	634
30	863	891	716	752	-----	1,980	1,280	1,640	942	774	682	634
31	849	-----	710	740	-----	1,830	-----	1,630	-----	767	682	-----
Total	26,182	24,881	24,111	20,570	29,777	35,094	46,710	46,820	37,282	25,954	22,639	19,566
Mean	845	829	778	664	1,027	1,132	1,557	1,575	1,243	837	730	655
Cfs/m	4.59	4.51	4.23	3.61	5.58	6.15	8.46	8.56	6.76	4.55	3.97	3.56
In.	5.29	5.03	4.87	4.16	6.02	7.09	9.44	9.87	7.54	5.25	4.58	3.97
Ac-ft	51,950	49,350	47,820	40,800	59,080	69,610	92,650	96,830	73,950	51,480	44,900	38,990
Calendar year 1959: Max	-	-	-	Min	-	Mean	-	Cfs/m	-	In.	-	Ac-ft
Water year 1959-60: Max	1,980	-	-	Min	626	Mean	988	Cfs/m	5.37	In.	73.11	Ac-ft
												717,400

\* Discharge measurement made on this day.

Note.--Shifting-control method used Mar. 29, Apr. 7 to May 13. Backwater from log jam Aug. 15 to Sept. 30.

## 1590. McKenzie River at McKenzie Bridge, Oreg.

Location.--Lat 44°10'45", long 122°07'45", on line between NE $\frac{1}{4}$  and NW $\frac{1}{4}$  sec.18, T.16 S., R.6 E., on left bank 1.0 mile upstream from Glen Creek and 1.7 miles east of town of McKenzie Bridge.

Drainage area.--348 sq mi at cableway 1.2 miles upstream, where all discharge measurements are made.

Records available.--August 1910 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Published as "near McKenzie Bridge" August 1910 to September 1911 and October 1914 to September 1916.

Gage.--Water-stage recorder. Datum of gage is 1,419.04 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to June 12, 1932, staff gage at several sites within 2 miles of present site at various datums.

Average discharge.--50 years, 1,656 cfs (1,199,000 acre-ft per year).

Extremes.--Maximum discharge during year, 3,770 cfs Mar. 29 (gage height, 3.36 ft); minimum, 1,030 cfs Sept. 30.

1910-60: Maximum discharge, 16,500 cfs Jan. 6, 1923 (gage height, 8.3 ft, from floodmarks, site and datum then in use), from rating curve extended above 6,300 cfs by logarithmic plotting; minimum, 805 cfs Oct. 20, 1931.

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

Revisions (water years).--WSP 1248: 1911-16, 1920-25. WSP 1448: 1919. WSP 1638: 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		
1.2	1,130		1.1	970	
2.0	1,930		2.0	1,930	
			3.1	3,380	

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	1,240	1,360	*1,420	1,200	1,380	1,410	3,040	2,040	2,410	1,530	1,270	1,140	
2	1,230	1,360	1,410	1,190	1,460	*1,380	3,210	2,070	2,390	1,520	1,260	1,130	
3	1,210	1,410	1,400	1,170	1,440	1,400	3,140	2,050	2,360	1,510	1,260	1,130	
4	1,190	1,380	1,370	1,160	1,490	1,500	3,090	1,990	2,310	1,500	*1,250	1,140	
5	1,180	1,360	1,340	1,160	1,590	1,760	3,090	1,940	2,240	1,490	1,240	1,130	
6	1,180	1,350	1,320	1,160	1,670	2,050	3,030	1,990	2,170	1,480	1,240	1,120	
7	1,180	1,330	1,310	1,160	2,400	2,350	*3,130	2,340	2,090	*1,480	1,230	1,120	
8	1,360	1,310	1,300	1,170	2,820	2,350	3,070	2,290	2,010	1,470	1,220	1,110	
9	1,880	1,300	1,280	1,160	2,740	2,150	2,860	2,210	1,970	1,460	1,220	1,110	
10	1,540	1,280	1,260	1,150	2,510	1,980	2,610	2,270	1,920	1,460	1,210	1,110	
11	1,680	1,260	1,300	1,160	2,230	1,860	2,460	2,370	1,890	1,450	1,210	1,110	
12	1,570	1,250	1,360	1,160	2,070	1,820	2,370	2,640	1,840	1,440	1,200	1,100	
13	1,470	1,240	1,320	1,150	1,980	1,820	2,360	2,750	1,810	1,440	1,200	1,100	
14	1,410	1,230	1,290	1,140	1,990	1,780	2,410	2,600	1,810	1,420	1,200	1,100	
15	1,370	1,230	1,290	1,130	2,350	1,800	2,360	2,440	1,850	1,410	1,200	1,090	
16	1,350	1,210	1,290	1,130	2,190	1,780	2,270	2,440	1,810	1,400	1,190	1,080	
17	1,330	1,200	1,280	1,130	2,070	1,750	2,250	2,390	1,750	1,390	1,180	1,070	
18	1,320	1,190	1,270	*1,120	1,980	1,780	2,300	2,390	1,710	1,390	1,170	1,070	
19	1,300	1,220	1,260	1,120	1,860	1,690	2,330	*2,340	1,690	1,380	1,170	1,070	
20	1,360	1,220	1,250	1,120	1,780	2,060	2,620	2,850	1,670	1,370	1,160	*1,070	
21	1,360	1,430	1,240	1,110	1,740	2,180	2,720	2,970	1,660	1,360	1,160	1,070	
22	*1,690	1,730	1,220	1,100	1,680	2,230	2,480	2,760	1,660	1,350	1,190	1,060	
23	1,810	2,450	1,210	1,110	1,620	2,240	2,330	2,640	1,620	1,340	1,200	1,060	
24	1,630	2,000	1,300	1,120	1,580	2,190	2,190	2,550	1,610	1,340	1,210	1,050	
25	1,570	1,760	1,280	1,140	1,570	2,170	2,120	2,510	1,590	1,320	1,170	1,050	
26	1,510	1,630	1,260	1,180	1,520	2,190	2,070	2,620	1,590	1,320	1,160	1,050	
27	1,470	1,560	1,240	1,190	1,480	2,400	2,050	2,670	1,580	1,310	1,150	1,040	
28	1,450	1,540	1,240	1,190	1,460	2,500	2,060	2,580	1,570	1,300	1,140	1,040	
29	1,430	1,500	1,230	1,270	1,440	2,880	2,030	2,510	1,560	1,290	1,140	1,040	
30	1,410	1,460	1,220	1,410	-----	3,370	2,010	2,480	1,540	1,290	1,140	1,030	
31	1,380	-----	1,210	1,390	-----	3,000	-----	2,460	-----	1,280	1,140	-----	
Total	44,060	42,750	39,970	36,250	54,090	64,020	76,060	75,150	55,680	43,490	37,080	32,590	
Mean	1,421	1,425	1,289	1,169	1,865	2,065	2,535	2,424	1,856	1,403	1,196	1,086	
Cfs/m	4.08	4.09	3.70	3.36	5.36	5.93	7.28	6.97	5.33	4.03	3.44	3.12	
In.	4.71	4.57	4.27	3.87	5.78	6.84	8.13	8.03	5.95	4.65	3.96	3.48	
Ac-ft	87,390	84,790	79,280	71,900	107,300	127,000	150,900	149,100	110,400	86,260	73,550	64,640	
Calendar year 1959: Max.	3,690			Min	1,090	Mean	1,591	Cfs/m	4.57	In.	62.09	Ac-ft	1,152,000
Water year 1959-60: Max.	3,370			Min	1,030	Mean	1,643	Cfs/m	4.72	In.	64.24	Ac-ft	1,193,000

Peak discharge (base, 3,000 cfs).--Feb. 8 (9:30 a.m.) 3,180 cfs (2.96 ft); Mar. 29 (9:30 p.m.) 3,770 cfs (3.36 ft); May 20 (8 p.m.) 3,140 cfs (2.93 ft).

\* Discharge measurement made on this day.

1592. South Fork McKenzie River above Cougar Reservoir, near Rainbow, Oreg.

Location.--Lat 44°02'50", long 122°13'00", in T.17 S., R.5 E. (unsurveyed), on right bank 100 ft upstream from Tipsoo Creek, 8 miles south of Rainbow, and 9 miles southeast of town of Blue River. Records include flow of Tipsoo Creek.

Drainage area.--160 sq mi at cableway 0.2 mile downstream, where all discharge measurements are made.

Records available.--October 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,709.51 ft above mean sea level (Corps of Engineers bench mark).

Extremes.--Maximum discharge during year, 2,400 cfs Feb. 8 (gage height, 7.60 ft); minimum, 205 cfs Sept. 30.

1957-60: Maximum discharge, 6,760 cfs Feb. 16, 1958 (gage height, 10.80 ft); minimum, that of Sept. 30, 1960.

Flood of Dec. 11, 1956, reached a stage of about 15 ft, from floodmarks.

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

Revisions.--WSP 1638: Drainage area.

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

5.1	194	5.0	730
5.5	270	6.0	1,210
4.0	385	7.0	1,880
4.5	530	8.0	2,800

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	278	298	348	304	610	390	1,620	802	1,200	315	248	236
2	284	290	340	302	670	385	1,790	835	1,220	308	244	234
3	254	362	338	294	610	434	1,730	850	1,210	304	242	248
4	248	365	320	290	658	666	1,720	815	1,160	298	240	276
5	242	335	310	288	690	1,040	1,720	782	1,100	290	*258	250
6	238	318	302	292	710	1,310	1,650	840	1,040	286	236	240
7	252	302	296	306	1,330	1,860	*1,620	1,300	945	*284	234	234
8	485	294	292	340	2,030	1,610	1,470	1,260	850	278	232	230
9	875	286	*286	325	1,830	1,260	1,330	1,160	782	276	232	226
10	570	278	282	320	1,480	1,040	1,140	1,180	750	274	230	225
11	642	272	302	325	1,120	920	1,050	1,240	722	272	230	225
12	562	268	365	310	955	875	955	1,580	686	270	230	223
13	461	262	348	*300	850	910	930	1,650	654	270	230	223
14	398	258	325	298	830	860	960	1,480	674	268	230	221
15	358	260	335	296	965	845	910	1,270	754	264	234	219
16	332	260	342	294	880	810	865	1,220	674	262	236	217
17	308	250	340	300	782	794	890	1,160	610	258	234	216
18	296	252	335	288	710	880	930	1,120	534	256	232	214
19	288	270	325	286	650	1,080	975	*1,060	500	256	230	212
20	310	266	318	284	582	1,300	1,180	1,440	470	254	230	212
21	*310	443	310	282	558	1,400	1,280	1,590	440	252	234	212
22	488	670	302	282	521	1,440	1,100	1,360	419	250	282	212
23	500	1,080	304	294	491	1,430	955	1,220	398	252	304	*212
24	440	830	372	335	476	1,380	860	1,130	388	248	332	212
25	410	654	380	395	470	1,310	810	1,110	375	248	278	212
26	378	534	348	482	455	1,270	774	1,220	360	248	262	212
27	352	467	340	473	428	1,300	770	1,280	350	248	256	210
28	345	428	335	452	410	1,290	786	1,220	338	246	246	210
29	335	388	328	550	*395	1,330	770	1,200	330	246	242	210
30	315	368	325	682	-----	1,730	770	1,190	322	266	238	208
31	306	-----	318	642	-----	1,530	-----	1,210	-----	254	236	-----
Total	11,840	11,608	10,111	10,911	23,126	34,689	34,310	36,754	20,255	8,303	7,602	6,691
Mean	382	387	326	352	797	1,119	1,144	1,186	675	268	245	223
Cfs/m	2.39	2.42	2.04	2.20	4.98	6.99	7.15	7.41	4.22	1.68	1.53	1.39
In.	2.75	2.70	2.35	2.54	5.38	8.06	7.97	8.54	4.71	1.93	1.77	1.56
Ac-ft	23,480	23,020	20,050	21,640	45,870	68,800	68,050	72,900	40,180	16,470	15,080	13,270
Calendar year 1959: Max	2,410	Min	210	Mean	500	Cfs/m	3.12	In.	42.40	Ac-ft	361,900	
Water year 1959-60: Max	2,030	Min	208	Mean	591	Cfs/m	3.69	In.	50.26	Ac-ft	428,800	

Peak discharge (base, 2,500 cfs).--No peak above base.

\* Discharge measurement made on this day.

1595. South Fork McKenzie River near Rainbow, Oreg.

Location.--Lat 44°08'10", long 122°14'50", in NE $\frac{1}{4}$  sec.31, T.16 S., R.5 E., on right bank 0.2 mile upstream from Cougar Creek, 2 miles south of Rainbow, and 5 miles southeast of town of Blue River.

Drainage area.--208 sq mi.

Records available.--October 1947 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,236.42 ft above mean sea level (Bureau of Public Roads bench mark). Prior to Nov. 4, 1947, staff gage at site 40 ft upstream at same datum.

Average discharge.--13 years, 934 cfs (676,200 acre-ft per year).

Extremes.--Maximum discharge during year, 3,620 cfs Feb. 8 (gage height, 4.06 ft); minimum, 200 cfs Sept. 29, 30.

1947-60: Maximum discharge, 17,600 cfs Dec. 11, 1956 (gage height, 8.66 ft), from rating curve extended above 8,100 cfs by logarithmic plotting; maximum gage height, 8.90 ft Dec. 22, 1955 (backwater from debris); minimum discharge, that of Sept. 29, 30, 1960.

Maximum discharge known, 24,500 cfs Dec. 28, 1945 (gage height, 8.8 ft, from flood-marks, at Corps of Engineers gage at site 40 ft upstream; corresponding gage height at present site and datum, about 9.3 ft), computed by Corps of Engineers.

Remarks.--Records excellent. No apparent regulation but construction work in progress at Cougar Dam, three-quarters of a mile above station. No diversion above station. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions.--WSP 1638: Drainage area.

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

Oct. 1 to May 20				May 21 to Sept. 30			
1.2	280	3.0	1,880	1.1	175	2.0	760
1.5	440	4.0	3,500	1.2	225	3.0	1,880
2.0	800			1.5	390	4.0	3,500

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	352	402	*476	407	910	494	2,540	1,130	1,620	378	275	245
2	325	390	452	402	1,030	488	2,800	1,230	1,620	360	265	250
3	310	494	452	390	930	535	2,590	1,180	1,600	354	265	275
4	300	521	424	380	980	872	2,510	1,160	1,510	348	265	319
5	290	464	402	374	1,050	1,550	2,480	1,090	1,400	342	*250	275
6	290	454	390	385	1,080	2,170	2,290	1,150	1,310	330	245	260
7	315	412	380	412	2,050	2,820	*2,230	1,990	1,160	*319	245	255
8	696	402	374	488	3,030	2,520	2,020	1,870	1,040	314	245	250
9	1,340	380	363	458	2,850	1,920	1,800	1,640	960	314	240	235
10	880	368	358	452	2,200	1,500	1,520	1,640	910	308	240	235
11	960	358	412	452	1,570	1,280	1,380	1,700	870	302	235	235
12	856	352	521	424	1,510	1,190	1,250	2,200	816	297	235	235
13	698	336	521	*590	1,140	1,300	1,240	2,360	800	297	235	235
14	584	330	470	374	1,150	1,250	1,330	2,130	824	297	235	235
15	507	330	470	368	1,430	1,200	1,310	1,800	940	297	240	235
16	452	341	470	368	1,260	1,170	1,220	1,740	824	292	240	235
17	424	325	464	374	1,080	1,110	1,270	1,670	744	286	240	235
18	407	325	458	358	980	1,230	1,350	1,670	672	286	240	235
19	385	346	440	352	872	1,500	1,430	*1,540	616	286	235	230
20	429	341	429	346	784	1,940	1,810	2,220	584	286	235	220
21	*464	626	407	352	768	2,030	2,060	2,490	544	280	235	220
22	816	977	402	363	704	2,060	1,670	2,080	513	275	309	220
23	800	1,800	390	390	684	2,030	1,390	1,750	485	275	366	*215
24	664	1,300	507	488	648	1,910	1,240	1,610	471	275	414	210
25	626	1,000	542	605	648	1,800	1,150	1,560	457	275	319	205
26	556	792	494	776	591	1,730	1,090	1,700	438	275	297	205
27	672	672	482	768	556	1,740	1,080	1,850	414	275	280	205
28	500	605	470	720	542	1,820	1,120	1,750	402	270	260	205
29	482	549	452	880	*514	1,870	1,080	1,680	390	270	255	200
30	452	500	446	1,050	-----	2,620	1,080	1,640	390	297	245	200
31	424	-----	434	980	-----	2,270	-----	1,630	-----	280	245	-----
Total	17,081	16,472	13,752	15,326	33,321	49,819	49,330	52,830	25,324	9,340	8,130	7,014
Mean	551	549	444	494	1,149	1,607	1,644	1,704	844	301	262	234
Cfs/m	2.65	2.64	2.13	2.37	5.52	7.73	7.90	8.18	4.06	1.45	1.26	1.12
In.	3.05	2.95	2.46	2.74	8.96	8.91	8.82	9.45	4.53	1.67	1.45	1.25
Ac-ft	33,880	32,670	27,280	30,400	66,090	98,810	97,840	104,800	50,230	18,530	16,130	13,910

Calendar year 1959: Max 3,930 Min 215 Mean 663 Cfs/m 3.19 In. 43.30 Ac-ft 480,300  
 Water year 1959-60: Max 3,030 Min 200 Mean 813 Cfs/m 3.91 In. 53.24 Ac-ft 590,600

Peak discharge (base, 5,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

## 1620. Blue River near Blue River, Oreg.

Location.--Lat 44°10'55", long 122°16'45", in NW $\frac{1}{4}$  sec.13, T.16 S., R.4 E., on right bank 3 miles upstream from Quartz Creek and 3 $\frac{1}{2}$  miles northeast of town of Blue River.

Drainage area.--75.0 sq mi.

Records available.--September 1935 to September 1960. Monthly discharge only for September 1935, published in WSP 1318.

Gage.--Water-stage recorder. Altitude of gage is 1,220 ft (from river-profile map).

Average discharge.--25 years, 394 cfs (285,200 acre-ft per year).

Extremes.--Maximum discharge during year, 2,960 cfs Feb. 8 (gage height, 4.21 ft); minimum, 18 cfs Sept. 30.

1935-60: Maximum discharge, 13,300 cfs Dec. 28, 1945 (gage height, 9.80 ft), from rating curve extended above 7,400 cfs; minimum, 13 cfs Sept. 27, 28, Oct. 1, 2, 1938.

Remarks.--Records excellent except those for periods of shifting control or backwater from debris, which are good. No regulation or diversion above station.

Rating table, water year 1959-60, except periods of shifting control or backwater from debris (gage height, in feet, and discharge, in cubic feet per second)

1.0	18	1.7	280
1.1	34	2.2	650
1.2	57	3.0	1,380
1.3	85	4.0	2,650

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	113	121	200	140	642	175	1,710	458	490	76	34	34
2	93	105	175	140	794	175	1,830	474	450	73	34	34
3	85	194	*175	125	730	185	1,600	418	418	70	30	34
4	73	195	160	121	935	322	1,380	382	375	70	30	67
5	70	155	140	117	1,060	1,130	1,230	354	328	67	30	52
6	67	130	130	125	1,020	1,540	1,080	375	292	64	30	41
7	82	113	121	140	2,000	1,780	1,000	706	269	61	30	36
8	471	97	113	210	2,470	1,510	*850	586	236	*57	*30	32
9	1,260	93	105	200	2,130	1,040	730	506	220	57	30	32
10	554	82	93	185	1,600	746	578	522	210	57	28	30
11	786	76	135	175	1,050	602	506	546	195	57	28	28
12	554	73	280	155	786	570	482	682	185	52	28	28
13	347	67	247	140	658	650	586	980	175	52	28	28
14	252	64	195	135	730	634	706	850	195	52	28	28
15	200	64	185	*135	1,420	658	754	682	225	49	30	26
16	160	64	200	135	1,000	650	674	626	185	49	32	*24
17	140	61	190	145	738	578	690	634	160	47	30	24
18	113	61	180	140	610	674	778	698	150	45	30	22
19	105	89	165	135	490	899	874	130	43	28	22	22
20	165	79	150	135	396	1,110	1,330	1,190	125	43	28	22
21	205	468	135	135	368	1,210	1,340	1,310	121	41	30	22
22	802	978	125	135	334	1,180	962	1,000	113	41	45	21
23	*770	1,790	121	160	298	1,090	722	818	105	38	67	21
24	490	1,010	230	264	280	980	586	*738	97	38	105	21
25	347	650	264	375	264	882	506	730	93	38	61	21
26	274	466	215	538	242	834	458	953	93	38	47	20
27	225	340	195	506	220	935	458	917	89	38	47	20
28	205	298	185	498	210	1,050	514	730	85	36	41	20
29	190	258	180	674	*195	1,560	474	658	82	36	36	19
30	160	225	175	802	2,130	442	578	79	38	34	19	19
31	140	-----	155	690	1,530	-----	530	-----	36	34	-----	-----
Total	9,498	8,466	5,319	7,710	23,670	28,989	25,830	21,265	5,970	1,559	1,143	848
Mean	306	282	172	249	816	935	861	686	199	50.3	36.9	28.3
Cfs/m	4.08	3.76	2.29	3.32	10.9	12.5	11.5	9.15	2.65	0.671	0.492	0.377
In.	4.71	4.20	2.64	3.82	11.74	14.37	12.81	10.54	2.96	0.77	0.57	0.42
Ac-ft	18,840	16,790	10,550	15,290	46,950	57,500	51,230	42,180	11,840	3,090	2,270	1,680

Calendar year 1959: Max 3,450 Min 20 Mean 321 Cfs/m 4.28 In. 58.16 Ac-ft 232,600  
 Water year 1959-60: Max 2,470 Min 19 Mean 383 Cfs/m 5.11 In. 69.55 Ac-ft 279,200

Peak discharge (base, 3,800 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Shifting-control method used Oct. 9 to Nov. 22, Dec. 18 to Feb. 6. Backwater from debris Sept. 3-30.

1625. McKenzie River near Vida, Oreg.

Location.--Lat 44°07'30", long 122°28'10", in NE $\frac{1}{4}$  sec. 5, T.17 S., R.3 E., on left bank 1 mile upstream from head of Martin Rapids and 5 miles east of Vida.

Drainage area.--930 sq mi, at cableway 0.4 mile downstream where all discharge measurements are made.

Records available.--July 1910 to March 1911 (published as "at Martins Rapids, near Vida"), September 1924 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 855.56 ft above mean sea level, datum of 1929. July 1, 1910, to Mar. 31, 1911, staff gage at site 3 miles downstream at different datum. Sept. 1, 1924, to Nov. 16, 1928, staff gage at site 20 ft upstream at same datum.

Average discharge.--36 years (1924-60), 3,982 cfs (2,883,000 acre-ft per year).

Extremes.--Maximum discharge during year, 14,300 cfs Mar. 30 (gage height, 5.89 ft); minimum, 1,650 cfs Sept. 30.

1910-11, 1924-60: Maximum discharge, 64,400 cfs Dec. 28, 1945 (gage height, 17.70 ft), from rating curve extended above 32,000 cfs by logarithmic plotting; minimum, 1,260 cfs Nov. 7, 1930, Sept. 17, Oct. 4, 8, 9, 1931.

Flood in January 1923 reached a stage of 17.2 ft, from floodmarks (discharge, 62,000 cfs).

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

Revisions (water years).--WSP 1124: 1943.

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

Oct. 1 to Mar. 29		Mar. 30 to Sept. 30	
0.9	1,700	0.7	1,570
2.0	3,490	2.0	3,600
4.0	8,250	4.0	8,400
6.0	14,700	6.0	14,700

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	2,060	2,330	2,700	2,300	4,070	2,840	11,700	4,900	6,180	2,690	2,080	1,860
2	1,970	2,250	2,620	2,250	4,640	*2,900	12,000	5,120	8,180	2,660	2,050	1,860
3	1,900	2,650	*2,620	2,180	4,360	2,320	16,700	4,950	6,080	2,610	2,020	1,880
4	1,840	2,770	2,540	2,140	4,850	4,220	9,900	4,900	5,800	2,580	2,000	2,040
5	1,820	2,490	2,490	2,120	5,120	7,560	9,510	4,640	5,480	2,560	2,000	1,980
6	1,820	2,340	2,440	2,170	5,070	9,990	8,910	4,700	5,200	2,520	1,990	1,890
7	1,890	2,280	2,390	2,330	9,180	11,100	8,790	7,020	4,820	2,480	1,960	1,850
8	3,220	2,220	2,380	2,790	12,000	10,500	*8,100	6,720	4,500	*2,460	*1,950	1,820
9	6,980	2,170	2,360	2,650	12,100	8,700	7,450	6,180	4,260	2,410	1,930	1,810
10	4,220	2,120	2,340	2,520	10,700	6,750	6,520	6,050	4,140	2,410	1,930	1,790
11	4,720	2,080	2,580	2,500	7,530	5,840	6,100	6,300	4,020	2,380	1,920	1,790
12	4,200	2,030	3,110	2,380	6,300	5,480	5,720	7,800	3,920	2,360	1,920	1,780
13	3,410	1,970	3,110	2,310	5,670	5,880	5,720	9,060	3,800	2,350	1,900	1,780
14	2,970	1,970	2,800	2,250	5,740	5,720	6,420	8,130	3,800	2,340	1,880	1,770
15	2,680	1,960	2,740	2,200	7,770	5,620	6,500	6,980	4,280	2,320	1,880	1,760
16	2,520	1,970	2,750	2,180	6,700	5,500	6,000	6,800	3,920	2,290	1,890	*1,740
17	2,410	1,910	2,720	2,300	5,760	5,120	6,080	6,750	3,880	2,260	1,880	1,730
18	2,310	1,810	2,650	2,280	5,210	5,370	6,420	7,050	3,460	2,260	1,860	1,720
19	2,220	2,060	2,580	*2,220	4,680	6,050	6,580	6,500	3,350	2,260	1,850	1,700
20	2,470	2,040	2,500	2,140	4,260	7,020	7,800	9,180	3,220	2,230	1,830	1,700
21	*2,550	3,320	2,460	2,120	4,090	7,440	8,500	10,600	3,120	2,220	1,830	1,690
22	4,510	4,780	2,380	2,150	3,890	7,410	7,550	8,760	3,040	2,180	2,060	1,690
23	4,640	8,850	2,330	2,330	3,630	7,220	6,480	7,620	2,990	2,170	2,280	1,690
24	3,710	6,180	2,960	2,750	4,480	6,980	5,900	*7,020	2,980	2,160	2,380	1,690
25	3,320	4,700	3,040	3,200	3,470	6,480	5,350	6,800	2,940	2,140	2,140	1,690
26	3,010	3,930	2,800	3,830	3,300	6,350	5,150	7,420	2,880	2,140	2,000	1,690
27	2,800	3,470	2,650	3,790	3,110	6,720	5,000	7,680	2,830	2,120	2,000	1,690
28	2,700	3,200	2,550	3,490	2,990	7,380	5,200	7,080	2,800	2,110	1,950	1,690
29	2,630	2,990	2,500	4,010	2,910	8,400	4,980	6,720	2,770	2,080	1,900	1,680
30	2,490	2,820	2,470	4,700	-----	12,500	4,850	6,480	2,720	2,120	1,880	*2,670
31	2,390	-----	2,390	4,340	-----	10,500	-----	6,350	-----	2,110	1,860	-----
Total	92,280	87,760	80,790	82,900	162,590	212,260	215,810	212,260	119,150	71,980	61,000	53,100
Mean	2,977	2,925	2,606	2,674	5,607	6,847	7,194	6,847	3,972	2,322	1,968	1,770
Cfs/m	3.20	3.15	2.80	2.88	6.03	7.36	7.74	7.36	4.27	2.50	2.12	1.90
In.	3.69	3.51	3.23	3.32	6.50	8.49	8.63	8.49	4.76	2.88	2.44	2.12
Ac-ft	183,000	174,100	160,200	164,400	322,500	421,000	428,100	421,000	236,300	142,900	121,000	105,300

Calendar year 1959: Max 16,800 Min 1,560 Mean 3,492 Cfs/m 3.75 In. 50.97 Ac-ft 2,528,000  
 Water year 1959-60: Max 12,500 Min 1,670 Mean 3,967 Cfs/m 4.27 In. 58.06 Ac-ft 2,880,000

Peak discharge (base, 16,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

## 1655. McKenzie River near Coburg, Oreg.

Location.--Lat 44°06'45", long 123°02'45", in NE 1/4 sec. 9, T.17 S., R.3 W., on left bank at downstream side of Armitage Bridge, 2 miles southeast of Coburg, and 3 miles upstream from mouth.

Drainage area.--1,337 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 396.32 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Nov. 24, 1944, wire-weight gage at same site and datum.

Average discharge.--16 years, 6,066 cfs (4,392,000 acre-ft per year).

Extremes.--Maximum discharge during year, 23,000 cfs Feb. 8 (gage height, 8.50 ft); minimum, 1,680 cfs Sept. 30.

1944-60: Maximum discharge, 88,200 cfs Dec. 29, 1945 (gage height, 17.36 ft), from rating curve extended above 59,000 cfs; minimum daily, 1,310 cfs Oct. 29, 1944.

Remarks.--Records excellent except those for periods of shifting control, which are good. Slight diurnal fluctuation caused by logponds and powerplants upstream. Water supply for city of Eugene is diverted 10 miles upstream; small diversions for irrigation above station.

Revisions.--WSP. 1638: 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	2,530	2,780	3,360	3,080	5,710	3,880	16,200	6,460	7,720	2,970	2,240	1,990
2	2,400	2,820	3,210	2,950	6,550	3,810	17,100	6,840	7,470	2,920	2,190	2,000
3	2,320	*2,750	3,150	2,920	6,610	4,200	15,400	6,490	7,300	2,880	2,160	1,960
4	2,140	3,570	3,090	2,850	7,450	6,190	13,600	6,490	6,970	2,830	2,160	2,130
5	2,280	3,120	2,920	2,790	8,020	11,800	12,600	6,010	6,590	2,780	2,140	2,240
6	2,140	2,930	2,830	2,830	7,840	16,600	11,700	5,890	6,250	2,700	2,120	2,030
7	2,240	2,740	2,920	3,230	11,600	16,700	11,100	8,560	5,890	2,620	2,110	1,950
8	3,020	2,660	2,780	4,370	17,500	16,700	10,500	9,130	5,470	2,740	2,100	1,930
9	2,170	2,720	2,710	4,850	21,600	15,700	9,740	8,200	5,140	2,630	2,110	1,880
10	5,800	2,580	2,650	4,100	20,100	12,500	8,590	7,690	4,920	2,630	2,070	1,860
11	4,990	2,530	*2,810	4,160	14,200	10,700	7,990	7,750	4,770	2,610	2,060	1,830
12	5,750	2,490	3,410	4,020	*11,200	9,740	7,570	8,920	4,550	*2,520	2,040	1,830
13	4,280	2,490	4,390	3,700	9,800	9,700	7,330	11,200	4,360	2,440	2,040	1,820
14	3,830	2,380	3,750	3,480	9,340	9,700	8,380	11,400	4,280	2,520	2,000	1,820
15	3,340	2,290	3,410	3,340	11,600	*9,460	9,250	9,610	4,850	2,520	2,000	1,820
16	3,080	2,480	3,450	3,410	11,400	9,740	8,830	9,070	4,570	2,460	2,030	1,810
17	2,820	2,390	3,260	5,200	9,580	8,760	8,380	9,010	4,360	2,440	1,990	1,780
18	2,710	2,370	3,180	5,150	8,560	8,410	*8,680	9,670	4,060	2,410	1,930	1,790
19	2,780	2,440	3,040	4,580	7,540	8,740	9,310	9,130	3,840	2,390	1,900	1,780
20	2,780	2,520	3,000	4,100	6,670	9,520	9,520	10,800	3,700	2,350	1,870	1,780
21	3,060	3,090	2,990	3,830	6,190	9,940	13,100	15,300	3,540	2,340	1,870	1,760
22	4,400	4,500	2,890	*3,700	5,800	9,680	11,300	12,700	3,310	2,320	2,000	1,730
23	5,820	10,700	2,790	3,660	5,350	9,580	9,520	10,800	3,450	2,320	2,510	*1,760
24	4,850	8,900	3,180	4,040	4,980	9,160	8,560	9,680	3,310	2,340	2,530	1,770
25	4,220	6,350	4,480	4,600	4,850	8,560	7,900	9,120	3,240	2,310	2,420	1,770
26	3,860	5,230	4,100	5,390	4,880	8,260	7,450	10,700	3,210	2,290	*2,130	1,760
27	3,540	4,570	3,750	6,010	4,430	8,380	7,000	*11,200	3,140	2,260	2,100	1,750
28	3,280	4,120	3,590	5,350	4,200	9,520	7,240	10,000	3,090	2,230	2,040	1,730
29	3,200	3,640	3,380	5,500	4,020	9,280	6,940	9,120	3,030	2,200	1,970	1,720
30	3,040	3,590	3,310	6,580	-----	16,800	6,630	8,560	3,020	2,230	1,920	1,710
31	2,860	-----	3,260	6,310	-----	16,100	-----	8,060	-----	2,280	1,930	-----
Total	110,400	107,910	101,050	130,100	257,570	317,010	297,390	283,360	139,400	77,480	64,680	55,490
Mean	3,561	3,597	3,260	4,197	8,827	10,230	9,913	9,141	4,647	2,499	2,086	1,850
Cfsm	2.66	2.69	2.44	3.14	6.64	7.65	7.41	6.84	3.48	1.87	1.56	1.38
In.	3.07	3.00	2.81	3.62	7.16	8.82	8.27	7.88	3.88	2.16	1.80	1.54
Ac-ft	219,000	214,000	200,400	258,000	510,900	628,800	569,900	562,000	276,500	153,700	128,300	110,100
Calendar year 1959: Max	35,000	Min	1,700	Mean	4,727	Cfsm	3.54	In.	47.98	Ac-ft	3,422,000	
Water year 1959-60: Max	21,600	Min	1,710	Mean	5,306	Cfsm	3.97	In.	54.01	Ac-ft	3,852,000	

Peak discharge (base, 31,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Shifting-control method used Mar. 5-14, Aug. 9-19.

1660. Willamette River at Harrisburg, Oreg.

Location.--Lat 44°16'05", long 123°10'20", in SW¼NE¼ sec.16, T.15 S., R.4 W., on right bank 10 ft downstream from bridge on U. S. Highway 99 at Harrisburg and at mile 162.9.

Drainage area.--3,420 sq mi, approximately.

Records available.--October 1944 to September 1960. Gage-height records collected at same site in 1927-28, 1931, 1934, are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 290.39 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Oct. 1 to Nov. 14, 1944, wire-weight gage on bridge 10 ft upstream at same datum.

Average discharge.--16 years, 12,840 cfs (9,296,000 acre-ft per year).

Extremes.--Maximum discharge during year, 47,400 cfs Feb. 10 (gage height, 10.63 ft); minimum, 2,720 cfs Nov. 19.

1944-60: Maximum discharge, 210,000 cfs Dec. 29, 1945 (gage height, 19.69 ft), from rating curve extended above 89,000 cfs; minimum, 1,990 cfs Oct. 30, 1944.

Flood of Dec. 4, 1861 reached a stage of about 21 ft (present site and datum), from information by local residents. Flood of Jan. 1, 1943, reached a stage of 19.1 ft (present datum), from U. S. Weather Bureau records.

Remarks.--Records fair. Flow regulated at times by Lookout Point, Cottage Grove, and Dorena Reservoirs (see elsewhere in this report). Many small diversions above station for irrigation; about 15 cfs diverted from McKenzie River for city of Eugene water supply.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6,650	6,450	6,380	6,620	8,440	6,510	40,600	9,740	17,000	5,760	4,490	4,600
2	6,510	6,510	5,720	5,690	9,560	6,340	43,000	9,700	15,400	5,440	4,430	4,690
3	5,890	6,580	5,540	5,500	11,600	7,040	37,500	9,770	15,000	4,930	4,380	4,660
4	4,720	7,540	5,440	5,600	12,200	10,700	30,200	11,600	13,700	4,900	4,400	4,930
5	4,010	7,500	4,990	5,690	13,500	23,700	25,800	11,500	12,800	5,110	4,460	5,290
6	5,440	7,000	4,780	5,110	13,700	33,000	23,300	10,700	12,600	4,690	4,210	4,900
7	6,580	5,950	5,140	5,470	17,900	34,500	21,700	13,500	12,600	4,400	4,010	4,580
8	7,900	5,440	4,900	8,910	27,200	*36,500	21,100	17,800	11,800	4,550	3,790	4,520
9	13,200	5,350	4,380	12,800	40,900	38,100	18,400	16,400	10,700	4,550	3,840	4,520
10	13,600	5,260	4,260	10,600	*44,900	32,600	15,000	16,400	10,600	4,600	4,100	4,580
11	10,300	5,170	*4,430	9,050	40,000	33,300	13,900	16,000	9,950	4,550	4,430	4,240
12	11,400	4,930	5,350	10,200	38,600	30,200	13,200	16,400	9,340	*4,380	4,460	4,210
13	10,300	5,050	8,330	10,300	33,000	27,900	11,700	20,200	8,620	4,340	4,430	4,430
14	9,560	4,840	7,760	9,160	30,300	26,900	14,600	23,600	8,660	4,460	4,430	4,550
15	9,340	4,240	7,400	7,830	27,100	*24,800	17,200	21,600	9,920	4,520	4,400	4,550
16	8,940	4,100	7,360	7,250	*25,100	23,800	17,200	20,500	9,840	4,430	4,430	4,580
17	8,400	3,650	6,790	10,900	20,900	21,800	14,800	19,600	9,700	4,430	4,490	4,660
18	7,500	3,080	6,050	15,200	*17,800	19,200	*15,200	20,500	9,340	4,290	4,290	4,600
19	6,650	3,050	5,630	12,800	15,400	18,000	17,600	20,200	9,020	4,210	4,010	4,630
20	6,680	3,560	5,540	11,100	13,200	17,800	18,200	20,200	8,800	4,280	4,100	4,630
21	7,470	3,760	5,410	9,560	11,900	18,100	21,300	32,800	8,150	4,240	4,210	4,630
22	9,630	6,620	5,200	*8,510	11,800	19,100	20,600	30,200	6,760	4,290	4,400	4,550
23	13,000	14,700	4,750	7,970	11,500	19,000	18,800	24,600	6,550	4,290	5,290	*4,380
24	11,200	16,500	5,140	7,360	10,500	18,300	16,400	24,100	6,240	4,350	5,570	4,290
25	8,510	14,000	6,580	7,860	9,020	17,000	14,800	23,500	6,010	4,210	5,440	4,290
26	7,680	12,000	8,760	8,760	8,510	15,200	14,000	24,900	5,790	4,290	*4,630	4,380
27	8,480	10,100	7,650	10,100	7,720	15,000	12,900	*27,400	5,630	4,290	4,400	4,580
28	8,580	8,800	7,140	9,410	7,000	16,900	12,300	24,600	5,660	4,350	4,240	4,720
29	8,440	7,580	6,900	8,730	6,820	17,400	12,600	22,200	5,920	4,350	4,150	4,630
30	8,080	6,960	7,220	9,560	-----	26,400	11,400	20,600	5,850	4,430	3,960	4,600
31	7,140	-----	7,540	9,590	-----	33,400	-----	18,400	-----	4,520	4,120	-----
Total	261,770	206,070	190,460	273,190	546,070	688,490	585,100	599,210	287,950	140,410	135,990	137,400
Mean	8,444	6,869	6,144	8,813	18,830	22,210	19,500	19,330	9,598	4,529	4,387	4,580
Ac-ft	519,200	408,700	377,900	541,900	*1,083	*1,366	*1,161	*1,189	571,100	278,500	269,700	272,500
Calendar year 1959: Max	57,500				3,050		9,709			7,029,000		
Water year 1959-60: Max	44,900				3,050		11,070			8,038,000		

\* Discharge measurement made on this day.

\* Expressed in thousands.

1665. Long Tom River near Noti, Oreg.

Location.--Lat 44°03'00", long 123°25'30", in sec.33, T.17 S., R.6 W., on left bank 0.2 mile upstream from Southern Pacific Railroad bridge, 0.9 mile downstream from Noti Creek, and 1.3 miles southeast of Noti.

Drainage area.--88 sq mi, approximately.

Records available.--October 1935 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 388.76 ft above mean sea level (levels by U. S. Weather Bureau). Prior to Nov. 6, 1940, staff gage at same site and datum.

Average discharge.--25 years, 242 cfs (175,200 acre-ft per year).

Extremes.--Maximum discharge during year, 2,980 cfs Feb. 9 (gage height, 15.38 ft); minimum, 12 cfs Sept. 22, 23, 30.

1935-60: Maximum discharge, 6,990 cfs Dec. 22, 1955 (gage height, 20.17 ft); minimum observed, 7 cfs Sept. 25-27, 1939.

Remarks.--Records excellent except those for period of shifting control, which are good. Slight diurnal fluctuation caused by logpond above Noti. No diversion above station.

Revisions (water years).--WSP 1318: 1936(M).

Rating table, water year 1959-60, except period of shifting control (gage height, in feet, and discharge, in cubic feet per second)

0.6	12	2.0	137	10.0	1,230
.8	21	4.0	377	13.0	2,000
1.0	34	7.0	767	15.0	2,750

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	19	22	35	70	193	154	844	209	181	60	23	19
2	18	22	34	84	424	184	560	197	188	58	24	23
3	17	23	31	59	433	*182	471	193	157	55	23	22
4	16	30	31	56	595	438	394	209	147	54	22	29
5	17	28	29	53	592	1,170	351	196	137	49	22	33
6	17	24	28	53	488	1,290	311	180	132	*44	21	24
7	17	22	28	61	869	886	282	193	125	41	20	20
8	32	21	*28	202	1,410	850	262	177	118	38	19	19
9	64	21	29	251	2,680	1,050	240	166	115	39	19	18
10	55	21	30	173	2,100	885	226	158	111	39	19	17
11	41	20	39	162	989	673	241	152	107	39	19	16
12	45	20	108	173	671	549	228	158	103	39	19	14
13	34	20	179	148	598	476	226	233	98	39	20	15
14	28	19	117	136	493	419	*289	229	95	39	19	14
15	24	20	89	122	508	491	446	197	97	37	18	14
16	22	21	73	113	469	578	421	199	96	34	18	14
17	21	21	64	136	400	472	348	193	92	31	18	14
18	20	20	60	183	364	403	315	199	88	30	19	15
19	20	29	58	*198	326	358	337	181	84	28	18	15
20	26	37	53	172	283	321	361	211	83	27	18	*14
21	34	102	51	150	258	289	448	263	80	27	18	14
22	41	113	49	139	238	265	460	264	79	26	*20	12
23	66	149	47	127	221	245	408	248	74	26	22	13
24	47	108	81	124	204	226	346	265	72	25	37	14
25	35	76	141	119	198	216	306	272	70	25	34	13
26	28	59	138	117	190	214	308	407	69	26	26	13
27	*26	49	112	203	173	216	286	398	68	26	25	13
28	25	36	93	304	166	226	269	317	64	25	22	13
29	24	40	80	232	159	332	258	263	62	23	20	13
30	22	59	73	245	---	818	221	230	61	22	19	12
31	22	---	78	211	---	845	---	*199	---	22	23	---
Total	923	1,232	2,086	4,575	16,692	15,691	10,443	6,959	3,033	1,093	664	499
Mean	29.8	41.1	67.3	148	576	506	348	224	101	35.3	21.4	16.6
Cfs/m	0.339	0.467	0.765	1.68	6.55	5.75	3.95	2.55	1.15	0.401	0.243	0.189
In.	0.39	0.52	0.88	1.93	7.05	6.63	4.41	2.94	1.28	0.46	0.28	0.21
Ac-ft	1,830	2,440	4,140	9,070	33,110	31,120	20,710	13,800	6,020	2,170	1,320	990
Calendar year 1959: Max			3,200	Min 11		Mean 191		Cfs/m 2.17	In. 29.54	Ac-ft 138,600		
Water year 1959-60: Max			2,680	Min 12		Mean 175		Cfs/m 1.99	In. 26.98	Ac-ft 126,700		

Peak discharge (base, 1,600 cfs).--Feb. 9 (7:30 p.m.) 2,980 cfs (15.38 ft); Mar. 5 (11:30 p.m.) 1,620 cfs (11.70 ft).

\* Discharge measurement made on this day.

Note.--Shifting-control method used June 6 to Sept. 30.

1670. Coyote Creek near Crow, Oreg.

Location.--Lat 44°01'19", long 123°15'17", in NE<sup>1</sup>/<sub>4</sub> sec.11, T.18 S., R.5 W., on right bank just upstream from Fern Ridge Reservoir, 1 mile downstream from Spencer Creek and 5 miles northeast of Crow.

Drainage area.--94 sq mi, approximately.

Records available.--June 1940 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 374.0 ft above mean sea level (Corps of Engineers bench mark). Prior to Aug. 31, 1940, staff gages near same site at different datums.

Average discharge.--20 years, 188 cfs (136,100 acre-ft per year).

Extremes.--Maximum discharge during year, 3,520 cfs Feb. 9 (gage height, 11.95 ft); no flow Aug. 21, 22.  
1940-60: Maximum discharge, 10,100 cfs Dec. 21, 1955 (gage height, 14.32 ft, from floodmarks), from rating curve extended above 4,700 cfs by logarithmic plotting; no flow at times.

Remarks.--Records good except those for periods of shifting control or backwater, which are fair. Small diversions for irrigation.

Rating table, water year 1959-60, except periods of shifting control or backwater from irrigation dam or debris (gage height, in feet, and discharge, in cubic feet per second)

0.12	0	0.7	10	9.0	1,000
.2	.2	.8	18	10.0	1,420
.3	.5	2.0	106	11.0	2,240
.4	1.2	4.0	269	12.0	3,600
.5	2.7	6.0	475		
.6	5.4	8.0	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	0.9	1.8	2.9	13	114	58	686	98	143	9.4	0.3	0.2
2	*.9	1.8	2.9	13	414	57	524	88	114	8.9	.3	.3
3	.8	1.9	2.9	11	445	*173	377	83	94	8.9	.3	.4
4	.7	2.5	2.9	9.4	595	607	292	107	79	7.4	.2	.5
5	.7	2.3	2.7	8.4	632	1,200	228	96	66	6.9	.2	.6
6	.7	2.2	2.5	7.8	511	1,650	187	76	57	*6.5	.2	.8
7	.8	2.1	2.2	8.4	729	2,120	158	188	49	5.7	.2	1.5
8	1.2	2.0	*2.2	93	1,720	1,890	136	165	46	5.4	.2	2.0
9	4.0	*1.9	2.2	242	3,240	1,840	119	122	42	4.4	.2	3.0
10	3.5	1.9	2.3	136	2,030	1,380	99	98	39	1.3	.2	2.0
11	3.2	1.8	2.9	88	1,130	878	112	84	34	2.4	.2	1.2
12	3.4	1.8	5.0	102	661	582	115	83	30	.2	.2	1.1
13	2.5	1.8	24	82	479	474	105	117	28	3.8	.2	.6
14	2.2	1.7	27	70	346	371	*206	116	27	3.0	.2	.6
15	1.9	1.8	14	59	321	418	378	91	27	*2.8	.1	.5
16	1.7	1.8	9.4	57	279	461	323	86	27	1.1	.1	.2
17	1.5	1.9	7.8	184	229	371	251	91	24	4.2	.1	.1
18	1.3	1.9	6.9	256	218	295	224	154	22	3.2	.1	.1
19	1.2	2.5	6.5	*218	187	243	244	126	20	2.0	.1	.1
20	*1.2	3.5	5.7	144	159	202	264	154	18	1.4	.1	*.1
21	1.5	8.0	5.4	109	141	167	367	266	18	.9	0	.4
22	2.5	13	4.7	84	124	142	395	233	17	1.0	*0	.4
23	4.0	10	4.7	70	110	126	316	222	15	.8	.1	.3
24	3.5	*10	5.4	61	98	107	246	212	14	.7	.2	.2
25	2.8	8.4	20	55	92	94	228	270	12	.6	.2	.3
26	2.4	6.1	32	55	88	86	206	803	11	.5	.2	.4
27	*2.2	5.0	24	113	77	114	178	888	11	.4	.2	.8
28	2.0	4.4	18	168	67	118	180	884	10	.4	.1	1.0
29	1.9	3.4	14	154	61	174	134	360	10	.3	.1	.8
30	1.8	3.2	12	176	-----	664	111	244	10	.3	.1	.8
31	1.8	-----	12	132	-----	734	-----	*185	-----	.3	.1	-----
Total	60.7	112.4	287.1	2,979.9	15,297	17,796	7,389	6,570	1,114	95.1	5.0	21.3
Mean	1.96	3.75	9.26	96.1	527	574	246	212	37.1	3.07	0.16	0.71
Ac-ft	120	223	569	5,910	30,340	35,300	14,660	13,030	2,210	189	9.9	42

Calendar year 1959: Max 4,930 Min 0 Mean 158 Ac-ft 114,200

Water year 1959-60: Max 3,240 Min 0 Mean 141 Ac-ft 102,600

Peak discharge (base, 1,600 cfs).--Feb. 9 (3 p.m.) 3,520 cfs (11.95 ft); Mar. 7 (1:30 p.m.) 2,480 cfs (11.22 ft).

\* Discharge measurement or observation of no flow made on this day.

Note.--Shifting-control method used Dec. 4 to Feb. 3, Feb. 6, 7, Feb. 12 to Mar. 4, July 11-23. Backwater from irrigation dam or debris Oct. 1 to Nov. 22, July 24 to Sept. 30.

1680. Fern Ridge Reservoir near Elmira, Oreg.

Location.--Lat 44°07'15", long 123°18'00", near center of sec.4, T.17 S., R.5 W., in control house at spillway section of dam across Long Tom River and Coyote Creek, 4½ miles northeast of Elmira.

Drainage area.--252 sq mi, not including Amazon Creek basin (see Remarks).

Records available.--October 1941 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers).

Extremes.--Maximum contents during year, 103,600 acre-ft June 14 (elevation, 373.75 ft); minimum, 6,770 acre-ft Dec. 8-10 (elevation, 352.85 ft).  
1941-60: Maximum contents, 124,500 acre-ft Dec. 27, 1955 (elevation, 375.83 ft); minimum since first filling in 1942, 189 acre-ft Nov. 11, 1950 (elevation, 344.00 ft).

Remarks.--Reservoir is formed by earth-fill dam with concrete outlet and spillway, completed in 1941 by Corps of Engineers; storage began Nov. 13, 1941. Capacity, 101,200 acre-ft between elevations 340.0 (sill of outlet gate) and 373.5 ft (normal maximum operating pool level); dead storage, 23 acre-ft below elevation 340 ft. Reservoir used for flood control and improvement of navigation. Since November 1951, most of flow of Amazon Creek has been diverted in SE¼ sec.29, T.17 S., R.4 W., and discharged into Fern Ridge Reservoir; drainage area at point of diversion, 21.3 sq mi.

Capacity table, water year 1959-60 (elevation, in feet, and contents, in acre-feet)

352	5,600	357	14,510	366	46,820
353	6,980	358	16,970	368	58,380
354	8,550	360	22,620	370	71,980
355	10,320	362	29,260	372	87,830
356	12,300	364	37,180	374	106,000

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	32,510	15,590	6,900	7,150	16,920	44,690	80,800	101,200	101,720	102,400	96,530	91,450
2	31,850	15,060	6,900	7,090	18,920	45,350	81,850	101,200	102,000	102,300	96,440	91,360
3	31,240	14,560	6,850	7,090	21,060	47,030	82,820	101,400	102,200	102,300	96,260	91,630
4	30,610	14,020	6,840	7,180	23,270	51,090	83,150	101,200	102,600	102,200	95,990	91,450
5	30,020	13,480	6,810	7,180	24,540	58,200	84,060	101,200	102,800	101,900	95,810	91,360
6	29,400	12,930	6,780	7,220	24,900	64,240	85,470	101,300	102,800	101,800	95,720	91,190
7	28,900	12,400	6,780	7,670	26,080	69,100	86,310	101,400	102,900	101,600	95,540	90,840
8	28,510	11,860	6,770	8,270	32,980	71,620	87,150	101,100	103,100	101,200	95,450	90,930
9	28,160	11,340	6,770	8,910	45,300	73,310	88,000	100,900	103,100	101,000	95,000	90,750
10	27,710	10,810	6,790	8,870	52,180	71,980	88,770	100,900	103,200	100,900	94,910	90,750
11	27,230	10,260	7,090	8,840	50,750	68,100	89,710	101,200	103,200	100,700	93,730	90,490
12	26,720	9,690	7,420	8,600	47,030	63,770	90,230	101,700	103,300	100,500	94,460	90,320
13	26,150	9,270	7,410	8,240	42,640	60,940	90,930	101,500	103,400	100,400	94,280	90,320
14	25,550	8,870	7,350	7,780	38,100	61,850	91,360	101,200	103,500	100,300	94,100	90,150
15	25,000	8,520	7,130	7,280	35,470	63,640	92,770	101,000	103,500	100,100	93,920	89,970
16	24,410	8,260	7,150	7,250	35,590	65,670	93,660	100,800	103,400	99,920	93,660	89,890
17	23,870	8,060	7,270	8,030	35,930	66,980	94,100	100,600	103,400	99,830	93,480	89,710
18	23,240	7,900	7,280	8,420	36,700	68,030	94,640	100,800	103,400	99,650	93,210	89,630
19	22,680	7,730	7,180	8,470	37,830	68,810	95,000	101,200	103,300	99,370	93,040	89,460
20	22,040	7,940	7,040	8,130	38,680	69,380	95,900	101,700	103,300	99,180	92,860	89,370
21	21,500	7,700	7,070	7,560	39,500	70,100	97,080	101,800	103,200	98,910	92,770	89,020
22	21,000	8,020	7,130	7,680	40,290	70,670	97,990	101,600	103,200	98,630	92,600	88,940
23	20,470	7,980	7,300	8,210	41,000	71,540	98,630	101,300	103,200	98,450	92,600	88,770
24	19,960	7,840	7,380	8,650	41,710	72,350	99,180	101,200	103,100	98,170	92,600	88,680
25	19,420	7,560	7,350	9,090	42,240	73,020	99,370	101,900	102,900	98,080	92,420	88,680
26	18,920	7,270	7,330	9,500	42,830	73,690	99,370	102,900	102,900	97,900	92,330	88,510
27	18,340	7,070	7,250	10,930	43,330	74,580	99,650	102,300	102,800	97,720	92,240	88,420
28	17,780	6,860	7,120	12,320	43,720	75,420	99,830	101,300	102,800	97,550	92,070	88,250
29	17,250	6,670	7,130	13,620	44,280	77,880	100,300	100,900	102,600	97,260	91,890	88,080
30	16,710	6,900	7,180	14,790	-----	79,760	101,000	101,200	102,600	96,990	91,800	88,000
31	16,210	-----	7,160	15,660	-----	80,400	-----	101,200	-----	96,800	91,630	-----
(†)	357.70	352.94	353.12	357.48	365.51	371.10	373.48	373.50	373.65	373.02	372.44	372.02
(*)	-16,890	-9,310	+280	+8,500	+28,620	+36,120	+20,600	+200	+1,400	-5,800	-5,170	-3,630

Calendar year 1959..... + -190  
Water year 1959-60..... + +54,900

† Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.

1690. Long Tom River near Alvadore, Oreg.  
(Formerly published as Long Tom River below Fern Ridge Dam, near Smithfield)

Location (revised).--Lat 44°07'25", long 123°17'55", in SW¼NE¼ sec.4, T.17 S., R.5 W., on left bank 1,000 ft downstream from Fern Ridge Dam and 1.7 miles west of Alvadore.

Drainage area.--252 sq mi, not including Amazon Creek basin.

Records available.--August 1939 to September 1960. Prior to October 1943, published as "at Smithfield" and October 1943 to September 1959 as "below Fern Ridge Dam, near Smithfield."

Gage.--Water-stage recorder and masonry control. Datum of gage is 332.00 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Sept. 21, 1939, staff gage and Sept. 21, 1939, to Sept. 30, 1943 (corrected), water-stage recorder, at site 2.5 miles downstream at datum 11.09 ft lower.

Average discharge.--21 years, 550 cfs (398,200 acre-ft per year), adjusted for diversion to Coyote Creek since 1943.

Extremes.--Maximum discharge during year, 4,000 cfs Mar. 10; minimum daily, 36 cfs Sept. 30. 1939-60: Maximum discharge, 11,500 cfs Jan. 1, 1943 (gage height, 15.12 ft, site and datum then in use); minimum daily, 2 cfs Aug. 7, 1941.

Remarks.--Records good. Flow regulated by Fern Ridge Reservoir since 1941 (see preceding page). A few small diversions for irrigation above station. Records include diversion to Coyote Creek channel for irrigation and stockwater, records for which are based on daily staff-gage readings and occasional measurements. Point of diversion is 500 ft upstream and point of return, 2.3 miles downstream. Discharge not adjusted for storage or release from Fern Ridge Reservoir as evaporation from reservoir at times exceeds natural flow and diversions, and beginning in November 1951 most of flow of Amazon Creek has been diverted in SE¼ sec.29, T.17 S., R.4 W., and discharged into Fern Ridge Reservoir; drainage area at point of diversion, 21.3 sq mi.

Revisions (water years).--WSP 1248: 1940-41, 1948.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	329	289	43	99	50	51	1,690	252	*233	44	38	38
2	324	284	43	99	51	*53	921	336	158	40	38	38
3	319	284	40	66	368	55	652	336	85	40	38	38
4	319	284	40	39	547	58	652	487	63	40	38	38
5	319	280	40	54	1,010	61	218	425	63	40	38	38
6	319	276	40	65	1,440	936	66	330	63	40	37	38
7	319	276	*40	66	1,460	2,140	64	494	85	40	37	38
8	321	271	40	218	1,160	2,850	64	575	65	*40	37	38
9	321	271	40	323	576	3,040	65	406	62	40	37	38
10	320	266	40	415	1,830	3,510	65	227	62	40	37	38
11	320	266	39	470	3,620	3,920	65	177	62	40	37	38
12	316	262	148	470	3,840	3,800	65	235	61	40	37	38
13	313	226	194	464	3,680	2,840	306	508	51	40	37	38
14	308	179	194	457	3,480	796	555	586	51	39	37	38
15	308	179	194	450	2,480	415	*563	507	51	39	38	37
16	308	140	86	293	982	414	563	460	50	39	39	37
17	308	103	37	282	709	414	563	454	50	38	39	37
18	308	103	75	*475	394	414	557	283	50	38	39	37
19	308	103	97	571	167	414	557	174	51	37	39	37
20	307	103	97	577	167	373	557	421	51	37	39	37
21	307	101	54	576	119	288	562	592	51	38	39	*37
22	307	98	37	251	69	112	562	697	51	39	38	37
23	302	155	37	62	55	80	568	698	50	39	*37	37
24	302	192	150	54	51	59	568	698	50	39	38	37
25	302	168	195	54	50	59	568	705	50	39	38	37
26	*298	185	194	54	51	59	574	1,360	50	39	38	37
27	298	128	194	55	51	59	574	1,800	50	39	38	37
28	298	92	159	54	50	59	439	1,800	50	39	38	37
29	294	62	98	55	50	59	182	879	50	39	38	37
30	294	45	97	57	---	1,130	85	472	49	39	38	36
31	289	---	97	53	---	1,970	---	338	---	39	38	---
Total	9,605	5,691	2,879	7,276	28,557	30,348	13,490	17,712	1,942	1,219	1,174	1,123
Mean	310	190	92.9	235	985	979	450	571	64.7	39.3	37.9	37.4
Ac-ft	19,050	11,290	5,710	14,435	56,640	60,190	26,760	35,130	3,850	2,420	2,330	2,230
Calendar year 1959: Max 5,420 Min 33 Mean 457 Ac-ft 331,200												
Water year 1959-60: Max 3,920 Min 36 Mean 331 Ac-ft 240,000												

\* Discharge measurement made on this day.

## 1695. Amazon Creek near Eugene, Oreg.

Location.--Lat 44°03'40", long 123°11'40", in SE $\frac{1}{4}$  sec.29, T.17 S., R.4 W., on right bank 250 ft upstream from diversion structure and 5 miles west of Eugene.

Drainage area.--21.3 sq mi.

Records available.--October 1954 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 372.41 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--6 years, 30.5 cfs (22,080 acre-ft per year).

Extremes.--Maximum discharge during year, 1,350 cfs Mar. 7 (gage height, 7.38 ft); no flow for many days.

1954-60: Maximum discharge, 3,000 cfs Dec. 20, 1957 (gage height, 9.52 ft); no flow at times in each year.

Remarks.--Records good above 10 cfs and poor below. During summer and fall natural flow (if any) may be augmented slightly by return flow from irrigation in and below the city of Eugene. Records include diversion at station to Fern Ridge Reservoir; diversion in 1960 water year amounted to 16,090 acre-ft.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	0.4	0.4	1.8	12	4.0	89	18	*8.8	1.2	0.4	0.6
2	.2	.4	.4	.8	142	5.6	50	17	7.5	1.3	.1	1.0
3	.2	.3	.4	.6	67	*110	36	18	6.7	1.4	.1	.9
4	.2	.5	.4	.5	129	258	28	34	5.8	1.5	0	2.1
5	.2	.5	.6	.4	92	444	21	20	5.2	1.2	0	1.7
6	.2	.5	.6	.4	51	215	19	32	4.5	*.5	.1	1.0
7	.2	.4	*.5	11	147	556	18	97	3.8	.2	.4	.6
8	2.7	.4	.8	129	689	312	18	38	2.9	.2	.5	.5
9	4.4	.4	.6	32	367	245	18	24	1.9	.2	.2	.4
10	2.2	.4	.5	9.1	118	94	16	19	1.4	.7	.1	.4
11	.6	.4	1.8	21	52	60	27	18	1.1	1.1	0	.5
12	.7	.4	11	19	48	64	23	21	.9	.5	0	.4
13	.4	.4	7.2	7.9	48	79	24	73	.5	.5	0	.4
14	.4	.4	2.6	7.0	23	46	69	36	.3	.8	0	.3
15	.4	.4	1.1	5.8	50	97	147	20	.4	.4	0	.2
16	.3	.4	.7	27	23	54	48	25	.9	.4	0	.2
17	.3	.4	.8	205	15	36	35	29	.6	.8	0	.2
18	.3	.4	.6	79	19	29	40	27	.4	.8	0	.2
19	.2	.4	.8	*50	11	24	52	18	.5	.3	0	.2
20	1.0	.5	.6	23	9.0	20	92	67	.4	.1	0	.2
21	.8	3.9	.5	13	7.8	18	114	79	.2	.1	.1	*.2
22	1.8	6.0	.5	9.7	6.9	18	79	38	.2	0	.3	.4
23	.9	5.2	.5	7.9	6.4	17	43	52	.3	0	*.2	.3
24	.5	1.6	6.2	7.4	5.2	16	*32	67	.5	0	1.0	.2
25	.5	.6	9.6	7.0	6.0	15	45	145	.6	.1	2.2	.2
26	.4	.5	4.8	10	8.4	16	36	430	.7	0	1.5	.2
27	*.3	.4	2.3	58	5.2	36	37	103	.8	0	.9	.2
28	.3	.4	1.1	38	4.0	24	46	51	.9	0	.6	.1
29	.4	.4	.6	39	3.7	102	25	30	1.0	0	.3	0
30	.4	.4	.6	30	-----	150	20	19	1.0	.3	.4	0
31	.5	-----	2.4	14	-----	108	-----	11	-----	.7	.6	-----
Total	22.2	27.7	61.5	864.3	2,165.6	3,272.8	1,347	1,676	60.7	15.3	10.0	13.8
Mean	0.72	0.92	1.98	27.9	74.7	106	44.9	54.1	2.02	0.49	0.32	0.46
Cfsm	0.034	0.043	0.093	1.31	3.51	4.98	2.11	2.54	0.095	0.023	0.015	0.022
In.	0.04	0.05	0.11	1.51	3.78	5.71	2.35	2.93	0.11	0.03	0.02	0.02
Ac-ft	44	55	122	1,710	4,300	6,490	2,670	3,320	120	30	20	27

calendar year 1959: Max 1,280 Min 0 Mean 24.6 Cfsm 1.15 In. 15.71 Ac-ft 17,830  
 water year 1959-60: Max 689 Min 0 Mean 26.1 Cfsm 1.23 In. 16.66 Ac-ft 18,910

Peak discharge (base, 400 cfs).--Feb. 8 (9:30 a.m.) 1,130 cfs (6.89 ft); Mar. 7 (4 a.m.) 1,350 cfs (7.38 ft); Mar. 29 (6:30 p.m.) 544 cfs (5.57 ft); May 26 (4:30 a.m.) 788 cfs (6.11 ft).

\* Discharge measurement made on this day.

1700. Long Tom River at Monroe, Oreg.

Location.--Lat 44°18'50", long 123°17'45", in NE $\frac{1}{4}$  sec. 33, T.14 S., R.5 W., on left bank in canalized river channel at Monroe just downstream from Shafer Creek, 800 ft upstream from a concrete drop structure.

Drainage area.--391 sq mi.

Records available.--November 1920 to July 1921, October 1921 to April 1926, November 1926 to May 1927, October 1927 to September 1960. Prior to October 1930, published as "near Monroe."

Gage.--Water-stage recorder and concrete control. Datum of gage is 270.00 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Nov. 24, 1944, staff gages at various sites ranging from present site to  $1\frac{1}{2}$  miles downstream, at different datums.

Average discharge.--37 years (1921-25, 1927-60), 777 cfs (562,500 acre-ft per year).

Extremes.--Maximum discharge during year, 5,200 cfs Mar. 10 (gage height, 8.04 ft); minimum, 39 cfs Sept. 3, 23, 24.

1920-60: Maximum discharge, 19,300 cfs Jan. 2, 1943 (gage height, 17.14 ft, site and datum then in use, from graph based on gage readings) includes some overflow from Willamette River near Junction City; no flow Oct. 20-22, 1944 (water filling pool at gage); minimum observed prior to regulation of flow, 7 cfs Sept. 29, Oct. 1, 1939.

Remarks.--Records excellent. Flow regulated by Fern Ridge Reservoir since 1941 (see p. 136). A few small diversions above station. In 1943-44 river channel was improved from outlet of Fern Ridge Reservoir to a point below Monroe.

Revisions (water years).--WSP 654: Drainage area. WSP 1248: 1923, 1927, 1928(M). WSP 1288: 1952 (yearly runoff only).

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

Oct. 1 to Jan. 8

Jan. 9 to Sept. 30

4.2	37	4.17	39	5.5	970
4.3	86	4.2	42	6.0	1,480
4.6	215	4.3	65	7.0	2,960
4.9	415	4.6	205	8.0	5,100
		5.0	505		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	352	289	54	155	291	159	2,580	356	380	62	41	42
2	345	289	51	150	651	*171	1,670	523	325	53	40	42
3	345	289	51	140	780	257	1,160	532	218	50	40	42
4	345	289	51	75	1,440	1,070	1,080	658	148	50	40	45
5	345	282	51	75	1,540	2,130	759	704	139	50	40	48
6	345	282	51	106	2,000	2,290	348	514	134	*48	41	48
7	345	282	*51	120	2,580	3,500	312	667	130	46	41	42
8	345	275	51	284	3,670	4,480	284	818	125	46	41	41
9	352	275	51	541	3,930	5,010	264	658	120	46	41	40
10	352	275	51	568	3,580	4,790	250	412	116	45	40	41
11	345	269	51	676	4,880	4,990	264	305	111	45	40	42
12	345	269	166	685	4,900	4,730	264	319	111	45	41	41
13	338	251	345	649	4,680	4,090	368	649	102	44	40	42
14	331	188	289	640	4,330	1,600	894	818	94	45	40	41
15	331	182	263	613	3,500	1,090	*1,200	732	94	44	40	44
16	331	171	204	496	1,600	1,100	1,070	649	94	42	40	42
17	331	115	79	496	1,160	932	942	640	90	42	40	42
18	324	115	88	*742	951	846	904	523	90	42	40	42
19	331	110	145	894	541	790	951	305	86	40	40	42
20	331	120	145	846	480	732	1,020	488	78	40	40	41
21	331	135	125	808	412	586	1,120	799	75	40	41	*41
22	331	150	66	608	505	466	1,110	904	75	40	44	40
23	331	182	66	238	257	264	1,000	904	75	40	*44	39
24	331	251	136	218	224	257	922	904	75	41	45	40
25	324	245	296	205	212	238	904	980	72	40	45	40
26	*317	227	303	205	218	238	932	1,680	72	40	45	40
27	310	198	289	410	199	250	904	2,310	72	40	44	41
28	310	120	269	523	176	277	790	2,130	68	40	44	40
29	303	106	171	412	165	453	488	1,390	65	40	42	40
30	296	58	166	396	-----	1,800	284	714	65	41	42	40
31	296	-----	166	319	-----	5,040	-----	*586	-----	41	42	-----
Total	10,289	6,289	4,341	13,293	49,652	52,626	25,038	24,571	3,500	1,368	1,284	1,251
Mean	332	210	140	429	1,712	1,698	835	793	117	44.1	41.4	41.7
Ac-ft	20,410	12,470	8,610	26,370	98,480	104,400	49,660	48,740	6,940	2,710	2,550	2,480

Calendar year 1959: Max 6,610 Min 31 Mean 676 Ac-ft 489,400  
 Water year 1959-60: Max 5,010 Min 39 Mean 529 Ac-ft 383,800

\* Discharge measurement made on this day.

1710. Marys River near Philomath, Oreg.

Location.--Lat 44°31'35", long 123°20'00", in NE 1/4 sec. 18, T. 12 S., R. 5 W., near mid-span on downstream side of bridge on Bellfountain Road, 0.6 mile downstream from Newton Creek and 2.0 miles southeast of Philomath.

Drainage area.--159 sq mi (including drainage area of Evergreen Creek above Bellfountain Road, 1.4 miles south of station).

Records available.--October 1940 to September 1960.

Gage.--Wire-weight gage read twice daily, more often during floods. Altitude of gage is 218 ft (by barometer).

Average discharge.--20 years, 471 cfs (341,000 acre-ft per year).

Extremes.--Maximum discharge during year, 7,290 cfs Feb. 9 (gage height, 20.43 ft, from floodmark); minimum not determined.  
1940-60: Maximum discharge observed, 8,660 cfs Dec. 21, 1955 (gage height, 20.83 ft); minimum observed, 4.7 cfs Oct. 15, 1952.

Remarks.--Records fair. Records include flow of Evergreen Creek at Bellfountain Road crossing 1.4 miles south of station, with which overflow from Marys River may at times be mingled. Slight regulation by small storage reservoir on Rock Creek from which municipal supply is diverted for city of Corvallis. Other small diversions above station for irrigation of 1,500 acres.

Revisions.--WSP 1218: Drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Backwater from debris Oct. 24 to Nov. 19)

Oct. 1 to Feb. 8

Feb. 9 to Sept. 30

2.3	30	7.0	661	1.9	14	7.0	700
2.5	41	10.0	1,330	2.5	41	10.0	1,390
3.0	74	14.0	2,510	3.0	74	14.0	2,370
4.0	170	18.0	3,850	4.0	170	18.0	3,820
5.0	308			5.0	308	20.0	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	a60	74	172	a260	782	332	1,530	a460	355	a70	a24	a20
2	a50	70	154	a240	1,480	329	1,310	a440	311	a65	a24	a22
3	a45	a80	146	228	1,750	412	1,140	a420	a280	a65	a23	a21
4	40	a90	137	225	1,860	747	*999	a420	a250	a60	a22	a20
5	37	*a75	126	195	1,600	1,560	861	a380	a220	a60	a21	a22
6	34	70	116	181	1,630	1,640	735	a360	a210	a55	a21	a21
7	32	64	114	355	1,880	1,510	637	a380	a200	a50	a20	a19
8	37	56	114	568	3,650	1,770	564	a340	a190	a50	a19	a18
9	66	53	109	458	5,850	2,140	496	a320	a180	a50	a18	a17
10	88	49	*102	441	4,190	1,660	458	a300	a170	a48	a18	a17
11	83	49	160	402	*2,800	1,380	a450	a300	a160	a46	*18	a17
12	123	48	669	385	1,940	1,320	a450	a340	a150	a44	a18	a17
13	131	46	782	346	1,540	1,270	a450	a650	a150	a44	a18	a16
14	106	45	544	342	1,340	1,280	a550	a650	a140	a42	a18	a16
15	84	43	414	298	1,510	1,430	a800	a550	a140	a40	a18	a16
16	73	42	387	269	1,440	1,600	a750	a550	a140	a40	a18	a16
17	65	41	351	530	*1,260	1,360	a700	a550	a130	a38	a18	a16
18	58	41	306	644	1,120	1,060	a650	639	a120	a38	a17	a16
19	54	52	224	585	944	872	a800	*626	a120	a36	a17	a16
20	59	86	249	472	768	718	a1,000	641	a110	a34	a17	a16
21	62	209	275	*431	694	639	a1,200	718	a110	a32	a17	a16
22	82	281	250	427	654	574	a1,100	a850	a110	a30	a20	a16
23	213	710	a240	530	570	519	a950	a950	*104	a30	a26	*16
24	249	720	a350	519	464	482	a800	a850	a95	a30	a36	a16
25	208	537	a640	581	424	432	a650	a800	a90	a29	a30	a16
26	150	a390	a560	566	*406	383	a650	850	a90	a29	a26	a16
27	125	a280	a450	564	387	362	a650	768	a85	a28	a25	a16
28	106	231	370	718	371	401	a800	722	a80	a27	a21	a15
29	96	220	326	370	354	885	a850	538	a75	a26	a20	a15
30	84	192	278	961	-----	1,320	a500	466	a70	a25	a19	a14
31	79	-----	263	768	-----	1,650	-----	406	-----	a24	a19	-----
Total	2,779	4,944	9,378	14,459	44,658	31,997	22,980	17,234	4,635	1,285	644	515
Mean	89.6	165	303	466	1,540	1,032	766	556	154	41.5	20.8	17.2
Cfsm	0.564	1.04	1.91	2.93	9.69	6.49	4.82	3.50	0.969	0.261	0.131	0.108
In.	0.65	1.16	2.19	3.38	10.45	7.48	5.38	4.03	1.08	0.30	0.15	0.12
Ac-ft	5,510	9,810	18,600	28,680	88,590	63,470	45,580	34,150	9,190	2,550	1,280	1,020

Calendar year 1959: Max 6,600 Min 7.6 Mean 427 Cfsm 2.69 In. 36.43 Ac-ft 309,000  
Water year 1959-60: Max 5,850 Min 14 Mean 425 Cfsm 2.67 In. 36.37 Ac-ft 308,400

Peak discharge (base, 3,200 cfs).--Feb. 9 (about 1 a.m.) 7,290 cfs (20.43 ft).

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Alsea River near Tidewater.

## 1720. Calapooya River at Holley, Oreg.

Location.--Lat 44°21'05", long 122°47'10", in SE $\frac{1}{4}$  sec.15, T.14 S., R.1 W., on right bank 200 ft downstream from bridge on State Highway 288, 0.3 mile southwest of Holley, and 5.0 miles upstream from Brush Creek.

Drainage area.--105 sq mi.

Records available.--September 1935 to September 1960.

Gage.--Staff gage read once daily below and two or more times daily above 3.0 ft gage height. Datum of gage is 527.20 ft above mean sea level, datum of 1929.

Average discharge.--25 years, 448 cfs (324,300 acre-ft per year).

Extremes.--Maximum discharge during year, 3,220 cfs Feb. 8 (gage height, 6.00 ft, observed at crest); minimum observed, 25 cfs Sept. 30.

1935-60: Maximum discharge, 12,200 cfs Dec. 28, 1945 (gage height, 14.1 ft, from floodmark); minimum observed, 13 cfs Sept. 8, 1940.

Remarks.--Records good. Slight regulation at times during low-water periods by small dam upstream. Diversions for irrigation of about 150 acres above station.

Cooperation.--Gage-height record collected in cooperation with U. S. Weather Bureau.

Revisions (water years).--WSP 1044: 1943. WSP 1218: Drainage area.

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

Oct. 1-9

Oct. 10 to Sept. 30

1.1	67	3.0	770	0.7	24	2.0	305
1.5	145	4.0	1,410	.9	44	3.0	770
2.0	305			1.2	90	4.0	1,410
				1.5	158	6.0	3,220

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	114	170	210	199	466	274	*1,710	417	443	90	42	42
2	100	158	202	186	640	277	1,750	383	393	90	42	40
3	89	222	202	176	595	401	1,340	*365	353	86	42	40
4	80	258	180	168	884	920	1,050	365	321	86	40	79
5	74	205	168	163	830	1,900	872	341	291	83	40	76
6	80	183	158	178	758	2,160	716	353	270	79	37	52
7	91	170	156	219	1,270	2,040	635	650	258	74	37	43
8	244	158	153	466	2,680	2,030	556	551	255	72	35	37
9	998	143	143	397	2,800	1,710	502	479	222	69	35	36
10	510	133	138	337	2,260	1,240	430	420	207	68	33	33
11	665	131	168	349	*1,470	992	417	380	199	66	33	33
12	590	119	381	313	1,110	914	397	510	186	66	33	33
13	405	110	393	280	938	998	409	920	170	66	33	31
14	*309	110	302	267	968	950	565	884	*219	66	33	31
15	249	112	261	*261	1,560	944	800	675	213	63	36	30
16	219	112	249	298	1,210	914	685	685	178	57	38	30
17	188	*106	234	488	944	794	675	650	173	60	33	29
18	168	102	219	434	788	782	746	685	156	57	33	29
19	158	138	199	425	650	824	630	605	146	54	31	29
20	264	133	186	377	560	642	1,080	1,240	143	54	29	30
21	228	166	176	349	520	818	1,210	2,210	136	52	31	*28
22	533	640	168	361	470	752	962	1,100	131	49	53	29
23	570	1,100	170	385	425	680	770	890	124	49	83	28
24	405	754	277	466	393	590	650	716	117	49	115	28
25	357	502	400	497	381	510	575	650	110	49	90	28
26	284	381	329	565	365	528	538	1,100	110	*49	57	29
27	252	317	274	546	333	546	506	1,030	106	47	53	29
28	240	277	252	506	309	705	528	800	102	44	44	29
29	222	249	243	575	288	1,130	479	655	98	42	41	28
30	199	234	228	605	---	2,220	443	580	94	42	36	25
31	180	---	219	510	---	1,720	---	524	---	42	34	---
Total	9,063	7,573	7,038	11,346	26,845	32,085	22,826	21,819	5,924	1,920	1,352	1,061
Mean	292	252	227	366	926	1,035	761	704	197	61.9	43.6	35.4
Cfsm	2.78	2.40	2.16	3.49	8.82	9.86	7.25	6.71	1.88	0.590	0.415	0.337
In.	3.21	2.68	2.49	4.02	9.51	11.36	8.08	7.73	2.10	0.68	0.48	0.38
Ac-ft	17,980	15,020	13,980	22,500	53,250	63,640	45,270	43,280	11,750	3,810	2,680	2,100

Calendar year 1959: Max 3,530 Min 30 Mean 378 Cfsm 3.60 In. 48.93 Ac-ft 274,000  
 Water year 1959-60: Max 2,800 Min 25 Mean 407 Cfsm 3.88 In. 52.72 Ac-ft 295,200

Peak discharge (base, 3,400 cfs).--No peak above base.

\* Discharge measurement made on this day.

## 1735. Calapooya River at Albany, Oreg.

Location.--Lat 44°37'15", long 123°07'40", in NW $\frac{1}{4}$  sec.13, T.11 S., R.4 W., near right bank on upstream side of highway bridge, half a mile downstream from Oak Creek,  $\frac{1}{2}$  miles southwest of Albany, and 3 miles upstream from mouth.

Drainage area.--372 sq mi.

Records available.--October 1940 to September 1960.

Gage.--Wire-weight gage read twice daily, more often at high stages. Datum of gage is 180.37 ft above mean sea level, datum of 1929.

Average discharge.--20 years, 925 cfs (669,700 acre-ft per year).

Extremes.--Maximum discharge during year, 8,970 cfs Feb. 9 (gage height, 16.8 ft, from graph based on gage readings); minimum observed, 18 cfs July 25, 1940-60; Maximum discharge observed, 32,700 cfs Dec. 22, 1955 (gage height, 22.12 ft); maximum gage height, 25.5 ft Jan. 2, 1943, from graph based on gage readings (backwater from Willamette River); minimum discharge observed, 4 cfs Oct. 7, 1952.

Remarks.--Records good. Diurnal fluctuation caused by ponds at flour mills near Shedd. Diversions for irrigation of 2,200 acres above station.

Revisions.--WSP 1218: Drainage area.

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

Oct. 1 to Jan. 18

Jan. 19 to Sept. 30

2.4	88	1.5	18	3.5	295
3.0	178	1.7	28	7.0	1,570
3.5	295	2.0	47	11.0	3,370
7.0	1,570	2.5	96	14.0	5,710
9.0	2,370	3.0	178	17.0	9,250

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	165	194	265	323	939	498	3,950	730	810	107	25	52
2	140	188	235	288	1,180	476	3,300	634	702	107	34	42
3	123	174	228	255	1,600	590	2,880	*630	610	106	47	42
4	107	200	240	255	1,820	2,100	2,150	730	522	122	40	61
5	99	260	205	*228	1,960	4,590	1,620	782	470	79	38	32
6	95	216	182	218	1,780	6,300	1,320	610	410	83	41	*57
7	90	190	190	380	2,490	6,050	1,120	1,090	377	88	40	49
8	101	176	180	754	3,900	6,170	998	1,690	350	88	26	81
9	280	164	174	1,330	*7,340	6,570	886	1,190	323	82	44	71
10	939	158	169	922	7,980	5,440	792	858	300	74	30	54
11	606	147	162	714	5,540	3,410	742	722	275	69	30	56
12	714	136	246	1,100	3,410	2,200	806	666	270	77	32	28
13	626	129	820	858	2,420	2,250	734	1,010	258	73	30	44
14	442	123	714	666	2,090	2,290	844	1,630	240	70	39	44
15	*335	119	476	618	2,110	2,100	1,730	1,400	245	74	24	32
16	270	119	404	634	2,730	2,420	2,320	1,100	270	73	28	28
17	232	125	374	1,500	2,180	1,850	1,480	1,140	240	74	32	25
18	202	122	335	2,140	1,760	1,470	1,270	1,140	238	45	35	48
19	186	115	318	1,490	1,620	1,330	1,370	1,070	202	69	33	24
20	174	122	275	1,170	1,290	1,310	1,610	1,050	198	66	33	30
21	228	144	268	964	1,100	1,260	2,250	2,030	*178	61	36	33
22	247	386	238	981	984	*1,150	2,620	2,370	174	64	24	36
23	614	785	218	1,040	964	1,060	1,980	2,320	164	59	34	27
24	662	*1,140	213	995	771	960	1,450	1,600	149	39	57	33
25	515	834	522	862	710	866	1,160	1,490	157	24	74	32
26	347	558	658	925	820	810	1,100	2,090	125	60	106	22
27	312	456	487	1,010	785	844	1,020	3,170	122	56	82	30
28	270	371	414	1,250	622	1,190	978	2,360	132	53	66	33
29	248	320	374	1,130	550	1,360	950	1,550	124	51	49	28
30	225	305	341	1,210	-----	2,860	816	1,130	118	44	66	30
31	209	-----	341	1,090	-----	4,530	-----	932	-----	55	66	-----
Total	9,803	8,476	10,266	27,280	63,445	75,884	46,246	40,914	8,733	2,192	1,341	1,204
Mean	316	283	331	880	2,188	2,448	1,542	1,320	291	70.7	43.3	40.1
Cfs/m	0.849	0.761	0.890	2.37	5.98	6.58	4.15	3.55	0.782	0.190	0.116	0.108
In.	0.98	0.85	1.03	2.73	6.34	7.59	4.62	4.09	0.87	0.22	0.13	0.12
Ac-ft	19,440	16,810	20,360	54,110	125,800	150,500	91,730	81,150	17,320	4,350	2,660	2,390
Calendar year 1959: Max	10,900	Min	19	Mean	784	Cfs/m	2.11	In.	28.60	Ac-ft	567,300	
Water year 1959-60: Max	7,980	Min	22	Mean	808	Cfs/m	2.17	In.	29.57	Ac-ft	586,600	

\* Discharge measurement made on this day.

## 1740. Willamette River at Albany, Oreg.

Location.--Lat 44°38'20", long 123°06'20", in SW $\frac{1}{4}$  sec. 6, T.11 S., R.3 W., on right bank at Albany, a quarter of a mile downstream from Calapooya River and at mile 120.0.

Drainage area.--4,840 sq mi, approximately.

Records available.--November 1878 to April 1888 (fragmentary), January to June 1892, November 1892 to September 1894, December 1894 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 172.18 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Sept. 27, 1906, staff gage at site a quarter of a mile upstream at same datum. Sept. 27, 1906, to Nov. 13, 1934, staff gage at site 300 ft upstream at same datum.

Average discharge.--66 years (1893-94, 1895-1960), 14,400 cfs (10,430,000 acre-ft per year).

Extremes.--Maximum discharge during year, 63,000 cfs Feb. 10 (gage height, 15.21 ft); minimum, 4,000 cfs Aug. 9.

1878-82, 1892-1960: Maximum discharge, 266,000 cfs Jan. 14, 1881 (gage height, 32.8 ft); minimum, 1,840 cfs Sept. 1, 2, 1940.

Maximum stage known, 36.0 ft Dec. 4, 1861 (discharge, 340,000 cfs, from rating curve extended above 220,000 cfs). Flood of Feb. 4, 1890, reached a stage of 33.9 ft (discharge, 291,000 cfs).

Remarks.--Records good. Flow regulated at times by Lookout Point, Cottage Grove, Dorena, and Fern Ridge Reservoirs (see elsewhere in this report). Albany power canal diverts water from South Santiam River at Lebanon and discharges into Calapooya River near mouth; small diversions for irrigation and municipal supply.

Revisions (water years).--WSP 694: Drainage area. WSP 904: 1939. WSP 964: 1881, 1932(M). WSP 964 (daily high-water figures only) and WSP 1318 (monthly and annual figures only): 1894, 1897, 1901, 1903, 1908, 1910, 1916, 1923, 1927. WSP 984: 1916. WSP 1248: 1895, 1902, 1907, 1915(M), 1917(M), 1918-19, 1934(M).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 7-14)

-1.4	3,890	10.0	58,900
0.0	6,880	16.0	67,000
4.0	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	7,950	8,380	7,570	8,050	15,000	a9,000	45,500	13,300	19,400	a8,000	4,470	4,410
2	7,740	8,070	6,850	6,940	15,300	8,790	49,400	12,700	17,500	a6,000	4,450	4,620
3	7,760	7,950	6,390	6,460	16,400	9,080	48,700	*12,700	16,800	a5,800	4,400	4,680
4	6,620	8,410	6,170	6,150	18,000	13,100	41,900	13,400	15,500	a5,400	4,410	4,810
5	5,820	9,010	5,190	*6,420	20,200	26,600	34,600	14,700	14,500	a5,200	4,410	5,040
6	5,800	8,820	5,540	6,020	21,100	43,100	30,000	13,900	13,800	a5,000	4,410	*5,120
7	7,040	8,050	5,500	6,110	23,800	48,400	26,900	14,200	13,600	4,870	4,250	4,850
8	7,930	7,280	5,600	7,880	33,100	52,500	25,300	19,100	15,400	4,700	4,090	4,680
9	10,100	6,970	5,300	13,000	*51,900	55,500	23,700	20,000	12,300	4,810	4,020	4,640
10	16,000	6,820	4,980	13,300	62,400	54,800	19,200	18,300	11,800	4,790	4,050	4,580
11	13,100	6,800	4,980	11,700	60,200	47,000	17,500	18,300	11,500	4,790	4,300	4,450
12	12,500	6,590	5,950	12,000	52,000	43,700	16,800	17,400	10,300	*4,790	4,430	4,270
13	12,600	6,460	6,530	12,400	46,500	39,100	15,400	19,900	9,180	4,720	4,390	4,300
14	11,400	6,590	9,570	11,700	40,100	36,500	15,700	25,100	8,790	4,720	4,410	4,470
15	*11,000	6,170	8,670	10,400	37,400	33,100	20,600	26,400	9,240	4,730	4,430	4,490
16	10,400	5,560	8,500	9,600	33,200	31,800	23,400	23,900	10,100	4,700	4,430	4,470
17	10,000	5,500	8,120	11,000	28,900	29,300	21,000	23,100	9,830	4,640	4,430	4,490
18	9,470	4,900	7,420	16,800	25,400	25,400	19,500	22,400	9,630	4,520	4,430	4,560
19	8,500	4,520	6,750	17,600	22,600	22,400	20,500	23,100	9,160	4,510	4,250	4,470
20	8,240	4,910	6,530	15,700	19,500	20,800	22,900	22,200	8,960	4,470	4,140	4,410
21	8,430	5,220	6,330	13,900	16,700	20,400	25,200	27,900	*8,650	4,470	4,210	4,410
22	9,110	6,920	6,150	12,700	15,600	*20,600	28,100	36,800	a7,500	4,450	4,380	4,410
23	12,600	10,900	5,780	12,200	14,900	20,900	25,600	32,300	6,590	4,430	4,620	4,380
24	14,000	*17,700	5,700	11,600	14,200	20,100	22,200	26,600	6,440	4,430	5,160	4,250
25	11,300	16,300	7,740	11,200	12,600	19,000	19,600	28,000	6,200	4,360	5,300	4,200
26	9,570	14,000	10,000	11,500	11,900	17,300	18,400	28,700	5,980	*4,380	5,060	4,230
27	9,600	12,100	9,370	12,700	11,100	16,600	17,800	33,700	a5,800	4,380	4,770	4,250
28	9,960	10,400	8,530	13,900	a10,000	17,200	16,300	33,900	a5,800	4,380	4,620	4,430
29	9,830	9,080	8,050	13,600	a9,500	16,600	15,700	29,400	a5,800	4,390	4,510	4,450
30	9,760	8,070	7,950	13,700	-----	26,000	15,600	24,800	a6,000	4,390	4,340	4,430
31	9,210	-----	8,240	13,900	-----	40,600	-----	21,800	-----	4,450	4,210	-----
Total	303,140	248,350	218,650	350,130	755,500	885,270	742,700	700,600	309,650	147,670	137,810	135,250
Mean	9,779	8,278	7,053	11,290	28,050	28,560	24,760	22,600	10,520	4,764	4,445	4,508
Ac-ft	601,300	492,600	433,700	694,500	*1,439	*1,756	*1,473	*1,390	614,200	292,900	273,300	268,300
Calendar year 1959: Max			75,000		Min	3,910	Mean	12,570	Ac-ft	9,104,000		
Water year 1959-60: Max			62,400		Min	4,020	Mean	13,480	Ac-ft	9,789,000		

\* Discharge measurement made on this day.

† Expressed in thousands.

a No gage-height record; discharge estimated on basis of records for station at Salem.

1780. North Santiam River below Boulder Creek, near Detroit, Oreg.

Location.--Lat 44°42'25", long 122°06'00", in SE 1/4 sec. 17, T.10 S., R.6 E., on right bank 0.5 mile downstream from Boulder Creek and 3.0 miles southeast of Detroit.

Drainage area.--216 sq mi.

Records available.--January 1907 to October 1909, October 1928 to September 1960. Monthly discharge only January 1907, published in WSP 1318. Prior to October 1952, published as "at Detroit."

Gage.--Water-stage recorder. Datum of gage is 1,590.07 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Jan. 24, 1907, to Oct. 31, 1909, staff gage at site 1 1/2 miles downstream and Oct. 1, 1928, to June 30, 1932, at site 2 1/2 miles downstream, at different datums. July 1, 1932, to Sept. 30, 1952, water-stage recorder at site 2 miles downstream at datum 114.39 ft lower.

Average discharge.--34 years, 997 cfs (721,800 acre-ft per year).

Extremes.--Maximum discharge during year, 4,320 cfs Feb. 8 (gage height, 5.70 ft); minimum, 366 cfs Sept. 30.

1907-9, 1928-60: Maximum discharge, 20,300 cfs Dec. 28, 1945 (gage height, 11.24 ft, site and datum then in use); minimum, 250 cfs Sept. 13, 1909.

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 814: Drainage area at former site. WSP 1248: 1931.

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			
2.7	450	4.0	1,500	2.6	370	4.0	1,500
3.0	630	5.0	2,960	3.0	600	5.0	2,960
3.5	1,010			3.5	1,010	6.0	5,000

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	565	630	798	551	822	694	2,380	1,250	1,740	742	494	435
2	*541	604	750	544	947	678	2,440	1,320	1,800	710	488	435
3	523	700	734	524	911	686	2,350	1,270	1,810	694	488	440
4	505	700	694	524	956	798	2,320	*1,220	1,780	678	488	494
5	505	644	670	512	1,030	1,000	2,440	1,190	1,710	670	482	465
6	505	610	642	518	1,140	1,100	2,440	1,260	1,630	686	482	445
7	517	591	628	518	2,270	1,340	2,510	1,870	1,460	656	476	430
8	693	572	607	537	3,450	1,480	2,380	1,760	1,320	649	476	420
9	1,340	559	593	506	3,030	1,290	2,160	1,610	1,260	614	470	415
10	1,010	547	579	500	2,330	1,140	1,820	1,710	1,240	600	470	415
11	1,180	535	686	506	1,780	1,050	1,630	1,850	1,200	593	465	420
12	1,060	523	830	494	1,480	1,010	1,510	2,140	1,170	579	460	415
13	930	511	750	*476	1,330	1,010	1,500	2,120	1,160	579	455	415
14	826	505	686	470	1,310	965	1,560	1,870	1,170	579	450	415
15	770	505	742	470	1,630	983	1,470	1,670	*1,380	565	455	410
16	707	505	774	470	1,410	947	1,350	1,670	1,400	558	450	405
17	658	494	750	470	1,250	938	1,340	1,600	1,250	565	455	405
18	630	494	742	470	1,150	956	1,360	1,540	1,110	565	455	405
19	604	*535	710	470	1,060	1,030	1,380	1,460	1,030	558	450	400
20	714	529	686	465	1,010	1,210	1,720	2,220	992	544	450	395
21	735	818	670	460	983	1,430	1,830	2,270	911	530	450	385
22	1,040	1,150	649	455	938	1,650	1,600	1,930	875	524	470	*385
23	1,170	2,220	635	460	884	1,760	1,400	1,760	866	512	506	385
24	1,000	1,560	710	476	848	1,780	1,290	1,630	875	506	558	390
25	938	1,260	694	488	848	1,800	1,200	1,580	848	500	488	390
26	842	1,090	656	537	798	1,870	1,160	1,690	822	512	476	385
27	770	992	628	537	750	2,200	1,180	1,760	790	*518	465	380
28	766	947	614	572	742	2,270	1,190	1,680	782	506	455	375
29	756	893	600	666	710	2,790	1,190	1,670	774	506	450	370
30	714	830	593	822	-----	*3,320	1,190	1,680	766	506	440	370
31	672	-----	579	814	-----	2,590	-----	1,760	-----	500	430	-----
Total	24,206	23,053	21,079	16,302	37,797	43,745	51,290	52,010	35,921	18,004	14,547	12,294
Mean	781	768	680	526	1,303	1,411	1,710	1,678	1,197	581	469	410
Cfsm	3.62	3.56	3.15	2.44	6.03	6.53	7.92	7.77	5.54	2.69	2.17	1.90
In.	4.17	3.97	3.63	2.81	6.51	7.53	8.83	8.95	6.18	3.10	2.50	2.12
Ac-ft	48,010	45,720	41,810	32,330	74,970	86,770	101,700	103,200	71,250	35,710	28,850	24,380

Peak discharge (base, 3,700 cfs).--Feb. 8 (11 a.m.) 4,320 cfs (5.70 ft); Mar. 29 (9 p.m.) 3,980 cfs (5.54 ft).

\* Discharge measurement made on this day.

1790. Breitenbush River above Canyon Creek, near Detroit, Oreg.

Location.--Lat 44°45'10", long 122°07'40", in SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec.36, T.9 S., R.5 E., on left bank 600 ft upstream from Canyon Creek and 1.5 miles northeast of Detroit.

Drainage area.--106 sq mi.

Records available.--June 1932 to September 1960. Monthly discharge only for June 1932, published in WSP 1318. Prior to October 1952, published as "above French Creek, near Detroit."

Gage.--Water-stage recorder. Datum of gage is 1,573.95 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 1, 1952, at site 0.2 mile downstream at datum 13.46 ft lower.

Average discharge.--28 years, 569 cfs (411,900 acre-ft per year).

Extremes.--Maximum discharge during year, 3,200 cfs Mar. 29 (gage height, 6.90 ft); minimum, 121 cfs Sept. 29, 30.

1932-60: Maximum discharge, 11,600 cfs Dec. 28, 1945 (gage height, 11.86 ft, site and datum then in use); minimum, 87 cfs Sept. 2, 1940.

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 1044: 1943(M). WSP 1248: 1947.

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

2.5	118	5.0	1,250
3.0	215	6.0	2,150
3.5	380	7.0	3,330
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	232	291	344	267	625	288	1,630	655	1,020	354	172	154
2	*212	273	326	258	758	280	1,730	696	1,050	330		150
3	198	438	312	240	678	288	1,620	640	1,040	308	170	149
4	184	412	291	243	720	316	1,560	*590	1,010	312	168	180
5	178	340	273	240	792	575	1,550	550	946	322	166	166
6	178	312	264	232	930	768	1,470	610	899	322	163	161
7	190	291	258	*228	2,080	1,140	1,410	1,010	790	312	159	150
8	451	273	246	258	2,420	1,130	1,260	888	672	294	157	145
9	1,420	261	240	238	2,060	834	1,110	792	640	273	154	144
10	690	249	240	228	1,630	645	894	682	625	264	154	140
11	981	240	356	232	1,170	565	792	968	590	255	152	137
12	762	230	635	222	900	515	726	1,140	580	255	150	135
13	555	220	490	215	780	520	720	1,110	575	252	150	135
14	440	215	436	212	816	495	792	967	646	246	150	135
15	372	215	666	210	1,250	565	768	840	*846	240	152	132
16	326	205	756	208	954	535	690	870	870	235	154	130
17	294	200	615	202	762	505	714	888	650	230	154	130
18	270	202	535	195	655	555	744	888	515	220	149	130
19	252	*235	480	192	575	660	774	852	475	220	147	130
20	305	225	440	190	510	912	1,110	1,560	428	210	147	132
21	319	595	408	184	495	1,120	1,090	1,550	380	202	150	130
22	1,190	1,070	372	180	456	1,240	858	1,200	380	195	168	*130
23	1,250	2,150	348	190	424	1,250	726	1,000	404	190	200	130
24	756	1,220	424	220	396	1,170	655	900	432	186	258	130
25	610	816	412	255	388	1,140	590	858	420	184	190	130
26	495	615	364	322	352	1,190	565	1,020	376	186	184	128
27	424	510	340	336	326	1,440	600	1,020	360	*184	180	126
28	368	470	319	368	308	1,480	615	927	368	180	165	125
29	368	420	305	660	298	2,080	605	919	376	178	157	125
30	333	380	298	858	---	*2,350	610	942	384	176	152	121
31	308	---	260	672	---	1,700	---	1,050	---	174	150	---
Total	14,911	13,573	12,075	8,755	24,488	28,251	28,958	28,802	18,747	7,499	5,092	4,136
Mean	481	452	389	282	844	911	965	929	625	242	164	138
Cfsm	4.54	4.26	3.67	2.66	7.96	8.59	9.10	8.76	5.90	2.28	1.55	1.30
In.-ft.	5.23	4.76	4.24	3.07	8.59	9.91	10.16	10.11	6.58	2.63	1.79	1.45
Ac-ft	29,580	26,920	23,950	17,370	48,570	56,040	57,440	57,130	37,180	14,870	10,100	8,200
Calendar year 1959: Max	2,780			MIn 128		Mean 504		Cfsm 4.75	In. 64.50	Ac-ft 364,600		
Water year 1959-60: Max	2,420			MIn 121		Mean 534		Cfsm 5.04	In. 68.52	Ac-ft 387,400		

Peak discharge (base, 4,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

## WILLAMETTE RIVER BASIN

1805. Detroit Reservoir near Detroit, Oreg.

Location.--Lat 44°43'20", long 122°15'20", in NW¼ sec.7, T.10 S., R.5 E., in control house near right abutment of Detroit Dam, 5 miles west of Detroit.

Drainage area.--437 sq mi.

Records available.--January 1953 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers).

Extremes.--Maximum contents during year, 457,500 acre-ft June 17 (elevation, 1,569.74 ft); minimum, 150,800 acre-ft Dec. 21 (elevation, 1,447.53 ft); 1953-60: Maximum contents, that of June 17, 1960; minimum since first filling, 137,500 acre-ft Jan. 31, 1957 (elevation, 1,439.70 ft).

Remarks.--Reservoir is formed by concrete, gravity-type dam with six 42- by 28-foot control gates. Length of dam is 1,580 ft; built by Corps of Engineers. Storage began in January 1953. Total capacity is 454,900 acre-ft and usable capacity is 340,200 acre-ft between elevations 1,425.0 (proposed lower limit of operation) and 1,569.0 ft (top of spillway gates). Reservoir used for flood control, power development, irrigation, improvement of navigation, pollution abatement, and other purposes. Capacity table computed by Corps of Engineers. Figures given herein represent total contents.

Capacity table, water year 1959-60 (elevation, in feet, and contents, in acre-feet)

1,447	149,900	1,510	278,800
1,450	155,000	1,520	304,200
1,460	172,600	1,530	330,800
1,470	191,000	1,540	359,600
1,480	210,600	1,550	391,000
1,490	231,800	1,560	424,000
1,500	254,500	1,570	458,400

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	355,300	248,800	157,400	155,100	172,600	289,800	405,100	433,400	434,300	447,200	434,000	407,200
2	350,100	245,200	155,200	155,000	176,900	290,600	406,700	435,400	436,500	447,600	433,200	408,300
3	346,400	243,300	153,600	155,800	180,500	291,500	402,800	435,900	438,600	447,900	432,400	405,400
4	345,700	241,200	153,000	153,800	184,500	292,800	395,400	435,100	439,200	448,300	431,500	404,800
5	341,400	238,500	152,800	154,600	189,000	296,500	387,800	434,100	439,200	447,400	430,700	404,000
6	335,800	235,800	153,600	155,200	194,800	301,200	383,600	433,600	442,000	447,300	429,900	403,600
7	330,200	232,900	152,800	155,100	209,000	308,500	378,800	438,300	444,800	447,200	429,000	401,800
8	326,400	231,300	152,800	153,600	227,800	314,700	380,800	441,900	447,000	447,000	428,100	400,600
9	327,200	227,100	152,900	153,200	242,100	317,300	382,400	438,500	448,800	446,800	427,100	399,100
10	324,300	223,000	153,000	153,900	246,200	316,900	383,300	437,200	450,700	446,600	426,200	396,500
11	324,100	220,400	154,100	153,400	246,400	313,600	383,000	436,500	452,400	446,300	425,300	395,600
12	321,600	216,200	156,900	153,100	249,300	311,900	387,200	437,100	453,700	445,000	424,300	390,700
13	317,600	211,500	158,700	152,900	254,500	310,300	389,600	437,200	454,800	445,600	423,100	389,200
14	313,000	207,600	157,300	153,100	260,100	308,500	392,600	434,900	455,600	445,200	422,100	388,100
15	307,900	204,100	156,700	153,300	268,400	311,500	395,400	431,900	456,600	445,100	421,200	385,300
16	302,500	199,400	157,700	153,500	274,400	314,200	398,000	429,500	457,000	444,700	420,200	382,500
17	296,500	195,300	158,200	153,700	279,100	316,800	400,600	430,000	458,900	444,200	419,300	379,700
18	293,800	191,000	155,900	153,800	283,000	320,000	401,500	430,500	454,400	443,700	418,300	376,900
19	290,400	187,000	154,700	153,900	284,800	324,000	404,800	430,400	451,800	443,200	417,300	373,900
20	287,400	183,000	153,500	154,000	287,400	329,000	408,700	436,000	449,500	442,600	416,300	371,100
21	282,900	182,200	151,000	153,900	290,000	335,800	412,500	436,900	448,400	441,500	415,400	368,200
22	283,200	185,000	151,700	153,900	288,400	343,700	414,500	435,600	447,400	440,900	414,700	365,400
23	286,400	195,300	152,400	153,900	287,600	351,100	416,600	435,700	447,900	440,300	414,300	362,500
24	284,200	194,800	153,800	154,300	288,000	357,900	419,000	432,200	448,400	439,600	414,000	359,700
25	281,100	191,800	155,000	154,700	288,500	364,600	417,500	430,300	449,200	438,900	413,300	356,900
26	275,800	187,400	155,800	155,800	288,400	372,000	418,800	431,300	450,100	438,300	412,600	354,000
27	270,400	181,900	156,600	157,300	289,100	381,100	421,000	433,200	449,600	437,800	411,900	351,500
28	264,900	176,200	156,800	158,700	289,800	390,500	423,700	433,000	449,000	437,100	411,000	349,000
29	259,100	169,400	156,100	161,900	289,100	401,800	426,400	432,600	448,500	436,300	410,000	346,400
30	253,100	162,700	155,300	166,100	-----	413,700	429,400	432,200	447,900	435,600	409,000	343,800
31	250,100	-----	154,700	169,400	-----	410,400	-----	432,400	-----	434,800	408,200	-----
(+)	1,498.10	1,454.50	1,449.80	1,458.24	1,514.12	1,555.90	1,561.60	1,562.47	1,566.99	1,563.19	1,555.23	1,534.57
(*)	-109,900	-87,400	-8,000	+14,700	+119,700	+121,300	+19,000	+3,000	+15,500	-13,100	-26,600	-64,400

Calendar year 1959..... \* -12,300

Water year 1959-60..... \* -16,200

+ Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.

## 1815. North Santiam River at Niagara, Oreg.

Location.--Lat 44°45'10", long 122°17'50", in NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec.34, T.9 S., R.4 E., on left bank 0.1 mile downstream from Little Sardine Creek, 0.8 mile downstream from Big Cliff Dam, and 2.1 miles east of Niagara.

Drainage area.--453 sq mi.

Records Available.--December 1908 to January 1920, October 1921 to March 1922, October 1938 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Published as North Fork of Santiam River near Niagara prior to October 1913, and as "above Mayflower Creek, near Detroit" October 1938 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,093.78 ft above mean sea level (Bureau of Public Roads bench mark). Dec. 1, 1908, to May 31, 1922, staff gage at site 2 $\frac{1}{2}$  miles downstream at different datum. Oct. 1, 1938, to Nov. 16, 1939, staff gage and Nov. 17, 1939, to Sept. 30, 1952, water-stage recorder, at various sites and datums about 3 $\frac{1}{2}$  miles upstream.

Average discharge.--32 years (1909-19, 1938-60), 2,326 cfs (1,684,000 acre-ft per year), adjusted for storage.

Extremes.--Maximum discharge during year, 9,960 cfs Mar. 31 (gage height, 7.67 ft); minimum, 480 cfs July 18; minimum daily, 814 cfs Feb. 18.

1908-22, 1938-60: Maximum discharge, 63,200 cfs Nov. 22, 1909 (gage height, 16.4 ft, from floodmark, site and datum then in use), from rating curve extended above 35,000 cfs; minimum, 87 cfs Nov. 8, 1953; minimum daily, 430 cfs Sept. 23-25, 1915.

Remarks.--Records excellent. Flow completely regulated by Detroit Reservoir since 1953 (see preceding page). No diversion above station. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1288: 1914-18, 1920.

Corrections.--Daily discharges shown for Dec. 9, 1953, Apr. 27, May 27, June 16, and July 20, 1954, include typographical errors and should be corrected to 4,110, 1,130, 3,110, 3,480, and 1,210 cfs, respectively; monthly and annual figures are correct.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,780	2,240	4,500	1,140	974	1,070	9,360	1,120	3,080	1,640	1,170	1,170
2	*3,850	2,600	2,800	1,150	934	926	5,680	1,410	2,630	1,170	1,160	1,200
3	2,710	2,790	2,430	1,000	1,010	974	8,030	2,530	2,500	1,140	1,200	1,180
4	2,000	2,810	1,690	1,760	966	1,050	9,390	*2,790	3,080	1,130	1,190	1,210
5	2,410	2,790	1,260	1,210	910	1,160	9,320	3,060	3,000	1,150	1,160	1,220
6	3,710	2,710	1,280	1,110	958	1,220	7,540	2,470	1,880	1,230	1,180	1,240
7	4,020	2,610	1,710	1,070	1,280	1,290	7,700	2,080	1,230	1,130	1,150	1,240
8	3,850	2,470	1,010	1,840	1,180	1,830	4,090	2,450	1,280	1,140	1,180	1,220
9	4,590	2,810	918	1,400	1,930	2,350	3,680	4,470	1,250	1,110	1,140	1,480
10	4,540	3,090	1,150	1,390	4,830	3,250	3,310	4,180	1,320	1,200	1,190	2,070
11	4,120	2,900	1,130	1,260	4,660	4,280	3,430	4,200	1,280	1,230	1,140	2,000
12	4,360	3,000	1,220	1,100	2,310	3,510	1,250	4,200	1,340	1,160	1,170	2,130
13	4,360	3,000	1,680	*966	974	3,510	1,840	5,010	1,520	1,170	1,180	1,240
14	4,360	3,380	1,990	870	894	2,940	2,210	5,510	1,950	1,150	1,170	1,400
15	4,340	3,000	2,670	886	1,010	1,140	2,080	5,510	2,240	1,190	1,190	2,010
16	4,360	3,080	2,270	958	998	942	2,050	4,730	*2,530	1,170	1,240	*2,010
17	4,070	2,970	1,980	966	878	910	2,160	3,500	2,850	1,160	1,160	2,050
18	3,020	3,150	3,200	934	814	918	2,450	3,580	2,910	1,140	1,170	2,060
19	2,810	*3,480	2,750	926	1,130	1,050	1,860	3,510	2,980	1,180	1,180	2,060
20	3,260	3,000	2,410	918	1,100	1,020	2,810	3,700	3,080	1,180	1,160	2,060
21	3,880	3,280	2,640	886	1,340	1,050	2,940	5,360	2,540	1,190	1,210	2,060
22	4,220	3,350	1,150	926	2,440	1,070	2,770	5,470	1,670	1,160	1,190	2,080
23	2,780	2,790	1,140	966	2,300	1,210	2,580	4,460	1,270	1,160	1,220	2,080
24	2,950	4,970	1,140	926	1,580	1,270	2,170	5,450	1,270	1,190	1,240	2,060
25	4,310	5,010	1,150	910	1,560	1,220	2,610	4,950	1,180	1,180	1,180	2,110
26	4,390	5,010	1,130	1,060	1,470	1,340	1,890	3,530	1,160	1,180	1,230	2,070
27	4,430	4,970	1,130	950	1,200	1,280	1,790	3,460	1,150	*1,230	1,200	1,940
28	4,410	5,130	1,350	1,010	1,160	1,460	1,370	3,930	1,440	1,150	1,190	1,800
29	4,460	5,110	1,730	1,050	1,400	3,060	1,480	3,640	1,430	1,180	1,230	1,800
30	4,450	5,150	1,730	1,070	-----	*3,710	1,120	3,600	1,670	1,170	1,160	1,930
31	2,880	-----	1,930	1,040	-----	8,630	-----	3,400	-----	1,160	1,220	-----
Total	118,680	102,630	56,028	35,848	44,200	60,640	110,750	117,660	58,710	36,720	36,770	52,340
Mean	3,828	3,421	1,807	1,092	1,524	1,956	3,692	3,795	1,957	1,185	1,186	1,745
Ac-ft	235,400	203,600	111,100	67,140	87,670	120,300	219,700	233,400	116,400	72,830	72,930	103,800

Adjusted for change in contents in Detroit Reservoir

Mean	2,041	1,955	1,677	1,531	3,606	3,929	4,012	3,645	2,217	971	753	662
Cfsm	4.51	4.31	3.70	2.94	7.96	8.67	8.66	8.49	4.89	2.14	1.66	1.46
In.	5.19	4.81	4.27	3.39	8.58	10.00	9.88	9.78	5.46	2.47	1.92	1.63
Ac-ft	125,500	116,200	103,100	81,640	207,400	241,600	238,700	236,400	131,900	59,730	46,330	39,400

Observed

Calendar year 1959: Max	9,040	Min	760	Mean	2,151	Ac-ft	1,557,000
Water year 1959-60: Max	9,380	Min	814	Mean	2,265	Ac-ft	1,644,000

Adjusted

Calendar year 1959: Mean	2,134	Cfsm	4.71	In.	63.94	Ac-ft	1,545,000
Water year 1959-60: Mean	2,243	Cfsm	4.95	In.	67.38	Ac-ft	1,628,000

\* Discharge measurement made on this day.

1825. Little North Santiam River near Mehama, Oreg.

Location.--Lat 44°47'30", long 122°34'40", in NW $\frac{1}{4}$  sec.16 T.9 S., R.2 E., on left bank 2 miles east of Mehama and 2 miles upstream from mouth.

Drainage area.--110 sq mi.

Records available.--October 1931 to September 1960. Records for July to September 1931 at site 4 miles upstream not equivalent owing to difference in drainage areas.

Gage.--Water-stage recorder. Datum of gage is 655.41 ft above mean sea level, datum of 1929. Prior to June 1, 1948, staff or wire-weight gages at about same site and datum.

Average discharge.--29 years, 774 cfs (560,400 acre-ft per year).

Extremes.--Maximum discharge during year, 6,740 cfs Oct. 22 (gage height, 8.83 ft); minimum, 30 cfs Aug. 21.

1931-60: Maximum discharge, 19,900 cfs Dec. 28, 1945 (gage height, 15.20 ft), from rating curve extended above 13,000 cfs by logarithmic plotting; minimum, 21 cfs Sept. 11, 1934, Sept. 27, 28, 1938, Sept. 1, 1940.

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

Revisions (water years).--WSP 754: 1932. WSP 1218: 1934, 1936, 1949-50.

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

Oct. 1-22

Oct. 23 to Sept. 30

3.3	190	5.0	960	2.3	26	4.0	400
3.5	240	6.0	1,810	2.4	34	4.5	630
4.0	420	8.0	5,130	2.7	67	5.0	930
4.5	650			3.0	115	6.0	1,810
				3.5	230	8.0	5,080

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	*360	416	485	342	944	325	2,570	824	867	172	53	84
2	308	372	444	314	1,080	304	2,940	895	812	165	52	77
3	264	771	432	294	958	308	2,240	800	788	153	50	75
4	232	916	384	278	1,190	590	1,870	712	724	147	47	159
5	212	658	350	263	1,280	2,090	1,600	*636	641	137	45	182
6	200	530	325	311	1,540	2,170	1,380	685	580	129	44	165
7	210	454	318	350	4,140	2,300	1,230	1,480	498	123	42	129
8	442	400	294	440	3,240	2,050	1,090	1,220	436	117	39	106
9	3,480	350	278	444	2,940	1,470	986	1,000	396	111	37	*91
10	1,360	318	278	396	2,610	1,090	764	900	388	106	36	84
11	2,420	290	452	392	1,620	881	707	850	372	104	36	75
12	1,790	272	1,250	353	1,240	794	729	950	350	99	36	70
13	1,120	248	1,040	*328	1,070	923	874	1,500	322	95	35	68
14	778	233	746	322	1,400	888	1,260	1,400	353	92	34	65
15	615	230	1,050	318	2,220	1,190	1,220	1,100	680	87	35	61
16	505	215	1,430	339	1,550	1,130	1,000	1,200	*590	84	38	57
17	428	205	993	392	1,150	923	1,040	1,300	545	81	37	55
18	372	210	764	364	*930	930	1,200	1,400	412	80	34	52
19	330	311	641	346	770	1,160	1,130	1,300	353	75	33	50
20	436	*322	545	318	658	1,480	1,900	3,000	346	70	32	53
21	492	953	485	300	636	1,560	1,810	2,500	314	71	33	48
22	4,590	2,020	428	300	585	1,500	1,290	2,100	284	68	55	45
23	4,030	3,540	396	339	530	1,350	1,000	1,700	272	66	132	45
24	1,780	1,840	555	512	485	1,170	842	1,500	257	63	630	45
25	1,380	1,210	685	729	476	1,080	776	1,400	239	62	388	44
26	993	881	575	1,060	440	1,120	764	2,000	222	61	222	43
27	770	712	503	972	396	1,560	824	1,860	212	59	170	41
28	680	680	467	902	364	1,630	902	1,420	200	*56	133	38
29	630	625	428	1,520	336	*2,510	836	1,220	195	55	110	37
30	540	540	412	1,560	---	3,190	806	1,070	182	54	95	34
31	476	---	380	1,130	---	2,260	---	1,000	---	54	87	---
Total	32,223	20,722	17,813	16,228	36,778	41,926	37,580	40,922	12,830	2,896	2,850	2,178
Mean	1,039	691	575	523	1,268	1,352	1,253	1,320	428	93.4	91.9	72.6
Cfsm	9.45	6.28	5.23	4.75	11.5	12.3	11.4	12.0	3.89	0.849	0.835	0.660
In.	10.89	7.01	6.02	5.49	12.43	14.17	12.71	13.84	4.34	0.98	0.96	0.74
Ac-ft	63,910	41,100	35,330	32,190	72,950	83,160	74,540	81,170	25,450	5,740	5,650	4,320

Peak discharge (base, 8,200 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--No gage-height record May 9-26; discharge estimated on basis of records for Molalla River above Pine Creek, near Wilhoit.

## 1830. North Santiam River at Mehama, Oreg.

Location.--Lat 44°47'20", long 122°37'00", in NW¼ sec.18, T.9 S., R.2 E., on right bank 300 ft downstream from highway bridge at Mehama and 0.5 mile downstream from Little North Santiam River.

Drainage area.--665 sq mi.

Records available.--July 1905 to March 1907, October 1910 to September 1914, September 1921 to September 1960. Monthly discharge only for September 1921, published in WSP 1318. Prior to October 1913, published as North Fork of Santiam River at Mehama.

Gage.--Water-stage recorder. Datum of gage is 602.49 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to June 15, 1933, staff gage at site 100 ft upstream at same datum.

Average discharge.--44 years (1905-6, 1910-14, 1921-60), 3,321 cfs (2,404,000 acre-ft per year).

Extremes.--Maximum discharge during year, 15,000 cfs Apr. 1 (gage height, 7.60 ft); minimum, 1,040 cfs July 18, 1905-7, 1910-14, 1921-60: Maximum discharge, 76,600 cfs Dec. 28, 1945 (gage height, 15.37 ft), from rating curve extended above 36,000 cfs on basis of slope-area measurement of peak flow; maximum gage height, 17.5 ft Nov. 20, 1921, from graph based on gage readings and Jan. 6, 1923, from floodmark, at site then in use; minimum discharge, 400 cfs Sept. 29, Oct. 13, 1934.

Remarks.--Records excellent. Flow regulated by Detroit Reservoir since 1953 (see p. 146). No diversion above station.

Revisions (water years).--WSP 634: Drainage area. WSP 739: 1922-23(M). WSP 1044: 1943. WSP 1248: 1906, 1911-14, 1924(M), 1926, 1934-36(M), 1937, 1938(M), 1942(M).

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

Oct. 1 to Mar. 11

Mar. 12 to Sept. 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	*4,280	2,840	5,540	1,720	2,290	1,660	14,400	2,320	4,400	1,830	1,160	1,230
2	4,220	3,130	3,370	1,560	2,490	1,470	10,100	2,550	3,750	1,400	1,160	1,250
3	3,060	3,750	3,020	1,530	2,360	1,530	12,000	3,580	3,440	1,340	1,200	1,240
4	2,290	3,950	2,440	1,900	2,600	2,110	13,100	3,790	3,970	1,280	1,200	1,340
5	2,650	3,610	1,930	1,550	2,700	4,240	12,600	*3,950	3,830	1,270	1,180	1,380
6	3,950	3,400	1,730	1,540	2,970	4,540	10,200	3,510	2,820	1,350	1,180	1,360
7	4,280	3,200	2,040	1,500	6,660	4,740	10,100	4,240	1,910	1,270	1,150	1,350
8	4,370	3,000	1,610	2,160	6,080	5,050	5,840	4,180	1,900	1,250	1,190	1,280
9	8,650	3,220	1,320	2,060	6,120	4,830	5,100	5,800	1,800	1,230	1,150	1,440
10	6,320	3,500	1,520	1,860	8,960	5,000	4,350	5,700	1,780	1,280	1,210	2,010
11	7,000	3,330	1,860	1,800	7,350	5,920	4,530	5,520	1,740	1,340	1,160	2,000
12	6,460	3,370	3,000	1,680	4,610	4,670	2,460	5,940	1,740	1,230	1,170	2,080
13	5,650	3,330	3,180	1,460	2,930	4,810	2,920	7,620	1,860	1,240	1,180	*1,350
14	5,290	3,710	3,040	*1,430	3,040	4,330	3,830	8,180	2,300	1,240	1,180	1,450
15	5,050	3,420	3,970	1,430	4,300	3,100	3,830	7,460	2,850	1,250	1,190	1,800
16	4,970	3,380	4,150	1,580	3,480	2,600	3,550	7,170	*3,190	1,240	1,250	1,970
17	4,590	3,290	3,290	1,740	2,780	2,280	3,620	5,780	3,420	1,220	1,150	1,980
18	3,520	3,460	4,050	1,660	*2,400	2,230	4,090	6,180	3,390	1,200	1,170	2,000
19	3,130	3,670	3,770	1,600	2,410	2,570	3,570	5,600	3,390	1,210	1,190	2,000
20	3,670	*3,540	3,200	1,530	2,230	2,870	5,310	8,580	3,420	1,220	1,160	2,000
21	4,410	4,430	3,580	1,470	2,360	2,990	5,680	9,860	2,900	1,200	1,200	2,000
22	9,790	6,140	2,010	1,470	3,290	2,900	4,860	8,860	2,220	1,210	1,220	1,980
23	7,350	7,000	1,730	1,580	3,200	2,820	4,090	7,050	1,560	1,180	1,320	2,000
24	6,270	7,620	2,030	1,800	2,460	2,680	3,510	7,460	1,540	1,180	1,840	1,970
25	6,130	6,720	2,160	2,040	2,350	2,510	3,730	7,170	1,460	1,170	1,580	2,040
26	5,780	6,270	2,000	2,540	2,170	2,710	3,210	6,720	1,430	1,190	1,420	2,010
27	5,540	6,050	1,920	2,400	1,890	3,210	3,060	6,240	1,370	1,220	1,360	1,910
28	5,390	6,080	1,930	2,300	1,760	3,490	2,750	5,990	1,590	*1,140	1,280	1,840
29	5,360	6,050	2,260	3,110	1,940	*6,410	2,700	5,700	1,650	1,180	1,510	1,840
30	5,220	5,920	2,290	---	---	8,370	2,340	5,400	1,790	1,160	1,250	1,860
31	3,770	---	2,320	2,600	---	12,700	---	4,910	---	1,160	1,270	---
Total	158,390	130,580	82,080	57,800	100,180	121,540	171,430	182,810	74,390	58,880	58,610	51,960
Mean	5,109	4,553	2,648	1,865	3,454	3,921	5,714	5,897	2,480	1,254	1,245	1,732
Cfsm	---	---	---	---	---	---	---	---	---	---	---	---
In.	---	---	---	---	---	---	---	---	---	---	---	---
Ac-ft	314,200	259,000	162,800	114,600	198,700	241,100	340,000	362,600	147,600	77,120	76,580	103,100
Calendar year 1959: Max	12,400	Min	970	Mean	3,225	Cfsm	4.65	In.	65.83	Ac-ft	2,335,000	
Water year 1959-60: Max	14,400	Min	1,140	Mean	3,302	Cfsm	4.97	In.	67.59	Ac-ft	2,397,000	

\* Discharge measurement made on this day.

1850. South Santiam River below Cascadia, Oreg.

Location.--Lat 44°23'35", long 122°30'35", in SE $\frac{1}{4}$  sec.36, T.13 S., R.2 E., on right bank 100 ft downstream from bridge at Cascadia ranger station, 0.5 mile downstream from Mouse Creek, 0.5 mile upstream from Deer Creek, and 1.5 miles southwest of Cascadia. All records computed are for site at gaging cable 0.7 mile upstream, above Mouse Creek.

Drainage area.--174 sq mi at gaging cable.

Records available.--September 1935 to September 1960. Monthly discharge only for September 1935, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 759.88 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Nov. 1, 1935, staff gage at same site and datum.

Average discharge.--25 years, 817 cfs (591,500 acre-ft per year).

Extremes.--Maximum discharge during year, 6,880 cfs Nov. 23 (gage height, 9.36 ft); minimum, 44 cfs Sept. 30.

1935-60: Maximum discharge, 26,800 cfs Dec. 11, 1956 (gage height, 19.35 ft), from rating curve extended above 14,000 cfs by logarithmic plotting; minimum, 23 cfs Dec. 1, 2, 1936.

Remarks.--Records excellent except those for periods of backwater from log, which are fair. No regulation or diversion above station.

Rating tables, water year 1959-60, except periods of backwater from log (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22

Nov. 23 to Sept. 30

2.1	202	4.0	1,050	2.0	44	4.0	920
2.5	305	6.0	2,650	2.2	87	5.0	1,610
3.0	475	7.0	3,700	2.5	190	7.0	3,700
				3.0	400	9.0	6,300

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	372	400	490	298	920	472	3,380	950	968	206	77	72
2	326	368	450	278	1,080	454	3,530	*1,030	914	202	74	72
3	284	527	432	262	986	510	2,720	958	860	190	70	82
4	258	570	373	238	1,140	1,350	2,260	908	794	182	70	150
5	238	451	342	238	1,240	2,820	1,990	844	734	174	67	136
6	235	400	314	306	1,230	3,860	1,740	902	668	182	64	104
7	282	365	404	306	3,140	3,410	1,680	1,910	590	158	82	87
8	745	341	274	673	4,460	2,900	1,470	1,900	525	154	60	80
9	2,850	317	258	600	4,360	2,250	1,360	1,290	486	143	58	67
10	1,430	299	242	505	3,580	1,610	1,090	1,200	468	140	58	64
11	1,720	275	332	495	2,110	1,290	1,000	1,160	436	136	58	62
12	1,410	268	595	432	*1,550	1,200	928	1,530	414	129	58	62
13	994	250	570	398	1,280	1,480	968	2,430	*391	122	58	62
14	735	245	468	368	1,490	1,440	1,220	2,110	433	118	57	62
15	*598	248	450	*337	2,470	1,510	1,370	1,560	592	112	60	60
16	493	248	481	368	1,890	1,510	1,210	1,610	490	109	64	58
17	421	225	450	540	1,400	1,250	1,240	1,630	440	109	62	57
18	376	*218	427	505	1,160	1,260	1,360	1,900	382	107	58	57
19	350	265	391	*450	998	1,450	1,430	1,610	350	101	57	55
20	488	258	355	440	860	1,710	2,030	3,420	350	98	55	*53
21	467	934	328	445	838	1,790	2,280	3,680	314	95	57	53
22	2,230	2,640	306	481	800	1,790	1,740	2,520	294	93	80	53
23	2,470	5,490	290	555	734	1,680	1,350	1,910	278	90	112	53
24	1,480	2,890	510	700	678	1,500	1,140	1,670	274	90	194	53
25	1,160	1,580	595	778	668	1,370	1,040	1,530	262	*90	150	51
26	856	1,120	500	944	615	1,360	986	2,000	246	90	112	51
27	702	866	454	896	550	1,630	980	1,920	234	87	107	49
28	636	750	418	838	530	1,910	1,010	1,540	230	82	87	49
29	578	635	396	1,080	495	2,860	956	1,300	222	80	80	48
30	502	545	364	1,200	495	4,590	920	1,150	210	80	70	46
31	439	-----	332	1,020	-----	*3,150	-----	1,060	-----	80	67	-----
Total	26,103	23,788	12,479	17,040	43,252	57,546	46,356	50,820	13,849	3,809	2,363	2,008
Mean	842	793	403	550	1,491	1,850	1,545	1,639	462	123	76.2	66.9
Cfs/m	4.84	4.56	2.32	3.16	8.57	10.63	8.88	9.42	2.66	0.707	0.438	0.384
In.	5.58	5.08	2.67	3.64	9.24	12.26	9.91	10.86	2.96	0.91	0.51	0.43
Ac-ft	51,770	47,380	24,750	33,800	85,790	113,700	91,950	100,800	27,470	7,560	4,690	3,990
Calendar year 1959:	Max	6,130	Min	52	Mean	770	Cfs/m	4.43	In.	60.04	Ac-ft	557,200
Water year 1959-60:	Max	5,490	Min	46	Mean	818	Cfs/m	4.70	In.	63.95	Ac-ft	593,400

Peak discharge (base, 5,700 cfs).--Nov. 23 (5 a.m.) 6,880 cfs (9.36 ft); Feb. 8 (12 m.) 5,850 cfs (8.68 ft); Mar. 23 (11:30 p.m.) 6,300 cfs (9.00 ft).

\* Discharge measurement made on this day.

Note.--Backwater from log May 27 to July 19, Aug. 23-27, Sept. 4-6.

1865. Middle Santiam River at mouth, near Foster, Oreg.

Location.--Lat 44°25'25", long 122°37'25", in NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.24, T.13 S., R.1 E., on right bank 0.7 mile upstream from mouth and 2.7 miles northeast of Foster.

Drainage area.--287 sq mi.

Records available.--January 1951 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 562.14 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Oct. 24, 1952, staff gage at same site and datum.

Average discharge.--9 years, 1,810 cfs (1,310,000 acre-ft per year).

Extremes.--Maximum discharge during year, 12,100 cfs Feb. 8 (gage height, 12.55 ft); minimum, 102 cfs Sept. 30.

1951-60: Maximum discharge, 41,000 cfs Dec. 11, 1956 (gage height, 20.25 ft); minimum, 72 cfs Sept. 22-24, 1951.

During flood of Dec. 28, 1945, flow of 41,800 cfs occurred at former station upstream where drainage area is 6 percent smaller.

Remarks.--Records excellent. No regulation or diversion above station. Records of 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 May 20				May 21 to Sept. 30			
2.9	430	7.0	2,520	0.8	96	5.0	1,000
4.0	680	10.0	6,690	1.5	178	6.0	1,570
5.0	1,030	12.0	10,800	3.0	430	7.0	2,520
6.0	1,570			4.0	655	10.0	6,690

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	734	886	1,100	821	2,220	910	*6,190	1,890	1,920	371	164	172
2	620	810	1,030	770	2,790	878	6,550	*1,940	1,790	357	160	168
3	542	1,310	978	722	2,460	950	5,290	1,760	1,700	344	157	164
4	492	1,440	878	680	2,990	1,990	4,490	1,650	1,560	335	151	275
5	450	1,140	810	650	2,970	5,070	3,960	1,510	1,420	319	151	305
6	440	998	758	752	2,890	5,740	3,480	1,540	1,290	303	147	254
7	510	886	734	810	6,860	6,090	3,280	3,150	1,160	295	144	208
8	1,320	797	680	1,130	8,960	5,500	2,860	2,690	1,040	285	140	184
9	5,230	737	642	1,110	8,450	4,270	2,580	2,170	960	278	138	165
10	2,560	678	618	962	7,000	3,180	2,050	2,070	916	270	134	155
11	3,990	630	926	950	4,390	2,580	1,870	2,010	864	264	132	147
12	2,970	595	2,300	856	3,340	2,280	1,830	2,620	805	253	132	142
13	1,980	558	1,920	782	2,790	2,550	2,030	4,560	749	250	128	139
14	1,500	528	1,390	758	3,220	2,450	2,610	3,900	*774	244	127	135
15	*1,220	530	1,400	725	5,760	2,850	2,940	2,830	1,140	234	133	132
16	1,070	516	1,600	758	4,160	2,750	2,400	3,040	992	230	144	126
17	930	492	1,430	852	*3,120	2,310	2,480	3,170	924	222	135	125
18	818	*474	1,290	838	2,550	2,490	2,870	3,470	752	218	129	122
19	740	550	1,160	*800	2,100	3,020	3,080	2,990	672	210	124	118
20	962	622	1,070	737	1,790	3,730	4,350	5,580	652	206	119	117
21	1,050	2,000	986	710	1,700	3,910	4,790	5,790	592	202	122	*115
22	5,900	4,180	906	722	1,560	3,770	3,580	4,530	550	196	157	113
23	5,880	8,410	849	835	1,420	3,520	2,760	3,840	518	192	305	116
24	3,200	4,560	1,310	1,190	1,300	3,130	2,310	3,280	494	188	555	116
25	2,360	2,910	1,540	1,540	1,280	2,890	2,070	3,200	472	*184	440	113
26	1,780	2,110	1,250	2,000	1,190	2,800	1,970	4,240	450	185	281	112
27	1,480	1,680	1,130	1,970	1,090	3,240	1,980	3,940	430	181	267	109
28	1,310	1,540	1,080	1,920	1,030	3,810	2,060	3,130	414	175	220	107
29	1,190	1,360	1,020	2,930	958	5,670	1,950	2,690	400	170	191	105
30	1,090	1,190	982	3,390	-----	7,700	1,880	2,380	386	170	174	102
31	982	-----	910	2,560	-----	5,440	-----	2,180	-----	165	164	-----
Total	55,300	45,207	34,677	36,230	92,338	107,468	92,520	93,540	26,786	7,496	5,665	4,461
Mean	1,784	1,507	1,119	1,169	3,184	3,467	3,084	3,017	893	242	183	149
Cfsm	6.22	5.25	3.90	4.07	11.1	12.1	10.7	10.5	3.11	0.843	0.638	0.519
In.	7.17	5.86	4.49	4.69	11.97	13.93	11.99	12.12	3.47	0.97	0.73	0.58
Ac-ft	109,700	89,670	68,780	71,860	183,100	213,200	185,500	185,500	53,130	14,870	11,240	8,850

Calendar year 1959: Max 12,500 Min 111 Mean 1,562 Cfsm 5.44 In. 73.87 Ac-ft 1,131,000

Water year 1959-60: Max 8,960 Min 102 Mean 1,644 Cfsm 5.73 In. 77.97 Ac-ft 1,193,000

Peak discharge (base, 16,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

1870. Wiley Creek near Foster, Oreg.

Location.--Lat 44°22'20", long 122°37'20", in NE<sup>1</sup>/<sub>4</sub> sec.12, T.14 S., R.1 E., on right bank 0.4 mile downstream from Little Wiley Creek and 3.5 miles southeast of Foster.

Drainage area.--52 sq mi, approximately.

Records available.--October 1947 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 718.08 ft above mean sea level (Corps of Engineers bench mark).

Average discharge.--13 years, 231 cfs (167,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,650 cfs Feb. 8 (gage height, 3.88 ft); minimum, 6.7 cfs Sept. 30.

1947-60: Maximum discharge, 6,290 cfs Dec. 21, 1955 (gage height, 8.42 ft, momentary backwater from debris); minimum, 5.6 cfs Nov. 26, 1952.

Remarks.--Records good except those for period 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 Nov. 22				Nov. 23 to Sept. 30			
0.6	38	0.18	7.7	1.5	215		
1.0	94	.2	8.9	2.0	395		
1.5	220	.4	24	3.0	970		
2.0	410	.7	55	4.0	1,750		
2.5	680	1.0	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	57	80	110	95	224	121	*796	197	180	41	19	20
2	49	74	105	90	304	119	752	185	158	40	17	19
3	46	110	100	85	290	178	584	*178	143	38	16	17
4	41	106	90	80	383	551	455	180	135	34	16	40
5	38	89	85	80	375	972	367	180	117	34	16	32
6	42	80	80	90	351	1,060	308	179	110	31	16	24
7	52	72	80	120	628	991	273	347	100	32	15	20
8	150	68	80	210	1,320	887	233	280	93	31	14	16
9	430	64	75	190	1,380	722	215	227	88	30	14	14
10	244	59	75	160	991	515	182	200	82	30	14	13
11	289	56	90	170	612	408	188	178	78	29	14	13
12	250	53	150	150	*480	400	180	234	76	27	14	12
13	190	50	180	130	379	505	186	470	*68	26	14	13
14	147	49	150	125	422	455	280	413	86	26	13	12
15	*121	48	130	*119	680	475	400	319	94	24	15	11
16	98	48	120	137	530	426	335	347	82	24	15	10
17	86	*46	110	259	404	371	331	343	74	23	14	9.6
18	76	46	100	*218	339	355	355	347	68	23	14	10
19	71	53	95	212	280	375	395	304	65	22	13	9.6
20	130	49	90	194	236	387	540	637	63	21	12	*9.6
21	112	196	85	188	221	363	622	722	56	21	12	8.9
22	241	390	80	194	203	331	495	540	54	20	22	8.3
23	244	480	80	203	180	290	383	431	53	20	33	8.3
24	205	331	130	238	165	256	315	359	51	19	48	8.3
25	190	245	180	245	170	227	280	335	48	19	34	8.3
26	154	188	160	266	160	221	256	500	47	*20	24	8.3
27	135	160	140	252	143	276	245	460	44	20	22	8.3
28	130	145	120	245	135	359	242	351	42	18	19	8.3
29	112	127	110	284	127	774	224	284	42	17	16	8.3
30	98	120	105	290	-----	1,210	209	239	42	22	16	7.7
31	89	-----	100	245	-----	848	-----	209	-----	20	16	-----
Total	4,517	3,682	3,385	5,565	12,092	15,428	10,626	10,155	2,437	802	557	407.8
Mean	139	123	109	180	417	498	354	328	81.2	25.9	18.0	13.6
Cfs/m	2.67	2.37	2.10	3.46	8.02	9.58	6.81	6.31	1.56	0.498	0.346	0.262
In.	3.09	2.63	2.42	3.98	8.65	11.03	7.60	7.26	1.74	0.57	0.40	0.29
Ac-ft	8,560	7,300	6,710	11,040	23,980	30,600	21,080	20,140	4,630	1,590	1,100	809

Calendar year 1959:	Max	1,840	Min	11	Mean	185	Cfs/m	3.56	In.	48.39	Ac-ft	134,200
Water year 1959-60:	Max	1,380	Min	7.7	Mean	190	Cfs/m	3.65	In.	49.66	Ac-ft	137,700

Peak discharge (base, 2,300 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--No gage-height record Nov. 30 to Jan. 14; discharge estimated on basis of weather records, recorded range in stage, and records for Calapooya River at Holley.

## 1875. South Santiam River at Waterloo, Oreg.

Location.--Lat 44°29'55", long 122°49'20", in SW¼NW¼ sec.28, T.12 S., R.1 W., on left bank 600 ft downstream from bridge at Waterloo and 2 miles upstream from Hamilton Creek.

Drainage area.--640 sq mi, approximately.

Records available.--July 1905 to March 1907, October 1910 to December 1911 (gage heights only January to December 1911), July 1923 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Published as South Fork of Santiam River at Waterloo 1905-7, 1910-11.

Gage.--Water-stage recorder. Datum of gage is 370.39 ft above mean sea level, datum of 1929. Prior to Dec. 31, 1911, staff gage at site half a mile downstream at datum about 5.0 ft lower. July 1, 1923, to Nov. 12, 1934, staff gage at present site and datum.

Average discharge.--38 years (1905-6, 1923-60), 2,878 cfs (2,084,000 acre-ft per year).

Extremes.--Maximum discharge during year, 20,700 cfs Feb. 8 (gage height, 10.60 ft); minimum, 169 cfs Sept. 30.

1905-7, 1910-11, 1923-60: Maximum discharge, 74,200 cfs Dec. 28, 1945 (gage height, 22.85 ft), from rating curve extended above 37,000 cfs by logarithmic plotting; minimum, 96 cfs Sept. 1, 2, 1940.

Remarks.--Records excellent except those for period of no gage-height record, which are good. Some diurnal fluctuation caused by numerous logponds above station. No diversion above station.

Revisions (water years).--WSP 1248: 1907, 1924-30, 1932.

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

Oct. 1-9

Oct. 10 to Sept. 30

2.9	630	5.0	3,600	2.1	157	4.0	1,930
3.4	1,110	6.0	5,900	2.5	350	5.0	3,600
4.0	1,870	8.0	12,000	3.0	750	6.0	5,900
				3.5	1,250	10.0	18,600

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	1,210	1,450	1,860	1,350	3,620	1,630	*11,600	a3,400	3,550	678	265	265
2	1,010	1,330	1,670	1,250	4,460	1,570	12,600	a3,600	3,280	580	255	275
3	900	1,730	1,630	1,180	4,090	1,780	10,300	*3,210	3,090	642	250	255
4	800	2,420	1,440	1,120	4,880	4,340	8,400	3,160	2,820	606	245	406
5	728	1,810	1,320	1,060	5,000	9,960	7,290	2,870	2,610	570	240	522
6	694	1,560	1,250	1,260	4,680	13,000	6,280	2,870	2,380	562	240	441
7	791	1,400	1,220	1,530	11,700	12,800	5,800	5,970	2,130	530	236	350
8	1,460	1,250	1,140	2,510	16,600	11,800	5,080	5,430	1,880	498	222	296
9	9,120	1,150	1,080	2,430	16,000	9,860	4,680	4,310	1,740	490	218	260
10	4,570	1,080	1,030	1,960	14,200	7,030	3,760	3,920	1,640	483	205	240
11	5,850	1,020	1,350	2,050	8,860	5,460	3,380	3,780	1,570	462	209	231
12	5,120	950	3,310	1,810	6,440	4,760	3,210	4,730	1,470	448	214	227
13	5,440	910	3,310	1,810	5,360	5,280	3,350	3,360	1,360	427	209	222
14	*2,640	850	2,420	1,540	5,720	5,330	4,350	7,910	*1,310	420	205	216
15	2,160	870	2,240	1,420	10,200	5,590	5,380	5,670	2,030	413	205	209
16	1,780	880	2,480	1,610	8,000	5,800	4,620	5,640	1,700	392	231	205
17	1,530	*795	2,290	2,400	*5,850	4,680	4,400	5,770	1,650	378	227	196
18	1,350	768	2,050	*2,220	4,780	4,640	5,040	6,580	1,360	344	209	196
19	1,210	940	1,840	2,050	3,920	5,210	5,460	5,740	1,220	338	200	196
20	1,490	1,000	1,640	1,860	3,510	6,300	7,000	6,100	1,160	338	196	196
21	1,640	2,820	1,530	1,750	3,100	6,610	9,220	12,600	1,090	332	192	196
22	7,660	6,600	1,410	1,750	2,930	6,500	a6,000	9,540	1,010	326	227	184
23	10,100	15,400	1,350	1,880	2,640	6,040	a5,000	7,320	960	308	364	*164
24	5,410	8,800	1,980	2,420	2,400	5,410	a4,200	6,360	930	296	741	196
25	3,980	5,410	1,960	2,870	2,350	4,920	a3,800	5,930	870	290	813	192
26	3,070	3,840	2,260	3,490	2,240	4,620	a3,400	8,240	840	*302	498	188
27	2,530	3,070	1,950	3,560	1,980	5,310	a3,400	7,970	804	296	448	184
28	2,240	2,680	1,780	3,280	1,960	6,800	a3,600	6,170	750	285	378	180
29	2,050	2,350	1,650	4,420	1,700	8,080	a3,400	5,120	732	270	314	176
30	1,780	2,040	1,580	5,360	-----	16,000	a3,400	4,400	696	275	280	173
31	1,600	-----	1,500	4,200	-----	11,300	-----	3,960	-----	270	285	-----
Total	89,913	77,193	56,320	69,200	168,850	208,430	187,410	176,610	48,612	12,929	9,001	7,259
Mean	2,900	2,573	1,817	2,232	5,822	6,724	5,580	5,697	1,620	417	290	242
Cfsm	4.55	4.02	2.84	3.49	9.10	10.5	8.72	8.90	2.53	0.652	0.453	0.378
In.	5.22	4.49	5.27	4.02	9.81	12.11	9.73	10.26	2.82	0.75	0.52	0.42
Ac-ft	178,300	153,100	111,700	137,300	334,900	413,400	332,100	350,300	96,420	25,640	17,850	14,400

Calendar year 1959: Max 21,500 Min 192 Mean 2,824 Cfsm 4.41 In. 59.90 Ac-ft 2,044,000  
 Water year 1959-60: Max 16,600 Min 173 Mean 2,983 Cfsm 4.66 In. 63.42 Ac-ft 2,165,000

Peak discharge (base, 24,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage and records for station below Cascadia and Middle Santiam River at mouth, near Foster.

## 1890. Santiam River at Jefferson, Oreg.

Location.--Lat 44°42'55", long 123°00'40", in SE $\frac{1}{4}$  sec. 11, T.10 S., R.3 W., on right bank 350 ft upstream from Southern Pacific railroad bridge at Jefferson, 2.0 miles downstream from confluence of North and South Santiam Rivers, and 3.5 miles upstream from mouth.

Drainage area.--1,790 sq mi, approximately.

Records available.--October 1905 to June 1906 (gage heights and discharge measurements only), October 1907 to September 1916, October 1939 to September 1960. Gage-height records collected at same site since 1907 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 199.63 ft above mean sea level, datum of 1929. Prior to Sept. 22, 1940, staff gages at sites within 350 ft downstream at different datums.

Average discharge.--30 years (1907-16, 1939-60), 7,790 cfs (5,640,000 acre-ft per year).

Extremes.--Maximum discharge during year, 36,400 cfs Feb. 8 (gage height, 13.49 ft); minimum, 866 cfs Aug. 10.

1905-6, 1907-16, 1939-60: Maximum discharge, 161,000 cfs Nov. 22, 1909 (gage height, 18.2 ft, from floodmark, site and datum then in use; corresponding gage height at present site, 23.0 ft, from curve of relation); minimum observed, 260 cfs Aug. 15-22, Aug. 24 to Sept. 2, 1940.

Maximum stage known, 19.5 ft Nov. 21, 1921, at railroad bridge 350 ft downstream, U. S. Weather Bureau datum; corresponding gage height at present site and datum, 24.4 ft, from curve of relation (discharge, 202,000 cfs).

Remarks.--Records excellent. Flow regulated by Detroit Reservoir (see p. 146). Salem Canal diverts from North Santiam River at Stayton for irrigation and power use; most of this water reaches Willamette River by way of Mill Creek at Salem. Stayton Canal diverts from North Santiam River at Stayton for irrigation of lands near West Stayton; some return flow reaches North Santiam River above station. Albany power canal diverts from South Santiam River at Lebanon; return flow reaches Willamette River at Albany.

Revisions (water years).--WSP 904: Drainage area. WSP 1094: 1908, 1910, 1912, 1943.

WSP 1248: 1911, 1915-16(M).

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

Oct. 1-22		Oct. 23 to Sept. 30			
3.8	3,220	1.9	890	7.0	9,940
6.0	7,510	3.0	2,040	10.0	20,000
9.0	16,300	5.0	5,190	13.0	33,500
10.0	20,000				

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	5,940	5,110	8,320	4,140	7,680	4,300	30,400	6,850	9,790	2,330	944	1,430
2	5,540	4,800	6,300	3,520	8,420	3,970	28,300	7,090	8,540	2,080	944	1,340
3	4,770	5,190	5,370	3,350	8,460	4,210	26,200	7,730	7,800	1,790	953	1,310
4	3,540	7,250	4,800	3,410	9,130	7,700	24,300	8,190	7,750	1,710	980	1,360
5	3,220	6,050	4,050	3,580	9,850	17,800	22,500	7,940	7,420	1,660	962	1,620
6	4,370	5,610	3,520	3,350	9,520	24,200	19,500	*7,510	6,470	1,660	944	1,620
7	5,120	5,190	3,700	3,930	21,600	23,700	17,900	11,800	4,990	1,540	926	*1,510
8	5,540	4,820	3,620	5,470	26,900	24,000	14,500	12,400	4,390	1,420	908	1,360
9	16,700	4,690	2,960	6,410	31,000	21,600	12,100	11,100	4,160	1,380	899	1,300
10	13,300	4,820	2,880	5,190	32,200	16,400	10,100	11,900	3,870	1,350	890	1,580
11	13,700	4,800	3,230	5,390	22,700	15,200	9,580	10,800	3,650	1,380	908	1,980
12	13,900	4,540	6,720	5,190	16,300	13,100	7,970	11,800	3,520	1,390	890	1,910
13	10,800	4,500	9,850	4,430	12,900	13,900	7,460	16,300	3,430	1,270	908	1,800
14	*9,100	4,610	7,340	*4,200	11,800	13,900	9,790	19,500	3,680	1,280	908	1,270
15	8,100	4,560	7,090	3,970	17,900	12,800	12,100	15,800	5,030	1,220	944	1,470
16	7,510	*4,390	8,020	4,390	16,400	12,900	11,000	15,300	5,190	1,210	980	1,880
17	6,920	4,250	7,070	6,470	12,500	10,400	10,100	14,400	*5,470	1,190	980	1,900
18	5,680	4,360	6,830	6,120	10,600	9,520	11,400	15,400	5,190	1,150	935	1,920
19	4,880	4,860	6,830	5,510	9,020	9,910	11,900	14,200	4,880	1,090	908	1,910
20	5,360	4,950	5,960	5,030	7,870	11,300	13,900	19,200	4,900	1,090	917	1,920
21	6,440	6,300	5,630	4,630	7,340	11,900	19,400	27,500	4,480	1,070	899	1,930
22	15,500	10,300	4,820	4,630	7,680	11,700	16,200	22,900	3,920	1,070	998	1,920
23	23,600	25,600	3,800	4,820	7,510	10,900	13,200	18,800	2,760	1,040	1,140	1,960
24	15,200	20,900	4,320	5,390	6,520	10,000	10,800	16,900	2,570	1,040	1,850	1,980
25	12,400	15,000	6,300	6,140	6,050	9,100	9,940	16,600	2,400	1,030	2,440	2,040
26	10,500	12,200	5,670	7,180	5,820	8,770	9,440	19,300	2,280	1,020	1,920	2,020
27	9,290	10,600	5,010	7,900	5,150	10,300	8,390	19,200	2,180	1,020	1,700	1,980
28	8,540	9,790	4,650	7,110	4,690	12,900	8,490	15,800	2,180	1,020	1,560	1,860
29	8,220	9,470	4,670	8,590	4,540	14,100	7,820	13,900	2,260	*989	1,470	1,820
30	7,700	8,830	4,690	10,600	-----	30,500	7,270	12,400	2,230	989	1,370	1,820
31	6,470	-----	4,650	8,910	-----	*28,500	-----	11,100	-----	980	1,390	-----
Total	277,850	228,320	168,570	168,750	358,050	429,480	421,950	439,610	137,380	40,438	35,365	51,700
Mean	9,963	7,611	5,458	5,444	12,350	13,850	14,060	14,180	4,579	1,304	1,141	1,723
Ac-ft	551,100	452,900	334,400	334,700	710,200	851,900	836,900	872,000	272,500	80,210	70,150	102,500
Calendar year 1959:	Max	50,300	Min	695	Mean	7,441	Ac-ft	5,387,000				
Water year 1959-60:	Max	32,200	Min	890	Mean	7,534	Ac-ft	5,469,000				

\* Discharge measurement made on this day.

1895. Luckiamute River near Hoskins, Oreg.

Location.--Lat 44°43'10", long 123°30'10", in NE $\frac{1}{4}$  sec.11, T.10 S., R.7 W., on right bank a quarter of a mile downstream from Benton County line and 3.5 miles northwest of Hoskins.

Drainage area.--34 sq mi, approximately.

Records available.--May 1934 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 378.7 ft above mean sea level (river-profile survey).

Average discharge.--26 years, 209 cfs (151,300 acre-ft per year).

Extremes.--Maximum discharge during year, 2,080 cfs Feb. 9 (gage height, 7.29 ft); minimum, 9.9 cfs Sept. 29, 30.

1934-60: Maximum discharge, 5,560 cfs Dec. 14, 1946, Feb. 17, 1949; maximum gage height, 13.22 ft Dec. 14, 1946; minimum daily discharge, 5 cfs Oct. 15, 16, 1952, Aug. 25, 1958.

Remarks.--Records good except those for periods of shifting control or backwater from debris, which are fair. Logponds upstream cause diurnal fluctuation at times. No diversion above station.

Revisions (water years).--WSP 834: 1936(M). WSP 1638: 1943(P), 1946(P).

Rating table, water year 1959-60, except periods of shifting control or backwater from debris (gage height, in feet, and discharge, in cubic feet per second)

1.4	9.3	2.5	217
1.5	17	3.0	344
1.6	28	5.0	1,000
1.8	62	7.0	1,880

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	80	116	164	155	367	167	689	186	151	40	18	16
2	70	105	153	144	594	164	543	*167	135	38	17	14
3	60	155	142	137	531	186	442	162	128	37	17	14
4	54	131	131	128	552	254	367	162	120	34	17	18
5	51	114	124	122	564	422	310	146	111	32	17	16
6	49	105	118	137	703	480	271	153	101	31	17	14
7	51	99	116	128	1,150	430	241	162	*92	31	16	14
8	158	92	107	155	1,120	622	217	144	90	31	15	12
9	328	84	103	146	1,850	878	195	137	84	31	14	11
10	239	*80	114	142	1,150	*537	186	131	78	31	15	11
11	472	76	244	155	773	430	191	124	74	30	16	11
12	367	72	661	144	636	378	205	146	70	30	16	11
13	269	68	453	142	564	347	219	224	70	30	15	11
14	212	64	433	148	748	326	313	207	74	*28	14	12
15	176	66	840	153	1,060	534	436	188	80	27	14	12
16	151	62	703	179	748	507	367	212	70	26	14	11
17	133	58	*483	234	558	417	323	284	62	25	14	11
18	120	97	386	234	459	360	339	310	58	25	14	11
19	109	135	308	222	386	315	401	279	58	23	13	11
20	142	131	276	195	339	284	580	357	58	23	13	12
21	135	264	241	181	313	258	561	373	54	23	15	11
22	449	696	217	174	282	236	444	354	51	22	*26	11
23	419	1,020	215	215	256	215	370	321	47	22	37	11
24	323	598	269	266	236	198	323	295	45	21	45	13
25	264	417	279	287	222	186	289	295	45	21	28	13
26	222	326	258	334	207	179	284	282	45	21	20	12
27	191	266	239	*365	193	171	256	254	43	20	17	11
28	169	241	217	467	183	198	234	227	43	20	15	11
29	151	207	198	692	171	540	217	203	41	18	14	11
30	137	181	188	525	770	193	181	20	18	14	14	9.9
31	124	---	171	414	---	804	---	167	---	18	14	---
Total	5,875	6,126	8,551	7,110	16,895	11,593	10,006	6,833	221.8	827	549	366.9
Mean	190	204	276	229	583	374	334	220	73.9	26.7	17.7	12.2
Cfs/m	5.59	6.00	8.12	6.74	17.1	11.0	9.82	6.47	2.17	0.785	0.521	0.359
In.	6.43	6.70	9.35	7.78	18.48	12.68	10.94	7.47	2.43	0.90	0.60	0.40
Ac-ft	11,650	12,150	16,960	14,100	33,510	22,990	19,850	13,550	4,400	1,640	1,090	728

Calendar year 1959: Max 1,500 Min 11 Mean 203 Cfs/m 5.97 In. 81.01 Ac-ft 146,900  
 Water year 1959-60: Max 1,830 Min 9.9 Mean 210 Cfs/m 6.18 In. 84.16 Ac-ft 152,600

Peak discharge (base, 2,000 cfs)--Feb. 9 (7:30 a.m.) 2,080 cfs (7.29 ft).

\* Discharge measurement made on this day.

Note.--Shifting-control method used Feb. 9 to Mar. 29, May 20 to July 6. Backwater from debris Oct. 1 to Nov. 22, Aug. 21 to Sept. 30.

1900. Luckiamute River at Pedee, Oreg.

Location.--Lat 44°44'35", long 123°25'25", in SE $\frac{1}{4}$  sec.33, T.9 S., R.6 W., on left bank 0.5 mile downstream from Pedee Creek and 1.0 mile southwest of Pedee.

Drainage area.--115 sq mi.

Records available.--October 1940 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 245.47 ft above mean sea level, datum of 1928, supplementary adjustment of 1947. Prior to July 1, 1949, staff gage at site 1,700 ft downstream at datum 1.85 ft lower.

Average discharge.--20 years, 472 cfs (341,700 acre-ft per year).

Extremes.--Maximum discharge during year, 5,460 cfs Feb. 9 (gage height, 12.14 ft); minimum, 17 cfs Sept. 28-30.

1940-60: Maximum discharge, 13,500 cfs Feb. 17, 1949 (gage height, 18.46 ft, from floodmark, present site and datum), from rating curve extended above 8,000 cfs by logarithmic plotting; minimum observed, 7 cfs Sept. 12, 1944.

Remarks.--Records excellent. Some diurnal fluctuation at low flow caused by logponds above station. Several small diversions for irrigation above station.

Revisions (water years).--WSP 964: 1941. WSP 1044: Drainage area. WSP 1248: 1945.

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

2.0	69	1.4	12	2.5	173
2.4	150	1.6	25	3.0	335
3.0	350	1.9	55	6.0	1,680
5.0	1,220	2.2	102	12.0	5,350

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	104	168	286	335	802	318	1,460	394	318	81	31	32
2	95	155	265	310	1,380	310	1,190	*360	290	78	31	32
3	88	199	244	290	1,200	332	981	349	272	74	31	31
4	82	184	227	268	1,230	522	806	352	254	69	31	41
5	76	158	212	258	1,320	954	686	310	237	*66	28	36
6	75	150	200	276	1,500	1,130	602	307	224	61	26	31
7	74	142	200	268	2,670	1,010	530	328	206	56	25	28
8	111	135	186	418	2,970	1,530	478	290	*192	56	24	25
9	310	128	184	398	4,960	1,680	434	272	178	55	24	23
10	230	*123	184	360	3,060	*1,310	398	262	176	55	24	22
11	528	120	352	366	1,890	1,030	406	254	168	54	26	22
12	484	116	1,300	338	1,490	868	410	272	156	50	26	22
13	350	111	958	328	1,280	794	442	390	146	51	24	22
14	278	109	762	335	1,420	730	634	370	146	50	23	22
15	230	104	1,260	335	2,040	1,210	976	338	163	47	23	21
16	196	102	1,160	370	1,580	1,160	814	378	143	44	24	21
17	172	100	*946	546	1,220	956	726	530	134	44	23	21
18	155	128	706	550	1,030	782	710	610	127	43	21	22
19	145	190	590	522	832	678	846	538	125	41	20	22
20	178	172	534	450	710	598	1,150	650	125	39	19	22
21	175	390	482	414	642	526	1,190	702	120	38	23	21
22	566	1,110	430	406	578	474	972	690	114	37	*39	19
23	636	1,800	410	498	514	426	824	634	107	34	54	19
24	471	1,050	558	642	470	394	718	590	102	34	91	21
25	370	730	610	678	446	360	638	586	100	34	55	22
26	306	570	558	730	418	335	630	574	97	33	41	21
27	268	466	506	*770	378	324	558	530	95	31	35	19
28	236	414	462	855	352	342	506	482	89	31	32	18
29	212	356	418	1,320	335	819	458	430	88	30	30	17
30	193	314	402	1,100	-----	1,420	422	386	84	31	28	17
31	175	-----	374	891	-----	1,580	-----	349	-----	31	28	-----
Total	7,571	9,994	15,625	15,625	38,707	24,882	21,595	13,507	4,776	1,478	950	712
Mean	244	333	512	504	1,335	803	720	436	159	47.7	30.6	23.7
Cfsm	2.12	2.90	4.45	4.38	11.6	6.98	6.26	3.79	1.38	0.415	0.266	0.206
In.	2.45	3.23	5.13	5.05	12.52	8.05	6.98	4.37	1.54	0.48	0.31	0.23
Ac-ft	15,020	19,820	31,470	30,990	76,770	49,350	42,830	26,790	9,470	2,930	1,880	1,410

Calendar year 1959: Max 4,200 Min 16 Mean 429 Cfsm 3.73 In. 50.60 Ac-ft 310,300  
 Water year 1959-60: Max 4,960 Min 17 Mean 425 Cfsm 3.70 In. 50.34 Ac-ft 308,700

Peak discharge (base, 4,200 cfs).--Feb. 9 (8 a.m.) 5,460 cfs (12.14 ft).

\* Discharge measurement made on this day.

## 1905. Luckiamute River near Suver, Oreg.

Location.--Lat 44°47'00", long 123°14'00", in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.18, T.9 S., R.4 W., on right bank 10 ft upstream from highway bridge at Helmick State Park, 3.0 miles northwest of Suver, and 4.5 miles downstream from Little Luckiamute River.

Drainage area.--240 sq mi.

Records available.--August 1905 to October 1911, July 1940 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 171.92 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Aug. 18, 1905, to Oct. 31, 1911, staff gage at same site at different datum and Aug. 20 to Oct. 15, 1940, at present datum.

Average discharge.--26 years, 942 cfs (682,000 acre-ft per year).

Extremes.--Maximum discharge during year, 9,130 cfs Feb. 9 (gage height, 27.70 ft); minimum, 31 cfs Aug. 19, 20.

1905-11, 1940-60: Maximum discharge, 23,800 cfs Feb. 18, 1949 (gage height, 33.10 ft), from rating curve extended above 14,000 cfs by logarithmic plotting; minimum, 13 cfs Oct. 17, 18, 1952.

Maximum stage known, 33.5 ft probably on Dec. 29, 1937, from information by local residents (discharge, 25,000 cfs, from rating curve extended above 14,000 cfs by logarithmic plotting).

Remarks.--Records excellent. Some diurnal fluctuation during periods of low flow caused by millpond above station. A few small diversions for irrigation above station.

Revisions (water years).--WSP 1044: Drainage area. WSP 1094: 1945-46. WSP 1248: 1905-11.

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

3.5	125	1.9	30	12.0	1,370
5.0	260	2.0	35	18.0	2,900
8.0	670	3.0	102	24.0	4,900
12.0	1,400	5.0	287	26.0	6,100
18.0	2,900	8.0	670	28.0	9,810

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	207	266	499	606	1,760	620	3,340	769	582	144	50	46
2	182	248	462	558	2,370	603	2,790	708	533	138	48	52
3	162	246	436	517	2,740	628	2,150	*70	494	134	48	50
4	149	347	398	478	2,730	837	1,720	712	456	128	46	54
5	139	266	371	455	2,830	1,620	1,440	632	425	*121	45	65
6	130	238	351	444	2,680	2,450	1,240	579	395	115	44	56
7	125	226	340	478	4,230	2,410	1,080	646	*375	108	42	51
8	139	213	331	611	5,040	2,610	963	592	356	101	40	46
9	393	202	311	750	6,670	3,730	871	541	339	97	38	41
10	447	*195	309	639	7,750	3,110	792	507	322	95	36	37
11	598	188	407	614	5,170	*2,280	817	490	317	96	36	35
12	932	180	1,620	620	3,650	1,790	782	495	295	91	37	37
13	680	171	2,200	568	2,990	1,650	915	622	277	87	39	37
14	520	162	1,420	575	2,630	1,520	1,180	696	263	91	37	37
15	416	157	1,850	592	3,520	1,800	1,880	618	290	86	37	37
16	347	161	2,330	600	3,540	2,460	1,780	615	276	82	34	35
17	304	152	1,770	867	2,720	1,950	1,480	756	256	78	34	35
18	274	152	1,380	983	2,160	1,610	1,370	1,100	240	76	34	35
19	248	256	1,140	946	1,790	1,380	1,810	968	227	72	32	37
20	268	292	976	840	1,490	1,210	2,100	1,020	229	67	32	37
21	323	590	*908	753	1,320	1,080	2,510	1,160	220	65	32	37
22	453	888	798	715	1,190	966	2,120	1,180	206	62	42	36
23	1,120	2,670	731	898	1,050	884	1,710	1,100	194	61	*65	35
24	840	2,250	888	1,410	942	798	1,480	1,010	182	60	101	35
25	655	1,410	1,110	1,490	881	732	1,310	968	172	60	105	37
26	538	1,040	1,030	1,660	867	673	1,280	1,090	168	57	76	39
27	458	830	922	1,710	870	870	1,150	959	166	56	60	35
28	405	708	830	*1,700	705	670	1,030	864	158	54	53	36
29	352	636	753	3,000	653	1,370	925	776	149	52	49	33
30	314	558	689	3,110	-----	3,270	837	696	145	48	46	32
31	287	-----	676	2,220	-----	3,500	-----	632	-----	48	45	-----
Total	12,405	15,898	28,216	31,405	77,034	51,081	44,852	24,170	8,707	2,630	1,463	1,215
Mean	400	530	910	1,013	2,656	1,648	1,495	780	290	84.8	47.2	40.5
Cfsm	1.87	2.21	3.79	4.22	11.1	6.87	6.23	3.25	1.21	0.353	0.197	0.169
In.	1.92	2.48	4.37	4.87	11.94	7.92	6.95	3.75	1.35	0.41	0.23	0.19
Ac-ft	24,600	31,530	55,970	62,290	152,800	101,500	88,960	47,940	17,270	5,220	2,900	2,430
Calendar year 1959: Max	8,110	Min	27	Mean	806	Cfsm	3.36	In.	45.61	Ac-ft	583,800	
Water year 1959-60: Max	7,750	Min	32	Mean	817	Cfsm	3.40	In.	46.36	Ac-ft	593,200	

Peak discharge (base, 6,600 cfs).--Feb. 9 (11 p.m.) 9,130 cfs (27.70 ft).

\* Discharge measurement made on this day.

## 1907. Rickreall Creek near Dallas, Oreg.

Location (revised).--Lat 44°54'50", long 123°23'20", in SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.35, T.7 S., R.6 W., on left bank 1.8 miles downstream from Canyon Creek, 3.5 miles west of Dallas, and 5.1 miles downstream from Rickreall Creek Reservoir.

Drainage area.--26.5 sq mi.

Records available.--August 1957 to September 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 520 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,570 cfs Feb. 6 (gage height, 4.91 ft); minimum, 0.8 cfs Sept. 15.

1957-60: Maximum discharge, 2,610 cfs Dec. 19, 1957 (gage height, 5.81 ft); no flow at times.

Remarks.--Records good. Diversion above station to city of Dallas from 3 small tributaries and from Rickreall Creek. Rickreall Creek Reservoir (usable capacity, 740 acre-ft with dead storage of 40 acre-ft), 5.1 miles above station, was built in 1960 to insure adequate municipal supply during low-flow periods. During 1960, records for reservoir were too fragmentary to publish or to use in adjusting records for Rickreall Creek. Storage and regulation began June 8, 1960, and maximum contents of about 580 acre-ft was reached Aug. 8, after which usable contents was released gradually and entirely by Oct. 15.

Cooperation.--Records of diversion and reservoir capacity curve furnished by city of Dallas.

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	14	3.3	415	1.2	1.6	2.2	81
1.9	39	4.0	815	1.5	3.6	2.7	196
2.2	81	5.0	1,660	1.4	6.4	3.5	415
2.7	196			1.5	10	4.0	815
				1.6	15	5.0	1,660
				1.9	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	32	30	78	90	346	106	470	108	92	4.4	5.4	6.4
2	27	29	76	89	465	104	370	102	89	3.6	3.6	7.0
3	25	40	75	87	460	106	294	*102	89	6.4	3.8	10
4	23	35	73	87	521	115	234	98	85	5.4	4.4	10
5	21	32	73	85	500	274	199	96	83	4.6	3.6	10
6	20	31	73	83	663	406	172	96	81	6.1	3.6	9.3
7	20	28	73	81	1,180	388	146	94	79	*5.7	4.1	9.7
8	36	27	70	85	970	516	130	92	*59	6.0	3.0	6.7
9	79	*26	68	83	1,280	*465	119	90	18	7.8	3.0	7.4
10	78	25	88	81	787	350	110	90	24	8.5	3.6	7.4
11	119	23	82	81	505	269	108	90	23	7.8	4.8	7.4
12	132	23	364	79	402	231	123	90	23	7.4	3.6	7.8
13	95	20	310	78	346	216	152	92	57	7.4	3.8	7.4
14	87	21	233	76	447	202	230	90	81	7.4	4.8	7.0
15	75	20	432	76	620	340	306	90	78	7.8	4.4	6.4
16	49	20	379	76	446	334	252	90	41	6.7	3.6	6.0
17	40	19	258	92	346	269	222	100	20	6.7	4.1	6.4
18	37	24	205	94	283	228	239	106	22	6.4	2.6	6.4
19	33	44	164	90	237	199	306	135	26	5.7	3.6	6.4
20	47	43	142	85	202	180	470	169	24	6.0	3.8	6.0
21	41	110	*126	81	185	162	410	174	26	5.4	5.1	6.7
22	70	221	113	83	164	142	314	184	32	5.7	5.1	7.0
23	102	429	106	96	144	128	252	149	31	6.4	*7.4	7.8
24	83	246	130	130	132	115	216	135	24	7.0	6.4	8.9
25	78	174	162	294	126	106	191	152	25	5.7	5.7	8.9
26	87	132	149	423	119	102	182	164	28	5.7	4.8	8.9
27	50	106	135	*402	113	100	162	144	45	5.4	5.7	9.3
28	44	94	121	694	110	118	142	126	23	5.1	4.4	9.3
29	40	87	108	1,010	108	835	130	113	3.6	6.7	4.1	10
30	35	81	100	587	-----	700	117	102	4.4	6.4	3.6	9.7
31	33	-----	94	410	-----	582	-----	96	-----	7.0	5.4	-----
Total	1,719	2,240	4,640	5,888	12,207	8,586	6,768	3,539	1,334.0	194.3	135.1	237.6
Mean	55.5	74.7	150	190	421	271	228	114	44.5	6.27	4.36	7.92
Ac-ft	3,410	4,440	9,200	11,680	24,210	16,630	13,420	7,020	2,650	385	268	471

Adjusted for diversion to city of Dallas

	Mean	57.4	76.6	151	191	422	272	228	116	47.4	10.1	7.64	10.3
Cfs/m	2.17	2.89	5.70	7.21	15.9	10.3	8.60	4.38	1.79	0.381	0.288	0.389	
In.	2.50	3.23	6.58	8.32	17.20	11.85	9.59	5.06	2.00	0.44	0.33	0.43	
Ac-ft	3,530	4,560	9,300	11,760	24,310	16,750	13,560	7,150	2,820	621	470	810	

observed

Calendar year 1959: Max	1,900	Min	0.8	Mean	126	Ac-ft	91,270
Water year 1959-60: Max	1,280	Min	2.8	Mean	129	Ac-ft	93,780

Adjusted

Calendar year 1959: Mean	128	Cfs/m	4.83	In.	65.69	Ac-ft	92,830
Water year 1959-60: Mean	131	Cfs/m	4.94	In.	67.53	Ac-ft	95,430

Peak discharge (base, 1,300 cfs).--Jan. 28 (11 p.m.) 1,430 cfs (4.76 ft); Feb. 6 (12 p.m.) 1,570 cfs (4.91 ft); Feb. 9 (7 a.m.) 1,480 cfs (4.81 ft).

\* Discharge measurement made on this day.

## 1910. Willamette River at Salem, Oreg.

Location.--Lat 44°56'40", long 123°02'30", in SW $\frac{1}{4}$  sec. 22, T. 7 S., R. 3 W., on right bank 300 ft upstream from Center Street Bridge at Salem and at mile 85.1.

Drainage area.--7,280 sq mi, approximately.

Records available.--October 1909 to December 1916, January 1923 to September 1960.

Monthly discharge only January 1923 to September 1927, published in WSP 1318. Gage-height records collected at about the same site since 1892 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 114.14 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Oct. 1, 1909, to Dec. 31, 1916, staff gage at site half a mile upstream at about present datum. Jan. 1, 1923, to Nov. 26, 1934, staff gage at Center Street Bridge at present datum.

Average discharge.--44 years, 23,260 cfs (16,840,000 acre-ft per year).

Extremes.--Maximum discharge during year, 106,000 cfs Feb. 10 (gage height, 14.21 ft); minimum, 5,280 cfs Aug. 9 (gage height, -3.61 ft).

1909-16, 1923-60: Maximum discharge, 348,000 cfs Jan. 8, 1923 (gage height, 30.3 ft); minimum, 2,470 cfs Aug. 27, 1940 (gage height, -4.45 ft).  
Maximum discharge known, 500,000 cfs Dec. 4, 1861 (gage height, about 39 ft), from rating curve extended above 250,000 cfs in 1916. Flood of Feb. 5, 1890, reached a stage of 37.1 ft.

Remarks.--Records excellent. Flow regulated at times by Lookout Point, Cottage Grove, Dorena, Fern Ridge, and Detroit Reservoirs (see elsewhere in this report). Many small diversions for irrigation above station; part of flow of Salem Canal, which diverts water from North Santiam River, returns to Willamette River below station, through Mill Creek at Salem. Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years)--WSP 1318: 1915(M).

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

-3.6	5,300	2.0	24,800
-2.0	8,350	10.0	72,800
0.0	16,000	14.0	105,000

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	13,600	13,900	16,200	13,000	24,200	14,600	80,200	22,000	32,300	8,480	5,880	5,940
2	13,000	12,600	14,400	11,500	23,600	13,800	85,000	*20,400	25,500	8,450	5,820	6,180
3	12,600	12,600	12,300	10,600	28,700	13,700	83,200	20,600	25,600	7,850	5,780	6,220
4	10,900	14,200	11,700	10,400	31,000	17,200	76,100	21,500	24,400	7,380	5,760	6,300
5	9,470	14,900	10,700	10,200	34,600	35,700	64,800	22,800	22,700	7,120	5,760	6,580
6	9,200	14,200	9,830	*9,950	35,900	63,000	55,900	22,300	21,000	7,080	5,740	7,020
7	11,500	13,400	9,500	10,500	46,000	75,100	49,100	23,600	19,200	6,800	5,680	*6,820
8	12,200	12,300	9,770	12,200	*61,500	82,000	45,300	30,800	18,000	6,420	5,520	6,420
9	17,900	11,500	9,550	17,900	89,200	88,600	40,100	32,500	16,900	6,280	5,360	6,180
10	30,200	11,400	8,330	19,300	102,000	84,800	34,400	31,500	15,800	6,320	5,300	6,300
11	26,200	11,400	8,450	17,700	103,000	74,100	29,800	30,000	15,400	6,320	5,440	6,780
12	27,100	11,200	11,100	17,300	87,400	65,000	28,000	29,600	14,500	6,300	5,660	6,650
13	24,800	10,800	19,200	17,200	71,500	59,100	24,900	33,800	13,200	6,120	5,660	6,620
14	21,200	10,800	19,000	16,500	60,600	56,700	25,000	44,000	12,700	6,040	5,660	6,100
15	19,000	10,800	17,100	15,300	59,700	51,900	33,700	45,000	13,600	6,100	5,680	6,120
16	*17,600	10,200	18,500	14,500	60,400	51,900	38,900	41,700	15,100	6,100	5,680	6,580
17	16,800	10,000	17,800	16,900	50,900	47,300	36,200	40,000	15,100	6,040	5,780	6,780
18	15,300	9,650	15,600	22,100	43,300	41,800	33,800	39,600	14,800	6,000	5,720	6,850
19	13,700	9,550	15,300	24,700	38,300	36,900	35,200	40,100	14,300	5,900	5,660	6,850
20	12,800	10,000	13,900	22,200	33,100	35,400	38,000	39,700	13,900	5,860	5,480	6,780
21	13,800	10,400	13,100	19,700	28,500	35,200	46,300	52,400	13,500	5,820	5,460	6,750
22	16,100	14,600	12,700	18,200	25,000	34,900	49,700	62,400	*12,300	5,800	5,640	6,720
23	35,700	29,400	10,900	18,400	25,200	34,500	45,400	58,400	10,600	5,800	5,900	6,750
24	32,400	41,800	10,700	19,100	23,200	33,000	39,000	49,700	9,740	5,760	6,680	6,680
25	25,600	*35,700	13,100	19,400	20,800	30,700	34,100	47,600	9,290	5,820	7,880	6,600
26	21,100	28,700	16,100	20,400	19,400	28,200	31,400	48,500	8,930	5,800	7,780	6,620
27	18,700	24,200	15,500	22,400	18,100	27,300	29,000	54,600	8,600	*5,800	7,000	6,620
28	18,200	20,900	14,200	23,400	16,200	30,000	27,200	54,800	8,300	5,800	6,580	6,620
29	17,700	19,100	13,400	25,500	15,200	34,000	25,500	48,200	8,390	5,760	6,320	6,680
30	17,200	17,400	13,100	29,300	-----	52,900	24,500	41,900	8,480	5,760	6,120	6,650
31	16,100	-----	13,100	27,300	-----	71,000	-----	36,900	-----	5,800	5,920	-----
Total	565,970	477,610	413,630	551,850	*1,277.4	*1,420.3	*1,290.7	*1,186.9	465,430	196,680	184,300	196,760
Mean	18,260	15,920	13,340	17,800	44,050	45,820	43,020	38,290	15,510	6,345	5,945	6,559
Ac-ft	*1,123	947,300	820,400	*1,095	*2,534	*2,817	*2,560	*2,354	923,200	390,100	365,600	390,300

Calendar year 1959: Max 128,000 Min 5,300 Mean 21,180 Ac-ft 15,330,000  
Water year 1959-60: Max 103,000 Min 5,300 Mean 22,480 Ac-ft 16,320,000

\* Discharge measurement made on this day.

† Expressed in thousands.

1920. Mill Creek at Salem, Oreg.

Location.--Lat 44°56'05", long 123°01'00", in NE $\frac{1}{4}$  sec.26, T.7 S., R.3 W., on left bank at State Street Bridge in Salem, 220 ft downstream from 19th Street power diversion.

Drainage area.--110 sq mi.

Records available.--November, December 1934, August to October 1938, May 1939 to September 1960. Prior to October 1940 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 166.12 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Nov. 2 to Dec. 31, 1934, staff gage at site three-quarters of a mile downstream at different datum. July 21 to Aug. 14, 1938, staff gage and Aug. 15, 1938, to Oct. 9, 1940, water-stage recorder, at site 200 ft upstream at different datum.

Average discharge.--21 years (1939-60), 140 cfs (101,400 acre-ft per year).

Extremes.--Maximum discharge during year, 699 cfs Feb. 9 (gage height, 4.20 ft); minimum, 13 cfs Sept. 1.

1934, 1938-60: Maximum discharge, 1,460 cfs (revised) Jan. 28, 1954 (gage height, 7.07 ft); no flow Oct. 2, 1938.

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)
1348	1954	Jan. 28, 1954	1,460	7.07
1448	1956	Dec. 22, 1955	1,310	6.53
1568	1958	Jan. 31, 1958	1,100	5.79

Remarks.--Records excellent except those for periods of no gage-height record, backwater from debris, or shifting control, which are good. Diurnal fluctuation caused by power-plant above station. Salem power canal diverts water into Mill Creek near Stayton.

Several diversions from Mill Creek, including Shelton flood bypass  $1\frac{1}{2}$  miles upstream and 19th Street power diversion 220 ft upstream.

Revisions.--WSP 1218: Drainage area.

Rating table, water year 1959-60, except periods of backwater from debris or shifting control (gage height, in feet, and discharge, in cubic feet per second)

0.7	17	1.5	110
.8	24	2.0	200
1.0	43	4.0	653

Discharge, in cubic 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	59	62	118	260	76	208	115	141	74	*86	*18
2	54	58	60	101	280	78	*190	110	141	69	86	20
3	56	55	65	98	320	95	170	110	142	69	88	46
4	50	73	61	96	340	150	161	115	115	65	82	86
5	42	66	55	95	360	240	147	*106	107	61	83	64
6	51	62	52	117	400	300	130	101	106	54	82	*44
7	48	66	56	130	460	340	115	141	90	55	83	65
8	56	67	59	170	540	380	104	132	89	66	84	61
9	62	65	45	260	600	300	98	115	79	69	83	59
10	60	65	45	240	440	240	89	108	92	76	79	89
11	73	61	93	220	380	220	102	104	94	79	76	101
12	*74	60	199	*208	320	200	104	115	90	72	69	94
13	67	55	174	180	280	190	106	144	84	72	79	100
14	69	73	136	180	260	200	158	134	94	72	67	96
15	66	79	152	172	*245	240	208	122	104	72	64	83
16	64	*65	180	216	208	200	170	120	94	76	64	102
17	111	58	165	281	182	180	156	134	*90	80	64	96
18	122	59	161	233	196	160	144	142	86	82	72	89
19	60	77	152	214	172	150	146	129	89	77	77	107
20	70	80	147	210	158	140	178	196	88	77	77	115
21	72	112	144	200	154	130	190	218	84	82	86	65
22	82	124	136	190	132	120	194	214	86	82	90	69
23	95	144	129	220	118	110	165	198	76	82	95	72
24	88	106	200	240	110	100	149	202	73	80	100	52
25	89	95	198	280	112	95	144	196	82	82	92	48
26	79	88	169	300	107	110	139	261	79	80	90	47
27	73	77	154	280	95	140	125	235	79	79	55	45
28	76	74	144	300	86	170	124	202	73	82	71	43
29	72	72	141	340	80	210	110	182	73	74	37	46
30	66	67	130	320	-----	260	118	165	74	76	19	48
31	64	-----	137	280	-----	233	-----	149	-----	80	18	-----
Total	2,171	2,282	3,801	6,489	7,397	5,755	4,342	4,709	2,794	2,297	2,298	2,092
Mean	70.0	76.1	123	209	255	188	145	152	95.1	74.1	74.1	69.7
Ac-ft	4,310	4,530	7,540	21,870	14,670	11,410	8,610	9,340	5,540	4,560	4,560	4,150
Calendar year 1959: Max	627				Min	9.8	Mean	105	Ac-ft	75,680		
Water year 1959-60: Max	600				Min	18	Mean	127	Ac-ft	82,090		

\* Discharge measurement made on this day.

Note.--No gage-height record Jan. 8-11, Jan. 20 to Feb. 14, Mar. 3-30; discharge estimated on basis of recorded range in stage and records for Pudding River near Mount Angel and Johnson Creek at Sycamore. Backwater from debris Oct. 1 to Dec. 12. Shifting-control method used Aug. 28 to Sept. 30.

1925. South Yamhill River near Willamina, Oreg.

Location.--Lat 45°02'50", long 123°30'10", in sec.14, T.6 S., R.7 W. on left bank 2.3 miles southwest of Willamina and 3.2 miles upstream from Willamina Creek.

Drainage area.--133 sq mi.

Records available.--May 1934 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 235.55 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--26 years, 617 cfs (446,700 acre-ft per year).

Extremes.--Maximum discharge during year, 7,050 cfs Jan. 28 (gage height, 9.18 ft); minimum, 12 cfs Sept. 30.

1934-60: Maximum discharge, 15,200 cfs Feb. 10, 1949 (gage height, 14.80 ft); minimum, 2.6 cfs Oct. 11, 1952.

Remarks.--Records excellent except those for periods of no gage-height record or backwater from debris, which are good. Slight regulation occasionally at low flows by millpond upstream. No diversion above station.

Revisions (water years).--WSP 814: Drainage area. WSP 1318: 1934.

Rating tables, water year 1959-60, except period of backwater from debris (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 22

Nov. 23 to Sept. 30

1.2	119	0.5	12	2.0	375
1.5	204	.6	20	3.0	825
2.0	390	.8	43	4.0	1,430
3.0	890	1.0	75	6.0	3,150
4.0	1,520	1.4	173	9.0	6,800
5.0	2,250				

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	*276	260	395	399	1,600	350	1,650	407	364	79	30	30
2	220	240	350	364	2,340	347	1,330	372	328	77	30	30
3	180	340	333	336	2,040	383	1,090	347	298	75	29	28
4	160	360	308	316	1,800	598	902	347	291	73	28	29
5	150	320	300	305	1,960	1,120	760	305	270	70	29	29
6	140	280	280	316	2,500	1,240	657	330	244	*63	27	29
7	130	260	300	305	3,860	*1,400	572	387	214	58	25	27
8	340	240	280	375	4,110	2,370	513	333	204	56	25	23
9	850	220	280	344	5,510	1,100	459	298	*192	55	24	19
10	585	200	300	308	3,560	1,650	403	294	179	55	26	19
11	1,360	190	900	319	2,270	1,320	415	294	170	54	28	19
12	1,100	180	2,300	316	1,810	1,090	451	322	159	54	29	19
13	795	180	1,500	308	1,620	984	531	350	151	52	30	19
14	610	170	1,100	308	1,800	918	858	340	151	54	29	19
15	480	180	*1,500	312	2,420	1,500	1,270	305	167	50	29	19
16	390	170	1,320	411	1,810	1,350	990	387	151	48	29	19
17	330	170	1,060	775	1,430	1,110	869	634	145	43	30	18
18	285	*234	918	715	1,170	930	896	800	137	48	30	18
19	254	318	755	670	940	790	1,090	690	129	39	30	18
20	330	408	675	590	785	695	1,740	1,100	140	38	29	18
21	291	1,490	585	536	755	608	1,530	1,150	127	36	28	19
22	659	2,000	518	549	662	536	1,210	996	117	35	33	18
23	785	1,190	487	830	580	475	1,030	874	112	35	50	18
24	640	1,520	644	1,180	528	431	864	815	103	34	*92	19
25	575	1,120	745	*1,120	513	391	755	760	98	33	66	21
26	470	852	648	1,580	495	375	700	690	96	33	50	19
27	418	680	576	1,540	435	358	603	621	94	31	43	18
28	394	612	526	2,960	399	395	549	549	92	29	36	15
29	350	518	479	5,020	372	2,380	*483	483	83	29	34	14
30	310	447	483	2,990	-----	2,380	447	443	81	29	31	13
31	287	-----	455	1,940	-----	2,060	-----	403	-----	29	30	-----
Total	14,142	16,349	21,300	28,337	50,072	32,634	25,617	16,426	5,085	1,494	1,061	623
Mean	458	545	687	914	1,727	1,053	854	530	170	46.2	34.2	20.8
Cfsm	3.43	4.10	5.17	6.87	13.0	7.92	6.42	3.98	1.28	0.362	0.257	0.156
In.	3.95	4.57	5.96	7.92	14.00	9.12	7.16	4.59	1.42	0.42	0.30	0.17
Ac-ft	28,050	32,430	42,250	56,210	99,320	64,750	50,810	32,580	10,090	2,960	2,100	1,240

Calendar year 1959: Max 7,280 Min 14 Mean 602 Cfsm 4.53 In. 61.44 Ac-ft 435,900  
 Water year 1959-60: Max 5,510 Min 13 Mean 582 Cfsm 4.38 In. 59.58 Ac-ft 422,600

Peak discharge (base, 5,700 cfs).--Jan. 28 (11 p.m.) 7,050 cfs (9.18 ft); Feb. 6 (12 p.m.) 5,890 cfs (8.32 ft); Feb. 9 (6 a.m.) 6,510 cfs (8.79 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 2-7, Nov. 1-17, Dec. 5-15; discharge estimated on basis of recorded range in stage and records for Willamina Creek near Willamina and Mill Creek near Willamina. Backwater from debris Sept. 3-30.

1930. Willamina Creek near Willamina, Oreg.

Location.--Lat 45°08'30" long 123°29'35", in W<sup>1</sup>/<sub>4</sub>NE<sup>1</sup>/<sub>4</sub> sec.13, T.5 S., R.7 W., on left bank 4.5 miles north of Willamina and 7.0 miles upstream from mouth.

Drainage area.--65 sq mi, approximately.

Records available.--June 1934 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 315.1 ft above mean sea level (from river-profile map). Prior to Oct. 1, 1939, at datum 1.00 ft higher.

Average discharge.--26 years, 255 cfs (184,600 acre-ft per year).

Extremes.--Maximum discharge during year, 2,590 cfs Feb. 9 (gage height, 7.27 ft); minimum, 14 cfs Sept. 30.

1934-60: Maximum discharge, 7,760 cfs Dec. 21, 1955 (gage height, 11.65 ft), from rating curve extended above 3,400 cfs on basis of slope-area measurement of peak flow; minimum, 9 cfs Sept. 3, 4, 1934, Sept. 9, 1935, Aug. 8-10, 19, Sept. 22-27, 1939, Aug. 17, 18, 1940.

Flood of Mar. 31, 1931, reached a stage of about 12 ft, from information by local resident (discharge, 8,200 cfs).

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

Revisions.--WSP 964: Drainage area.

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

1.4	14	3.0	255
1.5	18	4.0	560
1.8	41	5.0	1,010
2.1	77	7.0	2,350
2.5	145		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	78	106	196	203	608	196	584	250	194	57	26	22
2	70	102	183	192	747	189	496	228	179	57	26	21
3	63	139	175	181	716	196	432	216	167	55	25	22
4	58	126	161	169	688	212	376	205	159	53	25	36
5	56	110	149	165	700	318	352	192	147	52	24	25
6	52	105	143	169	1,000	388	302	194	141	*46	23	23
7	52	100	145	163	1,560	454	275	189	134	43	22	21
8	120	94	134	177	1,650	684	252	175	128	42	20	18
9	218	*89	130	161	2,220	876	228	165	*122	42	19	17
10	193	84	141	155	1,450	596	214	159	112	41	19	17
11	406	82	374	155	1,000	506	221	159	106	41	20	16
12	315	77	825	147	830	446	230	171	103	39	21	16
13	250	74	516	145	747	418	232	177	97	39	19	17
14	200	73	506	145	855	403	300	165	102	40	19	17
15	169	76	700	145	990	661	443	157	105	37	19	17
16	145	71	*620	169	835	612	400	200	95	35	19	17
17	126	73	510	268	676	513	370	356	90	34	19	17
18	113	94	432	250	564	446	373	385	89	33	18	17
19	106	121	361	235	464	382	454	338	88	32	18	17
20	132	161	328	209	400	345	712	443	89	31	17	18
21	117	468	292	198	373	310	664	443	83	30	21	17
22	218	1,300	262	196	330	282	544	409	78	30	34	16
23	230	1,080	*250	214	302	255	482	367	73	30	34	17
24	194	680	292	255	278	232	422	342	69	30	42	17
25	177	492	328	292	272	218	376	330	67	29	*32	19
26	161	385	305	*348	250	205	348	310	66	28	26	17
27	149	318	282	376	228	198	320	288	64	28	24	16
28	145	280	260	855	212	*198	*305	260	65	26	22	15
29	152	245	240	1,670	203	482	285	240	61	24	21	15
30	121	214	240	1,060	203	482	285	223	59	24	21	14
31	112	221	747	747	42,010	644	22,290	15,750	6,210	2,290	1,420	1,100
Total	4,678	7,419	9,701	9,814	21,178	12,301	11,237	7,941	3,130	1,154	716	554
Mean	151	247	313	317	730	397	375	256	104	37.2	23.1	18.5
Cfs	2.32	3.80	4.82	4.88	11.2	6.11	5.77	3.94	1.60	0.572	0.355	0.285
In.	2.68	4.24	5.55	5.62	12.12	7.04	6.43	4.54	1.79	0.66	0.41	0.32
Ac-ft	9,280	14,720	19,240	19,470	42,010	24,400	22,290	15,750	6,210	2,290	1,420	1,100

Calendar year 1959: Max 2,360 Min 16 Mean 254 Cfs 3.91 In. 53.08 Ac-ft 184,000  
 Water year 1959-60: Max 2,220 Min 14 Mean 245 Cfs 3.77 In. 51.40 Ac-ft 178,200

Peak discharge (base, 2,300 cfs).--Jan. 28 (11 p.m.) 2,540 cfs (7.21 ft); Feb. 6 (11 p.m.) 2,390 cfs (7.04 ft); Feb. 9 (7 a.m.) 2,590 cfs (7.27 ft).

\* Discharge measurement made on this day.

1933. Mill Creek near Willamina, Oreg.

Location.--Lat 44°58'20", long 123°27'00", in NE $\frac{1}{4}$  NW $\frac{1}{4}$  sec. 17, T.7 S., R.6 W., on left bank 0.2 mile upstream from road bridge, 4 miles southwest of Buell, and 8 miles south of Willamina.

Drainage area.--27.4 sq mi.

Records available.--July 1958 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 562.02 ft above mean sea level (levels by Bureau of Reclamation).

Extremes.--Maximum discharge during year, 1,970 cfs Jan. 28 (gage height, 7.05 ft); minimum, 4.5 cfs Sept. 30.

1958-60: Maximum discharge, 2,560 cfs (revised) Jan. 9, 1959 (gage height, 7.77 ft); minimum, 2.6 cfs Sept. 8, 1958.

Revisions.--The figure of maximum discharge for the water year 1959 has been revised to 2,560 cfs Jan. 9, 1959 (gage height, 7.77 ft), superseding that published in WSP 1638.

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

Revisions.--Revised figures of discharge, in cubic feet per second, for the high-water period in the water year 1959, superseding those published in WSP 1638, are given herewith:

Jan. 9, 1959..... 2,120

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
January 1959.....	15,296	2,120	116	493	18.0	20.76	30,340
Water year 1958-59.....	-	2,120	3.2	140	5.11	69.21	101,100

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

Oct. 1-8

Oct. 9 to Sept. 30

2.3	17	1.9	3.5	2.4	23	4.0	310
2.4	23	2.0	5.7	2.7	47	5.0	690
2.6	38	2.1	8.8	3.0	84	7.0	1,930
		2.2	13	3.5	178		

Discharge, in cubic 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	27	47	65	293	64	508	102	68	19	8.1	7.4
2	28	26	43	60	544	62	361	84	83	19	8.1	7.2
3	24	36	41	55	556	78	268	78	57	17	8.1	8.5
4	21	37	38	52	618	142	210	77	52	17	8.1	8.8
5	20	34	36	49	528	375	171	68	48	16	7.8	7.2
6	19	31	34	50	646	403	142	70	45	15	7.8	6.8
7	29	29	35	52	1,030	375	122	78	42	*4.4	7.2	6.6
8	36	27	31	57	1,040	*524	107	74	*42	13	6.8	6.0
9	102	*25	30	51	*1,500	431	94	68	40	13	6.6	5.7
10	76	23	32	50	781	304	86	62	37	13	6.2	5.4
11	204	22	177	51	462	241	84	59	36	13	6.6	5.4
12	138	21	654	48	334	202	97	62	34	12	6.8	5.2
13	90	20	293	48	288	192	140	71	32	12	6.8	5.4
14	68	20	227	51	389	192	265	71	32	13	6.6	5.4
15	54	19	428	54	540	357	378	65	32	12	6.6	5.4
16	45	19	*334	59	364	340	279	70	31	11	6.6	5.2
17	39	18	220	109	244	260	228	126	30	11	6.2	5.2
18	35	28	165	111	218	215	251	158	29	10	6.2	5.2
19	32	42	131	95	174	176	358	131	28	9.9	5.7	5.2
20	42	96	114	77	148	156	528	156	28	9.9	5.7	5.4
21	42	426	100	68	140	140	434	178	27	9.6	6.6	5.2
22	92	404	90	78	125	123	293	185	25	9.6	9.6	5.0
23	95	382	87	244	113	109	218	142	25	9.6	9.2	5.0
24	70	210	131	500	104	95	178	122	23	9.6	*13	5.2
25	57	136	180	456	97	84	154	146	22	9.2	9.6	a5.4
26	48	100	150	*504	89	83	158	174	21	8.8	8.4	a5.2
27	42	78	122	445	78	77	150	148	21	8.4	7.8	a5.0
28	40	69	102	953	73	110	136	122	20	8.1	7.2	a4.8
29	36	60	87	1,130	68	953	*122	102	19	8.1	7.8	a4.6
30	32	52	81	572	---	808	105	87	19	7.8	6.8	a4.5
31	29	---	73	368	---	668	---	77	---	7.8	6.8	---
Total	1,706	2,515	4,311	6,562	11,584	8,339	6,625	3,139	1,028	366.4	230.4	172.5
Mean	55.0	83.8	139	212	399	269	221	103	34.3	11.8	7.43	5.75
Cfsm	2.01	3.06	5.07	7.74	14.6	9.82	8.07	3.76	1.25	0.431	0.271	0.210
In.	2.32	3.41	5.86	8.91	15.72	11.32	8.99	4.53	1.40	0.50	0.31	0.23
Ac-ft	3,380	4,990	8,550	15,020	22,980	16,540	13,140	6,330	2,040	727	457	342

Calendar year 1959: Max 2,120 Min 4.6 Mean 125 Cfsm 4.56 In. 62.05 Ac-ft 90,660  
 Water year 1959-60: Max 1,500 Min 4.5 Mean 127 Cfsm 4.64 In. 63.29 Ac-ft 92,500

Peak discharge (base, 1,400 cfs).--Jan. 28 (9 p.m.) 1,970 cfs (7.05 ft); Feb. 6 (11 p.m.) 1,560 cfs (6.50 ft); Feb. 9 (6 a.m.) 1,670 cfs (6.93 ft); Mar. 29 (3 p.m.) 1,560 cfs (6.50 ft).

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage and records for Willamina Creek near Willamina.

1940. South Yamhill River near Whiteson, Oreg.

Location.--Lat 45°10'08", long 123°12'25", in NW $\frac{1}{4}$  sec. 5, T. 5 S., R. 4 W., near left bank on downstream side of Whiteson Bridge on U. S. Highway 99W., 1.3 miles northwest of Whiteson and 1.4 miles downstream from Salt Creek.

Drainage area.--502 sq mi.

Records available.--July 1940 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 82.30 ft above mean sea level, datum of 1929. Prior to Sept. 20, 1940, wire-weight gage at same site and datum.

Average discharge.--20 years, 1,742 cfs (1,261,000 acre-ft per year).

Extremes.--Maximum discharge during year, 19,700 cfs Feb. 10 (gage height, 40.72 ft); minimum, 41 cfs Sept. 30.

1940-60: Maximum discharge, 36,800 cfs Dec. 22, 1955 (gage height, 45.25 ft); minimum, 8.5 cfs Sept. 25, 26, 1952.

Remarks.--Records fair. Slight regulation during low-water periods by logpond upstream. Small diversions for irrigation above station.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Rate of change in stage used as a factor Nov. 23, 24, Dec. 12, 13, Jan. 29, 31, Feb. 1, 7-13, 15, Mar. 8, 10, 11, Mar. 29 to Apr. 3)

Oct. 1 to Feb. 9

Feb. 10 to Sept. 30

3.6	282	25.0	6,000	1.2	42	10.0	1,500
5.0	467	35.0	10,800	1.5	59	15.0	2,800
10.0	1,500	39.0	15,300	2.0	95	25.0	6,000
15.0	2,800	40.0	17,500	3.0	190	35.0	10,800
				5.0	467	39.0	15,300

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	523	519	940	1,090	5,230	1,140	6,160	1,420	1,040	200	62	65
2	*437	477	840	988	5,250	1,100	4,930	1,300	944	199	59	69
3	580	467	787	920	6,050	1,110	3,830	1,190	856	192	60	67
4	340	669	745	840	5,850	1,350	3,100	1,160	783	177	59	73
5	309	537	684	798	5,720	2,680	2,560	1,080	726	167	56	86
6	278	474	631	775	5,570	4,390	2,200	1,010	650	155	56	74
7	265	447	631	825	5,580	4,950	1,920	1,120	604	136	56	67
8	285	421	612	960	10,800	6,200	1,700	1,060	574	124	53	58
9	1,030	399	574	1,240	15,700	7,530	1,540	968	530	122	48	54
10	1,120	372	555	1,080	*15,300	6,500	1,370	892	*487	123	46	52
11	1,560	357	893	1,020	10,600	5,020	1,330	844	467	*124	46	50
12	2,340	343	3,820	1,010	7,180	3,940	1,290	888	447	120	48	49
13	1,880	323	4,540	960	5,480	3,250	1,520	912	418	115	50	46
14	1,220	309	3,010	964	4,880	*3,070	1,940	964	330	115	51	46
15	960	298	*3,290	996	5,910	3,270	3,150	888	440	118	50	49
16	798	304	3,760	1,020	5,960	4,480	3,490	908	431	109	49	47
17	669	285	3,080	1,830	4,920	3,820	2,860	1,280	392	101	49	48
18	589	*301	2,460	2,320	4,000	3,160	2,480	2,220	370	94	48	48
19	526	537	2,090	2,080	3,340	2,670	2,980	1,970	354	89	47	49
20	526	604	1,760	1,800	2,730	2,320	3,630	2,160	356	82	46	50
21	631	2,020	1,620	1,580	2,400	2,060	4,700	2,690	344	78	46	50
22	646	3,010	1,400	1,450	2,240	1,840	4,160	2,680	318	75	48	51
23	1,440	6,490	1,250	1,900	1,980	1,640	3,480	2,340	289	74	71	50
24	1,240	4,610	1,420	3,160	1,760	1,480	3,060	2,120	266	73	101	50
25	1,060	3,130	2,000	*3,520	1,630	1,350	2,670	1,940	248	75	163	52
26	920	2,220	2,000	3,880	1,660	1,230	2,400	2,080	238	73	114	56
27	802	1,720	1,750	4,180	1,480	1,200	2,180	1,950	232	70	91	52
28	783	1,410	1,520	4,090	1,330	1,170	*2,000	1,720	224	66	81	48
29	711	1,220	1,350	8,260	1,200	2,230	1,760	1,480	211	61	*74	44
30	627	1,060	1,220	10,500	-----	7,050	1,560	1,280	201	59	65	43
31	570	-----	1,240	7,680	-----	7,320	-----	1,140	-----	59	64	-----
Total	25,215	35,333	52,472	73,676	154,730	100,520	81,950	45,634	13,830	3,423	1,957	1,643
Mean	813	1,178	1,693	2,377	5,336	3,243	2,732	1,472	461	110	63.1	54.8
Cfs/m	1.62	2.35	3.37	4.74	10.6	6.48	5.44	2.93	0.918	0.219	0.126	0.109
In.	1.37	2.62	3.89	5.46	11.46	7.45	6.07	3.38	1.02	0.25	0.14	0.12
Ac-ft	50,010	70,080	104,100	146,100	306,900	199,400	162,500	90,510	27,430	6,780	3,880	3,260

Calendar year 1959: Max 22,500 Min 40 Mean 1,630 Cfs/m 3.25 In. 44.09 Ac-ft 1,180,000  
Water year 1959-60: Max 15,700 Min 43 Mean 1,613 Cfs/m 3.21 In. 43.73 Ac-ft 1,171,000

Peak discharge (base, 13,000 cfs).--Feb. 10 (2:30 a.m.) 19,700 cfs (40.72 ft).

\* Discharge measurement made on this day.

1943. North Yamhill River near Fairdale, Oreg.

Location.--Lat 45°21'55", long 123°22'40", in SW<sup>1</sup>/<sub>4</sub> sec.25, T.2 S., R.6 W., on right bank 0.4 mile downstream from small tributary, 1.4 miles upstream from Kutch Creek, 2.1 miles west of Fairdale, and 9.5 miles west of Yamhill.

Drainage area.--9.03 sq mi.

Records available.--October 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 560 ft (from topographic map).

Extremes.--Maximum discharge during year, 401 cfs Nov. 22 (gage height, 4.34 ft); minimum, 3.4 cfs Sept. 29, 30.

1958-60: Maximum discharge, 650 cfs Nov. 18, 1958 (gage height, 5.19 ft), from rating curve extended above 320 cfs; minimum daily, 2.6 cfs Oct. 1-5, 1958.

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

Rating tables, water year 1959-60, except periods of backwater from debris (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 28

Jan. 29 to Sept. 30

2.1	8.7	3.0	77	1.8	2.5	3.0	78
2.2	12	3.5	161	2.0	6.0	3.5	167
2.4	22	4.0	288	2.2	12	4.0	300
2.7	44			2.4	21	4.5	465
				2.7	44		

Discharge, in cubic 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	19	37	31	110	36	119	48	36	12	6.0	5.0
2	15	18	35	30	142	35	105	44	34	12	6.3	4.8
3	13	25	33	29	146	38	89	42	32	11	5.6	4.8
4	12	21	30	27	146	38	75	*39	30	11	5.8	5.8
5	11	19	28	27	152	45	65	37	29	10	5.6	5.4
6	11	18	27	29	185	55	57	38	27	9.6	5.4	4.8
7	10	17	27	27	240	72	52	38	26	9.6	5.2	4.6
8	28	16	*25	28	252	105	48	34	25	*9.3	5.0	4.3
9	35	16	25	26	288	95	43	32	24	9.6	4.6	4.1
10	46	15	27	25	222	79	40	30	*23	9.6	4.8	3.9
11	99	14	74	25	165	68	41	30	22	9.3	5.0	3.7
12	76	14	196	24	144	62	43	32	21	9.0	5.4	4.1
13	56	14	115	23	130	64	45	32	20	9.3	5.2	4.3
14	43	13	98	23	174	66	62	32	21	9.0	5.0	4.3
15	34	14	119	22	218	*146	67	30	20	8.4	5.0	4.1
16	28	13	114	24	167	130	77	36	20	8.1	5.0	4.1
17	23	14	94	27	134	106	74	44	19	7.8	5.0	4.3
18	20	19	78	25	108	94	77	60	18	7.6	4.8	4.1
19	19	23	64	25	89	85	89	55	18	7.3	4.8	4.1
20	22	*40	57	23	77	78	148	65	18	7.0	4.6	4.1
21	20	93	51	22	70	72	142	70	17	7.0	5.0	3.9
22	46	238	46	23	62	64	113	85	16	7.0	7.0	3.9
23	51	218	43	28	56	57	97	60	15	6.8	6.6	4.1
24	45	133	48	39	51	52	82	55	15	6.5	7.0	4.3
25	40	98	46	49	50	47	73	60	15	6.5	*6.0	4.4
26	33	75	43	69	45	45	65	56	14	6.5	5.8	4.1
27	30	61	40	78	42	41	63	54	14	6.0	5.4	3.9
28	28	52	39	164	40	42	61	50	13	6.0	5.0	3.7
29	24	46	36	*312	38	108	55	46	13	5.8	5.0	3.5
30	22	40	35	192	---	130	52	42	13	5.8	4.8	3.5
31	20	---	33	134	---	132	---	40	---	6.0	5.2	---
Total	979	1,414	1,763	1,630	3,743	2,289	2,239	1,396	628	256.4	166.9	128.0
Mean	31.6	47.1	56.9	52.6	129	73.8	74.6	45.0	20.9	8.27	5.38	4.27
Cfs/m	3.50	5.22	6.30	5.83	14.3	8.17	8.26	4.98	2.31	0.916	0.596	0.473
In.	4.03	5.82	7.26	6.71	15.42	9.43	9.22	5.75	2.59	1.06	0.69	0.53
Ac-ft	1,940	2,800	3,500	3,230	7,420	4,540	4,440	2,770	1,250	509	331	254

Calendar year 1959: Max 441 Min 4.3 Mean 50.4 Cfs/m 5.58 In. 75.75 Ac-ft 36,460

Water year 1959-60: Max 312 Min 3.5 Mean 45.4 Cfs/m 5.03 In. 68.51 Ac-ft 32,980

Peak discharge (base, 350 cfs).--Nov. 22 (3 p.m.) 401 cfs (4.34 ft); Jan. 28 (10 p.m.) 382 cfs (4.29 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record May 7 to June 9, Aug. 11-24; discharge estimated on basis of recorded range in stage and records for station at Pike. Backwater from debris Oct. 1 to Nov. 20, Apr. 15 to May 4.

1960. Haskins Creek below reservoir, near McMinnville, Oreg.

Location.--Lat 45°18'40", long 123°20'55", in NE $\frac{1}{4}$  sec.18, T.3 S., R.5 W., on right bank 800 ft downstream from dam of McMinnville water-supply reservoir and 11 miles north-west of McMinnville.

Drainage area.--7.1 sq mi, approximately.

Records available.--October 1951 to September 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 707 ft above mean sea level (topographic survey of 1955). Prior to Aug. 5, 1952, at site 600 ft upstream at different datum.

Average discharge.--9 years, 32.9 cfs (23,820 acre-ft per year), adjusted for storage and diversion.

Extremes.--Maximum daily discharge during year, 208 cfs Feb. 9; minimum daily, 1.9 cfs Apr. 16.

1951-60: Maximum daily discharge, 378 cfs Dec. 22, 1955; minimum daily, 0.3 cfs Oct. 1, 2, 1951.

Remarks.--Records good. All records presented herein include flow in pipeline which diverts 600 ft above station for municipal supply of McMinnville. Flow regulated by Haskins Creek Reservoir (see p. 176), but during winter months reservoir is empty except when inflow exceeds capacity of outlet tunnel.

Cooperation.--Meter readings for diversion furnished by city of McMinnville.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*8.7	10	19	19	81	26	85	30	23	9.2	4.9	3.4
2	8.2	10	18	19	99	24	73	29	21	9.2	4.9	3.4
3	7.8	15	16	17	102	26	62	27	21	8.9	5.4	3.0
4	7.4	12	15	16	106	26	52	*26	20	8.6	5.8	3.0
5	7.0	11	15	15	108	32	45	25	18	8.1	6.2	3.2
6	7.0	10	14	16	119	35	42	24	16	7.6	5.4	3.2
7	7.0	9.6	13	15	139	45	36	24	16	7.5	5.3	3.2
8	13	9.1	12	16	173	68	16	23	15	7.3	5.6	3.3
9	21	9.1	12	15	208	62	2.3	22	14	7.3	6.3	3.4
10	17	8.6	14	14	149	54	2.4	21	14	6.9	7.2	3.7
11	40	8.6	50	15	115	50	3.4	23	14	*6.2	5.7	5.9
12	33	8.1	39	14	102	46	2.5	25	14	6.6	5.6	6.2
13	25	7.7	58	13	93	47	2.4	25	*12	7.0	5.0	4.5
14	21	7.7	*52	13	109	48	2.6	22	14	6.7	5.0	4.6
15	18	7.7	64	12	126	*88	2.5	21	13	6.4	5.0	4.6
16	16	7.0	59	14	109	83	1.9	24	12	6.8	5.0	4.1
17	13	8.2	52	18	92	72	2.7	36	12	6.8	5.0	4.1
18	12	9.2	44	16	78	62	3.4	38	12	6.8	5.5	4.1
19	12	*14	38	15	65	56	42	36	11	6.8	6.3	4.2
20	12	22	35	15	58	50	68	43	11	7.1	6.1	3.8
21	12	47	30	14	52	46	64	43	11	7.1	5.5	3.8
22	21	96	27	15	47	42	62	41	9.8	6.3	4.5	3.8
23	21	86	26	20	42	38	56	38	10	6.3	4.0	3.8
24	18	89	29	24	38	34	42	37	10	6.0	3.5	3.9
25	16	124	28	29	36	30	44	37	10	5.2	3.4	3.9
26	15	115	26	37	34	29	43	36	9.8	6.5	3.4	3.9
27	13	106	25	40	32	28	36	34	9.6	7.2	3.4	3.9
28	13	95	23	106	28	28	38	32	9.9	7.2	3.4	4.0
29	12	70	21	*194	28	100	35	29	9.6	7.2	3.4	4.0
30	11	20	21	122	98	33	26	26	9.6	7.2	*3.4	4.0
31	11	-----	20	94	-----	97	-----	25	-----	6.1	3.4	-----
Total	469.1	1,052.6	972	1,001	2,568	1,570	1,000.1	922	402.3	220.1	152.5	117.9
Mean	15.1	35.1	31.4	32.3	88.6	50.6	33.3	29.7	13.4	7.10	4.92	3.95
Ac-ft	930	2,090	1,950	1,990	5,090	3,110	1,980	1,850	798	437	302	234

Adjusted for change in contents in Haskins Creek Reservoir

Mean	15.1	22.9	31.4	32.3	88.6	50.6	45.5	29.7	13.4	6.35	4.13	3.26
Cfsm	2.13	3.23	4.42	4.55	12.5	7.13	6.41	4.18	1.89	0.894	0.582	0.459
In.	2.46	3.59	5.10	5.25	13.44	8.21	7.16	4.85	2.11	1.03	0.67	0.51
Ac-ft	930	1,360	1,930	1,990	5,090	3,110	2,710	1,850	798	390	263	194

Observed

Calendar year 1959: Max	260	Min	1.6	Mean	30.4	Ac-ft	22,010
Water year 1959-60: Max	208	Min	1.9	Mean	28.5	Ac-ft	20,720

Adjusted

Calendar year 1959: Mean	30.4	Cfsm	4.28	In.	58.13	Ac-ft	22,010
Water year 1959-60: Mean	28.3	Cfsm	3.99	In.	54.36	Ac-ft	20,580

\* Discharge measurement made on this day.

1970. North Yamhill River at Pike, Oreg.

Location.--Lat 45°22'10", long 123°15'15", in NW¼ sec.25, T.2 S., R.5 W., on right bank 500 ft downstream from Turner Creek, 0.5 mile southeast of Pike, and 4.0 miles northwest of Yamhill.

Drainage area.--66.8 sq mi.

Records available.--October 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 192.66 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Aug. 21, 1950, at datum 1.02 ft higher.

Average discharge.--12 years, 252 cfs (182,400 acre-ft per year).

Extremes.--Maximum discharge during year, 3,140 cfs Jan. 28 (gage height, 7.21 ft); minimum, 7.5 cfs Sept. 29, 30.

1948-60: Maximum discharge, 9,530 cfs Dec. 21, 1955 (gage height, 12.42 ft), from rating curve extended above 2,600 cfs on basis of slope-area measurement of peak flow; minimum, 5.0 cfs Aug. 22, 1958.

Remarks.--Records excellent. Occasional diurnal fluctuations caused by small dams upstream; no seasonal regulation. Water supply for city of McMinnville is diverted from Haskins Creek above station and that for city of Yamhill is diverted from Turner Creek above station. Small diversions above station for irrigation.

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

1.3	29	2.5	250	0.9	5.8	2.1	138
1.5	43	3.0	420	1.1	14	2.5	240
1.8	77	4.0	880	1.3	25	3.0	405
2.1	136	5.0	1,440	1.5	42	4.0	830
				1.8	79	6.0	2,100

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	40	52	124	136	575	166	571	225	152	44	16	14
2	37	50	113	129	775	181	472	205	143	42	17	13
3	34	71	109	120	875	171	405	198	133	40	16	11
4	32	80	102	115	925	171	349	183	124	39	17	15
5	32	54	94	111	825	246	304	*168	115	36	16	15
6	30	51	91	117	1,040	294	270	163	109	31	15	14
7	31	49	91	115	1,240	440	240	161	104	28	14	11
8	63	48	86	147	1,650	745	210	147	100	*28	13	10
9	104	46	82	133	1,760	*626	178	140	94	27	12	9.2
10	105	45	88	126	1,080	499	163	131	89	26	12	8.9
11	250	43	367	124	785	422	168	131	86	27	13	8.5
12	178	42	1,080	115	672	365	175	145	81	25	14	8.2
13	129	40	491	111	613	350	190	143	*78	24	13	8.2
14	100	40	*416	111	815	360	282	136	81	25	13	9.6
15	82	41	519	107	980	646	391	131	82	23	13	9.2
16	70	40	454	115	750	551	321	143	75	22	13	8.9
17	61	40	370	161	595	454	285	234	72	20	13	9.2
18	56	51	314	150	511	391	297	246	68	20	12	10
19	54	*78	261	147	422	349	388	219	68	18	12	9.6
20	63	136	240	133	363	310	618	294	68	18	11	11
21	61	418	208	129	398	282	563	304	63	17	13	10
22	113	1,080	190	156	294	258	458	276	59	18	20	9.2
23	115	790	180	180	267	234	444	252	55	18	18	9.6
24	100	483	219	243	246	213	377	237	53	18	20	11
25	91	405	210	291	234	198	335	261	51	18	17	12
26	79	328	195	366	210	190	304	249	51	17	18	11
27	73	276	183	394	185	180	298	225	49	16	16	9.2
28	69	240	168	*1,170	183	183	294	208	45	16	15	8.5
29	62	198	159	1,820	173	741	261	188	44	15	*14	8.2
30	58	143	161	991	---	755	237	175	44	15	11	7.8
31	54	---	150	667	---	698	---	163	---	16	11	---
Total	2,424	5,436	7,513	8,910	19,391	11,657	9,838	6,081	2,434	747	446	311.0
Mean	78.2	181	242	287	689	376	328	196	81.1	24.1	14.4	10.4
Cfs/m	1.17	2.71	3.62	4.30	10.0	5.65	4.91	2.93	1.21	0.361	0.216	0.156
In.	1.35	3.03	4.18	4.96	10.80	6.49	5.48	3.39	1.36	0.42	0.25	0.17
Ac-ft	4,810	10,780	14,900	17,670	38,460	23,120	19,510	12,060	4,830	1,480	885	617

Calendar year 1959: Max 2,900 Min 9.2 Mean 219 Cfs/m 3.28 In. 44.47 Ac-ft 158,400  
 Water year 1959-60: Max 1,820 Min 7.8 Mean 205 Cfs/m 3.07 In. 41.88 Ac-ft 149,100

Peak discharge (base, 2,900 cfs).--Jan. 28 (10 p.m.) 3,140 cfs (7.21 ft).

\* Discharge measurement made on this day.

1980. Willamette River at Wilsonville, Oreg.

Location.--Lat 45°17'31", long 122°46'05", in SE $\frac{1}{4}$  sec.23, T.3 S., R.1 W., in upstream side of pier of bridge on U. S. Highway 99 at Wilsonville, 1.3 miles downstream from Corral Creek and 2.8 miles upstream from Molalla River.

Drainage area.--8,400 sq mi, approximately.

Records available.--October 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 50.00 ft above mean sea level, datum of 1929; gage readings have been reduced to elevations above mean sea level. Prior to Oct. 1, 1954, staff gage at Butteville 4.5 miles upstream at same datum.

Average discharge.--12 years, 30,110 cfs (21,800,000 acre-ft per year).

Extremes.--Maximum discharge during year, 112,000 cfs Feb. 11 (elevation, 72.20 ft); minimum daily, 6,000 cfs Aug. 8-22.

1948-60: Maximum discharge, 248,000 cfs Jan. 21, 1953 (elevation, 90.00 ft, site then in use; about 87 ft at present site); minimum daily, 3,600 cfs Nov. 29, 30, 1952. Maximum stage known, about 105 ft at Wilsonville Dec. 4, 1861.

Remarks.--Records fair. Flow regulated at times by Lookout Point, Cottage Grove, Dorena, Fern Ridge, and Detroit Reservoirs (see elsewhere in this report). Many small 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	15,000	16,500	18,800	16,000	36,700	17,600	80,700	28,000	34,300	9,710	6,500	6,500
2	14,500	14,500	17,200	15,200	33,200	16,800	85,100	25,400	31,200	9,780	6,500	6,500
3	14,000	14,500	15,000	13,500	36,500	16,500	85,800	24,500	28,200	9,710	6,500	7,000
4	12,500	16,000	13,800	*12,100	39,600	17,200	82,300	*24,900	26,900	8,500	6,500	7,000
5	11,000	17,000	12,900	11,700	41,800	28,900	73,700	25,600	25,200	8,000	6,500	7,000
6	11,000	16,000	11,600	11,800	44,000	58,000	64,000	25,800	23,500	8,000	6,500	7,500
7	12,000	15,000	10,700	11,700	54,100	55,500	26,400	21,800	7,500	6,500	7,500	
8	14,000	14,000	10,800	13,600	70,400	84,600	50,000	32,100	20,100	7,500	6,000	*7,000
9	17,000	13,000	10,700	19,000	88,200	93,800	44,100	34,500	19,200	7,500	8,000	6,500
10	29,000	13,000	9,970	23,500	*106,000	34,500	39,200	33,700	17,700	7,000	6,000	6,500
11	31,500	13,000	9,540	22,600	111,000	87,000	34,100	32,300	16,700	7,000	6,000	7,000
12	29,000	12,500	13,600	21,400	107,000	75,600	31,900	31,700	15,900	7,000	6,000	7,000
13	27,000	12,000	24,700	21,000	89,600	67,200	29,700	35,000	14,600	7,000	6,000	7,000
14	24,000	12,000	26,700	20,300	75,300	62,300	29,900	43,500	14,100	7,000	6,000	6,500
15	21,000	12,000	24,400	19,400	68,800	59,200	35,100	44,600	14,500	7,000	6,000	6,500
16	19,000	11,500	24,600	18,400	70,700	58,300	43,100	41,800	16,000	7,000	6,000	7,000
17	18,000	11,500	24,900	19,600	64,400	56,100	42,800	40,700	16,200	7,000	6,000	7,500
18	17,000	11,000	22,300	24,600	54,400	49,400	39,000	41,100	16,000	7,000	6,000	7,500
19	*15,500	11,000	20,400	28,900	46,800	42,900	38,800	41,500	15,600	6,500	6,000	7,500
20	14,500	11,500	19,000	26,000	40,200	39,600	42,000	44,700	*14,900	6,500	6,000	7,500
21	16,000	13,000	17,500	25,300	35,000	*38,700	50,000	59,300	14,700	6,500	6,000	7,500
22	18,000	17,000	16,400	23,100	31,400	38,000	56,000	63,500	14,100	6,500	6,000	7,500
23	26,000	*23,500	14,900	22,700	29,600	37,100	54,200	58,200	12,500	6,500	6,500	7,500
24	35,000	45,000	15,300	25,400	27,600	35,900	48,000	51,900	11,100	6,500	7,500	7,500
25	28,500	41,000	17,800	27,500	25,700	33,800	41,900	50,300	10,400	6,500	8,500	7,500
26	23,500	34,000	20,700	28,300	23,500	31,500	37,900	52,800	9,780	6,500	8,500	7,500
27	21,000	28,700	20,400	30,100	22,100	30,300	35,100	56,700	9,540	6,500	8,000	7,500
28	20,000	25,000	18,800	31,400	20,300	31,400	33,200	55,600	9,220	*6,500	7,000	7,500
29	19,500	22,500	17,200	36,700	18,600	35,300	31,400	49,700	9,280	6,500	7,000	7,500
30	19,000	20,700	16,200	42,600	-----	52,800	29,400	43,200	9,540	6,500	6,500	7,500
31	18,000	-----	15,700	41,900	-----	72,200	-----	38,300	-----	6,500	6,500	-----
Total	611,000	537,900	532,510	707,300	*1,511.5	*1,537.8	*1,442.9	*1,256.1	512,860	223,700	201,500	215,000
Mean	19,710	17,350	17,180	22,820	52,120	49,610	48,100	40,520	17,100	7,216	6,500	7,167
Ac-ft	*1,212	*1,067	*1,056	*1,403	*2,998	*3,050	*2,862	*2,491	*1,017	443,700	399,700	426,400
Calendar year 1959:	Max 134,000	Min 6,500	Mean 23,970	Cfsm 2.85	In. 38.74	Ac-ft 17,350,000						
Water year 1959-60:	Max 111,000	Min 6,000	Mean 23,380	Cfsm 3.02	In. 41.13	Ac-ft 18,430,000						

\* Discharge measurement made on this day.

† Expressed in thousands.

Note.--Backwater from stoplogs, gates, powerplant, and locks at Oregon City Oct. 1 to Nov. 24, July 4 to Sept. 30; discharge estimated on basis of 4 discharge measurements and records for station at Salem.

1985. Molalla River above Pine Creek, near Wilhoit, Oreg.

Location.--Lat 45°00'45", long 122°29'00", in SW<sup>1</sup>/<sub>4</sub>SE<sup>1</sup>/<sub>4</sub> sec.30, T.6 S., R.3 E., on right bank a quarter of a mile upstream from Pine Creek and 4.5 miles southeast of Wilhoit.

Drainage area.--96 sq mi, approximately.

Records available.--October 1935 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 780 ft (by barometer). Prior to Oct. 1, 1945, at datum 2.02 ft higher.

Average discharge.--25 years, 531 cfs (384,400 acre-ft per year).

Extremes.--Maximum discharge during year, 5,840 cfs Feb. 6 (gage height, 9.63 ft); minimum, 37 cfs Sept. 30.

1935-60: Maximum discharge, 12,200 cfs Jan. 7, 1948 (gage height, 13.17 ft), from rating curve extended above 4,800 cfs on basis of shape of previous curve defined to 7,000 cfs; maximum gage height, 16.04 ft Dec. 21, 1955; minimum discharge, 19 cfs Aug. 30 to Sept. 2, 1940.

Remarks.--Records good except those for periods of backwater from debris, which are fair. No regulation or diversion above station.

Rating tables, water year 1959-60, except periods of backwater from debris (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 8

June 9 to Sept. 30

2.9	120	5.0	985	1.8	37	3.0	220
3.0	145	6.0	1,670	2.0	54	3.5	355
3.5	290	8.0	3,620	2.5	120		
4.0	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	206	261	269	236	726	239	1,830	534	534	130	50	58
2	180	257	254	215	*675	230	1,840	556	488	129	50	57
3	167	342	260	200	770	251	1,510	524	464	124	49	56
4	150	353	233	192	997	372	1,260	496	424	120	48	147
5	142	300	221	186	1,070	1,280	1,080	468	368	105	47	120
6	138	269	203	230	1,850	1,360	930	508	353	94	46	102
7	142	245	221	248	3,450	1,580	836	930	318	90	45	86
8	258	224	200	322	3,120	1,590	748	765	300	89	43	75
9	1,240	*206	192	308	2,960	*1,150	670	635	298	84	42	64
10	732	192	186	278	2,230	842	560	578	270	83	41	61
11	1,290	180	378	266	1,380	665	520	547	260	80	41	57
12	946	172	1,260	239	1,020	598	508	615	245	77	41	55
13	625	164	870	221	3,826	660	565	908	227	76	41	53
14	464	156	610	215	941	635	743	908	262	75	39	52
15	376	153	690	200	1,420	812	792	710	322	*71	43	50
16	311	148	743	212	1,040	782	675	748	282	69	45	48
17	269	145	596	236	820	655	700	782	260	66	44	48
18	236	148	492	221	670	655	770	864	232	65	42	46
19	215	180	420	203	626	809	*864	798	222	64	39	46
20	300	175	364	192	488	1,060	1,360	2,240	220	63	39	50
21	311	557	*328	178	460	1,140	1,260	1,920	198	62	39	45
22	1,540	972	300	172	416	1,100	941	1,400	187	61	*58	44
23	1,720	1,250	284	194	368	985	754	1,110	177	60	93	44
24	946	820	416	322	342	848	625	952	171	59	238	45
25	754	620	452	468	336	782	556	914	161	57	145	45
26	570	480	372	690	304	924	520	1,260	155	57	106	44
27	458	404	332	615	281	1,400	556	1,200	151	56	92	43
28	440	368	308	709	263	1,350	601	946	143	54	76	41
29	400	325	284	1,390	251	3,330	574	770	137	52	66	39
30	350	290	272	1,210	-----	3,430	547	650	133	52	62	37
31	311	-----	254	875	-----	2,130	-----	*592	-----	52	57	-----
Total	16,187	10,376	12,264	11,443	30,230	33,654	25,695	26,828	7,982	2,376	1,907	1,758
Mean	522	346	396	369	1,042	1,086	856	865	266	76.8	61.5	58.5
Cfs/m	5.44	3.60	4.12	3.84	10.9	11.3	8.92	9.01	2.77	0.798	0.641	0.610
In.	6.27	4.02	4.75	4.43	11.71	13.04	9.95	10.39	3.09	0.92	0.74	0.68
Ac-ft	32,110	20,580	24,330	22,700	59,960	66,750	50,970	53,210	15,830	4,710	3,780	3,490

Calendar year 1959: Max 5,010 Min 32 Mean 499 Cfs/m 5.20 In. 70.58 Ac-ft 361,400  
Water year 1959-60: Max 3,450 Min 37 Mean 494 Cfs/m 5.15 In. 70.00 Ac-ft 358,400

Peak discharge (base, 3,600 cfs).--Feb. 6 (12 p.m.) 5,840 cfs (9.63 ft); Mar. 29 (8 p.m.) 5,670 cfs (9.52 ft).

\* Discharge measurement made on this day.

Note.--Backwater from debris Mar. 15-27, May 27 to June 9.

## 2010. Pudding River near Mount Angel, Oreg.

Location.--Lat 45°03'47" long 122°49'45", in SE¼ sec.8, T.6 S., R.1 W., on left bank on downstream side of Cline Bridge, 1.5 miles west of Mount Angel and 3.6 miles upstream from Little Pudding River.

Drainage area.--204 sq mi.

Records available.--October 1939 to September 1960. Monthly discharge only January to September 1945, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 119.76 ft above mean sea level, datum of 1929. Prior to Sept. 22, 1945, staff or wire-weight gages at same site and datum.

Average discharge.--21 years, 708 cfs (512,600 acre-ft per year).

Extremes.--Maximum discharge during year, 3,700 cfs Feb. 10 (gage height, 20.50 ft); minimum, 9.0 cfs Aug. 14.

1939-60: Maximum discharge, 15,000 cfs Feb. 17, 1949; maximum gage height, 30.38 ft Feb. 18, 1949; minimum discharge, 6.1 cfs Aug. 26, 1958.

Remarks.--Records good. No regulation. Small diversions for irrigation above station.

Revisions (water years).--WSP 1094: 1943. WSP 1218: Drainage area. WSP 1248: 1943.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 25 to Dec. 12; rate of change in stage used as a factor many days)

0.5	10	2.0	86	8.0	850
.6	13	3.0	158	17.0	2,750
1.0	30	4.0	256	21.0	3,850

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	124	268	357	409	904	479	1,890	670	773	99	16	30
2	110	245	351	375	994	464	1,800	642	872	96	16	34
3	100	337	365	344	*1,020	494	1,600	608	590	92	17	34
4	92	444	327	321	1,110	757	1,350	592	528	87	17	41
5	86	348	296	305	1,250	1,540	1,150	548	472	84	16	67
6	83	305	279	328	1,300	2,050	976	504	426	73	15	51
7	87	275	280	406	2,420	2,130	850	770	388	64	13	44
8	100	253	272	666	2,750	2,610	760	726	358	57	15	36
9	558	230	249	836	3,400	*3,000	712	636	330	55	14	30
10	506	*212	256	728	3,620	2,540	628	578	304	55	12	26
11	641	196	336	718	2,950	2,050	620	532	284	57	13	25
12	715	183	896	728	2,330	1,760	650	560	257	51	14	24
13	510	173	1,200	665	2,080	1,610	635	768	238	48	12	23
14	388	165	992	644	1,860	1,470	769	954	231	46	10	24
15	314	159	859	617	2,020	1,510	1,100	830	360	*46	11	24
16	274	157	839	626	1,970	1,750	1,080	823	293	42	12	22
17	225	148	735	792	1,710	1,570	978	888	255	39	15	22
18	196	155	654	850	1,510	1,360	*962	1,020	218	36	15	22
19	179	268	593	810	1,330	1,200	1,050	976	203	28	13	23
20	232	270	534	747	1,140	1,090	1,300	1,410	209	27	13	28
21	272	339	497	686	1,010	1,000	1,490	1,840	188	28	12	28
22	686	443	*458	671	915	931	1,510	1,830	170	23	20	25
23	1,450	776	429	734	814	854	1,380	1,660	157	21	41	24
24	1,020	778	527	850	738	778	1,190	1,540	147	21	96	26
25	637	672	693	891	696	712	1,050	1,400	137	24	107	26
26	646	578	626	962	656	696	951	1,660	129	21	72	26
27	530	497	569	983	596	872	884	1,740	126	21	49	24
28	467	458	527	938	548	1,000	954	1,530	116	20	43	22
29	411	444	465	1,140	506	1,160	859	1,280	106	15	*37	22
30	345	397	461	1,180	-----	1,830	736	1,050	100	14	36	20
31	501	-----	443	1,010	-----	1,950	-----	*684	-----	14	28	-----
Total	12,465	10,171	16,363	21,958	44,147	43,227	31,844	31,449	8,765	1,404	820	873
Mean	402	339	528	708	1,522	1,394	1,061	1,014	292	45.3	26.5	29.1
Cfsm	1.97	1.66	2.59	3.47	7.46	6.83	5.20	4.97	1.43	0.222	0.150	0.145
In.	2.27	1.85	2.98	4.00	8.05	7.88	5.81	5.73	1.60	0.26	0.15	0.16
Ac-ft	24,720	20,170	32,460	43,550	87,560	85,740	63,160	62,380	17,390	2,780	1,630	1,730
Calendar year 1959: Max	5,220	Min	12	Mean	662	Cfsm	3.25	In.	44.06	Ac-ft	479,400	
Water year 1959-60: Max	3,620	Min	10	Mean	611	Cfsm	3.00	In.	40.74	Ac-ft	443,300	

\* Discharge measurement made on this day.

2020. Pudding River at Aurora, Oreg.

Location.--Lat 45°14'00", long 122°44'56", in SE<sup>1</sup>/<sub>4</sub> sec.12, T.4 S., R.1 W., on upstream side of bridge on U. S. Highway 99E at Aurora, 1.0 mile upstream from Mill Creek.

Drainage area.--479 sq mi.

Records available.--October 1928 to September 1960.

Gage.--Wire-weight gage read once daily. Datum of gage is 77.23 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 2, 1934, and June 1 to Sept. 15, 1947, staff gage at same site and datum.

Average discharge.--32 years, 1,208 cfs (874,600 acre-ft per year).

Extremes.--Maximum discharge during year, 5,150 cfs Feb. 10 (gage height, 15.90 ft, from graph based on gage readings); minimum, 28 cfs Aug. 9.

1928-60: Maximum discharge, 25,400 cfs Dec. 30, 1937 (gage height, 24.5 ft, from graph based on gage readings), from rating curve extended above 16,000 cfs; minimum, 28 cfs Aug. 24, 25, 29, 1958, Aug. 9, 1960.

Maximum stage known, 25.0 ft about Jan. 7, 1923 (discharge, 27,900 cfs, from rating curve extended above 16,000 cfs).

Remarks.--Records good. Slight regulation at times in summer by mills on tributaries. Small diversions above station.

Revisions (water years).--WSP 1094: 1931, 1934, 1936(M), 1938, 1943. WSP 1218: Drainage area.

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

-0.4	27	2.0	328
-.2	42	4.0	740
.3	91	7.0	1,630
1.0	176	16.0	5,200

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	*229	478	584	730	1,940	869	3,590	1,540	1,480	176	32	75
2	207	436	530	657	1,830	832	3,370	1,220	1,260	170	33	74
3	184	402	528	617	*1,990	817	3,090	1,170	1,090	164	36	77
4	171	538	538	573	2,050	999	2,700	1,130	970	159	37	83
5	162	613	498	534	2,230	1,960	2,310	1,080	866	147	37	93
6	153	518	466	516	2,420	3,510	1,970	1,000	774	135	34	114
7	150	482	450	558	3,280	3,840	1,890	1,180	699	118	33	110
8	150	420	444	978	4,320	*4,080	1,480	1,600	637	104	33	94
9	252	389	436	1,900	4,840	4,650	1,330	1,450	589	98	29	86
10	722	*362	428	1,810	5,100	5,040	1,230	1,220	542	92	30	76
11	733	339	458	1,540	5,030	4,750	1,070	1,080	502	91	29	70
12	970	319	848	1,550	4,770	4,210	1,090	1,020	484	93	30	67
13	965	302	1,890	1,440	4,500	3,850	1,100	1,130	432	87	31	66
14	738	298	1,940	1,260	4,180	3,220	1,240	1,450	402	83	32	64
15	575	275	1,620	1,180	3,880	2,860	1,780	1,540	458	77	34	64
16	474	262	1,400	1,110	3,890	3,090	2,290	1,410	542	73	37	64
17	409	259	1,290	1,320	3,660	3,040	2,160	1,440	492	69	40	64
18	360	254	1,150	1,660	3,210	2,700	*1,940	1,560	430	*65	42	65
19	319	307	1,040	1,590	2,780	2,360	1,880	1,660	384	63	41	65
20	292	369	941	1,450	2,380	2,110	2,080	1,810	364	59	38	65
21	398	474	861	1,320	2,060	1,930	2,650	2,900	348	53	38	65
22	407	587	*801	1,210	1,840	1,780	2,970	3,210	319	48	40	69
23	1,060	845	745	1,350	1,640	1,600	2,850	3,060	307	45	48	69
24	1,750	1,120	714	1,780	1,460	1,450	2,500	2,850	281	46	72	67
25	1,420	1,080	884	1,860	1,320	1,310	2,170	2,720	260	46	137	68
26	1,150	947	1,210	1,840	1,210	1,200	1,910	2,700	246	47	172	67
27	928	817	1,120	1,880	1,110	1,270	1,720	*3,120	230	48	136	68
28	769	899	991	1,840	1,020	1,570	1,710	2,960	217	48	106	68
29	697	875	887	1,990	934	1,800	1,720	2,530	203	38	*91	65
30	615	844	806	2,330	-----	2,750	1,520	2,120	188	34	81	64
31	540	-----	771	2,220	-----	3,620	-----	1,770	-----	33	75	-----
Total	17,937	15,460	27,289	42,591	80,874	78,847	61,110	56,410	15,978	2,609	1,684	2,206
Mean	579	515	880	1,374	2,789	2,543	2,037	1,820	533	84.2	54.3	73.5
Cfsm	1.21	1.08	1.84	2.87	5.82	5.31	4.25	3.80	1.11	0.176	0.113	0.153
In.	1.39	1.20	2.12	3.31	6.28	6.12	4.74	4.38	1.24	0.20	0.13	0.17
Ac-ft	35,580	30,680	54,090	84,480	160,400	156,400	121,200	111,900	31,690	5,170	3,340	4,380
Calendar year 1959: Max	7,700	Min	32	Mean	1,154	Cfsm	2.41	In.	32.71	Ac-ft	835,500	
Water year 1959-60: Max	5,100	Min	29	Mean	1,101	Cfsm	2.30	In.	31.28	Ac-ft	799,300	

\* Discharge measurement made on this day.

## 2030. Scoggin Creek near Gaston, Oreg.

Location.--Lat 45°27'32", long 123°09'16", on line between secs.26 and 27, T.1 S., R.4 W., on left bank 100 ft upstream from bridge on State Highway 47 (Tualatin Valley Highway), 1.7 miles upstream from mouth, and 1.7 miles northwest of Gaston.

Drainage area.--44.0 sq mi.

Records available.--October 1940 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 168.92 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 1, 1947, water-stage recorder at site 300 ft upstream at same datum. Oct. 1, 1947, to June 7, 1950, staff gage at site 150 ft upstream at same datum.

Average discharge.--20 years, 141 cfs (102,100 acre-ft per year).

Extremes.--Maximum discharge during year, 1,540 cfs Jan. 29 (gage height, 11.94 ft); minimum, 0.8 cfs Aug. 14.  
1940-60: Maximum discharge, 5,320 cfs Dec. 21, 1955 (gage height, 15.94 ft); minimum, 0.1 cfs Aug. 28, Sept. 30, Oct. 1, 3, 1958.

Remarks.--Records excellent. Some diurnal fluctuation caused by logponds above station. Diversions by pumping for irrigation of 420 acres above station. Part of water supply (about 1 cfs) for Hillsboro is diverted from Sein Creek above station.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Backwater from debris Aug. 3 to Sept. 30)

Oct. 1 to Feb. 8			Feb. 9 to Sept. 30		
2.3	13	1.68	1.1	2.6	35
2.4	18	1.7	1.2	3.0	103
2.6	36	1.8	2.1	4.0	305
3.0	95	1.9	3.3	6.0	520
4.0	288	2.0	5.0	9.0	910
6.0	494	2.2	10	10.0	1,090
9.0	890	2.4	19		
11.0	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	15	26	78	92	423	125	421	155	101	28	8.6	6.5
2	14	26	73	86	489	119	360	145	92	25	6.3	6.5
3	13	35	68	81	593	127	298	140	85	25	*3.5	6.3
4	13	37	65	78	609	127	245	132	78	24	6.5	6.8
5	13	28	62	76	552	155	209	119	76	19	6.8	6.8
6	13	29	59	80	545	165	189	*127	69	16	6.5	5.4
7	14	30	59	78	865	231	171	135	67	18	6.8	3.1
8	18	29	56	*88	964	471	161	125	64	16	4.6	2.9
9	18	25	55	85	1,080	427	152	111	60	18	4.1	4.0
10	43	22	56	80	744	358	142	103	58	18	4.2	2.3
11	138	21	149	78	534	299	145	106	56	18	5.4	4.6
12	88	21	571	75	*453	255	145	125	54	18	5.4	4.2
13	*59	21	360	73	430	237	152	125	47	17	4.6	2.3
14	47	22	289	73	507	235	185	114	50	19	1.3	*3.2
15	37	23	488	68	596	364	293	103	54	14	4.6	3.6
16	33	24	403	70	486	384	249	114	48	9.7	4.7	4.6
17	30	24	309	86	415	322	215	165	48	14	2.0	4.7
18	28	34	235	86	372	273	205	185	46	12	2.1	5.4
19	27	55	185	88	316	235	233	173	45	11	3.4	4.6
20	32	59	161	81	257	205	366	189	43	9.2	4.0	2.5
21	31	291	144	78	233	185	382	185	41	5.9	4.0	3.4
22	49	393	130	78	207	173	317	181	37	10	6.8	3.9
23	54	457	124	93	189	161	292	171	36	10	5.4	6.3
24	44	270	140	158	175	155	245	165	*35	10	10	6.5
25	40	172	144	167	169	142	211	165	34	7.8	8.6	6.8
26	35	136	138	237	159	138	193	163	34	5.4	7.8	5.9
27	32	116	132	286	150	130	179	152	30	7.5	7.2	3.3
28	30	103	124	443	140	130	179	142	29	5.9	6.8	3.4
29	30	90	112	1,300	135	*405	167	132	28	3.7	5.7	4.6
30	28	*83	108	779	-----	527	159	122	28	7.0	2.5	4.7
31	27	-----	101	504	-----	481	-----	111	-----	6.0	3.9	-----
Total	1,133	2,702	5,178	5,705	12,787	7,741	6,860	4,380	1,570	431.1	161.1	138.7
Mean	36.5	90.1	167	184	441	250	229	141	52.3	13.9	5.20	4.62
Cfs/m	0.830	2.05	3.80	4.18	10.0	5.68	5.20	3.20	1.19	0.316	0.118	0.105
In.	0.96	2.28	4.38	4.82	10.81	6.54	5.80	3.70	1.33	0.36	0.14	0.12
Ac-ft	2,250	5,360	10,270	11,320	25,360	15,550	13,610	8,690	3,110	855	320	275

Calendar year 1959: Max 1,700 Min 1.8 Mean 133 Cfs/m 3.02 In. 41.00 Ac-ft 96,240  
Water year 1959-60: Max 1,300 Min 1.1 Mean 133 Cfs/m 3.02 In. 41.24 Ac-ft 96,770

Peak discharge (base, 1,100 cfs).--Jan. 29 (5 a.m.) 1,540 cfs (11.94 ft); Feb. 9 (10 a.m.) 1,180 cfs (10.44 ft).

\* Discharge measurement made on this day.

## 2035. Tualatin River near Dilley, Oreg.

Location.--Lat 45°28'30", long 123°07'23", in NE¼NW¼ sec.24, T.1 S., R.4 W., on left bank 5 ft upstream from highway bridge, 1.0 mile south of Dilley, and 1.5 miles downstream from Scoggin Creek.

Drainage area.--133 sq mi.

Records available.--October 1939 to September 1960. Prior to October 1940 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 151.57 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to June 16, 1950, chain, wire-weight, or staff gage at several sites within 200 ft of present site at same datum.

Average discharge.--21 years, 399 cfs (288,900 acre-ft per year).

Extremes.--Maximum discharge during year, 3,580 cfs Jan. 29 (gage height, 12.71 ft); minimum, 1.8 cfs Aug. 3.

1939-60: Maximum discharge, 13,200 cfs Dec. 22, 1955 (gage height, 14.78 ft); minimum, 0.4 cfs Sept. 5, 1951.

Remarks.--Records good except those for periods of shifting control or backwater from debris, which are fair. Diurnal fluctuation caused by dam below Gaston. Diversions above station for municipal supply and irrigation, chiefly in Wapato Lake area.

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

Oct. 1 to Jan. 29

Jan. 30 to Sept. 30

1.3	33	10.0	815	0.3	2.4	7.0	382
1.5	41	11.0	1,060	.4	3.7	10.0	780
2.0	65	11.5	1,360	.6	6.9	11.0	1,040
4.0	172	12.0	2,060	1.0	15	11.5	1,260
7.0	400	13.0	4,360	1.5	27	12.0	1,940
				2.0	43	13.0	4,360
				4.0	138		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	112	222	279	1,300	301	1,260	424	269	59	8.7	16
2	41	110	208	263	1,350	287	1,140	395	244	56	7.1	14
3	37	134	201	250	1,620	294	973	364	220	53	*3.4	12
4	35	150	194	238	1,760	298	798	355	205	49	7.4	17
5	34	128	179	231	1,690	362	659	323	190	42	9.5	18
6	34	121	174	235	1,560	458	559	*309	169	37	10	17
7	33	120	175	239	2,270	596	483	327	156	34	10	13
8	43	119	167	*254	2,570	1,150	428	295	154	32	8.7	12
9	215	114	161	263	3,310	1,320	389	273	144	31	5.2	12
10	168	106	182	251	2,480	1,150	354	259	134	32	4.3	8.9
11	371	104	314	250	1,740	991	357	252	130	33	4.6	10
12	*333	100	1,280	243	1,420	832	339	276	126	29	8.4	11
13	*233	95	1,320	236	1,340	714	368	289	115	26	9.3	9.7
14	176	98	915	245	*1,360	689	454	282	109	29	5.9	*9.5
15	148	105	1,200	236	1,780	866	689	262	127	25	8.7	10
16	129	107	1,280	236	1,570	1,150	737	262	116	21	8.9	11
17	120	102	1,000	287	1,310	985	674	349	111	22	6.4	10
18	110	143	777	296	1,140	858	615	510	107	21	5.7	12
19	105	213	614	304	961	716	680	460	102	17	5.5	12
20	118	225	505	292	794	626	830	495	103	16	6.2	11
21	128	591	437	274	690	552	1,100	532	97	11	6.9	11
22	170	708	382	267	606	492	970	532	90	13	14	11
23	227	1,300	350	297	532	443	864	490	82	13	19	12
24	190	978	394	434	488	402	766	453	*76	15	28	13
25	169	680	420	551	451	365	682	428	73	13	27	14
26	153	462	402	698	412	337	611	454	72	8.9	22	15
27	137	364	373	857	372	317	547	425	69	8.3	19	11
28	130	512	349	981	344	314	543	399	59	7.6	18	10
29	128	272	334	2,920	319	625	504	369	57	4.4	16	10
30	120	*244	322	2,650	-----	*1,430	458	331	59	6.7	13	11
31	114	-----	309	1,600	-----	1,390	-----	302	-----	7.6	12	-----
Total	4,200	8,417	15,120	16,657	37,539	21,290	19,831	11,476	3,765	772.5	336.8	364.1
Mean	135	.281	488	537	1,294	687	661	370	126	24.9	10.9	12.1
Cfs/m	1.02	2.11	3.67	4.04	9.73	5.17	4.97	2.78	0.947	0.187	0.082	0.091
In.	1.17	2.35	4.23	4.66	10.50	5.95	5.55	3.21	1.05	0.22	0.09	0.10
Ac-ft	8,330	16,690	29,990	33,040	74,460	42,230	39,330	22,760	7,470	1,830	668	722
Calendar year 1959: Max	4,610	Min	5.5	Mean	384	Cfs/m	2.89	In.	39.19	Ac-ft	278,000	
Water year 1959-60: Max	3,310	Min	3.4	Mean	382	Cfs/m	2.87	In.	39.08	Ac-ft	277,200	

Peak discharge (base, 4,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Shifting-control method used Oct. 1 to Dec. 12. Backwater from debris June 28 to Aug. 24.

## 2075. Tualatin River near Willamette, Oreg.

Location.--Lat 45°21'03", long 122°40'30", in SW<sup>1</sup> sec.34, T.2 S., R.1 E., on left bank 300 ft upstream from bridge on State Highway 212, 1.2 miles northwest of Willamette, and 1.8 miles upstream from mouth.

Drainage area.--710 sq mi.

Records available.--July 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 85.61 ft above mean sea level (levels by Corps of Engineers). Prior to June 12, 1941, staff gage at station 1.02 ft higher.

Average discharge.--32 years, 1,481 cfs (1,072,000 acre-ft per year).

Extremes.--Maximum discharge during year, 8,730 cfs Feb. 12; minimum daily, 31 cfs Aug. 16. 1928-60: Maximum discharge, 29,300 cfs Dec. 23, 1933; minimum daily, 15 cfs Aug. 16-19, 22, Sept. 2, 3, 1958.

Remarks.--Records excellent except those for period of no gage-height record, which are good. All records presented herein include flow of Oswego Canal which diverts 50 miles (corrected) above station for recreational use in Oswego Lake and development of power between outlet of that lake and Willamette River. Some regulation in low-water season by flashboards on crest of diversion dam for Oswego Canal. Several small diversions above station for irrigation.

Revisions (water years).--WSP 1014: 1943. WSP 1184: 1947. WSP 1248: 1941.

Discharge, in cubic 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	240	714	1,040	5,000	1,280	3,700	1,900	1,180	174	49	84
2	184	234	642	955	5,390	1,210	3,700	1,800	1,080	130	46	82
3	151	230	587	859	5,570	1,170	3,600	1,700	969	138	45	83
4	143	227	544	*806	5,630	1,140	3,500	*1,640	869	146	45	86
5	140	239	518	761	5,640	1,330	3,000	1,520	807	164	45	87
6	138	266	489	727	5,770	1,900	2,500	1,420	753	170	45	88
7	108	263	471	713	6,270	2,490	2,000	1,380	701	155	46	89
8	111	248	457	780	6,640	3,240	1,800	1,370	653	132	43	*90
9	153	231	441	870	7,220	4,100	1,600	1,280	621	121	40	90
10	188	229	456	1,020	*7,750	4,180	1,500	1,190	589	115	39	90
11	404	226	454	1,040	8,420	4,130	1,500	1,110	562	109	40	89
12	555	216	923	1,020	8,680	4,070	1,500	1,060	530	105	38	86
13	756	207	2,170	993	8,310	3,940	1,600	1,060	497	103	34	84
14	*680	202	2,680	949	7,650	3,760	1,800	1,070	480	100	32	82
15	513	198	2,660	917	7,060	3,630	2,000	1,050	471	97	32	79
16	385	195	2,560	931	6,420	3,610	3,000	1,010	488	95	31	77
17	302	192	2,540	1,090	5,940	3,490	2,700	993	492	92	33	76
18	270	204	2,600	1,340	5,590	3,380	2,500	1,100	455	89	35	75
19	253	237	2,590	1,440	5,180	3,290	3,000	1,360	435	85	38	77
20	379	292	2,580	1,380	4,750	3,120	3,200	1,570	410	82	39	78
21	349	481	1,980	1,280	4,240	*2,880	3,300	1,740	402	79	39	78
22	261	798	1,600	1,180	3,750	2,540	3,400	1,900	*385	75	41	77
23	261	*1,590	1,340	1,180	3,260	2,200	3,500	1,970	364	71	41	78
24	297	1,750	1,240	1,500	2,780	1,900	3,200	1,820	340	67	45	80
25	340	1,960	1,300	2,070	2,310	1,670	3,000	1,820	312	*65	54	82
26	333	1,930	1,450	2,580	1,930	1,510	2,700	1,760	294	63	67	83
27	314	1,620	1,420	2,890	1,710	1,410	2,500	1,740	284	62	76	85
28	288	1,250	1,320	3,050	1,510	1,340	2,400	1,670	274	60	80	85
29	263	969	1,230	3,700	1,400	1,600	2,200	1,550	255	56	82	86
30	253	817	1,140	4,200	-----	2,500	2,000	1,430	227	54	83	85
31	247	-----	1,070	4,470	-----	3,400	-----	1,280	-----	51	84	-----
Total	9,181	17,541	41,946	47,751	151,770	81,410	77,700	45,373	16,179	3,105	1,487	2,491
Mean	296	585	1,353	1,540	5,233	2,626	2,590	1,464	539	100	48.0	83.0
Cfs/m	0.417	0.824	1.91	2.17	7.37	3.70	3.65	2.06	0.759	0.141	0.068	0.117
In.	0.48	0.92	2.20	2.50	7.95	4.26	4.07	2.38	0.95	0.16	0.08	0.13
Ac-ft	18,210	34,790	83,200	94,670	301,000	161,500	154,100	90,000	32,090	6,160	2,950	4,940
Calendar year 1959: Max	11,300	Min	20	Mean	1,463	Cfs/m	2.06	In.	28.00	Ac-ft	1,060,000	
Water year 1959-60: Max	8,680	Min	31	Mean	1,355	Cfs/m	1.91	In.	25.98	Ac-ft	983,600	

\* Discharge measurement made on this day.

Note.--No gage-height record Mar. 29 to May 3; discharge estimated on basis of recorded range in stage and records for station near Dille.

2080. Clackamas River at Big Bottom, Oreg.

Location (revised).--Lat 45°01'00", long 121°55'00", in NW 1/4 sec. 26, T.6 S., R.7 E., on right bank at lower end of Big Bottom, 0.3 mile downstream from Pot Creek, 0.5 mile upstream from site of proposed dam, and 28 miles southeast of Estacada. Inflow between gage and measuring section 2,000 ft downstream is included in records.

Drainage area.--136 sq mi at cableway 2,000 ft downstream, where all discharge measurements are made.

Records available.--April 1920 to September 1960. Monthly discharge only April 1920, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 2,057.56 ft above mean sea level, datum of 1929 (Bureau of Public Roads bench mark).

Average discharge.--40 years, 475 cfs (343,900 acre-ft per year).

Extremes.--Maximum discharge during year, 2,010 cfs Mar. 29 (gage height, 5.24 ft); minimum, 234 cfs Sept. 29, 30.

1920-60: Maximum discharge, 6,750 cfs Mar. 31, 1931, Dec. 15, 1946, from rating curves extended above 3,500 and 1,700 cfs, respectively; maximum gage height, 8.96 ft Dec. 21, 1955; minimum discharge, 184 cfs Sept. 12, 1942.

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

Cooperation.--Water-stage-recorder graph and 11 discharge measurements furnished by Portland General Electric Co.

Revisions (water years).--WSP 1218: Drainage area. WSP 1248: 1943.

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

1.8	235	1.8	225	4.0	1,220
2.2	365	2.5	460	5.0	1,840
2.6	505	3.0	675		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	259	289	334	292	334	362	1,110	564	764	320	258	258
2	*259	286	324	286	372	355	*1,080	589	774	*320	255	255
3	256	323	320	282	362	341	1,040	578	780	313	255	255
4	253	320	310	279	369	366	1,030	556	764	306	252	264
5	253	295	302	279	411	432	1,070	564	730	302	252	261
6	253	292	299	279	464	450	1,090	576	690	296	249	255
7	259	289	296	279	912	500	1,110	774	630	292	249	252
8	289	283	292	285	1,240	532	1,090	747	*589	268	249	249
9	456	280	268	276	1,140	488	1,060	700	552	255	246	249
10	358	277	265	273	945	453	934	742	540	282	246	249
11	396	277	341	273	769	436	857	808	520	279	246	246
12	368	274	436	270	680	425	791	918	504	276	246	246
13	326	271	394	267	616	422	780	912	492	276	246	246
14	309	271	358	267	602	411	818	835	484	276	249	246
15	292	274	411	264	769	425	747	752	512	273	252	243
16	286	271	432	264	650	411	685	747	500	273	252	243
17	283	268	408	264	584	411	675	705	468	273	252	243
18	280	271	390	261	548	411	665	685	439	273	252	243
19	277	283	376	258	512	418	650	650	425	270	249	243
20	306	283	362	258	484	446	760	894	422	270	249	243
21	298	414	352	258	476	504	813	923	404	270	252	243
22	340	478	341	255	453	568	715	796	390	267	258	243
23	368	455	334	258	452	640	650	725	376	267	257	243
24	344	532	355	264	422	695	607	690	369	254	306	243
25	337	450	355	264	414	725	576	660	362	264	273	243
26	316	408	334	273	397	824	564	715	352	264	270	240
27	312	380	324	273	383	1,010	564	730	344	264	267	240
28	316	369	316	279	*372	1,060	560	700	338	261	*261	240
29	309	*358	313	316	366	1,310	556	*700	330	261	258	237
30	298	344	310	*352	-----	1,610	*548	725	*267	*258	256	237
31	*292	-----	302	338	-----	1,220	-----	758	-----	258	255	-----
Total	9,548	10,065	10,594	8,588	16,478	18,651	24,215	22,416	15,171	8,641	7,926	7,398
Mean	308	336	342	277	568	602	807	723	506	279	256	247
Cfsm	2.26	2.47	2.51	2.04	4.18	4.43	5.93	5.32	3.72	2.05	1.98	1.82
In.	2.61	2.75	2.90	2.35	4.51	5.10	6.82	6.13	4.15	2.36	2.17	2.02
Ac-ft	18,940	19,960	21,010	17,030	32,680	36,990	48,030	44,460	30,090	17,140	15,720	14,670

Calendar year 1959: Max 1,780 Min 238 Mean 425 Cfsm 3.12 In. 42.37 Ac-ft 307,300  
 Water year 1959-60: Max 1,610 Min 237 Mean 436 Cfsm 3.21 In. 43.67 Ac-ft 316,700

Peak discharge (base, 1,200 cfs).--Feb. 8 (1 p.m.) 1,520 cfs (4.50 ft); Mar. 29 (12 p.m.) 2,010 cfs (5.24 ft).

\* Discharge measurement made on this day.

## Smaller reservoirs in Willamette River basin, Oreg.

1955. **Haskins Creek Reservoir.**--Lat 45°18'40", long 123°21'15", in NW $\frac{1}{4}$  sec.18, T.3 S., R.5 W., on control tower 250 ft upstream from dam on Haskins Creek and 11 miles north-west of McMinnville. Drainage area, 7.1 sq mi, approximately. Records available, October 1951 to September 1960. Staff gage read once daily. Datum of gage is at mean sea level (levels by city of McMinnville). Maximum contents observed during year, 747 acre-ft Nov. 22 (elevation, 835.6 ft); no contents Nov. 30 to Apr. 8. Maximum contents observed during period 1951-60, 748 acre-ft Nov. 17, 1954 (elevation, 835.65 ft); no contents for most of time in winter months.

Reservoir is formed by earth-fill dam equipped with 5 siphon spillways which act as overflow weirs until priming occurs (approximately 835.5 ft elevation). Capacity of reservoir is 733 acre-ft between elevations 761.5 (invert of outlet tunnel) and 835.0 ft (crest of siphon spillways). Rated capacity of 3 siphons is 700 cfs each and remaining 2 siphons, 350 cfs each. Under normal operation, reservoir is filled in the spring (April or May) and drained when fall rains start. There is no planned storage during winter months; however, during periods of heavy runoff, inflow may be greater than capacity of outlet tunnel and there may be some temporary storage. Water is used for municipal supply of city of McMinnville.

2086. **Timothy Lake.**--Lat 45°06'50", long 121°48'35", in NE $\frac{1}{4}$  sec.27, T.5 S., R.8 E., in intake structure 350 ft upstream from dam on Oak Grove Fork, 0.5 mile upstream from Anvil Creek, and 14 miles south of Government Camp. Drainage area, 53.5 sq mi. Records available, May 1956 to September 1960. Prior to October 1957, published as Timothy Meadows Reservoir. Once-daily readings of Bristol pressure gage usually obtained by Three Lynx powerhouse personnel by microwave transmission. Datum of gage is at mean sea level (Portland General Electric Co. bench mark). Prior to Nov. 26, 1956, staff gage at same site and datum. Maximum contents observed during year, 66,130 acre-ft July 8-27 (elevation, 3,190.3 ft); minimum observed, 33,190 acre-ft Jan. 29, 30 (elevation, 3,163.2 ft). Maximum contents observed during period 1956-60, 66,820 acre-ft May 13, 14, 18-24, 27, 1958 (elevation, 3,190.8 ft); minimum observed, 16,010 acre-ft Feb. 24, 1957 (elevation, 3,144.5 ft).

Reservoir is formed by earth-fill dam with concrete spillway built by Portland General Electric Co. Usable storage began May 28, 1956. Capacity, 65,710 acre-ft at elevation 3,190.0 ft (normal maximum operating level). Usable capacity, 61,650 acre-ft between elevations 3,125.0 (invert of outlet pipe) and 3,190.0 ft (top of radial gates). Storage of 4,060 acre-ft below elevation 3,125.0 ft not normally available for release. Water is used for power generation.

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

Date	Elevation (feet) <sup>†</sup>	Usable contents (acre-feet)	Change in contents (acre-feet)	Elevation (feet) <sup>‡</sup>	Total contents (acre-feet)	Change in contents (acre-feet)
	Haskins Creek Reservoir			Timothy Lake		
Sept. 30.....	835.1	735	-	3,182.4	55,690	-
Oct. 31.....	835.1	735	0	3,179.2	51,680	-4,010
Nov. 30.....	-	0	-735	3,174.4	45,860	-5,820
Dec. 31.....	-	0	0	3,171.6	42,570	-3,290
Calendar year 1960.....	-	-	0	-	-	-13,750
Jan. 31.....	-	0	0	3,163.3	33,300	-9,270
Feb. 29.....	-	0	0	3,168.1	38,560	+5,260
Mar. 31.....	-	0	0	3,172.6	43,730	+5,170
Apr. 30.....	835.0	733	+733	3,182.2	55,430	+11,700
May 31.....	835.0	733	0	3,188.0	64,340	+8,910
June 30.....	835.0	733	0	3,189.9	65,570	+1,230
July 31.....	832.9	686	-47	3,190.2	65,990	+420
Aug. 31.....	830.6	637	-49	3,190.2	65,990	0
Sept. 30.....	828.7	597	-40	3,181.1	54,050	-11,940
Water year 1959-60.....	-	-	-138	-	-	-1,640

<sup>†</sup> Gage read at 4 p.m. Oct. 1 to Mar. 31, 8:30 a.m. Apr. 1 to Sept. 30.

<sup>‡</sup> Gage read at 12 p.m.

2087. Oak Grove Fork near Government Camp, Oreg.

Location.--Lat 45°06'50", long 121°48'50", in NE 1/4 sec. 27, T.5 S., R.8 E., on right bank 0.1 mile upstream from Anvil Creek, 0.3 mile downstream from Timothy Lake, and 14 miles south of Government Camp.

Drainage area.--54.3 sq mi.

Records available.--July 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 3,041.83 ft above mean sea level (Portland General Electric Co. bench mark).

Extremes.--Maximum discharge during year, 320 cfs Sept. 15 (gage height, 2.66 ft); minimum, 8.1 cfs Sept. 19; minimum daily, 38 cfs June 27 to July 1.  
1956-60: Maximum discharge, 410 cfs Nov. 10, 1957 (gage height, 2.87 ft), but may have been higher Sept. 5, 1959; minimum, 3.8 cfs July 19, 1956; minimum daily, 24 cfs for many days in July and September 1956.

Remarks.--Records fair. Regulation by Timothy Lake (see p. 176). No diversion above station.

Cooperation.--Water-stage-recorder graph and 11 discharge measurements furnished by Portland General Electric Co.

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

1.3	33	2.5	260
1.5	52	3.0	473
2.0	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	275	230	171	124	103	41	*44	44	42	38	70	78
2	275	230	215	*162	43	41	44	45	42	39	84	139
3	*275	230	212	179	55	41	44	45	*41	54	87	
4	275	247	141	234	95	41	44	45	42	43	41	43
5	278	257	124	221	75	41	44	44	144	46	41	99
6	275	260	221	218	43	41	44	45	104	47	42	212
7	271	260	237	221	46	41	44	45	95	48	43	215
8	241	257	244	170	47	41	45	45	*100	49	45	218
9	171	267	257	151	47	41	45	45	111	50	45	257
10	198	264	250	188	47	41	45	45	117	51	45	286
11	121	264	136	230	46	41	45	45	124	52	45	286
12	60	271	86	221	46	41	45	45	134	53	45	275
13	53	262	78	227	46	41	45	45	142	53	45	271
14	45	278	230	237	46	76	46	45	134	53	45	271
15	45	264	168	234	46	84	47	45	94	53	44	286
16	45	271	126	234	46	43	48	44	106	53	63	278
17	42	278	86	230	45	42	48	43	93	52	62	267
18	105	278	92	230	45	42	48	42	48	52	58	267
19	267	264	45	230	45	42	48	136	59	52	59	260
20	244	161	42	240	44	42	49	115	93	51	41	244
21	250	49	156	247	44	42	49	44	130	51	41	250
22	103	49	205	234	43	42	48	43	159	50	49	250
23	42	50	205	208	43	42	48	42	94	50	59	237
24	41	50	102	215	42	42	47	42	75	51	43	234
25	41	50	49	221	42	44	47	153	99	51	44	234
26	41	50	48	234	42	44	46	193	98	72	46	234
27	40	50	48	240	41	45	44	44	38	94	47	250
28	40	49	144	227	41	45	43	42	38	90	*47	244
29	84	*49	234	118	*41	46	*43	42	38	71	47	253
30	253	68	227	43	45	46	44	*42	38	42	47	253
31	*230	-----	154	43	-----	45	-----	42	-----	*44	51	-----
Total	4,726	5,627	4,753	6,211	1,435	1,587	1,371	1,792	2,653	1,642	1,538	6,777
Mean	152	188	153	200	49.5	50.9	44.2	57.5	88.4	53.0	49.6	226
Ac-ft	9,370	11,160	9,430	12,320	2,850	2,750	2,720	3,530	5,260	3,260	3,050	13,440

Adjusted for change in contents in Timothy Lake

Mean	87.2	89.7	99.9	49.6	141	129	242	202	109	59.8	49.6	25.2
Cfsm	1.61	1.65	1.84	0.913	2.60	2.38	4.46	3.72	2.01	1.10	0.913	0.464
In.	1.85	1.84	2.12	1.05	2.80	2.73	4.98	4.30	2.24	1.27	1.05	0.52
Ac-ft	5,360	5,340	6,140	3,050	8,110	7,920	14,420	12,440	6,490	3,680	3,050	1,500

Observed

Calendar year 1959: Max	301	Min	38	Mean	121	Ac-ft	87,860
Water year 1959-60: Max	286	Min	38	Mean	109	Ac-ft	79,140

Adjusted

Calendar year 1959: Mean	102	Cfsm	1.88	In.	25.59	Ac-ft	74,110
Water year 1959-60: Mean	107	Cfsm	1.97	In.	26.75	Ac-ft	77,500

\* Discharge measurement made on this day.

2090. Oak Grove Fork above powerplant intake, Oreg.

Location.--Lat 45°04'20", long 121°57'00", on line between secs. 3 and 4, T.6 S., R.7 E., on right bank 0.2 mile upstream from Spring Creek, 0.7 mile upstream from Kink Creek, 1.1 miles upstream from Portland General Electric Co. diversion dam, and 24 miles south-east of Estacada. Records include flow of Spring Creek.

Drainage area.--126 sq mi, includes that of Spring Creek.

Records available.--May 1909 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Published as both Oak Grove Fork of Clackamas River at proposed intake, near Cazadero and Oak Grove Fork of Clackamas River at intake, near Cazadero May 1909 to September 1910, as Oak Grove Fork of Clackamas River at intake, near Cazadero October 1910 to September 1921, and as "at Portland Electric Power Co.'s intake" October 1921 to September 1929.

Gage.--Water-stage recorder. Datum of gage is 2,052.31 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. May 21, 1909, to Nov. 17, 1911, staff gage and Mar. 26, 1912, to Sept. 30, 1923, water-stage recorder, at various sites 0.7 mile downstream, below Kink Creek, at different datum.

Average discharge.--51 years, 506 cfs (366,300 acre-ft per year).

Extremes.--Maximum discharge during year, 1,120 cfs Mar. 29 (gage height, 3.33 ft); minimum, 283 cfs Oct. 18, Aug. 20, 21, Sept. 4, 5.  
1909-60: Maximum discharge, 5,000 cfs Jan. 7, 1923 (gage height, 5.45 ft, site and datum then in use), computed from flow at stations on Clackamas River; minimum, 236 cfs Oct. 15, 16, 18, 1931.

Remarks.--Records good. Flow regulated by Timothy Lake beginning in 1956 (see p. 176). No diversion above station.

Cooperation.--Water-stage-recorder graph and 12 discharge measurements furnished by Portland General Electric Co.

Revisions (water years).--WSP 1248: 1909, 1910(M), 1916, 1918, 1923, 1932.

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

2.0	268	3.0	850
2.2	350	3.5	1,280
2.5	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	540	522	450	*395	390	365	770	492	546	328	310	328
2	540	522	546	474	341	360	*786	498	552	328	341	410
3	*540	552	528	462	336	365	763	498	558	*323	310	355
4	540	546	468	534	370	365	749	486	552	323	286	290
5	540	546	400	528	390	395	763	480	537	328	286	342
6	546	546	510	522	380	405	770	504	618	328	286	510
7	540	540	528	528	582	425	792	588	558	328	286	540
8	552	540	534	480	714	430	802	558	*546	328	286	552
9	516	546	540	430	700	410	778	552	552	328	286	552
10	540	540	540	480	624	400	714	570	552	328	286	552
11	450	540	480	528	558	390	672	600	552	328	286	552
12	350	540	450	522	516	385	650	630	546	323	286	552
13	332	552	370	534	492	385	624	644	552	323	290	552
14	305	552	534	534	492	405	637	606	570	323	290	552
15	301	540	540	534	528	456	594	582	522	323	294	558
16	294	534	492	534	492	380	570	588	528	323	305	558
17	286	546	415	528	468	385	558	582	486	323	314	558
18	323	546	430	522	456	390	546	570	420	323	305	558
19	510	540	360	522	435	395	534	581	395	323	314	552
20	528	461	346	522	420	425	588	682	445	318	286	540
21	540	395	440	522	425	462	594	707	492	318	286	552
22	468	606	516	528	410	498	558	637	516	314	298	552
23	425	686	516	510	395	516	528	600	456	314	328	552
24	365	546	435	510	390	528	504	570	405	314	314	552
25	350	498	346	510	390	558	492	693	410	314	290	552
26	328	440	336	522	375	606	486	810	440	336	294	546
27	323	425	332	534	370	686	486	576	341	365	*298	558
28	332	410	406	528	*370	707	480	*540	336	355	290	552
29	336	*385	552	430	365	858	480	540	332	336	290	558
30	552	395	546	*318	-----	962	*480	540	332	294	290	558
31	*528	-----	480	314	-----	818	-----	552	-----	*290	294	-----
Total	13,620	15,525	14,366	15,339	13,174	15,115	18,750	18,326	14,747	10,050	9,205	15,495
Mean	439	518	463	495	454	488	624	591	492	324	297	516
Ac-ft	27,010	30,790	28,490	30,420	26,130	29,980	37,150	36,350	29,250	19,950	18,260	30,730
Calendar year 1959: Max	848			Min	261	Mean	464	Ac-ft	336,000			
Water year 1959-60: Max	962			Min	286	Mean	475	Ac-ft	344,500			

\* Discharge measurement made on this day.

2095. Clackamas River above Three Lynx Creek, Oreg.

Location.--Lat 45°07'30", long 122°04'20", in NE $\frac{1}{4}$  sec.21, T.5 S., R.6 E., on right bank 500 ft upstream from Three Lynx Creek, 1,300 ft downstream from powerplant, and 17 miles southeast of Estacada.

Drainage area.--479 sq mi.

Records available.--April 1909 to December 1913, October 1921 to September 1960. Prior to October 1911 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 1,091.69 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Portland General Electric Co.). Apr. 23, 1909, to Jan. 4, 1914, staff gage at about same site and datum.

Average discharge.--43 years, 1,942 cfs (1,406,000 acre-ft per year).

Extremes.--Maximum discharge during year, 12,000 cfs Mar. 29 (gage height, 8.46 ft); minimum, 379 cfs Aug. 10, 11, 12, 13, 14; minimum daily, 645 cfs July 31.  
1909-13, 1921-60: Maximum discharge, 34,800 cfs Mar. 31, 1931 (gage height, 15.5 ft), from rating curve extended above 11,000 cfs; minimum observed, 324 cfs Oct. 17, 1958; minimum daily, 427 cfs Oct. 5, 1958.

Remarks.--Records excellent. Minor regulation since 1956 by Timothy Lake (see p. 176). Considerable diurnal fluctuation during periods of low flow.

Cooperation.--Water-stage-recorder graph and nine discharge measurements furnished by Portland General Electric Co.

Revisions (water years).--WSP 1184: Drainage area. WSP 1248: 1910(M), 1912, 1948-50(m).

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

1.1	615	5.0	4,720
2.0	1,200	7.0	8,590
3.0	2,100	8.0	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	1,360	1,410	1,420	1,100	2,050	1,240	6,000	2,320	2,930	1,070	746	790
2	*1,270	1,380	1,410	1,220	2,300	1,210	*5,230	2,470	2,920	*1,030	772	853
3	1,150	1,500	1,420	1,180	2,240	1,080	4,900	2,370	2,940	1,010	784	830
4	1,090	1,570	1,360	1,260	2,350	1,310	4,700	2,270	2,860	1,000	742	770
5	1,110	1,460	1,220	1,240	2,600	1,620	4,730	2,140	2,740	973	736	680
6	1,080	1,400	1,210	1,250	3,300	2,070	4,640	2,230	2,720	952	756	1,000
7	1,100	1,390	1,300	1,240	8,180	2,590	4,580	3,070	2,380	917	738	1,020
8	1,220	1,310	1,300	1,250	8,060	3,090	4,390	2,970	2,190	906	746	994
9	2,860	1,310	1,250	1,120	6,960	2,670	4,090	2,680	*2,100	880	758	1,010
10	2,140	1,260	1,250	1,140	5,380	2,200	3,500	2,850	2,060	881	692	1,020
11	2,550	1,230	1,530	1,170	3,910	1,960	3,150	3,060	1,990	866	688	922
12	2,200	1,210	2,520	1,160	3,170	1,830	2,870	3,430	1,930	840	608	998
13	1,740	1,170	2,080	1,120	2,720	1,740	2,790	3,470	1,900	814	682	986
14	1,540	1,150	1,930	1,140	2,690	1,800	3,080	3,200	1,910	816	680	982
15	1,280	1,150	2,160	1,100	3,600	1,960	2,970	2,830	2,100	790	704	996
16	1,170	1,160	2,340	1,100	3,190	2,040	2,680	2,830	1,960	772	699	993
17	1,010	1,140	2,090	1,080	2,670	1,810	2,590	2,760	1,900	770	728	948
18	1,020	1,150	1,890	1,050	2,360	1,890	2,670	2,790	1,800	765	707	933
19	1,130	1,210	1,620	1,020	2,130	2,040	2,700	2,680	1,600	752	706	998
20	1,410	1,200	1,310	1,080	1,850	2,450	3,500	4,420	1,600	744	686	944
21	1,390	1,870	1,600	1,080	1,740	3,170	3,900	4,610	1,520	733	692	957
22	2,330	3,310	1,510	1,080	1,740	3,580	3,240	3,720	1,480	740	742	972
23	2,870	4,600	1,500	1,060	1,630	3,780	2,840	3,230	1,150	766	796	960
24	2,160	5,300	1,520	1,130	1,570	3,650	2,470	2,920	1,360	704	1,040	964
25	1,710	2,510	1,280	1,150	1,520	3,680	2,340	2,850	1,290	732	876	932
26	1,700	2,010	1,390	1,320	1,450	4,100	2,140	3,390	1,110	746	838	966
27	1,350	1,900	1,140	1,390	1,590	5,090	2,220	3,390	1,130	797	838	948
28	1,450	1,710	1,420	1,480	1,340	5,130	2,240	3,090	1,100	866	777	953
29	1,420	1,330	1,400	2,210	*1,200	5,970	*2,240	*2,970	1,090	824	776	934
30	*1,530	*1,540	1,400	*2,480	9,320	2,260	2,950	3,070	1,070	783	748	953
31	1,480	-----	1,360	2,010	-----	7,000	-----	2,990	-----	845	716	-----
Total	48,820	49,840	48,130	39,410	85,290	93,070	101,660	92,930	56,830	25,884	23,287	28,216
Mean	1,575	1,661	1,553	1,271	2,941	3,002	3,389	2,998	1,894	835	751	941
Cfsm	3.29	3.47	3.24	2.65	6.14	6.27	7.08	6.26	3.95	1.74	1.57	1.96
In.	3.79	3.87	3.74	3.06	6.62	7.23	7.89	7.22	4.41	2.01	1.81	2.19
Ac-ft	96,830	98,860	95,460	78,170	169,200	184,600	201,600	184,300	112,700	51,340	46,190	55,970

Calendar year 1959: Max 10,800 Min 497 Mean 1,904 Cfsm 3.97 In. 53.95 Ac-ft 1,379,000  
Water year 1959-60: Max 9,320 Min 645 Mean 1,894 Cfsm 3.95 In. 53.84 Ac-ft 1,375,000

Peak discharge (base, 8,100 cfs).--Feb. 7 (6 a.m.) 10,000 cfs (7.64 ft); Mar. 29 (12 p.m.) 12,000 cfs (8.46 ft).

\* Discharge measurement made on this day.

## 2100. Clackamas River at Estacada, Oreg.

Location.--Lat 45°18'00", long 122°21'10", in NE¼ sec.19, T.3 S., R.4 E., on left bank 0.2 mile downstream from River Mill Dam and 1.5 miles northwest of Estacada.

Drainage area.--671 sq mi.

Records available.--April 1908 to September 1960. Monthly discharge only for April 1908, published in WSP 1318. Published as "near Cazadero" January 1909 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 298.93 ft above mean sea level (levels by Portland General Electric Co.). Apr. 6 to Dec. 31, 1908, staff gage at site 1.3 miles upstream; Jan. 1 to Nov. 19, 1909, staff gage and Nov. 20, 1909, to Oct. 3, 1922, water-stage recorder, at site 5.8 miles upstream; Oct. 10 to Nov. 14, 1922, staff gage and Nov. 15, 1922, to Sept. 30, 1957, water-stage recorder, at site 6.3 miles upstream, all at different datum.

Average discharge.--52 years, 2,693 cfs (1,950,000 acre-ft per year).

Extremes.--Maximum discharge during year, 18,000 cfs Mar. 29 (gage height, 8.70 ft); minimum, 66 cfs Sept. 28; minimum daily, 292 cfs Sept. 18.

1908-60: Maximum discharge, 60,800 cfs Mar. 31, 1931 (gage height, 24.5 ft, site and datum then in use), by computation of flow over dam, from data furnished by Portland General Electric Co.; minimum, that of Sept. 28, 1960; minimum daily, 285 cfs Oct. 4, 5, 1958, caused by filling of North Fork forebay.

Remarks.--Records excellent. Large diurnal fluctuations and some regulation caused by powerplants at River Mill Dam and, since 1958, North Fork Dam. Minor regulation since 1956 by Timothy Lake (see p. 176). Two small diversions above station for Oregon City and Estacada municipal water supplies.

Cooperation.--Water-stage-recorder graph and nine discharge measurements furnished by Portland General Electric Co.

Revisions (water years).--WSP 1184: Drainage area (former site). WSP 1248: 1908-9, 1910(M), 1916, 1917(M), 1922(M), 1923. WSP 1288: Drainage area (former site). WSP 1638: 1919(M).

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

Discharge, in cubic feet per second, water year October 1959 to September 1960												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,060	761	2,860	692	3,880	1,900	7,890	2,920	3,990	1,150	962	1,220
2	*1,420	2,860	2,500	1,110	3,560	2,940	*7,720	3,310	3,370	*749	944	1,170
3	1,100	2,650	2,090	397	3,490	2,240	7,140	3,370	4,000	792	822	698
4	572	2,610	2,180	2,590	3,670	2,350	6,680	3,130	3,740	788	812	700
5	2,900	2,670	898	1,500	3,640	1,560	6,820	2,690	3,590	1,360	800	682
6	2,000	1,700	368	2,370	3,440	2,910	6,450	3,330	3,330	1,610	712	1,020
7	1,180	574	2,350	2,010	11,100	3,860	6,200	3,720	3,020	2,140	718	1,970
8	1,870	758	2,370	2,310	11,400	5,330	6,050	4,380	2,770	1,070	1,070	1,750
9	3,180	2,850	2,150	826	10,700	5,530	5,700	4,070	*2,760	742	908	1,460
10	4,060	2,220	1,990	340	8,990	3,880	4,640	3,800	2,270	728	955	298
11	3,400	953	2,570	1,970	6,430	3,850	4,760	3,960	2,420	1,170	968	308
12	3,930	2,250	2,760	2,300	5,440	2,500	3,620	4,670	2,320	1,070	933	1,900
13	3,620	1,850	2,930	2,340	4,140	2,280	3,780	5,480	2,360	1,250	700	1,810
14	3,430	342	3,070	1,650	3,640	3,280	4,340	3,990	2,800	1,190	708	1,610
15	2,280	330	3,000	1,820	5,410	3,580	4,390	3,980	2,250	1,190	801	1,360
16	1,910	2,420	3,170	365	5,450	3,590	3,860	4,110	2,590	749	954	1,010
17	324	2,380	3,840	744	4,550	3,350	3,360	4,090	2,440	743	940	308
18	378	1,710	3,620	2,720	3,500	3,430	4,080	4,150	2,310	1,570	946	292
19	2,360	1,530	2,130	1,960	3,630	2,570	3,840	4,420	1,630	958	950	1,750
20	2,120	1,600	1,030	1,680	2,420	3,290	4,400	6,050	3,120	1,180	704	1,490
21	2,420	2,080	2,820	1,860	1,840	5,210	6,190	7,790	2,600	1,020	702	1,210
22	3,240	2,560	2,560	1,610	2,590	5,360	5,370	6,320	1,640	954	797	1,250
23	6,290	7,940	2,760	386	2,800	5,620	4,110	5,250	1,970	748	954	1,070
24	4,600	5,830	2,390	338	3,150	5,540	3,860	4,700	2,290	716	1,200	332
25	4,030	4,090	558	2,300	2,680	4,970	3,560	4,160	838	998	1,330	300
26	2,990	3,450	1,940	2,600	1,980	5,380	2,790	3,980	759	904	1,310	1,930
27	3,310	2,790	1,300	2,290	620	7,340	3,300	4,800	1,450	843	*721	422
28	2,800	2,720	2,710	2,760	*1,200	7,560	2,940	*4,260	1,710	1,130	707	630
29	2,620	1,730	2,500	3,260	2,210	9,380	3,670	4,310	2,130	1,410	1,130	1,250
30	*2,820	*2,260	2,260	3,380	-----	12,900	3,130	3,820	1,220	*922	1,090	1,600
31	1,150	-----	1,990	2,800	-----	9,100	-----	4,190	-----	716	977	-----
Total	79,364	70,448	71,464	55,278	127,740	141,180	144,440	133,200	73,687	32,558	28,325	32,796
Mean	2,560	2,348	2,305	1,783	4,405	4,554	4,815	4,297	2,456	1,050	914	1,093
Cfs/m	3.82	3.50	3.44	2.66	6.56	6.79	7.18	6.40	3.66	1.56	1.36	1.63
In.	4.40	3.90	3.96	3.06	7.08	7.82	8.01	7.58	4.08	1.80	1.57	1.82
Ac-ft	157,400	139,700	141,700	109,600	253,400	280,000	286,500	264,200	146,200	64,580	56,180	65,050
Calendar year 1959: Max	15,300	Min	304	Mean	2,676	Cfs/m	3.99	In.	54.13	Ac-ft	1,937,000	
Water year 1959-60: Max	12,900	Min	292	Mean	2,706	Cfs/m	4.03	In.	54.88	Ac-ft	1,965,000	

Peak discharge (base, 15,000 cfs).--Mar. 29 (11:30 p.m.) 18,000 cfs (8.70 ft).

\* Discharge measurement made on this day.

## 2115. Johnson Creek at Sycamore, Oreg.

Location.--Lat 45°28'40", long 122°30'24", in lot 2, SW $\frac{1}{4}$  sec.13, T.1 S., R.2 E., on right bank 0.3 mile southwest of Sycamore station and 2.5 miles east of city limits of Portland.

Drainage area.--28.2 sq mi.

Records available.--July 1940 to September 1960.

Gage.--Water-stage recorder and V-notch weir. Datum of gage is 228.47 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--20 years, 54.1 cfs (39,170 acre-ft per year).

Extremes.--Maximum discharge during year, 679 cfs Feb. 7 (gage height, 7.95 ft); minimum, 0.5 cfs Aug. 10.

1940-60: Maximum discharge, 2,110 cfs Feb. 10, 1949 (gage height, 13.77 ft, from floodmark); minimum, 0.2 cfs Aug. 14-16, 18-22, 1940, Aug. 2, 21, 22, 1941, Sept. 6, 1955, Sept. 4, 1956, Aug. 18, 1959.

Remarks.--Records good. Slight diurnal fluctuation at low flow caused by recreational ponds upstream. Small diversions for irrigation above station.

Revisions (water years).--WSP 1318: 1941(M).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Jan. 17 to Mar. 29)

0.8	0.6	1.5	20	5.0	275
.9	1.1	2.0	42	6.0	399
1.0	2.1	3.0	98	7.0	545
1.1	4.5	4.0	172		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.1	8.2	22	24	93	13	184	27	25	2.4	0.9	0.8
2	1.5	7.4	21	21	88	12	151	28	20	2.4	.8	1.0
3	1.3	13	31	18	*87	35	108	26	16	2.2	.8	.9
4	1.2	14	25	14	94	33	81	25	13	1.8	.7	2.4
5	1.2	8.9	22	14	100	112	63	21	11	1.7	.7	1.7
6	1.1	7.4	20	25	196	303	52	31	10	1.6	.7	1.0
7	1.5	7.0	35	29	462	374	41	90	9.2	1.3	.7	.9
8	1.6	6.2	31	234	401	485	33	69	8.6	1.3	.6	.8
9	10	*5.9	28	152	444	*337	28	52	7.8	1.3	.6	.7
10	12	5.9	30	100	250	177	25	38	7.0	1.3	.6	.7
11	105	5.6	78	105	143	118	30	31	7.0	1.3	.6	.7
12	52	5.2	97	132	88	29	30	5.9	1.2	.6	.6	.7
13	29	5.2	182	85	133	99	29	37	5.2	1.2	.6	.7
14	21	4.8	109	67	131	107	76	30	7.0	1.2	.6	.7
15	15	5.2	84	58	179	243	112	24	10	1.2	1.2	.8
16	12	8.2	87	165	129	168	81	38	7.8	1.2	1.2	.8
17	9.6	8.2	61	212	100	114	69	54	6.6	1.2	.8	.7
18	8.2	10	52	124	78	86	64	81	5.6	*1.1	.7	.7
19	7.8	28	44	92	61	88	*66	68	5.2	1.0	.7	.8
20	9.6	19	37	72	48	53	98	368	5.2	1.0	.6	1.6
21	10	88	*34	55	46	43	93	277	5.2	1.0	.6	1.1
22	23	140	29	46	44	36	84	148	4.5	.9	.9	.8
23	43	123	27	52	35	30	125	102	3.8	1.0	.9	1.0
24	36	79	79	100	31	26	116	82	3.2	.9	1.3	1.2
25	32	68	105	140	30	24	91	73	3.0	.9	1.5	1.2
26	24	51	80	195	25	22	77	104	3.2	.9	1.2	1.1
27	20	40	62	189	20	25	58	*91	3.0	.9	1.3	.9
28	16	32	49	213	17	34	48	63	2.8	.9	1.0	.8
29	14	28	39	304	15	69	37	50	2.6	.8	*.8	.7
30	11	26	34	167	---	251	31	38	2.2	.8	.8	.7
31	9.2	---	32	114	---	234	---	31	---	.8	.7	---
Total	540.9	858.3	1,911	3,283	3,612	3,817	2,180	2,217	226.6	38.7	25.7	28.5
Mean	17.4	28.6	61.6	106	125	123	72.7	71.5	7.55	1.25	0.83	0.95
Cfsm	0.617	1.01	2.18	3.76	4.43	4.36	2.58	2.54	0.268	0.044	0.029	0.037
In.	0.71	1.13	2.52	4.33	4.76	5.03	2.87	2.92	0.30	0.05	0.03	0.04
Ac-ft	1,070	1,700	3,790	6,510	7,160	7,570	4,320	4,400	449	77	51	56

Calendar year 1959: Max 559 Min 0.4 Mean 48.0 Cfsm 1.70 In. 23.09 Ac-ft 34,750  
Water year 1959-60: Max 485 Min 0.6 Mean 51.2 Cfsm 1.82 In. 24.69 Ac-ft 37,150

Peak discharge (base, 500 cfs).--Feb. 7 (4 a.m.) 679 cfs (7.95 ft); Feb. 9 (11 a.m.) 564 cfs (7.27 ft); Mar. 8 (6 p.m.) 570 cfs (7.31 ft).

\* Discharge measurement made on this day.

2120. Salmon Creek near Battle Ground, Wash.

Location.--Lat 45°46'25", long 122°26'35", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.4, T.3 N., R.3 E., on left bank 100 ft upstream from highway bridge, 150 ft downstream from Rock Creek, and 4 miles east of Battle Ground.

Drainage area.--18.3 sq mi.

Records available.--October 1943 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 354.88 ft above mean sea level (river-profile survey). Prior to Oct. 1, 1950, staff gage at same site at datum 1.0 ft higher. Oct. 1, 1950, to June 24, 1953, staff gage and crest-stage indicator at same site and datum.

Average discharge.--17 years, 61.6 cfs (44,600 acre-ft per year).

Extremes.--Maximum discharge during year, 674 cfs Nov. 22 (gage height, 3.08 ft); minimum, 2.6 cfs Aug. 10 (gage height, 1.03 ft).

1943-60: Maximum discharge, 1,500 cfs Jan. 22, 1954 (gage height, 4.02 ft), from rating curve extended above 440 cfs; minimum observed, 1.3 cfs Aug. 20, 22, 28-30, Sept. 5-9, 13, 14, 1949, Sept. 14-16, 22, 1951.

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

Revisions (water years).--WSP 1044: 1944. WSP 1318: 1946(M). WSP 1568: 1955(M).

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

1.0	2.4	1.7	52
1.1	3.4	2.0	115
1.2	5.4	2.4	253
1.4	13	2.8	471

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.8	34	55	42	104	37	142	60	44	10	4.1	5.2
2	7.7	31	55	40	94	34	131	55	42	9.6	4.2	4.9
3	7.4	59	55	37	97	54	110	50	37	9.2	4.2	4.5
4	7.4	49	52	34	90	40	92	46	36	8.8	4.2	16
5	7.4	44	49	34	85	64	77	40	30	8.8	4.1	8.8
6	9.2	40	49	44	112	70	64	53	27	8.1	3.9	6.5
7	14	38	56	42	200	81	55	81	24	7.7	3.6	5.2
8	17.5	32	52	56	*181	123	50	77	21	7.4	3.4	4.2
9	38	31	49	54	228	123	*48	64	19	7.4	2.9	3.4
10	59	28	55	50	185	101	43	55	17	7.7	3.0	3.4
11	262	25	98	56	139	85	54	49	16	7.4	3.3	3.3
12	128	24	378	55	128	76	68	50	15	7.1	3.6	3.3
13	83	21	200	52	123	74	60	54	14.5	6.8	3.4	3.9
14	62	20	139	49	193	77	74	52	27	6.8	3.1	4.1
15	50	20	120	50	267	*265	134	50	32	6.2	6.2	3.9
16	40	18	113	99	200	196	126	74	27	6.2	4.5	3.7
17	34	19	97	110	152	137	113	158	19	5.9	4.2	3.6
18	31	75	85	88	120	108	104	155	17	5.9	3.7	3.7
19	27	131	72	70	99	88	101	128	19	5.9	3.6	4.7
20	34	110	62	56	83	77	181	300	24	5.9	3.3	5.4
21	*28	*178	55	49	77	66	164	253	19	5.7	4.2	4.1
22	99	430	50	44	66	58	131	189	17	5.4	6.8	3.7
23	128	324	48	48	58	54	152	142	14.5	5.4	10.5	5.7
24	99	192	62	64	55	48	181	115	13	5.4	10.5	6.2
25	83	148	68	85	54	44	161	*97	*13	5.2	8.4	7.4
26	70	115	64	106	48	43	128	92	12.5	4.9	8.4	5.2
27	58	94	58	104	43	44	104	83	12	4.7	7.4	4.5
28	54	81	52	128	40	48	92	74	11	4.2	5.4	4.1
29	44	72	48	196	38	82	79	66	11	4.1	*4.7	3.9
30	40	62	48	152	---	120	68	56	10.5	4.2	4.2	3.6
31	37	---	*46	120	---	142	---	50	---	4.5	4.7	---
Total	1,667.4	2,540	2,490	2,214	3,359	2,639	3,067	2,848	641.0	202.5	151.7	150.1
Mean	53.8	84.7	80.3	71.4	116	85.1	102	91.9	21.4	6.53	4.89	5.00
Cfsm	2.94	4.63	4.39	3.90	6.34	4.65	5.57	5.02	1.17	0.357	0.267	0.273
In.	3.39	5.16	5.06	4.50	6.83	5.36	6.23	5.79	1.30	0.41	0.31	0.31
Ac-ft	3,310	5,040	4,940	4,390	6,660	5,230	6,080	5,650	1,270	402	301	298

Calendar year 1959: Max 430 Min 3.0 Mean 63.9 Cfsm 3.49 In. 47.36 Ac-ft 46,250  
 Water year 1959-60: Max 430 Min 2.9 Mean 60.0 Cfsm 3.28 In. 44.65 Ac-ft 43,570

Peak discharge (base, 470 cfs).--Nov. 22 (4:30 p.m.) 674 cfs (3.08 ft); Dec. 12 (4 a.m.) 545 cfs (2.93 ft).

\* Discharge measurement made on this day.

## 2132. Lewis River near Trout Lake, Wash.

Location.--Lat 46°09'55", long 121°52'10", in NW<sup>1</sup> sec.24, T.8 N., R.7 E., on right bank half a mile downstream from Copper Creek, 1½ miles downstream from Quartz Creek, and 20 miles northwest of Trout Lake.

Drainage area.--120 sq mi, approximately.

Records available.--October 1958 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,500 ft above mean sea level, unadjusted.

Extremes.--Maximum discharge during year, 4,610 cfs Nov. 23 (gage height, 23.63 ft); from rating curve extended above 2,100 cfs by logarithmic plotting; minimum, 105 cfs Sept. 30 (gage height, 18.37 ft).

1958-60: Maximum discharge, that of Nov. 23, 1959; minimum, 91 cfs about Oct. 6 or 7 (gage height, 18.30 ft, from recorded range in stage).

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

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

18.4	111	21.0	1,460
19.0	275	22.0	2,440
19.5	480	23.3	4,110
20.0	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	380	520	708	358	1,070	302	*1,360	954	1,550	565	210	150
2	350	480	654	354	1,090	292	1,290	*1,010	1,600	505	205	*143
3	320	625	605	350	996	278	1,250	1,000	1,850	485	*197	147
4	300	535	580	315	919	269	1,310	926	1,800	476	191	168
5	290	485	510	305	968	278	1,480	898	1,750	471	189	200
6	280	462	476	295	1,540	278	1,610	1,080	1,600	471	186	165
7	350	435	453	280	3,380	303	1,800	1,720	1,350	458	183	147
8	1,800	417	426	280	2,410	314	1,930	1,630	1,150	422	183	140
9	*1,640	399	*408	265	1,810	286	1,810	1,470	1,050	386	180	135
10	1,180	378	440	250	1,460	275	1,500	1,520	1,050	358	180	135
11	2,390	358	635	255	1,230	265	1,300	1,780	1,050	334	178	135
12	1,690	346	642	240	1,070	262	1,160	2,090	1,050	326	170	135
13	1,400	314	595	230	919	258	1,090	1,820	1,000	326	165	133
14	1,090	*310	610	230	884	252	1,120	1,570	1,100	314	160	131
15	891	306	1,490	230	905	265	1,010	1,390	1,250	296	170	126
16	738	272	1,810	230	804	255	912	1,290	1,500	292	157	122
17	642	314	1,400	225	726	265	852	1,170	1,200	296	165	120
18	565	440	1,150	195	660	278	804	1,060	1,000	296	170	120
19	515	580	975	205	600	303	822	1,020	850	286	162	129
20	746	1,050	840	195	555	394	940	1,680	800	272	152	122
21	768	2,200	744	195	535	560	940	1,580	750	258	162	113
22	1,370	2,370	666	200	485	762	840	1,370	700	245	170	113
23	1,510	4,070	620	220	453	926	780	1,230	700	240	214	120
24	1,290	2,730	805	245	426	1,040	714	1,170	750	240	242	133
25	1,140	2,060	550	260	408	1,220	672	1,130	720	240	205	135
26	954	1,540	500	320	366	1,470	666	*1,350	680	240	200	122
27	828	1,250	476	300	338	1,760	684	1,440	640	245	180	118
28	762	1,070	448	600	322	1,720	738	1,410	620	240	160	115
29	672	912	420	*1,550	*310	1,990	792	1,400	600	230	155	113
30	605	792	408	1,420	---	2,190	858	1,500	*580	225	152	111
31	560	---	366	1,180	---	1,650	---	1,600	---	215	162	---
Total	28,206	28,020	21,202	11,757	27,459	20,980	33,034	42,238	32,290	10,253	5,555	4,014
Mean	910	934	684	379	947	677	1,101	1,363	1,076	531	179	134
Cfs/m	7.58	7.78	5.70	3.16	7.89	5.64	9.18	11.4	8.97	2.76	1.49	1.12
In.	8.74	8.68	6.57	3.64	8.51	6.50	10.24	13.09	10.01	3.18	1.72	1.24
Ac-ft	55,950	55,580	42,050	23,320	54,460	41,610	65,520	83,780	64,050	20,340	11,020	7,960

Calendar year 1959: Max 4,070 Min 135 Mean 725 Cfs/m 6.04 In. 82.06 Ac-ft 525,200  
 Water year 1959-60: Max 4,070 Min 111 Mean 724 Cfs/m 6.03 In. 82.12 Ac-ft 525,600

Peak discharge (base, 2,800 cfs)--Nov. 23 (6:30 a.m.) 4,610 cfs (23.63 ft); Feb. 7 (3 a.m.) 3,940 cfs (23.18 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 1-8, Jan. 4-29, May 30 to June 30, July 23 to Aug. 2; discharge estimated on basis of 2 discharge measurements, recorded range in stage, and records for stations above Muddy River, near Cougar and Muddy River below Clear Creek, near Cougar.

2135. Big Creek below Skookum Meadow, near Trout Lake, Wash.

Location.--Lat 46°05'30", long 121°51'30", in NE $\frac{1}{4}$  sec.13, T.7 N., R.7 E., on left bank just downstream from Skookum Meadow, 3 miles upstream from Lewis River and 17 miles northwest of Trout Lake.

Drainage area.--13.2 sq mi.

Records available.--September 1927 to September 1931 (published as "below Skookum Meadow"), September 1955 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 3,213.00 ft above mean sea level (levels by Pacific Power & Light Co.). Prior to September 1955, at site 100 ft upstream at different datum.

Average discharge.--9 years, 58.7 cfs (42,500 acre-ft per year).

Extremes.--Maximum discharge during year, 376 cfs Nov. 23 (gage height, 3.64 ft); minimum, 4.9 cfs Mar. 16 (gage height, 0.77 ft, result of freezeup).  
1927-31, 1955-60: Maximum discharge recorded, 766 cfs Mar. 31, 1931 (gage height, 5.1 ft, site and datum then in use), from rating curve extended above 230 cfs, but may have been higher Nov. 25, 1927, during period of no gage-height record; minimum, 4 cfs Nov. 20, 21, Dec. 2, 1929, Sept. 2-4, 19-26, 29, 30, Oct. 1-5, 1930.

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 1448: 1928.

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

1.0	18	2.5	175	0.8	5.8	2.0	107
1.5	55	3.5	348	1.0	14	3.0	256
2.0	108			1.5	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	36	42	56	27	57	24	140	81	193	43	14	13.5
2	32	39	54	30	63	24	120	86	203	41	14	*12
3	30	67	51	25	54	23	110	84	216	38	*13.5	11.5
4	28	47	45	24	49	22	105	79	211	37	13	25
5	26	42	41	26	68	23	105	82	193	*34	12.5	26
6	28	38	37	25	94	24	110	113	178	31	12	16
7	35	36	37	24	217	29	115	178	154	30	11.5	13.5
8	68	35	35	24	180	30	140	168	137	28	11.5	12
9	151	33	*34	22	123	27	120	168	129	28	11	11
10	99	31	43	20	98	24	110	178	124	26	10.5	10.5
11	285	30	62	19.5	79	23	95	192	117	24	10.5	10.5
12	170	29	50	19.5	67	22	90	225	116	24	10.5	10
13	116	25	43	19.5	60	22	90	212	108	23	10.5	10
14	89	*25	50	19.5	58	22	100	196	126	22	10.5	10
15	*75	25	156	19.5	61	24	90	170	143	22	12.5	9.6
16	62	22	147	19.5	53	22	80	166	166	20	11.5	9.6
17	54	28	108	19.5	47	22	70	140	133	19.5	11	9.2
18	48	60	89	16.5	44	23	65	126	108	20	10.5	9.2
19	45	82	74	16.5	42	24	65	124	106	19.5	10	10
20	56	93	64	16.5	40	29	90	217	107	17	10	10.5
21	49	150	58	16.5	38	35	80	172	86	17	12	9.6
22	137	206	52	16.5	37	41	70	143	75	16.5	13.5	9.2
23	114	329	48	16.5	34	43	62	*138	68	16	22	10.5
24	96	234	48	19.5	*32	48	58	145	65	15.5	37	13
25	87	178	45	24	30	55	56	140	62	15.5	27	13
26	70	128	41	31	27	67	*53	175	57	15	26	10.5
27	62	98	39	25	27	94	58	187	54	15	22	9.2
28	64	89	37	35	26	100	69	174	50	14	16.5	8.9
29	54	72	34	30	25	142	69	174	47	14	14.5	8.4
30	43	62	*73	*73	---	*170	76	186	46	14	13.5	8.4
31	46	---	31	58	---	180	---	203	---	14	13.5	---
Total	2,361	2,373	1,743	828.0	1,810	1,458	2,661	4,822	3,598	713.5	447.5	350.2
Mean	76.2	79.1	56.2	26.7	62.4	47.0	86.7	156	120	23.0	14.4	11.7
Cfs/m	5.77	5.99	4.26	2.02	4.73	3.56	6.72	11.8	9.09	1.74	1.09	0.886
In.	6.65	6.69	4.91	2.33	5.10	4.11	7.50	13.59	10.14	2.01	1.26	0.99
Ac-ft	4,680	4,710	3,460	1,640	3,590	2,890	5,280	9,580	7,140	1,420	888	695

Calendar year 1959: Max 329 Min 8.7 Mean 62.0 Cfs/m 4.70 In. 63.72 Ac-ft 44,870  
Water year 1959-60: Max 329 Min 8.4 Mean 63.3 Cfs/m 4.80 In. 65.28 Ac-ft 45,950

Peak discharge (base, 360 cfs).--Nov. 23 (7 a.m.) 376 cfs (3.64 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Mar. 31 to Apr. 25; discharge estimated on basis of recorded range in stage and records for Curly Creek near Cougar.

2140. Rush Creek above Meadow Creek, near Trout Lake, Wash.

Location.--Lat 46°02'30", long 121°50'30", in NE $\frac{1}{4}$  sec. 6, T.6 N., R.8 E., on left bank 1 mile upstream from Meadow Creek and 15 miles west of Trout Lake.

Drainage area.--5.97 sq mi.

Records available.--September 1955 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 3,400 ft (from topographic map).

Average discharge.--5 years, 25.4 cfs (18,390 acre-ft per year).

Extremes.--Maximum discharge during year, 560 cfs Oct. 11 (gage height, 2.74 ft); no flow Sept. 21-24, 28-30.  
1955-60: Maximum discharge, 640 cfs Dec. 2, 1958 (gage height, 3.08 ft); no flow Sept. 21-24, 28-30, 1960.

Remarks.--Records 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. 1-10					Oct. 11 to Sept. 30				
0.4	0.1	0.8	15		0.33	0	1.0	35	
.5	.8	1.0	32		.5	.7	1.5	114	
.6	3.0	1.5	97		.6	2.5	2.2	315	
					.8	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	3.0	3.9	2.8	1.8	29	0.8	19.5	12.5	83	85	0.1	*0.2
2	1.8	2.8	2.8	.8	19.5	.8	21	14	97	70	*.1	.2
3	1.2	27	2.8	.7	12.5	.8	23	14	112	70	.1	.2
4	.9	11	1.6	.7	6.4	.8	26	10.5	114	70	.2	.2
5	.7	4.8	1.4	.6	5.3	.8	28	9.1	106	*69	.2	3.9
6	.7	3.5	1.1	.6	10.5	.9	30	22	101	66	.2	2.5
7	1.6	2.5	1.2	.5	74	1.0	34	43	88	63	.2	1.0
8	84	2.0	1.1	.5	56	1.2	39	50	74	52	.2	.4
9	89	1.8	1.0	.4	43	1.1	43	48	81	35	.1	.2
10	27	1.4	1.4	.4	33	.9	40	54	90	29	.1	.2
11	295	1.1	*26	.4	23	.9	35	62	95	19.5	.1	.2
12	48	1.1	12.5	.4	13.5	.9	27	78	101	19	.1	.1
13	19	1.0	11	.4	9.1	.8	22	75	99	17	.1	.1
14	*9.1	1.0	9.1	.4	5.8	.8	14	68	127	16	.1	.1
15	9.8	.8	148	.4	4.3	.8	16	58	190	9.1	.1	.1
16	5.3	.7	74	.4	3.5	.8	11	47	236	6.4	.1	.1
17	2.8	1.5	33	.4	3.2	.8	7.0	35	92	4.8	.1	.1
18	2.0	5.0	18	.4	2.5	.8	5.3	23	60	3.5	.1	.1
19	1.8	10	10.5	.4	2.0	.8	4.8	19	50	2.5	.1	.1
20	15	*109	7.0	.4	1.8	.8	3.9	66	38	1.8	.1	.1
21	16	74	4.3	.4	2.0	.9	3.9	*62	47	1.1	.1	0
22	221	164	3.2	.4	1.4	1.0	3.5	38	60	.7	.1	0
23	58	238	3.2	.4	1.8	1.2	2.8	26	76	.4	1.0	0
24	27	125	2.8	.5	1.1	1.4	2.5	25	95	.4	15	0
25	22	52	2.5	1.4	*1.1	2.0	2.2	23	100	.2	7.0	.1
26	9.1	16	2.0	2.0	.9	4.0	*2.8	47	90	.2	3.5	.1
27	5.8	8.4	1.8	2.2	.9	6.0	3.9	56	80	.2	2.0	.1
28	7.0	8.4	1.4	2.2	.9	6.0	6.4	47	80	.2	1.2	0
29	5.3	5.3	1.2	36.0	.9	24	7.7	52	90	.2	.7	0
30	3.9	3.2	1.2	50	---	24	10.5	69	100	.2	.4	0
31	3.5	---	1.1	*42	---	24	---	83	---	.1	.2	---
Total	996.3	886.2	391.0	148.5	368.9	111.8	495.7	1,356.1	2,850	712.5	33.7	10.4
Mean	32.1	29.5	12.6	4.79	12.7	3.61	16.5	43.1	95.0	23.0	1.09	0.35
Cfsm	5.38	4.94	2.11	0.802	2.13	0.605	2.76	7.22	15.9	3.85	0.183	0.059
In.	6.21	5.52	2.44	0.93	2.30	0.70	3.09	8.32	17.75	4.44	0.21	0.06
Ac-ft	1,980	1,760	776	295	732	222	983	2,650	5,650	1,410	67	21

Calendar year 1959: Max 295 Min 0.1 Mean 24.2 Cfsm 4.05 In. 55.05 Ac-ft 17,530  
Water year 1959-60: Max 295 Min 0 Mean 22.8 Cfsm 3.82 In. 51.97 Ac-ft 16,550

Peak discharge (base, 350 cfs).--Oct. 11 (10:30 a.m.) 560 cfs (2.74 ft); Oct. 22 (12:30 p.m.) 500 cfs (2.62 ft); Nov. 20 (10 p.m.) 422 cfs (2.46 ft); Nov. 22 (7:30 p.m.) 475 cfs (2.57 ft).

\* discharge measurement made on this day.

Note.--No gage-height record Nov. 13-19, Jan. 9-23, Feb. 26 to Mar. 30, June 25 to July 4, Aug. 15-31; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations.

2145. Meadow Creek below Lone Butte Meadow, near Trout Lake, Wash.

Location.--Lat 46°02'50", long 121°51'20", in E½ sec.36, T.7 N., R.7 E., on right bank just downstream from Lone Butte Meadow, half a mile upstream from mouth and 16 miles northwest of Trout Lake.

Drainage area.--11.7 sq mi.

Records available.--September to December 1927 (fragmentary), January 1928 to September 1931, September 1955 to September 1960. Prior to September 1955, published as "below Lone Butte Meadow."

Gage.--Water-stage recorder. Datum of gage is 3,226.84 ft above mean sea level (levels by Pacific Power & Light Co.).

Average discharge.--8 years (1928-31, 1955-60), 91.2 cfs (66,030 acre-ft per year).

Extremes.--Maximum discharge during year, 215 cfs Nov. 23 (gage height, 1.68 ft); minimum, 71 cfs Mar. 1-5, 12 (gage height, 0.96 ft).  
1927-31, 1955-60: Maximum discharge, 330 cfs Dec. 11, 1956 (gage height, 2.20 ft); minimum, 47 cfs Dec. 29-31, 1930, Jan. 1-3, 19-21, 1931.

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

Revisions (water years).--WSP 1448: 1928-29.

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

0.9	59
1.2	119
1.6	199

Discharge, in cubic 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	81	93	79	89	71	99	99	147	111	95	*87
2	75	79	91	79	93	71	107	99	151	109	*93	85
3	75	97	89	79	83	71	105	101	159	109	93	85
4	75	87	87	77	81	71	105	99	161	107	93	97
5	75	83	85	77	95	71	107	99	157	*109	93	93
6	77	81	83	79	107	73	109	111	155	109	91	87
7	79	79	81	79	141	77	115	135	147	109	91	83
8	89	79	81	79	129	77	121	123	139	107	91	83
9	131	77	79	79	115	73	125	125	139	107	89	83
10	101	77	87	79	105	73	115	135	141	105	89	85
11	185	77	101	79	97	73	111	143	139	103	89	85
12	137	77	*99	79	91	71	107	155	137	103	89	85
13	109	75	89	79	89	73	113	153	137	103	89	83
14	99	75	91	79	91	73	111	143	143	103	89	83
15	*95	75	135	79	97	73	103	137	165	101	89	83
16	91	73	123	77	87	73	99	139	181	101	89	81
17	87	75	105	77	85	73	97	133	155	99	89	81
18	85	93	99	77	83	73	95	129	137	99	89	81
19	83	101	97	77	81	73	97	125	137	99	89	83
20	89	*97	93	77	79	75	105	161	135	97	89	79
21	87	119	91	77	79	75	99	145	127	97	91	79
22	139	137	89	77	77	75	93	135	123	97	91	79
23	133	199	89	77	77	75	91	*133	121	95	99	79
24	109	161	89	77	*77	77	89	139	123	95	111	81
25	105	143	89	77	75	79	91	135	121	95	105	79
26	95	117	85	79	75	85	*91	145	117	95	99	81
27	91	107	83	75	73	95	95	145	115	95	95	79
28	93	105	81	85	73	95	99	139	115	95	91	79
29	89	99	81	109	73	129	95	139	115	95	89	79
30	85	95	81	*95	-----	*125	99	147	113	95	89	79
31	83	-----	79	85	-----	105	-----	153	-----	95	89	-----
Total	3,023	2,920	2,825	2,479	2,597	2,473	3,088	4,099	4,152	3,139	2,857	2,486
Mean	97.5	97.3	91.1	80.0	89.6	79.8	103	132	138	101	92.2	82.9
Cfsm	8.33	8.32	7.79	6.84	7.66	6.82	8.80	11.3	11.8	8.63	7.88	7.09
In.	9.61	9.28	8.98	7.88	8.25	7.86	9.82	13.03	13.20	9.98	9.08	7.90
Ac-ft	6,000	5,790	5,600	4,920	5,150	4,910	6,120	8,130	8,240	6,230	5,670	4,930

Calendar year 1959: Max 199 Min 73 Mean 96.7 Cfsm 8.26 In. 112.21 Ac-ft 70,020  
Water year 1959-60: Max 199 Min 71 Mean 98.7 Cfsm 8.44 In. 114.87 Ac-ft 71,690

Peak discharge (base, 230 cfs).--No peak above base.

\* Discharge measurement made on this day.

2150. Rush Creek above falls, near Cougar, Wash.

Location.--Lat 46°03'20", long 121°54'20", on line between secs. 27 and 34, T.7 N., R. 7 E., on right bank 500 ft upstream from falls, 2 miles upstream from mouth, and 18 miles east of Cougar.

Drainage area.--26.0 sq mi.

Records available.--December 1927 to September 1931 (published as Rush Creek above falls), October 1955 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,260.51 ft above mean sea level (levels by Pacific Power & Light Co.). December 1927 to September 1931, water-stage recorder at same site at different datum.

Average discharge.--8 years (1928-31, 1955-60), 166 cfs (120,200 acre-ft per year).

Extremes.--Maximum discharge during year, 718 cfs Oct. 11 (gage height, 3.37 ft); minimum, 112 cfs Nov. 16 (gage height, 0.70 ft).  
1927-31, 1955-60: Maximum discharge, 846 cfs Dec. 11, 1956 (gage height, 3.69 ft); minimum, 79 cfs Jan. 24-27, 29, Nov. 6, 7, 1930.

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 1568: 1956(P), 1957. WSP 1638: 1929(M).

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

0.7	112
1.0	150
2.0	295
3.0	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	122	129	149	132	176	125	203	181	303	268	145	133
2	119	127	149	130	175	125	216	182	327	244	*145	132
3	117	175	146	129	154	125	214	182	362	246	144	130
4	116	144	140	129	145	125	210	173	368	*246	142	147
5	115	129	138	128	164	124	215	172	362	250	142	144
6	116	125	136	128	192	124	220	205	352	242	142	134
7	120	123	136	127	321	129	234	256	313	239	141	130
8	210	122	133	127	385	128	246	251	283	221	140	129
9	282	120	132	127	250	124	252	251	281	201	140	128
10	177	119	138	127	216	123	238	262	297	189	138	127
11	506	118	*194	126	190	122	226	279	301	177	138	127
12	283	118	179	126	175	120	210	313	313	175	138	127
13	189	116	159	126	162	120	212	309	307	173	138	125
14	*160	114	159	126	167	124	206	290	345	172	137	125
15	153	116	357	126	173	125	185	260	439	164	138	124
16	141	112	295	125	155	125	176	260	482	159	137	123
17	134	116	215	125	149	125	172	250	362	158	137	123
18	130	154	184	125	146	125	170	235	287	155	136	123
19	128	180	168	125	142	125	170	230	270	154	136	124
20	146	*233	158	125	140	126	190	320	254	153	136	123
21	142	274	153	126	138	130	180	*277	246	153	137	122
22	371	354	149	126	136	132	170	248	257	151	138	122
23	286	542	147	126	134	133	164	233	270	150	149	122
24	198	385	149	126	133	136	160	240	303	149	173	123
25	189	287	145	126	*132	142	160	233	303	149	167	122
26	153	206	141	132	130	150	160	264	277	149	160	120
27	144	179	140	130	171	142	*166	249	274	187	145	119
28	146	172	137	160	128	180	181	256	277	146	140	119
29	138	162	136	230	127	*266	175	258	285	148	136	118
30	133	154	136	200	-----	257	179	279	303	146	134	118
31	130	-----	134	*180	-----	220	-----	309	-----	146	*134	-----
Total	5,472	5,405	5,032	4,211	4,964	4,415	5,860	7,728	9,403	5,618	4,413	3,783
Mean	177	180	162	136	171	142	195	249	313	187	145	126
Cfs/m	6.81	6.92	6.23	5.23	6.58	5.46	7.50	9.58	12.0	6.96	5.46	4.85
In.	7.83	7.73	7.20	6.02	7.10	6.32	8.38	11.05	13.45	8.04	6.31	5.41
Ac-ft	10,850	10,720	9,980	8,350	9,850	8,760	11,620	15,330	18,650	11,140	8,750	7,500

Calendar year 1959: Max 542 Min 112 Mean 178 Cfs/m 6.85 In. 92.83 Ac-ft 128,700  
Water year 1959-60: Max 542 Min 112 Mean 181 Cfs/m 6.96 In. 94.84 Ac-ft 131,500

Peak discharge (base, 500 cfs).--Oct. 11 (11 a.m.) 718 cfs (3.37 ft); Oct. 22 (2 p.m.) 626 cfs (3.13 ft); Nov. 23 (4 a.m.) 706 cfs (3.30 ft); June 16 (12 m.) 524 cfs (2.80 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Jan. 8-30, Mar. 13-28, Apr. 17-26, May 14-20; discharge estimated on basis of recorded range in stage, weather records, and records for Meadow Creek below Lone Butte Meadow, near Cougar.

## 2155. Curly Creek near Cougar, Wash.

Location.--Lat 46°02'05", long 121°54'30", in NW¼ sec.3, T.6 N., R.7 E., on right bank half a mile downstream from confluence of Hardtime and Outlaw Creeks, 4 miles upstream from mouth, and 18 miles east of Cougar.

Drainage area.--12.6 sq mi.

Records available.--September 1955 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,489.85 ft above mean sea level (levels by Pacific Power & Light Co.).

Average discharge.--5 years, 65.0 cfs (4,710 acre-ft per year).

Extremes.--Maximum discharge during year, 280 cfs Nov. 22 (gage height, 2.95 ft); minimum, 13 cfs Sept. 28, 29, 30 (gage height, 0.97 ft).  
1955-60: Maximum discharge, 417 cfs Dec. 22, 1955; maximum gage height, 3.25 ft Apr. 20, 1958; minimum discharge, 8.8 cfs Oct. 4-7, 1958 (gage height, 0.83 ft).

Remarks.--Records excellent except those above 150 cfs and those for periods of no gage-height record, which are good. No regulation or diversion above station.

Cooperation.--Gage-height record collected in cooperation with Pacific Power & Light Co.

Revisions (water years).--WSP 1518: 1956.

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

0.9	10.5
1.3	28
1.7	54
2.2	100
2.8	225

Discharge, in cubic 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	45	61	37	55	37	147	84	119	50	18.5	*16
2	20	43	58	36	63	35	143	85	127	47	*18.5	16
3	20	50	55	35	58	34	136	85	136	45	18.5	16
4	19.5	47	50	33	58	33	134	83	132	45	18	18.5
5	19	41	47	33	70	32	138	81	122	*44	18	18
6	20	39	45	30	91	32	140	92	113	41	18	16.5
7	21	37	44	29	195	33	151	125	96	39	17.5	16
8	34	36	41	28	188	33	155	125	86	36	17.5	16
9	64	34	39	27	168	31	149	122	84	34	17.5	15.5
10	40	33	41	26	136	30	132	127	86	32	17.5	15.5
11	161	32	*62	26	116	29	124	140	86	30	18	16
12	118	31	78	26	101	28	117	155	84	28	17.5	15.5
13	78	30	69	26	89	27	117	162	84	28	16.5	15.5
14	*63	29	70	25	89	27	122	149	90	28	17	15.5
15	56	28	152	25	99	27	106	136	100	26	17.5	15.5
16	50	27	153	24	85	26	98	130	110	24	17	15
17	47	27	116	24	78	28	92	125	100	24	16.5	15
18	44	36	96	24	73	26	86	114	80	23	16	15
19	42	*49	84	24	67	26	85	108	74	22	16	15
20	47	63	76	24	63	27	107	175	70	22	16	15
21	46	103	70	24	59	29	101	*166	65	21	16	14.5
22	111	160	65	23	55	33	92	143	62	20	16.5	14
23	106	132	61	23	51	38	86	128	62	20	18.5	14.5
24	82	168	60	22	48	42	81	124	64	20	22	14.5
25	76	134	56	20	*47	50	77	122	63	19	20	14.5
26	67	104	51	22	44	63	75	136	59	19	20	13.5
27	61	88	48	22	41	89	*75	134	57	19	21	13.5
28	58	81	46	27	40	119	81	124	56	19	18	13.5
29	55	74	44	27	39	*180	81	122	56	18.5	17	13
30	50	67	41	58	---	218	82	124	54	18.5	16.5	13
31	48	---	39	*53	---	166	---	127	---	18.5	16	---
Total	1,744.5	1,868	2,018	903	2,368	1,615	3,310	3,853	2,577	878.5	549.0	455.5
Mean	56.3	62.3	65.1	29.1	81.6	52.1	110	124	85.9	28.3	17.7	15.2
Cfsm	4.47	4.94	5.17	2.31	6.48	4.13	8.73	9.84	6.82	2.25	1.40	1.21
In.	5.15	5.51	5.96	2.67	6.98	4.77	9.77	11.37	7.61	2.58	1.62	1.34
Ac-ft	3,480	3,710	4,000	1,790	4,690	3,200	6,570	7,640	5,110	1,740	1,090	903

Calendar year 1959: Max 292 Min 11.5 Mean 58.4 Cfsm 4.63 In. 62.93 Ac-ft 42,300  
Water year 1959-60: Max 216 Min 13 Mean 60.5 Cfsm 4.80 In. 65.34 Ac-ft 43,900

Peak discharge (base, 180 cfs).--Oct. 11 (1:30 p.m.) 210 cfs (2.75 ft); Nov. 22 (9 to 10 p.m.) 280 cfs (2.95 ft); Dec. 15 (9 to 10 p.m.) 195 cfs (2.66 ft); Feb. 7 (4 a.m.) 207 cfs (2.74 ft); Mar. 29 (6 to 9 p.m.) 280 cfs (2.90 ft); May 20 (6 p.m.) 168 cfs (2.67 ft).

\* Discharge measurement made on this day.  
Note.--No gage-height record Feb. 28 to Mar. 17, June 10 to July 4; discharge estimated on basis of recorded range in stage and records for Lewis River above Muddy River, near Cougar.

2160. Lewis River above Muddy River, near Cougar, Wash.

Location.--Lat 46°03'30", long 121°58'50", in SE $\frac{1}{4}$  sec.30, T.7 N., R.7 E., on right bank 1 mile upstream from Pepper Creek, 2 miles upstream from Muddy River, and 15 miles east of Cougar.

Drainage area.--227 sq mi.

Records available.--August 1927 to September 1934, October 1954 to September 1960. Records for August to October 1909, published in WSP 272, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Altitude of gage is 1,080 ft (from river-profile map). August 1927 to September 1934 at datum 2.61 ft lower.

Average discharge.--13 years, 1,281 cfs (927,400 acre-ft per year).

Extremes.--Maximum discharge during year, 7,340 cfs Nov. 23 (gage height, 7.31 ft); minimum, 297 cfs Sept. 30 (gage height, 1.52 ft).  
1927-34, 1954-60: Maximum discharge, 27,000 cfs Dec. 21, 1933 (gage height, 10.6 ft, from high-water marks, present datum), from rating curve extended above 6,000 cfs; minimum, 175 cfs Nov. 21, 1929; minimum gage height, -0.13 ft Sept. 28, 29, 1934, datum then in use.

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

Revisions.--See Records available.

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

Oct. 1-11				Oct. 12 to Sept. 30			
2.0	500	5.0	3,220	1.5	290	4.0	2,040
3.0	1,100	6.0	4,770	2.0	500	5.0	3,260
4.0	2,000			3.0	1,120	7.0	6,690

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	716	945	1,330	756	1,900	720	2,760	1,790	2,760	1,070	470	373
2	656	890	1,250	756	1,950	702	2,610	1,840	2,920	980	460	361
3	615	1,140	1,180	714	1,850	666	2,510	1,830	3,150	952	450	357
4	580	1,010	1,070	690	1,700	684	2,490	1,720	3,060	938	441	446
5	550	897	1,000	*690	1,820	672	2,680	1,640	2,810	924	*436	475
6	545	858	952	678	2,350	678	2,830	1,870	2,680	917	428	405
7	575	826	924	649	5,620	708	3,070	2,910	2,330	*897	423	373
8	1,000	793	871	654	4,290	738	3,250	2,860	2,070	852	418	357
9	2,590	756	858	616	*3,400	678	3,130	2,570	1,970	786	418	349
10	1,750	726	904	583	2,830	649	2,670	2,630	2,010	744	410	345
11	4,010	702	1,340	605	2,340	627	2,540	2,940	2,020	708	414	341
12	3,220	684	1,580	578	2,060	616	2,110	3,460	1,980	678	397	341
13	2,330	632	1,400	561	1,820	616	2,020	3,200	1,950	678	393	337
14	1,810	622	1,400	550	1,850	610	2,110	2,810	2,020	660	385	337
15	1,510	622	3,030	550	1,980	672	*1,940	2,510	2,260	632	401	329
16	1,280	561	3,580	545	1,740	*649	1,760	2,370	2,670	616	385	322
17	1,120	805	2,720	525	1,570	644	1,670	2,180	2,140	610	385	318
18	1,020	884	2,230	485	1,420	672	1,580	1,960	1,690	610	393	318
19	931	1,180	1,870	495	1,300	714	1,600	1,880	1,540	600	385	322
20	1,190	1,140	1,640	490	1,200	864	1,940	3,030	1,490	578	373	329
21	1,240	2,270	1,460	480	1,150	1,110	1,970	2,980	1,330	556	381	311
22	*2,380	4,020	1,330	490	1,060	1,370	1,760	2,570	1,290	540	405	308
23	2,570	*6,670	1,240	505	987	1,580	1,650	2,320	1,300	525	468	322
24	2,130	4,780	1,220	583	938	1,730	1,510	2,230	1,400	515	605	333
25	1,900	3,660	1,120	583	897	1,950	1,460	2,130	1,340	510	510	353
26	1,590	2,730	1,030	708	826	2,320	1,420	*2,500	1,230	505	490	322
27	1,400	2,230	980	666	774	2,850	1,450	2,650	1,190	520	460	311
28	1,320	1,930	931	668	750	2,910	1,550	2,550	1,170	505	405	312
29	1,190	1,680	884	2,540	732	3,730	1,590	2,530	1,170	490	*385	304
30	1,080	1,480	858	2,370	732	4,260	1,690	2,680	1,150	480	373	300
31	1,020	---	819	2,070	---	3,330	---	2,890	---	475	381	---
Total	45,818	47,903	42,981	24,033	53,084	40,719	63,120	76,030	58,070	21,051	13,128	10,310
Mean	1,478	1,597	1,386	775	1,830	1,314	2,104	2,453	1,936	679	423	344
Cfs/m	6.51	7.04	6.11	3.41	8.06	5.79	9.27	10.8	8.53	2.98	1.86	1.52
In.	7.51	7.85	7.04	3.84	8.70	6.67	10.34	12.46	9.51	3.45	2.15	1.69
Ac-ft	90,880	95,010	85,250	47,670	105,300	80,780	125,200	150,800	115,200	41,750	26,040	20,450

Calendar year 1959: Max 6,670 Min 323 Mean 1,327 Cfs/m 5.85 In. 79.32 Ac-ft 960,400  
Water year 1959-60: Max 6,670 Min 300 Mean 1,356 Cfs/m 5.97 In. 81.31 Ac-ft 984,300

Peak discharge (base, 4,000 cfs).--Oct. 11 (11 a.m.) 4,620 cfs (5.91 ft); Nov. 23 (6:30 a.m.) 7,340 cfs (7.31 ft); Dec. 15 (9 to 11 p.m.) 4,100 cfs (5.57 ft); Feb. 7 (4 a.m.) 6,270 cfs (6.79 ft); Mar. 29 (9:30 p.m.) 4,780 cfs (5.98 ft).

\* Discharge measurement made on this day.

2165. Muddy River below Clear Creek, near Cougar, Wash.

Location.--Lat 46°06'50", long 122°00'30", in SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 1, T.7 N., R.6 E., on right bank a quarter of a mile downstream from Clear Creek, 4 miles upstream from mouth, and 14 $\frac{1}{2}$  miles northeast of Cougar.

Drainage area.--131 sq mi.

Records available.--August 1927 to September 1934, October 1954 to September 1960. Published as "near Cougar" 1927-34. Records for August to October 1909, published in WSP 272 and 492, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Altitude of gage is 1,200 ft above mean sea level (from River-profile map). August 1927 to September 1934 at site 3 miles downstream at different datum.

Average discharge.--13 years, 866 cfs (627,000 acre-ft per year).

Extremes.--Maximum discharge during year, 4,660 cfs Feb. 7 (gage height, 6.13 ft); minimum daily, 140 cfs Sept. 29, 30.  
1927-34, 1954-60: Maximum discharge, 17,500 cfs Dec. 21, 1933 (gage height, 14.0 ft, from high-water marks, site and datum then in use), from rating curve extended above 4,500 cfs; minimum recorded, 94 cfs Dec. 5-7, 1929.

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

Revisions.--See Records available.

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

1.6	134	4.0	1,800
2.0	264	5.0	3,000
2.5	515	6.0	4,450
3.0	870	7.0	6,100

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	461	682	934	557	1,810	485	2,300	1,100	1,440	479	227	178
2	428	634	862	533	1,860	467	2,000	1,120	1,470	450	220	175
3	400	742	790	503	1,690	455	1,830	1,110	1,580	433	217	172
4	380	627	726	*485	1,630	455	1,790	1,060	1,580	416	217	204
5	365	582	675	473	1,650	444	1,860	1,010	1,470	406	*210	215
6	348	557	640	473	2,270	444	1,950	1,210	1,380	395	207	185
7	348	533	614	455	4,470	509	2,090	1,550	1,250	*390	207	170
8	656	509	575	450	3,670	521	2,170	1,570	1,120	370	194	165
9	974	485	551	422	*2,830	461	2,080	1,500	1,030	355	197	160
10	822	467	654	400	2,300	444	1,820	1,470	1,020	341	197	160
11	1,960	450	1,220	400	1,870	422	1,610	1,560	1,020	328	194	155
12	1,770	458	1,260	380	1,680	411	1,470	1,770	1,010	318	188	155
13	1,470	416	1,090	370	1,460	418	1,370	1,770	974	318	185	155
14	1,230	406	1,230	365	1,510	416	1,470	1,580	998	310	178	155
15	1,050	400	2,240	355	1,580	503	*1,380	1,400	990	301	185	155
16	910	370	2,420	350	1,370	*473	1,270	1,320	1,030	297	182	150
17	806	420	2,040	336	1,240	467	1,210	1,230	950	284	178	150
18	726	620	1,730	318	1,220	485	1,180	1,120	822	284	180	145
19	661	750	1,450	318	1,010	533	1,270	1,080	750	276	175	150
20	854	1,270	1,260	310	926	661	1,620	1,640	710	268	175	150
21	774	2,690	1,120	305	886	870	1,580	1,620	640	260	180	145
22	*1,270	3,130	1,010	301	798	1,080	1,420	1,520	608	257	190	145
23	1,390	*4,480	942	318	734	1,250	1,300	1,380	601	249	210	150
24	1,360	3,540	966	455	689	1,380	1,170	1,290	614	246	260	155
25	1,250	2,570	878	444	647	1,580	1,080	*1,260	608	242	240	160
26	1,100	1,990	790	601	594	1,820	1,010	1,360	575	249	220	150
27	1,010	1,610	726	557	551	2,140	1,998	1,370	945	249	210	145
28	942	1,380	689	939	527	2,270	1,010	1,350	527	242	200	145
29	854	1,180	647	2,470	503	3,290	1,010	1,340	515	238	191	140
30	782	1,040	620	2,350	-----	3,900	1,060	1,400	503	238	*191	140
31	734	-----	594	2,040	-----	2,960	-----	1,460	-----	238	185	-----
Total	28,081	34,968	31,943	19,033	43,855	32,012	45,378	42,520	28,336	9,727	6,190	4,779
Mean	906	1,166	1,030	614	1,512	1,033	1,513	1,372	945	314	200	159
Cfs	6.92	8.90	7.86	4.69	11.5	7.29	11.5	10.5	7.21	2.40	1.53	1.21
In.	7.97	9.93	9.07	5.40	12.45	9.09	12.88	12.07	8.04	2.76	1.76	1.36
Ac-ft	55,700	69,360	63,360	37,750	86,990	63,490	90,010	84,340	56,200	19,290	12,280	9,480
Calendar year 1959: Max	5,540	Min	166	Mean	915	Cfs	6.98	In.	94.76	Ac-ft	662,100	
Water year 1959-60: Max	4,480	Min	140	Mean	893	Cfs	6.82	In.	92.78	Ac-ft	648,200	

Peak discharge (base, 3,500 cfs).--Nov. 23 (8 to 10 a.m.) 4,640 cfs (6.12 ft); Feb. 7 (3 a.m.) 4,660 cfs (6.13 ft); Mar. 29 (8:30 p.m.) 4,230 cfs (5.86 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Aug. 18-28, Sept. 5-30; discharge estimated on basis of records for Lewis River above Muddy River, near Cougar.

2168, Pine Creek near Cougar, Wash.

Location.--Lat 46°02'30", long 122°05'30" in E $\frac{1}{2}$  sec.15, T.7 N., R.6 E., on right bank 2 miles upstream from mouth and 12 $\frac{1}{2}$  miles east of Cougar.

Drainage area.--21.4 sq mi.

Records available.--August 1957 to September 1960. Records for August to October 1909, February 1928 to September 1930, published in WSP 272, 492, 674, 694, and 709, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Altitude of gage is 1,330 ft (from topographic map). Supplementary water-stage recorder on right bank at same datum used July 17 to Sept. 30, 1959.

Extremes.--Maximum discharge during year, 801 cfs Feb. 7 (gage height, 3.91 ft); minimum, 117 cfs Sept. 29, 30 (gage height, 2.23 ft).  
1957-60: Maximum discharge, 921 cfs Jan. 24, 1959 (gage height, 4.06 ft); minimum, 116 cfs Oct. 21, 1957 (gage height, 2.05 ft).

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

Revisions.--See Records available.

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

2.2	117
2.5	175
3.0	320
3.5	541
4.0	870

Discharge, in cubic 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	167	171	146	240	154	306	228	209	156	141	135
2	169	164	167	146	254	154	310	225	209	154	139	135
3	167	167	162	144	242	152	303	220	207	154	139	135
4	160	167	156	144	242	154	289	212	202	154	139	141
5	156	160	154	*143	254	154	289	207	197	154	*139	137
6	152	158	152	144	373	156	283	231	192	152	139	135
7	154	154	150	144	633	164	289	264	185	*152	139	131
8	258	152	148	144	415	160	283	251	180	152	141	128
9	320	152	146	143	*335	154	270	234	177	152	137	128
10	296	150	169	143	313	154	245	228	175	152	137	128
11	525	150	225	143	267	152	240	231	175	150	135	128
12	393	148	276	141	254	150	240	251	173	150	135	128
13	306	146	248	141	234	152	237	264	171	150	135	126
14	251	146	254	141	257	152	254	240	175	150	135	126
15	225	146	446	141	280	175	*242	225	175	150	137	126
16	212	143	385	139	251	*162	228	234	189	148	135	124
17	197	158	283	139	231	160	222	228	173	150	135	124
18	189	197	240	137	217	162	220	220	171	148	135	124
19	182	215	212	137	204	164	242	231	171	148	133	124
20	222	262	197	137	197	171	320	310	171	146	133	124
21	204	369	187	135	194	185	317	286	167	146	139	122
22	*346	466	177	135	185	202	276	260	164	144	139	122
23	*317	547	175	141	175	212	254	245	164	143	138	124
24	267	*365	160	148	175	220	237	234	162	143	154	128
25	222	286	173	150	169	231	225	231	162	143	146	124
26	209	245	164	160	164	248	220	231	160	143	144	121
27	199	220	160	158	162	270	217	*225	158	143	143	119
28	192	207	156	192	158	293	222	217	158	141	139	119
29	180	192	154	289	158	428	222	217	158	141	139	119
30	173	180	152	286	-----	460	225	220	156	141	137	117
31	169	-----	150	251	-----	357	-----	215	-----	141	*135	-----
Total	7,185	6,399	6,169	4,882	7,231	6,262	7,727	7,315	5,286	4,591	4,311	3,796
Mean	232	213	199	157	249	202	258	236	176	148	139	127
Cfs/m	10.8	9.95	9.30	7.34	11.6	9.44	12.1	11.0	8.22	6.92	6.50	5.93
In.	12.49	11.12	10.72	8.48	12.57	10.88	13.43	12.71	9.19	7.98	7.49	6.60
Ac-ft	14,250	12,690	12,240	9,680	14,540	12,420	15,330	14,510	10,480	9,110	8,550	7,530

Calendar year 1959: Max	753	Min	131	Mean	206	Cfs/m	9.63	In.	130.54	Ac-ft	149,000
Water year 1959-60: Max	633	Min	117	Mean	194	Cfs/m	9.07	In.	123.66	Ac-ft	141,100

Peak discharge (base, 450 cfs).--Oct. 8 (11:45 p.m.) 475 cfs (3.37 ft); Oct. 11 (4 a.m.) 615 cfs (3.56 ft); Nov. 20 (10 p.m.) 479 cfs (3.38 ft); Nov. 23 (2:30 a.m.) 683 cfs (3.79 ft); Dec. 15 (3:30 p.m.) 580 cfs (3.62 ft); Feb. 7 (1:30 a.m.) 801 cfs (3.91 ft); Mar. 29 (6:30 p.m.) 536 cfs (3.49 ft).

\* Discharge measurement made on this day.

2198. Speelyai Creek near Cougar, Wash.

Location.--Lat 46°00'25", long 122°20'40", in NW $\frac{1}{4}$  sec.17, T.6 N., R.4 E., on right bank  $\frac{3}{4}$  miles upstream from mouth and 4 miles southwest of Cougar. Prior to Nov. 21, 1959, at site 250 ft downstream.

Drainage area.--12.6 sq mi.

Records available.--May 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 500 ft (from topographic map). May 15 to Nov. 21, 1959, at site 250 ft downstream at different datum.

Extremes.--Maximum discharge during year, 1,260 cfs Nov. 23 (gage height, 5.26 ft); minimum, 3.4 cfs Aug. 19, 20.

1959-60: Maximum discharge, that of Nov. 23, 1959; minimum, that of Aug. 19, 20, 1960.

Revisions.--The maximum discharge for period of record for the water year 1959 has been revised to 402 cfs June 11, 1959 (gage height, 3.07 ft), superseding figure published in WSP 1638.

Remarks.--Records fair prior to Feb. 8, good thereafter. No regulation or diversion above station. Greater part of flow diverted into Yale Reservoir, 240 ft below station, beginning Mar. 30, 1959.

Revisions.--Revised figures of discharge, in cubic feet per second, for the water year 1959, superseding those published in WSP 1638, are given herewith:

1959	1959-Con.
June 9..... 266	June 12..... 303
10..... 249	Sept. 6..... 210
11..... 318	21..... 258

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
June 1959.....	2,603	318	30	86.8	6.89	7.68	5,160
September.....	2,648.9	258	4.7	88.3	7.01	7.82	5,250

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	73	56	*82	52	185	32	346	109	70	11	4.8	14.5
2	59	50	76	49	230	30	342	104	81	10.5	4.8	14
3	53	95	70	46	220	28	275	92	56	10	4.8	12
4	47	79	62	43	215	22	230	80	51	9.6	*4.8	39
5	44	70	56	42	250	40	202	73	48	8.8	4.8	34
6	42	64	54	44	330	46	180	104	44	8.0	4.6	27
7	40	59	54	41	628	61	160	145	38	7.7	4.4	23
8	228	54	47	44	*435	89	135	119	35	*9.6	4.2	19
9	466	50	46	38	465	87	*119	100	35	9.2	3.8	16
10	284	45	82	37	358	75	106	92	29	8.4	4.0	15
11	800	44	282	36	269	62	115	92	26	8.0	4.2	14
12	321	42	505	33	218	59	125	107	24	7.4	4.4	12.5
13	131	41	263	33	205	58	131	175	24	7.4	4.2	12.5
14	79	40	251	32	438	65	172	147	28	7.1	4.0	11.5
15	60	40	556	32	505	*220	185	121	29	7.1	4.4	11
16	52	40	375	43	306	180	160	139	33	6.8	4.6	10.5
17	48	40	222	30	210	145	137	212	24	6.8	4.4	9.6
18	43	173	158	28	149	137	188	260	22	6.5	4.0	9.2
19	44	267	120	27	121	149	260	254	22	6.2	3.8	9.6
20	68	350	95	28	96	188	410	435	24	6.2	3.6	9.2
21	*84	520	80	26	89	210	322	342	19	5.9	10	8.0
22	490	*687	75	25	72	205	239	263	16	5.3	14.5	7.7
23	363	860	70	28	64	185	198	172	15.5	5.3	54	17
24	230	440	140	44	56	165	172	155	17	5.3	67	15
25	174	306	111	61	51	160	170	*143	15.5	5.3	56	14
26	139	236	92	135	47	155	155	137	14.5	5.0	49	11
27	117	185	80	135	40	155	143	131	13	4.8	36	9.2
28	98	149	73	264	38	190	141	113	12.5	4.6	27	8.8
29	78	121	65	532	34	460	129	100	11.5	4.6	*22	8.4
30	66	98	59	350	---	475	117	92	11.5	4.8	17.5	7.7
31	62	---	*55	230	---	390	---	85	---	4.8	16	---
Total	4,883	5,299	4,356	2,586	6,324	4,533	5,764	4,691	865.0	218.0	455.6	423.9
Mean	158	177	141	83.4	218	146	192	151	28.8	7.03	14.7	14.1
Cfs	12.5	14.0	11.2	6.62	17.3	11.6	15.2	12.0	2.29	0.558	1.17	1.12
In.	14.41	15.64	12.98	7.63	18.67	13.38	17.01	13.85	2.55	0.64	1.34	1.25
Ac-ft	9,690	10,510	8,640	5,130	12,540	8,990	11,430	9,300	1,720	432	904	841

Calendar year 1959: Max 860 Min 3.6 Mean 110 Cfs 8.73 In. 119.23 Ac-ft 80,130  
Water year 1959-60: Max 860 Min 3.6 Mean 110 Cfs 8.73 In. 119.23 Ac-ft 80,130

Peak discharge (base, 700 cfs).--Oct. 8 (12 p.m.) 785 cfs (3.89 ft); Oct. 11 (6 a.m.) 1,060 cfs (4.40 ft); Nov. 24 (1 a.m.) 1,280 cfs (5.26 ft); Dec. 15 (2 p.m.) 708 cfs (4.62 ft); Jan. 28 (11:30 p.m.) 724 cfs (4.63 ft); Feb. 6 (11 p.m.) 1,020 cfs (5.00 ft); Feb. 14 (8 p.m.) 700 cfs (4.60 ft).

\* Discharge measurement made on this day.

Note.--Discharge computed from twice-daily staff-gage readings Feb. 8 to Mar. 14, Apr. 15-19, 21-24, 29, May 18-24, 27-31, June 5-20, June 24 to July 7.

## Reservoirs in Lewis River basin, Wash.

2176. **Swift Reservoir.**--Lat 46°03'40", long 122°11'45", in SW $\frac{1}{4}$  sec.28, T.7 N., R.5 E., near left bank in control room of Swift powerhouse on Lewis River, 5 miles east of Cougar. Drainage area, 481 sq mi. Records available, September 1958 to September 1960. Duplex water-stage recorder and long distance indicator in powerhouse. Datum of gage is at mean sea level (levels by Pacific Power & Light Co.). Maximum contents during year, 755,600 acre-ft for many days; maximum elevation, 1,000.05 ft Oct. 15, Apr. 15; minimum contents, 533,400 acre-ft Jan. 28 (elevation, 946.62 ft). Maximum contents during period 1958-60, 755,600 acre-ft for many days in each year; maximum elevation, that of Oct. 15, 1959, Apr. 15, 1960; minimum contents since reservoir was first filled, that of Jan. 28, 1960.

Reservoir is formed by rock- and earth-fill dam completed in December 1958; storage began Sept. 29, 1958. Usable capacity, 447,000 acre-ft between elevations 878 (lower limit for economic operation) and 1,000 ft (maximum operating limit). Dead storage, 308,580 acre-ft. Records given herein represent total contents. Water used for power. Records of stage and data from which capacity table was computed furnished by Pacific Power & Light Co.

2185. **Yale Reservoir.**--Lat 45°57'50", long 122°20'00", in NE $\frac{1}{4}$  sec.32, T.6 N., R.4 E., at left end of Yale Dam on Lewis River just upstream from intake, 500 ft upstream from powerhouse, 1 mile upstream from Canyon Creek, and 3 miles southeast of Yale. Drainage area, 596 sq mi. Records available, August 1952 to September 1960. Water-stage recorder and long distance indicator in powerhouse. Datum of gage is at mean sea level (levels by Pacific Power & Light Co.). Prior to Feb. 1, 1954, indicating gage at same site and datum. Maximum contents during year, 402,200 acre-ft Oct. 15 (elevation, 490.07 ft); minimum contents, 340,100 acre-ft Jan. 4 (elevation, 472.76 ft). Maximum contents during period 1952-60, 402,200 acre-ft Jan. 17-19, Apr. 6, Oct. 15, 1959; maximum elevation, 490.12 ft Jan. 18, 1959; minimum contents observed since reservoir was first filled, 227,600 acre-ft Feb. 22, 1957 (elevation, 435.65 ft).

Reservoir is formed by rock-fill dam; storage began July 31, 1952. Usable capacity, 189,530 acre-ft between elevations 430 (lower limit for economic operation) and 490 ft (top of spillway gates). Dead storage, 212,250 acre-ft. Records given herewith represent total contents. Water used by Pacific Power & Light Co. for power development. Records of stage and data from which capacity table was computed furnished by Pacific Power & Light Co.

2200. **Lake Merwin.**--Lat 45°57'25", long 122°33'15", in SW $\frac{1}{4}$  sec.34, T.6 N., R.2 E., on dam on Lewis River at Ariel. Drainage area, 730 sq mi. Records available, March 1931 to September 1960. Water-stage recorder and long distance indicator in powerhouse. Datum of gage is at mean sea level (levels by Pacific Power & Light Co.). Maximum contents during year, 423,200 acre-ft Oct. 13 (elevation, 239.70 ft); minimum, 287,300 acre-ft Sept. 27 (elevation, 203.46 ft). Maximum contents during period 1931-60 not determined; minimum observed since reservoir was first filled, 164,200 acre-ft Dec. 5, 1936 (elevation, 166.7 ft).

Reservoir is formed by concrete-arch dam completed in 1931. Usable capacity, 246,000 acre-ft between elevations 165 (lower limit of regulation set by Federal Power Commission) and 235 ft (top of spillway gates) above mean sea level. Dead storage, 159,000 acre-ft. Records given herein represent total contents. Water used for power.

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)
Swift Reservoir			Yale Reservoir			
Sept. 30.....	999.2	751,900	-	489.5	399,900	-
Oct. 31.....	994.1	728,900	-23,000	487.7	393,100	-6,800
Nov. 30.....	998.1	746,900	+18,000	485.9	386,400	-6,700
Dec. 31.....	994.3	728,800	-17,100	476.8	353,800	-32,600
Calendar year 1959.....	-	-	+33,900	-	-	+18,700
Jan. 31.....	956.5	571,200	-158,600	479.2	362,200	+8,400
Feb. 29.....	987.8	700,800	+129,600	480.4	366,500	+4,300
Mar. 31.....	987.7	697,100	-3,700	485.0	383,100	+16,600
Apr. 30.....	998.9	750,500	+53,400	488.1	394,600	+11,500
May 31.....	999.7	754,200	+3,700	489.9	401,400	+6,800
June 30.....	996.3	738,800	-15,400	489.4	399,500	-1,900
July 31.....	999.1	751,400	+12,600	487.6	392,800	-6,700
Aug. 31.....	999.9	755,100	+3,700	489.8	401,000	+8,200
Sept. 30.....	995.0	732,900	-22,200	488.0	394,300	-6,700
Water year 1959-60.....	-	-	-19,000	-	-	-5,600
Lake Merwin						
Sept. 30.....	234.6	403,000	-			
Oct. 31.....	236.8	411,700	+8,700			
Nov. 30.....	238.4	418,000	+6,300			
Dec. 31.....	231.7	391,800	-26,200			
Calendar year 1959.....	-	-	-16,700			
Jan. 31.....	236.8	411,700	+19,900			
Feb. 29.....	231.2	389,800	-21,900			
Mar. 31.....	235.2	405,400	+15,600			
Apr. 30.....	238.8	419,600	+14,200			
May 31.....	239.3	421,600	+2,000			
June 30.....	239.4	422,000	+400			
July 31.....	235.7	407,300	-14,700			
Aug. 31.....	239.5	422,400	+15,100			
Sept. 30.....	204.1	289,500	-132,900			
Water year 1959-60.....	-	-	-113,500			

† Elevation at 12 p.m.

## 2205. Lewis River at Ariel, Wash.

Location.--Lat 45°57'10", long 122°33'45", in NW¼NE¼ sec.4, T.5 N., R.2 E., on right bank at Ariel, half a mile downstream from Ariel Dam and powerplant and 3 miles upstream from Cedar Creek.

Drainage area.--731 sq mi.

Records available.--July to October 1909, November 1909 (gage heights only), July to October 1922, July 1923 to September 1960. Published as "near Ariel" 1922-29. Prior to October 1952, discharge measurements made at site half a mile downstream; low discharges not equivalent due to local inflow.

Gage.--Water-stage recorder. Datum of gage is 44.0 ft above mean sea level, unadjusted (levels by Pacific Power & Light Co.). July to November 1909 staff gage at site 4 miles upstream at different datum. July 27 to Oct. 28, 1922, and July 31, 1923, to Apr. 20, 1930, staff gages at site half a mile downstream at datums 3.90 and 0.90 ft higher, respectively, than present datum.

Average discharge.--37 years (1923-60), 4,747 cfs (3,437,000 acre-ft per year), adjusted for storage in Lake Merwin Reservoir since March 1931, Yale Reservoir since August 1952, and Swift Reservoir since October 1958.

Extremes.--Maximum discharge during year, 21,400 cfs Oct. 12 (gage height, 11.33 ft); minimum, 472 cfs July 25 (gage height, 0.07 ft); minimum daily, 638 cfs Aug. 21, 1909, 1922-60: Maximum discharge, 129,000 cfs Dec. 22, 1933 (gage height, 35.0 ft, from floodmarks), from rating curve extended above 56,000 cfs on basis of computation of peak flow over dam; no flow at times June 30, July 1-3, 6-9, 1931 (caused by regulation during construction of Ariel Dam); minimum daily, 1 cfs July 6, 1931.

Remarks.--Records excellent. No diversion. Flow regulated by Lake Merwin and Yale and Swift Reservoirs (see preceding page). 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 Pacific Power & Light Co. Revisions (water years).--WSP 884: 1938. WSP 984: 1936-37, 1940-42. WSP 1318: 1924-30(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	7,030	6,780	7,430	6,440	6,580	7,740	7,720	5,540	6,970	1,850	692	4,330
2	5,730	6,400	7,450	6,240	7,360	7,130	6,770	7,410	8,130	2,670	692	4,670
3	1,280	5,180	6,900	6,520	7,740	7,020	3,630	6,460	8,400	720	692	3,830
4	1,270	7,720	7,850	8,910	7,970	8,240	7,300	5,510	7,680	712	692	2,690
5	5,360	8,970	8,080	7,110	6,140	7,500	6,030	6,200	7,100	2,980	692	1,370
6	6,030	8,460	7,700	*6,260	5,870	1,130	3,420	7,930	7,250	3,000	686	5,680
7	5,630	7,100	7,960	6,730	1,130	5,660	4,220	5,660	7,030	3,100	680	6,070
8	7,580	6,510	7,100	6,770	6,730	6,700	3,460	4,880	7,930	*3,740	686	5,930
9	7,700	5,740	7,400	6,100	7,310	7,250	3,130	6,980	8,300	4,320	680	7,630
10	3,750	4,740	6,330	5,790	*8,280	8,250	3,190	5,840	9,020	2,260	680	7,040
11	1,650	6,090	6,200	7,670	7,870	7,490	6,570	6,450	3,630	4,280	*680	2,450
12	9,820	7,040	6,520	5,280	7,860	6,410	7,690	6,260	795	2,780	704	7,010
13	9,580	8,070	5,830	6,040	6,850	3,410	7,410	6,600	6,910	3,460	668	7,250
14	8,100	6,990	6,760	5,910	5,650	7,810	*7,590	8,350	7,300	4,240	662	7,160
15	6,790	5,570	8,370	6,090	7,720	7,180	7,630	6,870	5,730	2,250	662	7,210
16	6,680	7,300	8,790	6,020	7,600	7,280	8,030	7,340	3,920	2,830	662	6,820
17	5,830	6,840	9,580	4,020	8,270	*6,160	7,180	9,200	1,720	816	668	4,800
18	5,510	6,420	6,770	7,860	7,960	5,930	8,850	7,760	960	2,370	668	1,620
19	5,790	6,400	6,480	7,960	7,030	2,480	7,770	7,740	3,170	1,150	656	6,520
20	5,750	5,710	5,720	6,120	6,940	1,060	9,470	12,300	5,510	984	650	5,840
21	5,720	3,900	8,310	6,120	6,240	5,260	11,300	12,400	3,790	762	638	6,280
22	7,170	4,300	8,770	5,830	6,140	6,010	9,250	12,200	3,800	710	674	2,260
23	7,150	8,210	8,310	4,940	6,020	2,990	8,580	10,300	3,740	686	1,410	2,160
24	6,520	*8,080	7,990	1,370	6,720	866	7,350	6,420	3,890	698	2,420	1,280
25	7,780	8,430	5,720	5,040	7,700	1,490	8,510	7,130	2,340	698	2,370	746
26	6,970	4,950	6,180	6,800	8,770	5,870	7,820	6,830	734	890	2,430	1,270
27	9,990	5,050	8,600	6,520	7,830	5,290	7,580	9,310	3,180	710	808	990
28	9,240	7,130	9,540	5,840	3,370	6,830	6,920	6,630	2,230	698	692	928
29	10,100	6,200	8,750	6,220	8,070	6,860	7,280	7,470	1,810	686	692	752
30	8,710	8,930	9,120	4,270	-----	7,670	7,070	5,940	1,400	692	1,140	782
31	9,010	-----	9,210	2,720	-----	8,020	-----	*6,040	-----	692	*848	-----
Total	203,200	199,230	233,820	185,510	199,720	178,986	208,320	233,950	144,369	58,414	27,674	123,168
Mean	6,555	6,641	7,543	5,984	6,887	5,774	6,944	7,547	4,812	1,884	893	4,106
Ac-ft	403,000	395,200	463,900	368,000	396,100	355,000	413,200	464,000	266,400	115,800	54,890	244,300
(t)	-21,100	+17,600	-75,900	-130,300	+112,000	+18,500	+89,100	+12,500	-16,900	-8,800	+27,000	-161,800

## Adjusted for change in contents in Lake Merwin and Swift and Yale Reservoirs

Mean Cfs	6,211	6,937	6,309	3,866	8,833	6,074	8,441	7,750	4,529	1,742	1,332	1,386
In.												
Ac-ft	381,900	412,800	387,900	237,700	508,100	373,500	502,300	476,500	269,500	107,100	81,890	82,500

## observed

Calendar year 1959: Max	25,600	Min	701	Mean	5,324	Ac-ft	3,854,000
Water year 1959-60: Max	12,400	Min	638	Mean	5,455	Ac-ft	3,960,000

## Adjusted

Calendar year 1959: Mean	5,373	Cfs	In.	Ac-ft	3,890,000
Water year 1959-60: Mean	5,265	Cfs	In.	Ac-ft	3,822,000

\* Discharge measurement made on this day.

† Change in contents, in acre-feet.

## 2225. East Fork Lewis River near Heisson, Wash.

Location.--Lat 45°50'10", long 122°27'50", in N½ sec.17, T.4 N., R.3 E., on right bank 60 ft downstream from Basket Creek, 1½ miles northeast of Heisson, and 20 miles upstream from mouth.

Drainage area.--125 sq mi.

Records available.--September 1929 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 366.8 ft above mean sea level (river-profile survey).

Average discharge.--31 years, 748 cfs (541,500 acre-ft per year).

Extremes.--Maximum discharge during year, 5,540 cfs Oct. 11 (gage height, 7.76 ft); minimum, 55 cfs Aug. 10 (gage height, 0.39 ft).  
1929-60: Maximum discharge, 15,600 cfs Dec. 22, 1933 (gage height, 12.3 ft), from rating curve extended above 12,000 cfs; minimum, 29 cfs Nov. 3, 1935 (gage height, 0.04 ft).

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

0.4	56	3.0	745
.6	75	4.0	1,310
1.0	124	5.0	2,080
1.5	220	7.0	4,370
2.0	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	405	466	646	414	1,320	393	1,940	865	619	189	79	93
2	351	452	619	390	1,530	369	2,130	815	570	160	82	88
3	300	755	602	360	1,440	351	1,810	718	522	172	78	81
4	269	664	534	342	1,310	375	1,460	646	476	165	*77	226
5	245	582	490	330	1,440	444	1,250	574	430	155	75	206
6	242	530	472	399	1,860	466	1,080	673	402	*143	73	155
7	309	480	510	354	3,400	570	994	1,070	369	135	66	126
8	671	444	452	387	*2,490	972	915	920	345	135	64	104
9	1,560	411	438	342	2,650	885	*810	800	321	134	59	89
10	1,190	384	510	330	2,240	750	688	736	306	134	60	85
11	4,230	366	1,080	345	1,700	660	722	682	292	126	63	80
12	2,360	354	3,270	324	1,520	610	750	704	275	120	66	77
13	1,540	318	1,930	306	1,440	655	745	760	256	116	65	83
14	1,100	306	1,540	300	2,520	696	1,040	727	344	118	62	82
15	880	312	1,930	306	3,100	*1,990	1,420	646	430	109	82	77
16	696	275	1,940	360	2,170	1,580	1,220	850	532	104	75	75
17	582	294	1,450	357	1,650	1,210	1,210	1,290	455	100	72	74
18	510	907	1,460	321	1,310	1,110	1,230	1,580	381	97	64	72
19	455	1,370	940	303	1,060	1,080	1,400	1,440	366	96	62	77
20	510	1,320	805	300	890	1,260	2,360	3,140	417	95	61	87
21	*458	2,470	700	283	855	1,370	2,090	2,580	378	94	67	74
22	2,980	*3,360	614	278	718	1,260	1,610	1,920	345	92	88	69
23	2,680	4,020	574	309	642	1,120	1,460	1,530	318	92	161	83
24	1,750	2,480	718	424	602	1,010	1,350	1,310	292	89	218	100
25	1,440	1,960	745	566	586	950	1,330	*1,170	272	86	176	116
26	1,130	1,470	650	978	518	945	1,200	1,310	253	85	161	86
27	930	1,150	590	950	476	994	1,170	1,190	238	83	150	75
28	810	984	542	1,220	441	1,120	1,200	1,020	220	80	110	72
29	682	855	494	2,790	414	2,350	1,040	890	206	78	*99	71
30	590	732	483	2,170	-----	2,780	925	785	197	79	94	66
31	534	-----	*452	1,580	-----	2,140	-----	704	-----	61	90	-----
Total	32,389	30,491	27,880	18,418	42,292	32,485	38,529	34,045	10,827	3,562	2,799	2,849
Mean	1,045	1,016	899	594	1,458	1,048	1,284	1,098	361	115	90.3	95.0
Cfs/m	8.36	8.13	7.19	4.75	11.7	8.38	10.3	8.78	2.89	0.919	0.722	0.760
In.	8.64	9.07	8.29	5.48	12.58	8.65	11.46	10.13	3.22	1.06	0.85	0.85
Ac-ft	64,240	60,480	55,300	36,530	83,880	64,430	76,420	67,530	21,480	7,070	5,550	5,650
Calendar year 1959: Max	4,360	Min	60	Mean	816	Cfs/m	6.53	In.	88.59	Ac-ft	590,600	
Water year 1959-60: Max	4,230	Min	59	Mean	756	Cfs/m	6.05	In.	82.27	Ac-ft	548,600	

Peak discharge (base, 6,100 cfs).--No peak above base.

\* Discharge measurement made on this day.

2235. Kalama River below Italian Creek, near Kalama, Wash.

Location.--Lat 46°02'40", long 122°48'50", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.33, T.7 N., R.1 W., on right bank  $2\frac{1}{2}$  miles northeast of Kalama, 3 miles upstream from mouth, and 5 miles downstream from Italian Creek.

Drainage area.--201 sq mi.

Records available.--September 1946 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map). Prior to Oct. 7, 1952, staff gage and crest-stage indicator at site about 70 ft downstream at same datum.

Average discharge.--14 years, 1,259 cfs (911,500 acre-ft per year).

Extremes.--Maximum discharge during year, 6,990 cfs Nov. 23 (gage height, 8.99 ft); minimum, 245 cfs Sept. 22, 30 (gage height, 2.39 ft).  
1946-60: Maximum discharge, 16,000 cfs Dec. 9, 1953 (gage height, 14.93 ft); minimum, 155 cfs Oct. 3, 5-7, 1958; minimum gage height observed, 1.76 ft Sept. 13, 1951.

Remarks.--Records excellent. Small diversions for fish hatchery returned to stream above gage. No regulation. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1318: 1948-49(M).

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

2.8	535	2.3	200
4.0	1,460	3.0	660
5.0	2,360	5.0	2,430
7.0	4,540	7.0	4,540
		9.0	7,000

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	775	805	1,160	860	1,960	836	2,890	1,400	*1,040	458	285	318
2	710	768	1,110	820	2,270	812	2,710	1,320	981	444	285	312
3	661	956	1,050	788	2,690	788	2,430	1,230	963	430	285	306
4	626	892	963	756	2,410	780	2,150	1,130	909	430	280	465
5	591	828	909	732	2,550	828	1,940	1,040	868	423	275	444
6	584	790	884	796	2,590	876	1,760	1,130	828	409	275	381
7	612	752	909	*740	4,480	900	1,650	1,650	780	395	265	354
8	790	724	844	740	3,820	1,280	1,500	1,400	748	388	260	330
9	2,260	689	812	700	4,220	1,290	1,390	1,220	724	*381	255	306
10	1,490	668	900	676	3,430	1,200	1,220	1,170	700	381	255	300
11	3,870	654	1,940	684	*2,650	1,110	1,290	1,170	676	374	260	290
12	2,940	647	4,330	652	2,260	1,040	1,250	1,270	660	360	*260	285
13	1,980	605	2,770	636	1,990	1,030	1,300	1,540	644	360	255	280
14	1,510	591	2,260	636	2,730	*990	1,700	1,390	676	360	255	275
15	1,260	591	4,420	628	4,120	1,940	2,160	1,250	692	348	260	265
16	1,080	570	3,910	676	2,990	1,810	*1,960	1,340	700	342	265	260
17	956	612	2,710	684	2,380	1,520	1,810	1,620	644	336	265	255
18	868	1,270	2,160	652	2,010	1,400	1,800	1,870	604	330	260	255
19	805	1,800	1,780	628	1,730	1,370	2,140	1,810	588	324	255	260
20	900	1,920	1,540	596	1,520	1,540	3,270	3,120	620	318	255	260
21	924	4,360	1,370	588	1,420	1,740	3,060	2,780	580	312	275	250
22	2,020	4,490	1,250	564	1,280	1,780	2,240	2,260	564	306	348	250
23	2,430	6,270	1,170	612	1,170	1,660	2,240	1,940	540	300	493	280
24	*1,800	4,050	1,370	804	1,100	1,530	2,190	1,720	524	300	650	300
25	1,600	*3,010	1,400	892	1,070	1,480	1,990	1,540	508	300	516	336
26	1,360	2,330	1,250	1,400	981	1,430	1,800	1,480	500	300	486	275
27	1,200	1,900	1,150	1,350	918	1,380	1,680	1,460	493	295	472	260
28	1,110	1,650	1,060	1,510	892	1,450	1,660	1,350	479	295	409	255
29	988	1,440	999	4,090	860	3,070	1,550	1,260	472	290	367	250
30	908	1,270	972	3,070	-----	3,940	1,450	1,190	465	290	348	245
31	852	-----	909	2,240	-----	3,280	-----	1,130	-----	290	*342	-----
Total	40,460	47,902	50,261	31,200	64,491	46,080	58,340	47,180	20,170	10,869	10,016	8,902
Mean	1,305	1,597	1,621	1,006	2,224	1,486	1,945	1,522	672	351	323	297
Cfs/m	6.49	7.95	8.06	5.00	11.1	7.39	9.68	7.57	3.54	1.75	1.61	1.48
In.	7.49	8.86	9.30	5.77	11.93	8.53	10.79	8.73	3.73	2.01	1.85	1.65
Ac-ft	80,250	95,010	99,690	61,880	127,900	91,400	115,700	93,580	40,010	21,560	19,870	17,660

Peak discharge (base, 6,000 cfs).--Nov. 23 (6:30 a.m.) 6,990 cfs (8.99 ft).

\* Discharge measurement made on this day.

2254. Packwood Lake near Packwood, Wash.

Location.--Lat 46°35'50", long 121°33'40", in SW $\frac{1}{4}$  sec.21, T.13 N., R.10 E. (unsurveyed), on north side of lake, 1,500 ft east of outlet and 5 miles east of Packwood.

Drainage area.--18.8 sq mi.

Records available.--August 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,850.74 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Washington Public Power Supply System from Corps of Engineers bench mark).

Extremes.--1959: Maximum gage height during period August to September, 6.78 ft Sept. 6; minimum, 5.45 ft Aug. 25-26.  
1959-60: Maximum gage height during water year, 8.77 ft Nov. 23; minimum, 5.37 ft Mar. 19-20.

Remarks.--No regulation or diversion above station.

Gage height, in feet, 1959

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	-	5.60	7	-	6.55	13	-	5.73	19	-	5.71	25	5.46	5.75
2	-	5.56	8	-	6.45	14	-	5.67	20	5.50	6.05	26	5.47	6.26
3	-	5.51	9	-	6.20	15	-	5.63	21	5.48	6.06	27	5.73	6.49
4	-	5.67	10	-	5.99	16	-	5.60	22	5.47	6.01	28	5.84	6.36
5	-	6.24	11	-	5.87	17	-	5.57	23	5.47	5.89	29	5.73	6.19
6	-	6.69	12	-	5.79	18	-	5.54	24	5.47	5.79	30	5.62	6.05
												31	5.59	-

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	5.92	5.89	6.02	5.57	5.59	5.42	5.82	5.78	6.76	6.42	5.90	5.66
2	5.83	5.84	5.95	5.55	5.60	5.42	5.82	5.82	6.90	6.32	5.85	5.62
3	5.77	5.94	5.90	5.53	5.59	5.42	5.83	5.85	7.09	6.27	5.81	5.58
4	5.71	5.96	5.86	5.52	5.56	5.43	5.85	5.87	7.17	6.27	5.76	5.66
5	5.66	5.90	5.83	5.51	5.55	5.43	5.89	5.87	7.05	6.31	5.73	5.82
6	5.63	5.92	5.81	5.53	5.60	5.45	5.98	5.91	6.36	6.40	5.70	5.81
7	5.62	5.79	5.80	5.52	5.85	5.45	6.10	6.29	6.83	6.47	5.70	5.73
8	5.70	5.76	5.77	5.52	5.94	5.50	6.27	6.44	6.67	6.47	5.72	5.67
9	6.29	5.72	5.73	5.50	5.96	5.49	6.35	6.37	6.58	6.37	5.73	5.60
10	6.27	5.69	5.73	5.48	5.92	5.47	6.29	6.36	6.59	6.25	5.74	5.57
11	6.89	5.66	5.80	5.48	5.87	5.43	6.22	6.50	6.64	6.17	5.73	5.56
12	7.16	5.64	5.89	5.47	5.82	5.40	6.12	6.87	6.65	6.12	5.69	5.55
13	6.82	5.60	5.87	5.45	5.79	5.39	6.06	6.92	6.65	6.14	5.64	5.55
14	6.52	5.58	5.89	5.44	5.79	5.40	6.06	6.71	6.76	6.16	5.60	5.54
15	6.40	5.61	6.48	5.43	5.81	5.47	6.04	6.51	7.11	6.14	5.60	5.52
16	6.22	5.58	6.93	5.44	5.75	5.43	5.95	6.41	7.39	6.13	5.57	5.51
17	6.05	5.62	6.75	5.42	5.68	5.40	5.88	6.35	7.29	6.16	5.59	5.48
18	5.92	5.74	6.50	5.41	5.63	5.38	5.84	6.26	6.92	6.22	5.61	5.47
19	5.84	5.83	6.29	5.41	5.60	5.37	5.82	6.18	6.65	6.22	5.62	5.46
20	5.90	6.13	6.13	5.41	5.58	5.38	5.85	6.38	6.51	6.17	5.59	5.46
21	5.94	6.92	6.02	5.40	5.60	5.43	5.85	6.48	6.38	6.09	5.57	5.46
22	6.80	7.11	5.92	5.38	5.57	5.52	5.81	6.42	6.30	6.01	5.57	5.45
23	7.54	8.56	5.86	5.39	5.54	5.59	5.80	6.31	6.31	5.93	5.61	5.46
24	7.16	8.42	5.82	5.40	5.52	5.63	5.76	6.22	6.41	5.86	5.74	5.50
25	7.03	7.87	5.79	5.40	5.50	5.67	5.73	6.16	6.46	5.84	5.82	5.59
26	6.67	7.19	5.74	5.42	5.48	5.73	5.73	6.16	6.40	5.89	5.97	5.55
27	6.42	6.74	5.69	5.42	5.46	5.78	5.73	6.23	6.38	5.99	5.95	5.52
28	6.29	6.47	5.66	5.44	5.44	5.82	5.72	6.23	6.38	5.99	5.85	5.49
29	6.14	6.28	5.63	5.58	5.43	5.82	5.75	6.22	6.39	5.95	5.78	5.47
30	6.02	6.13	5.62	5.63	5.63	5.87	5.76	6.33	6.42	5.94	5.73	5.46
31	5.95	-----	5.60	5.61	-----	5.85	-----	6.66	-----	5.93	5.70	-----

2255. Lake Creek near Packwood, Wash.

Location.--Lat 46°35'45", long 121°34'05", in SW 1/4 sec.21, T.13 N., R.10 E. (unsurveyed), on left bank 500 ft downstream from outlet of Packwood Lake and 5 miles east of Packwood.

Drainage area.--18.8 sq mi.

Records available.--September 1911 to September 1924 (published as "at outlet of Packwood Lake, near Lewis"), September 1930 to October 1942, October 1949 to May 1954, August 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,844.62 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Washington Public Power Supply System from Corps of Engineers bench mark). Prior to Aug. 3, 1918, staff gages at several sites at or within 100 ft of present site at various datums. Aug. 3, 1918, to Sept. 30, 1924, water-stage recorder at site 110 ft upstream at different datum.

Average discharge.--30 years, 100 cfs (72,400 acre-ft per year).

Extremes.--1959: Maximum discharge during period August to September, 287 cfs Sept. 6 (gage height, 3.37 ft); minimum, 49 cfs Aug. 25 (gage height, 2.05 ft).

1959-60: Maximum discharge during water year, 1,000 cfs Nov. 23 (gage height, 4.90 ft, from recorded range in stage); minimum, 38 cfs Mar. 18, 19, 20 (gage height, 1.81 ft).

1911-24, 1930-42, 1949-54, 1959-60: Maximum discharge, 1,400 cfs Dec. 22, 1933 (gage height, 5.9 ft); minimum, 18 cfs Nov. 30, Dec. 1, 2, 1952 (gage height, 1.51 ft).

Maximum stage, estimated by observer, 6.0 ft Dec. 18, 1917, datum then in use (discharge not determined).

Remarks.--Records good. Natural regulation in Packwood Lake. No diversion above station.

Revisions (water years).--WSP 394: 1912. WSP 739: 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	-	67	7	-	232	13	-	83	19	60	84	25	50	91
2	-	62	8	-	212	14	-	78	20	57	135	26	51	170
3	-	57	9	-	164	15	-	*71	21	53	135	27	87	214
4	-	78	10	-	125	16	-	68	22	52	128	28	107	189
5	-	187	11	-	105	17	66	64	23	52	112	29	87	158
6	-	267	12	-	92	18	64	62	24	51	98	30	72	135
												31	68	-

Total.....	-	-	-	-	-	-	-	-	-	-	-	-	-	3,723
Mean.....	-	-	-	-	-	-	-	-	-	-	-	-	-	124
Cubic feet per second per square mile.....	-	-	-	-	-	-	-	-	-	-	-	-	-	6.60
Runoff in inches.....	-	-	-	-	-	-	-	-	-	-	-	-	-	7.36
Runoff in acre-feet.....	-	-	-	-	-	-	-	-	-	-	-	-	-	7,580

Peak discharge (base, 240 cfs).--Sept. 6 (4 to 5 p.m.) 287 cfs (3.37 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Sept. 16-30; discharge estimated on basis of recorded range in stage and records for Packwood Lake near Packwood.

Discharge, in cubic 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	112	116	58	57	42	83	75	224	164	89	61
2	104	104	101	56	59	41	82	80	257	150	82	57
3	94	118	91	54	58	42	84	84	298	141	75	53
4	84	121	86	52	54	42	85	*87	324	141	71	61
5	76	113	82	51	54	43	91	85	290	148	67	79
6	73	101	79	54	57	43	*102	89	270	162	65	76
7	96	78	53	85	44	118	143	174	242	174	65	70
8	82	92	74	51	98	*49	141	166	212	174	66	61
9	174	84	70	50	99	49	154	156	194	158	67	55
10	172	80	70	49	98	46	144	154	196	141	67	52
11	312	75	78	49	89	43	133	176	208	128	67	50
12	405	73	88	48	83	41	120	247	208	120	63	50
13	295	68	85	46	79	39	112	254	208	125	58	50
14	219	66	85	44	79	41	110	217	232	126	55	49
15	196	70	178	44	83	48	107	178	304	123	52	48
16	164	66	278	44	74	43	98	162	384	121	50	*46
17	137	70	236	43	67	40	89	150	355	126	53	44
18	116	87	192	42	63	39	84	139	280	135	55	43
19	105	104	152	41	60	38	80	128	205	137	55	43
20	*113	148	130	42	57	39	85	158	178	130	53	43
21	118	327	112	40	60	43	85	174	*156	116	51	42
22	290	391	99	39	57	51	79	162	143	105	50	42
23	546	855	91	33	53	58	78	146	144	96	55	43
24	408	776	87	41	50	63	74	133	162	88	68	47
25	361	582	82	41	50	67	71	125	170	83	76	55
26	257	*371	76	43	48	73	70	125	162	88	96	51
27	201	257	71	43	46	78	67	133	158	102	95	49
28	176	196	67	43	45	85	70	135	156	102	83	46
29	150	160	64	*57	43	84	71	135	160	96	74	45
30	132	135	63	62	---	88	73	152	164	95	70	43
31	121	---	*61	60	---	85	---	208	---	94	65	---

Total	5,868	5,898	3,222	1,479	1,903	1,625	2,840	4,556	6,624	3,889	2,058	1,554
Mean	189	197	104	47.7	65.6	52.4	94.7	147	221	125	66.3	51.8
Cfs/m	10.1	10.5	5.53	2.54	3.49	2.79	5.04	7.82	11.6	6.62	3.53	2.76
In.	11.61	11.67	6.37	2.93	3.76	3.21	5.62	9.01	13.10	7.89	4.07	3.07
Ac-ft	11,640	11,700	6,390	2,950	3,770	3,220	5,630	9,040	13,140	7,710	4,080	3,080

Calendar year 1959: Max - Min - Mean - Cfs/m - In. - Ac-ft -  
 Water year 1959-60: Max 855 Min 38 Mean 113. Cfs/m 6.01 In. 82.11 Ac-ft 82,330

Peak discharge (base, 240 cfs).--Oct. 12 (about 3 a.m.) 447 cfs (3.87 ft); Oct. 23 (about 3 a.m.) about 600 cfs; Nov. 23 (about 3:30 p.m.) 1,000 cfs (4.90 ft); Dec. 16 (9 a.m.) 287 cfs (3.26 ft); May 13 (1 a.m.) 270 cfs (3.20 ft); June 4 (6 a.m.) 333 cfs (3.42 ft); June 16 (5 p.m.) 429 cfs (5.71 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 1 to Nov. 25; discharge estimated on basis of recorded range in stage, 1 discharge measurement, and records for Packwood Lake near Packwood.

## 2265. Cowlitz River at Packwood, Wash.

Location.--Lat 46°36'40", long 121°40'45", in SE $\frac{1}{4}$  sec.16, T.13 N., R.9 E., on right bank 100 ft upstream from Forest Service bridge, half a mile upstream from Skate Creek, and half a mile northwest of Packwood.

Drainage area.--287 sq mi.

Records available.--July 1911 to December 1919, September 1929 to September 1960. Published as "at Lewis" 1911-19.

Gage.--Water-stage recorder. Datum of gage is 1,048.0 ft above mean sea level (Bureau of Public Roads bench mark). July 1, 1911, to Dec. 31, 1919, staff gages at sites about 1 mile upstream at different datums. Sept. 30, 1929, to Jan. 1, 1930, staff gage at present site and datum.

Average discharge.--39 years, 1,639 cfs (1,187,000 acre-ft per year).

Extremes.--Maximum discharge during year, 34,300 cfs Nov. 23 (gage height, 13.54 ft); minimum, 402 cfs Sept. 22 (gage height, 2.64 ft).  
1911-19, 1929-60: Maximum discharge, 36,600 cfs Dec. 21, 1933 (gage height, 13.0 ft), from rating curve extended above 12,600 cfs; maximum gage height, that of Nov. 23, 1959; minimum discharge, 130 cfs Nov. 29, 1952; minimum gage height, 2.47 ft Sept. 26, 1955.

Remarks.--Records excellent except those prior to Nov. 21 and those for periods of no gage-height record, which are good. Small diversions for domestic use. No regulation.

Revisions (water years).--WSP 884: 1938. WSP 1348: 1916-18(M), 1934. WSP 1638: 1947(P).

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. 19)

Oct. 1-22				Oct. 22 to May 12				May 13 to Sept. 30			
3.6	715	7.0	4,550	3.2	490	7.0	5,110	2.6	390	5.0	2,210
4.0	960	8.0	6,950	4.0	980	9.0	10,700	3.0	525	6.0	3,600
5.0	1,750	9.0	9,850	5.0	1,900	12.0	24,500	4.0	1,140	8.0	7,750
6.0	2,800			6.0	3,250						

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	1,360	1,070	1,500	798	1,750	570	1,620	1,500	4,650	2,430	930	521
2	1,180	1,000	1,410	752	1,560	555	1,700	1,600	5,470	1,960	900	482
3	1,040	1,620	1,330	722	1,360	545	1,900	1,600	5,970	2,100	850	482
4	932	1,470	1,180	*674	1,200	555	2,130	1,500	5,450	2,280	800	625
5	860	1,250	1,090	650	1,190	555	2,570	1,400	4,850	2,510	760	738
6	782	1,140	1,040	656	1,730	575	2,970	1,500	4,810	2,780	730	625
7	737	1,020	1,000	614	5,990	575	*3,630	2,200	3,840	2,810	700	542
8	1,610	1,000	938	585	5,610	596	3,980	2,800	3,400	2,460	700	501
9	3,180	988	917	580	2,610	*570	3,720	2,500	3,460	2,030	700	493
10	2,510	988	959	565	2,020	545	2,650	2,150	3,760	1,820	700	501
11	8,550	973	1,290	580	1,630	535	2,120	3,800	3,980	1,620	700	497
12	5,050	938	1,480	545	1,410	520	1,730	5,000	3,810	1,560	680	534
13	3,070	798	1,390	540	1,260	515	1,550	4,200	3,800	1,710	660	551
14	2,300	722	2,270	535	1,220	510	1,510	3,500	4,190	1,670	640	564
15	1,950	716	*11,100	530	1,380	585	1,370	3,000	4,850	1,550	620	529
16	1,600	580	*7,370	530	1,200	565	1,200	*2,740	6,520	1,510	610	497
17	1,350	709	4,090	525	1,050	565	1,140	2,330	4,390	1,620	*610	478
18	1,150	1,430	2,940	495	959	590	1,080	2,030	3,140	1,710	670	460
19	1,000	1,750	2,370	505	910	656	1,080	2,020	2,740	1,670	692	497
20	1,380	5,390	1,990	500	896	889	1,500	3,920	2,400	1,430	615	471
21	*1,620	8,210	1,670	454	889	1,400	1,510	3,530	2,140	1,260	573	*438
22	11,100	10,200	1,460	450	861	1,940	1,170	2,820	2,160	1,110	529	417
23	6,050	*20,500	1,330	462	812	2,150	1,120	2,340	2,710	1,060	564	455
24	*3,970	9,620	1,260	608	770	2,130	1,050	2,080	3,340	1,020	670	555
25	3,390	6,780	1,160	674	746	2,500	1,020	1,950	2,990	1,000	630	625
26	2,430	*4,110	1,040	784	686	2,860	1,040	2,340	2,580	1,100	786	555
27	1,940	3,020	966	777	638	2,680	1,080	2,750	2,690	1,260	732	509
28	1,820	2,430	917	861	620	2,320	1,150	2,620	2,760	1,120	601	513
29	1,510	2,010	882	3,600	585	2,200	1,200	2,860	2,800	1,050	559	482
30	1,310	1,720	854	*3,050	-----	2,260	1,250	4,290	2,760	1,000	529	474
31	1,170	-----	819	2,180	-----	1,900	-----	5,550	-----	1,000	529	-----
Total	77,901	94,152	60,012	25,761	41,542	35,911	52,340	84,320	112,410	51,210	20,969	15,641
Mean	2,513	3,138	1,936	831	1,432	1,158	1,745	2,722	3,747	1,652	676	521
Cfs/m	8.75	10.9	6.75	2.90	4.99	4.03	6.08	9.48	13.1	5.76	2.36	1.82
In.	10.09	12.20	7.78	3.34	5.58	4.65	6.78	10.93	14.57	6.84	2.72	2.03
Ac-ft	154,500	186,700	119,000	51,100	82,400	71,230	103,800	167,200	223,000	101,600	41,590	31,020

Calendar year 1959: Max 20,500 Min 511 Mean 2,024 Cfs/m 7.05 In. 95.75 Ac-ft 1,466,000  
Water year 1959-60: Max 20,500 Min 417 Mean 1,837 Cfs/m 6.40 In. 87.11 Ac-ft 1,333,000

Peak discharge (base, 8,000 cfs).--Oct. 11 (7 a.m.) 12,900 cfs (9.87 ft); Oct. 22 (11:30 a.m.) 18,800 cfs (10.92 ft); Nov. 21 (2 a.m.) 11,400 cfs (9.19 ft); Nov. 23 (2 a.m.) 34,300 cfs (13.54 ft); Dec. 15 (5:30 p.m.) 14,600 cfs (9.99 ft).

\* Discharge measurement made on this day.  
Note.--No gage-height record Apr. 28 to May 15, July 23-26, July 29 to Aug. 16; discharge estimated on basis of recorded range in stage and records for nearby stations.

2325. Cispus River near Randle, Wash.

Location.--Lat 46°26'50", long 121°51'35", in NW¼ sec.18, T.11 N., R.8 E. (unsurveyed), on left bank 60 ft upstream from bridge to Tower Rock ranger station, 4 miles downstream from North Fork, and 8 miles southeast of Randle.

Drainage area.--321 sq mi.

Records available.--October 1910 to February 1912, September 1929 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,221.60 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 1, 1912, staff gage at site 1 mile upstream at different datum. Sept. 28 to Oct. 31, 1929, staff gage and Nov. 1, 1929, to Nov. 26, 1949, Oct. 1-24, 1950, water-stage recorder, at site 450 ft upstream at datum 0.26 ft higher.

Average discharge.--32 years (1910-11, 1929-60), 1,319 cfs (954,900 acre-ft per year).

Extremes.--Maximum discharge during year, 7,810 cfs Nov. 23 (gage height, 8.32 ft); minimum, 356 cfs Sept. 30 (gage height, 3.24 ft).  
1910-12, 1929-60: Maximum discharge, 20,000 cfs Dec. 22, 1933 (gage height, 12.7 ft, site and datum then in use), from rating curve extended above 8,000 cfs; minimum, 183 cfs Dec. 30, 1936; minimum gage height, 2.55 ft Oct. 25, 1942, site and datum then in use.

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 794: 1934. WSP 1288: Drainage area.

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

3.2	350	5.0	1,850
3.5	525	6.0	3,180
4.0	850	8.0	7,090

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	754	1,140	1,500	767	1,730	682	2,080	1,730	2,680	1,250	630	465
2	702	1,060	1,390	748	1,660	676	1,970	1,850	2,910	1,140	585	441
3	663	1,220	1,290	728	1,500	656	1,950	1,810	3,100	1,110	598	447
4	618	1,170	1,170	702	1,380	656	2,020	1,720	3,090	1,110	579	531
5	585	1,070	1,100	*702	1,370	663	2,250	1,610	2,810	1,090	579	531
6	567	1,030	1,040	708	1,500	670	*2,400	1,840	2,740	1,090	567	483
7	567	970	994	682	3,520	*682	2,640	2,700	2,430	1,080	573	453
8	638	930	938	682	2,960	722	2,900	2,600	2,200	1,040	579	435
9	1,590	890	906	644	2,520	670	2,850	2,350	2,100	962	579	423
10	1,220	850	906	611	2,200	644	2,480	2,470	2,110	922	573	429
11	2,460	815	1,300	630	1,910	624	2,220	2,880	2,110	882	567	429
12	2,480	787	1,480	611	1,730	611	1,960	3,500	2,080	843	543	429
13	1,950	741	1,310	585	1,570	618	1,800	3,100	2,020	874	519	435
14	1,580	728	1,290	579	1,510	611	1,840	2,660	2,130	858	507	423
15	1,380	734	2,130	579	1,570	670	1,710	2,400	2,290	815	507	411
16	1,190	670	2,590	567	1,410	644	1,570	*2,290	2,520	794	*463	400
17	1,060	696	2,200	555	1,310	656	1,490	2,100	2,260	794	525	394
18	970	822	1,920	513	1,210	676	1,410	1,930	1,850	808	531	388
19	890	954	1,680	525	1,130	748	1,380	1,850	1,710	794	519	400
20	986	1,220	1,620	519	1,060	994	1,460	2,550	1,680	760	495	394
21	1,050	3,030	1,380	519	1,040	1,390	1,480	2,560	1,570	734	463	*388
22	*1,940	3,160	1,270	507	962	1,720	1,350	2,510	*1,490	715	477	378
23	2,840	7,090	1,200	519	898	1,820	1,320	2,130	1,480	682	495	394
24	2,300	5,480	1,180	579	882	1,870	1,260	2,030	1,580	650	543	429
25	2,290	*4,300	1,120	598	850	2,020	1,210	1,950	1,530	644	501	459
26	1,910	3,160	1,010	663	774	2,260	1,210	2,200	1,410	656	525	405
27	1,660	2,550	970	644	734	2,500	1,260	2,340	1,370	689	548	394
28	1,580	2,180	922	768	728	2,440	1,350	2,300	1,350	670	489	388
29	1,440	1,900	882	2,670	702	2,590	1,430	2,510	1,330	644	471	378
30	1,300	1,670	865	*2,510	---	2,840	1,600	2,510	1,320	644	471	366
31	1,210	---	822	2,020	---	2,400	---	2,750	---	644	463	---
Total	42,370	53,027	40,276	24,634	42,320	37,463	53,830	71,330	61,250	26,388	16,538	12,720
Mean	1,367	1,768	1,299	795	1,459	1,208	1,794	2,301	2,042	851	533	424
Cfsm	4.26	5.51	4.05	2.48	4.55	3.76	5.59	7.17	6.36	2.65	1.66	1.32
In.	4.91	6.14	4.67	2.85	4.90	4.34	6.24	8.26	7.10	3.06	1.92	1.47
Ac-ft	84,040	105,200	79,890	46,860	83,940	74,310	106,800	141,500	121,500	52,340	32,800	25,230
Calendar year 1959: Max	7,090	Min	394	Mean	1,338	Cfsm	4.17	In.	56.56	Ac-ft	968,700	
Water year 1959-60: Max	7,090	Min	366	Mean	1,317	Cfsm	4.10	In.	55.86	Ac-ft	956,400	

Peak discharge (base, 4,000 cfs).--Nov. 23 (2 p.m.) 7,810 cfs (8.32 ft).

\* Discharge measurement made on this day.

2335. Cowlitz River near Kosmos, Wash.

Location--Lat 46°28'00", long 122°07'20", in SE  $\frac{1}{4}$  sec. 1, T.11 N., R.5 E., on right bank half a mile downstream from Tumwater Creek,  $\frac{1}{2}$  miles downstream from Cispus River, and 4 miles southeast of Kosmos.

Drainage area--1,042 sq mi.

Records available--October 1947 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage--Water-stage recorder. Datum of gage is 759.29 ft above mean sea level (levels by City of Tacoma). Prior to Dec. 3, 1948, staff gage at site half a mile upstream at different datum.

Average discharge--13 years, 5,205 cfs (3,768,000 acre-ft per year).

Extremes--Maximum discharge during year, 47,500 cfs Nov. 24 (gage height, 19.50 ft); minimum, 1,150 cfs Sept. 22 (gage height, 3.51 ft).

1947-60: Maximum discharge, that of Nov. 24, 1959; minimum, 518 cfs Nov. 29, 1952 (gage height, 2.34 ft).

Remarks--Records excellent. No regulation. Small diversion for domestic use and irrigation above station. Records of chemical analyses and water temperatures for the water year 1960 are given in WSP 1744.

Revisions--WSP 1218: Drainage area.

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

				3.5	1,130		9.0	8,400				
				5.0	2,280		13.0	20,500				
				7.0	4,700		19.0	45,000				
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	3,480	4,390	5,940	2,870	6,210	2,450	7,060	5,810	10,800	4,890	2,110	1,510
2	3,060	4,060	5,390	2,740	5,860	2,380	6,530	6,200	11,100	4,370	2,010	1,460
3	2,790	4,340	5,040	2,640	5,440	2,290	6,690	6,260	12,300	4,110	1,910	1,400
4	2,570	5,040	4,550	2,530	4,990	2,260	6,900	5,980	12,300	4,180	1,830	1,550
5	2,380	4,420	4,160	*2,480	4,810	2,280	*7,680	5,520	10,800	4,190	1,790	1,790
6	2,230	4,120	3,940	2,520	4,940	2,340	8,470	5,700	10,400	4,370	1,760	1,780
7	2,150	3,840	3,800	2,450	13,000	*2,320	9,500	8,780	9,320	4,490	1,750	1,600
8	2,140	3,600	3,550	2,370	13,000	2,510	10,700	9,740	7,960	4,340	1,770	1,500
9	5,000	3,420	3,350	2,280	10,400	2,470	10,800	8,280	7,360	3,950	1,790	1,430
10	5,500	3,250	3,300	2,170	8,620	2,350	9,170	8,120	7,400	3,620	1,770	1,400
11	10,800	3,060	3,950	2,170	7,240	2,270	7,680	9,570	7,680	3,390	1,790	1,390
12	13,800	2,900	5,210	2,110	6,370	2,220	6,640	12,500	7,620	3,170	1,750	1,390
13	9,900	2,720	5,000	2,030	5,920	2,200	6,010	12,000	7,360	3,190	1,660	1,410
14	7,340	2,580	4,940	1,990	5,700	2,200	6,030	9,620	7,450	3,210	1,590	1,410
15	6,040	2,580	13,800	1,960	6,300	2,580	5,840	8,170	8,740	3,100	1,550	1,380
16	5,120	2,450	21,200	1,950	5,940	2,660	5,370	7,550	9,670	3,000	*1,490	1,330
17	4,420	2,410	15,100	1,900	5,420	2,640	5,070	*7,140	10,100	2,940	1,510	1,300
18	3,920	3,480	10,700	1,790	4,970	2,650	4,830	6,710	7,320	3,000	1,580	1,250
19	3,570	4,780	8,400	1,750	4,520	2,770	4,680	6,330	6,300	3,050	1,630	1,250
20	3,640	7,010	7,020	1,750	4,150	3,410	4,910	8,780	6,040	2,920	1,530	1,290
21	4,520	19,300	6,110	1,710	4,010	4,840	5,420	10,900	5,600	2,710	1,500	*1,200
22	*9,160	18,600	5,400	1,680	3,720	6,350	5,120	9,520	*5,280	2,550	1,500	1,160
23	18,800	35,800	4,940	1,890	3,460	7,180	4,840	8,240	5,280	2,100	1,480	1,180
24	12,800	*40,700	4,670	1,900	3,310	7,280	4,660	7,430	5,910	2,250	1,740	1,270
25	11,200	*26,700	4,430	2,080	3,160	7,660	4,460	6,940	5,990	2,160	1,760	1,480
26	8,830	17,700	4,060	2,320	2,940	8,590	4,390	7,140	5,390	2,140	1,870	1,400
27	7,200	12,400	3,770	2,430	2,740	9,050	4,420	7,960	5,160	2,320	2,070	1,300
28	6,550	9,900	3,570	*2,450	2,640	8,620	4,640	8,030	5,130	2,380	1,850	1,270
29	5,890	8,010	3,370	7,600	2,530	8,190	4,910	7,920	5,100	2,240	1,670	1,230
30	5,240	6,770	3,220	9,120	-----	9,340	5,310	8,710	5,050	2,140	1,590	1,190
31	4,730	-----	3,070	7,340	-----	8,150	-----	11,400	-----	2,140	1,550	-----
Total	195,370	270,210	184,950	83,770	162,310	134,500	188,730	252,950	231,870	98,910	53,210	41,500
Mean	6,302	9,007	5,966	2,702	5,597	4,339	6,291	8,160	7,729	3,191	1,716	1,383
Cfs/m	6.05	8.64	5.72	2.59	5.37	4.16	6.03	7.83	7.41	3.06	1.65	1.33
In.	6.97	9.64	6.60	2.99	5.79	4.80	6.74	9.03	8.28	3.53	1.90	1.48
Ac-ft	387,500	536,000	366,800	166,200	321,900	266,800	374,300	501,700	459,900	196,200	105,500	82,310

Calendar year 1959: Max 40,700 Min 1,340 Mean 5,612 Cfs/m 5.39 In. 73.10 Ac-ft 4,063,000  
 Water year 1959-60: Max 40,700 Min 1,160 Mean 5,187 Cfs/m 4.98 In. 67.75 Ac-ft 3,765,000

Peak discharge (base, 16,000 cfs)--Oct. 11 (8 to 10 p.m.) 15,900 cfs (11.67 ft); Oct. 23 (4 a.m.) 20,800 cfs (13.10 ft); Nov. 24 (3 a.m.) 47,500 cfs (19.50 ft); Dec. 16 (8 a.m.) 22,100 cfs (13.45 ft).

\* Discharge measurement made on this day.

2355. West Fork Tilton River near Morton, Wash.

Location.--Lat 46°36'45", long 122°14'45", in NE $\frac{1}{4}$  sec.13, T.13 N., R.4 E., on left bank three-quarters of a mile upstream from mouth and 4 miles northeast of Morton.

Drainage area.--16.4 sq mi.

Records available.--June 1950 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,150 ft (from topographic map).

Average discharge.--10 years, 129 cfs (93,390 acre-ft per year).

Extremes.--Maximum discharge during year, 2,120 cfs Nov. 20 (gage height, 5.76 ft), from rating curve extended above 1,200 cfs as explained below; minimum, 8.5 cfs Aug. 9, 10, 11, 12, 13 (gage height, 1.50 ft).  
1950-60: Maximum discharge, 6,620 cfs Dec. 11, 1955 (gage height, 7.55 ft, from high-water mark in gage well), from rating curve extended above 1,200 cfs on basis of slope-area measurement of peak flow; minimum, 4.7 cfs Oct. 29, 1952; minimum gage height, 0.87 ft Aug. 25, Sept. 20-24, 1951.

Remarks.--Records excellent prior to Aug. 1, good thereafter. Logging company diverts small amount for sprinkling system. No regulation.

Revisions (water years).--WSP 1348: 1953.

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

1.5	6.5	3.5	315
1.7	13	4.0	530
2.0	32	4.5	840
2.5	87	5.0	1,240
3.0	177	5.5	1,760

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	64	68	87	52	164	43	241	130	104	25	10.5	31
2	56	62	83	49	166	41	297	119	94	24	10.5	28
3	49	114	78	47	164	38	255	104	87	22	10.5	24
4	45	97	69	43	155	37	222	94	74	21	10.5	40
5	41	84	66	40	182	49	*201	86	68	19.5	10.5	63
6	40	75	64	*44	345	67	179	140	61	19	9.6	52
7	43	68	62	40	605	83	173	189	53	17.5	9.2	41
8	174	62	58	37	318	101	153	141	48	17	8.9	35
9	278	56	60	34	249	84	126	115	44	16.5	8.9	30
10	177	51	96	33	222	74	100	112	41	16	8.5	27
11	686	48	196	33	182	67	98	111	38	16	8.5	28
12	399	45	336	30	173	64	94	112	35	15	8.5	25
13	222	41	199	28	182	63	100	121	32	14.5	8.5	25
14	135	39	619	28	298	68	147	106	41	14	8.9	23
15	119	43	1,400	28	366	141	141	93	45	13.5	*13	21
16	97	37	520	27	224	106	124	121	75	13	11.5	20
17	82	104	264	25	162	106	135	*170	60	13	11.5	19.5
18	72	*366	182	25	126	119	143	194	50	12.5	10.5	19
19	66	394	157	24	104	159	194	226	54	12	9.9	19.5
20	209	1,070	115	24	97	241	404	545	*63	11.5	9.2	*19
21	227	964	98	24	98	294	270	332	55	11.5	14.5	17.5
22	540	980	87	24	86	285	184	244	49	11.5	15.5	17
23	326	*1,060	79	69	77	261	153	187	43	11.5	52	22
24	247	586	98	247	73	247	141	153	39	11	101	23
25	*235	394	100	247	67	255	135	133	36	10.5	103	21
26	166	241	87	*336	60	227	141	122	34	10.5	128	18.5
27	131	166	78	235	*54	184	143	124	31	10.5	91	17
28	112	141	72	298	49	173	145	111	29	10.5	70	15.5
29	97	114	73	622	46	342	135	101	27	10.5	47	15
30	84	97	62	329	-----	362	131	107	26	10.5	38	14.5
31	75	-----	56	238	-----	270	-----	124	-----	10.5	34	-----
Total	5,294	7,667	5,581	3,360	5,094	4,651	5,105	4,767	1,536	451.5	891.6	771.0
Mean	171	256	180	108	176	150	170	154	51.2	14.6	28.8	25.7
Cfs/m	10.4	15.6	11.0	6.59	10.7	9.15	10.4	9.39	3.12	0.890	1.76	1.57
In.	12.01	17.39	12.66	7.62	11.55	10.55	11.58	10.81	3.48	1.02	2.02	1.75
Ac-ft	10,500	15,210	11,070	6,660	10,100	9,230	10,130	9,460	3,050	896	1,770	1,530

Calendar year 1959: Max 1,400 Min 7.2 Mean 138 Cfs/m 8.41 In. 114.34 Ac-ft 100,000  
Water year 1959-60: Max 1,400 Min 8.5 Mean 123 Cfs/m 7.50 In. 102.44 Ac-ft 89,610

Peak discharge (base, 800 cfs).--Oct. 11 (5 a.m.) 950 cfs (4.65 ft); Nov. 20 (8:30 p.m.) 2,120 cfs (5.76 ft); Nov. 22 (11:30 p.m.) 1,950 cfs (5.64 ft); Dec. 15 (1:30 a.m.) 2,030 cfs (5.70 ft); Jan. 29 (2 a.m.) 854 cfs (4.52 ft); Feb. 6 (11:30 p.m.) 1,070 cfs (4.80 ft).

\* Discharge measurement made on this day.

2362. Tilton River above Bear Canyon Creek, near Cinebar, Wash.

Location.--Lat 46°35'40", long 122°27'30", in NE<sup>1</sup>/<sub>4</sub> sec. 20, T.13 N., R.3 E., on right bank 0.8 mile upstream from Bear Canyon Creek and 1 mile southeast of Cinebar.

Drainage area.--141 sq mi.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 600 ft (from topographic map).

Extremes.--Maximum discharge during year, 16,400 cfs Nov. 23 (gage height, 12.73 ft), from rating curve extended above 7,000 cfs; minimum, 90 cfs Aug. 13, 14 (gage height, 2.30 ft).

1956-60: Maximum discharge, that of Nov. 23, 1959; minimum, 58 cfs Aug. 25-27, Sept. 8, 9, 13, 1958 (gage height, 2.05 ft).

Remarks.--Records excellent except those above 7,000 cfs and those below 100 cfs, which are good, and those for periods of no gage-height record, which are fair. Several small diversions for municipal and domestic use above station. No regulation.

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

2.3	90	5.0	1,540
2.5	142	6.0	2,560
3.0	307	8.0	5,400
3.5	530	11.0	11,700
4.0	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	505	664	922	550	1,240	480	1,730	940	904	272	120	231
2	450	607	886	500	1,250	455	2,010	898	*820	265	110	205
3	403	892	850	480	1,240	430	1,760	920	754	252	110	186
4	359	882	768	450	1,140	421	1,530	760	676	238	110	289
5	340	742	700	425	1,240	455	1,400	676	612	228	*109	360
6	322	664	670	460	1,610	590	1,250	790	552	218	107	333
7	345	602	670	440	3,540	574	1,170	1,210	500	215	104	279
8	601	552	612	416	2,320	730	1,090	996	465	205	100	248
9	1,600	510	596	398	1,940	676	982	838	435	199	95	218
10	1,030	470	724	390	1,870	624	820	790	408	195	92	199
11	3,330	440	1,120	390	1,580	580	820	790	390	192	92	183
12	2,860	426	2,030	360	*1,480	563	778	798	369	186	95	170
13	1,780	394	1,460	350	1,560	568	778	862	348	179	92	164
14	1,280	377	2,550	350	2,430	590	1,010	808	377	176	95	*154
15	1,010	412	8,300	350	3,190	1,280	1,150	718	440	170	120	*145
16	825	369	*4,160	340	2,190	1,120	1,040	916	598	164	117	142
17	708	570	2,330	330	1,650	1,020	1,060	1,320	530	158	122	136
18	618	2,160	1,700	*314	1,360	*998	1,070	1,810	460	154	107	131
19	558	2,540	1,340	307	1,130	1,070	1,260	1,590	450	145	100	134
20	1,200	4,520	1,150	305	989	1,460	2,370	3,660	585	139	95	139
21	1,540	6,720	989	300	989	1,870	2,000	2,810	500	139	107	125
22	3,400	6,540	874	320	868	1,910	*1,490	2,110	455	134	139	120
23	2,890	11,200	798	700	778	1,750	1,260	1,670	412	134	221	154
24	2,120	5,680	862	1,500	738	1,570	1,160	1,420	377	130	505	170
25	2,010	*4,080	910	1,500	682	1,520	1,110	1,260	356	120	646	173
26	1,520	2,550	850	2,500	618	1,440	1,080	1,150	337	120	826	145
27	1,230	1,810	750	2,000	568	1,240	1,070	1,160	318	120	824	131
28	1,090	1,490	750	2,500	525	1,240	1,090	1,050	*300	120	416	122
29	940	1,240	750	3,500	505	1,850	1,040	940	288	120	326	117
30	826	1,060	650	2,000	-----	2,240	975	922	279	120	272	112
31	736	-----	600	1,490	-----	1,880	-----	1,040	-----	120	265	-----
Total	38,438	61,123	42,317	26,235	41,218	33,182	37,373	37,320	14,291	5,327	6,439	5,395
Mean	1,240	2,037	1,365	846	1,241	1,070	1,246	1,204	476	172	208	180
Cfs/m	8.79	14.4	9.68	6.00	10.1	7.59	8.84	8.54	3.58	1.22	1.48	1.28
In.	10.14	16.12	11.16	6.92	10.87	8.75	9.86	9.84	3.77	1.41	1.70	1.42
Ac-ft	76,240	121,200	85,930	52,040	81,750	65,820	74,130	74,020	28,350	10,570	12,770	10,700

Calendar year 1959: Max 11,200 Min 98 Mean 1,070 Cfs/m 7.59 In. 103.04 Ac-ft 774,700  
 Water year 1959-60: Max 11,200 Min 92 Mean 953 Cfs/m 6.76 In. 91.96 Ac-ft 691,500

Peak discharge (base, 6,200 cfs).--Nov. 20 (11:30 p.m.) 9,920 cfs (10.27 ft); Nov. 23 (3:30 a.m.) 16,400 cfs (12.73 ft); Dec. 15 (4 a.m.) 10,400 cfs (10.46 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Dec. 25 to Jan. 6, Jan. 10-17, 20-30, July 24 to Aug. 4; discharge estimated on basis of recorded range in stage, weather records, and records for nearby stations.

## 2364. Cinnabar Creek near Cinebar, Wash.

Location.--Lat 46°36'20", long 122°30'30", in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.13 T.13 N., R.2 E., on left bank 1 mile east of Cinebar and 2 miles upstream from mouth.

Drainage area.--4.79 sq mi.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 940 ft (from topographic map).

Extremes.--Maximum discharge during year, 498 cfs Nov. 22 (gage height, 3.27 ft); minimum, 5.8 cfs Aug. 12, 13, 14 (gage height, 0.94 ft).  
1956-60: Maximum discharge, that of Nov. 22, 1959; minimum, 3.1 cfs Aug. 25, 26, 27, 1958 (gage height, 0.83 ft).

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

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

0.9	3.5	1.6	52
1.0	6.0	2.0	130
1.2	13.5	2.7	325

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	21	20	15	32	13	69	32	28	11	7.0	10.5
2	18	19	22	15	32	13	84	30	*25	9.9	7.0	9.9
3	15.5	26	20	13.5	34	13	65	28	24	9.5	7.0	9.9
4	13.5	22	19	13.5	32	12.5	50	26	20	9.5	6.7	16.5
5	13	20	18	13	36	13.5	41	23	18.5	9.2	*6.7	20
6	13.5	18.5	18	16.5	50	13.5	34	30	17	9.2	6.4	17
7	13.5	17	16.5	15	86	14.5	30	32	16.5	9.2	6.0	13.5
8	29	15.5	15	14.5	61	15.5	28	28	15	9.2	6.0	12
9	48	15	15	13.5	53	15	25	25	13.5	8.8	6.0	11.5
10	38	13.5	18.5	13.5	61	14.5	22	24	13.5	8.4	6.0	10.5
11	104	13	24	14.5	*52	15	26	24	13	8.4	6.0	9.2
12	112	13	73	13.5	45	15	24	24	13	8.4	5.8	8.8
13	55	12.5	49	13	44	15.5	24	26	12	8.4	5.8	*8.4
14	44	12	*92	13	96	17	30	26	14.5	8.4	6.4	7.8
15	36	13	236	*13	107	56	36	24	14.5	8.1	7.8	7.4
16	30	11.5	135	13	67	38	34	38	20	8.1	7.4	7.0
17	25	27	76	12.5	49	38	36	71	18	8.1	7.4	7.0
18	22	74	53	12	38	*38	38	82	15.5	7.8	6.7	6.7
19	20	86	36	11.5	32	44	48	74	17	7.8	6.4	7.4
20	50	148	28	11	28	62	98	158	17	7.4	6.0	6.7
21	50	*214	24	11	25	67	80	101	15.7	7.4	8.4	6.4
22	108	247	21	11.5	23	59	*55	78	14.5	7.8	6.7	6.4
23	73	324	20	20	20	52	46	61	14.5	7.8	14.5	9.2
24	52	189	24	42	19	45	42	50	13	7.4	24	9.9
25	52	142	24	44	18	41	41	45	12.5	7.0	32	8.8
26	44	86	22	59	16.5	36	40	38	12	7.8	38	7.8
27	40	59	20	49	15	32	38	36	11.5	7.4	24	7.0
28	*34	45	19	48	14.5	36	38	32	*11	7.0	17	6.7
29	30	32	18.5	86	13	50	36	28	11	7.0	14.5	6.7
30	25	24	18	55	---	64	34	28	11	7.0	11.5	6.4
31	24	---	16.5	38	---	69	---	30	---	7.0	12	---
Total	1,252.0	1,959.5	1,211.0	733.5	1,199.0	1,027.5	1,292	1,352	472.2	255.4	333.1	283.0
Mean	40.4	65.3	39.1	23.7	41.3	33.1	43.1	43.6	15.7	8.24	10.7	9.43
Cfsm	8.43	13.6	8.16	4.95	8.62	6.91	9.00	9.10	3.28	1.72	2.23	1.97
In.	9.72	15.21	9.40	5.69	9.31	7.98	10.03	10.50	3.67	1.98	2.59	2.20
Ac-ft	2,480	3,890	2,400	1,450	2,380	2,040	2,560	2,680	937	507	661	561

Calendar year 1959: Max 324 Min 4.6 Mean 35.2 Cfsm 7.35 In. 99.68 Ac-ft 25,450  
Water year 1959-60: Max 324 Min 5.8 Mean 31.1 Cfsm 6.49 In. 88.28 Ac-ft 22,550

Peak discharge (base, 220 cfs).--Nov. 20 (12 p.m.) 355 cfs (2.80 ft); Nov. 22 (12 p.m.) 498 cfs (3.27 ft); Dec. 15 (2 a.m.) 274 cfs (2.58 ft).

\* Discharge measurement made on this day.

## 2370. Klickitat Creek at Mossyrock, Wash.

Location.--Lat 46°31'15", long 122°28'05", on line between secs.17 and 18, T.12 N., R.3 E., near left bank at upstream side of highway bridge, 1 mile southeast of Mossyrock and 4¼ miles upstream from mouth.

Drainage area.--3.45 sq mi.

Records available.--August 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 668.41 ft above mean sea level (levels by city of Tacoma).

Average discharge.--12 years, 9.71 cfs (7,030 acre-ft per year).

Extremes.--Maximum discharge during year, 138 cfs Nov. 22 (gage height, 4.95 ft, from high-water mark in well); no flow July 29, Aug. 6-14, 17-21, Sept. 22.  
1948-60: Maximum discharge, 165 cfs Feb. 17, 1949 (gage height, 3.62 ft), from rating curve extended above 42 cfs; maximum gage height, that of Nov. 22, 1959; no flow for long periods in most years.

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

Revisions (water years).--WSP 1288: Drainage area. WSP 1568: 1957.

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

0.37	0.0	1.5	16
.8	2.7	2.0	31
1.0	5.5	4.0	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	0.7	5.5	17	8.9	13.5	8.3	13	12	10.5	1.3	0.1	0.3
2	.6	5.3	18.5	8.5	17	7.7	13	14.5	*9.5	1.1	.2	.2
3	.6	9.9	16.5	7.7	19	7.1	11	11.5	8.9	1.0	.2	.2
4	.5	6.3	14	7.5	15	8.1	9.9	10.5	7.9	1.0	*.1	1.4
5	.5	5.5	12.5	7.5	14	10	9.5	9.1	7.1	.8	.1	1.1
6	.6	5.1	13.5	13.5	20	10.5	8.9	12	6.3	.6	0	.6
7	.9	4.7	14	10	23	9.3	8.3	13.5	5.9	.7	0	.3
8	2.7	4.5	11.5	8.9	23	16.5	8.7	9.9	5.7	.8	0	.2
9	7.6	4.5	11.5	8.5	28	15.5	8.7	8.3	5.1	.8	0	.1
10	4.9	4.3	13.5	7.9	27	13	7.7	8.3	4.9	.8	0	.1
11	16	4.1	16.5	8.3	*23	11.5	11.5	8.5	4.5	.8	0	.1
12	9.3	4.3	23	8.1	24	10.5	9.7	9.5	3.9	.7	0	.1
13	5.9	3.8	16	7.5	24	12	9.7	10.5	3.3	.7	0	*.1
14	4.5	3.8	*22	7.3	31	11.5	14.5	8.5	8.3	.6	0	.1
15	4.7	5.7	30	8.1	35	25	27	7.1	7.9	.5	.1	.1
16	3.2	3.9	24	10.5	28	18.5	18.5	11.5	7.7	.6	.1	.1
17	2.5	22	22	8.7	25	*17.5	16.5	18.5	4.7	.3	0	.1
18	2.3	32	22	*7.3	22	15.5	15	17.5	3.6	.3	0	.1
19	2.3	28	19	6.9	20	14.5	15	20	4.1	.2	0	.1
20	10.5	40	19	7.3	18.5	13.5	22	43	5.1	.2	0	.1
21	7.5	*55	16.5	7.1	18.5	13	*22	34	3.0	.2	0	.1
22	19.5	*89	14.5	6.9	15.5	12.5	19	30	2.5	.2	.1	0
23	14	78	14	12.5	14	11.5	20	25	2.1	.2	.3	.1
24	14	62	18.5	13	14	10.5	20	25	1.9	.1	.4	.4
25	12	48	15.5	12.5	13	9.9	17.5	22	1.8	.2	.7	.5
26	9.5	37	13	13	11	9.7	15.5	20	1.6	.2	2.1	.3
27	8.9	30	12	11.5	10.5	9.3	14	19	*1.5	.1	1.2	.2
28	*7.9	26	11	14.5	9.5	10	15	16	1.3	.1	.4	.1
29	7.1	23	10.5	21	8.7	15.5	13	13.5	1.2	0	.3	.2
30	6.3	19	17.5	15.5	---	15	12	15	1.2	.1	.3	.1
31	5.7	---	10.5	14	---	16	---	13	---	.1	.3	---
Total	193.2	670.2	503.5	310.4	564.7	388.9	426.1	494.7	143.0	15.3	6.9	7.5
Mean	6.23	22.3	16.2	10.0	19.5	12.5	14.2	16.0	4.77	0.49	0.22	0.25
Cfs/m	1.81	6.46	4.70	2.90	5.65	3.62	4.12	4.64	1.38	0.143	0.065	0.072
In.	2.08	7.22	5.43	3.35	6.09	4.19	4.59	5.33	1.54	0.16	0.07	0.08
Ac-ft	383	1,330	999	616	1,120	771	845	981	284	30	14	15
Calendar year 1959: Max	89			Min 0		Mean 10.7		Cfs/m 3.10		In. 42.13	Ac-ft 7,760	
Water year 1959-60: Max	89			Min 0		Mean 10.2		Cfs/m 2.96		In. 40.13	Ac-ft 7,390	

Peak discharge (base, 60 cfs).-- Nov. 20 (11 p.m.) 84 cfs (3.53 ft); Nov. 22 (about 12 m.) 138 cfs (4.95 ft).

\* Discharge measurement made on this day.

## 2375. Winston Creek near Mayfield, Wash.

Location.--Lat 46°29'00", long 122°31'15", about center of sec.35, T.12 N., R.2 E., on left bank 100 ft downstream from bridge, 3 miles southeast of Mayfield, and 3¼ miles upstream from mouth.

Drainage area.--40.0 sq mi.

Records available.--October 1949 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 470 ft (from topographic map).

Average discharge.--11 years, 121 cfs (87,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,390 cfs Nov. 23 (gage height, 7.04 ft); minimum, 4.4 cfs Aug. 10 (gage height, 2.29 ft).

1949-60: Maximum discharge, 3,510 cfs Dec. 9, 1953 (gage height, 8.58 ft), from rating curve extended above 550 cfs; minimum, 0.6 cfs Aug. 24, 1951 (gage height, 1.63 ft).

Remarks.--Records good. Small diversion by Howard Lumber Co. for millpond. Diverted water is returned to stream below station. No regulation.

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

2.3	4.5	4.0	173
2.5	8.0	5.0	435
2.7	13.5	6.0	820
3.0	26	7.0	1,370
3.5	74		

Discharge, in cubic 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	83	156	86	195	77	171	115	103	24	7.4	15
2	27	75	154	78	221	73	168	121	*91	24	7.8	13.5
3	24	105	151	74	233	69	149	105	83	21	8.0	
4	22	83	131	69	202	70	138	96	73	20	*7.6	31
5	21	71	119	69	195	80	125	86	66	18.5	7.2	29
6	22	66	117	99	221	107	113	98	60	16.5	6.4	21
7	27	62	133	87	308	99	101	147	55	15	5.8	16.5
8	47	59	115	81	290	149	96	117	51	14.5	5.4	13
9	187	56	111	77	322	147	98	101	47	14	4.8	10
10	105	54	123	75	332	144	84	96	44	14	4.5	9.2
11	302	51	178	73	*295	136	105	96	42	13	5.0	9.0
12	211	51	342	70	295	131	111	99	39	13	5.4	8.2
13	154	47	282	67	295	136	105	109	36	13	5.2	*9.2
14	121	46	292	66	366	131	161	96	53	13	5.6	9.5
15	109	58	432	*63	465	302	248	86	64	12	12	9.0
16	86	50	441	70	387	272	240	127	67	11	10	8.8
17	74	120	351	70	320	*260	233	183	59	10	9.8	8.5
18	64	292	298	63	268	235	211	228	47	9.5	8.0	8.2
19	60	330	243	61	226	211	199	258	47	9.0	7.2	8.0
20	134	400	214	60	195	197	288	556	60	8.8	6.8	9.0
21	138	*770	183	58	190	178	*235	479	50	8.5	7.6	8.2
22	252	935	159	59	156	161	275	372	42	8.2	12.5	7.8
23	280	1,090	142	96	136	144	268	296	38	8.0	23	10.5
24	292	722	166	168	129	131	252	262	35	8.0	33	17.5
25	305	510	154	171	121	121	226	219	34	7.4	32	22
26	233	375	136	209	103	111	202	192	32	7.6	46	15
27	*187	292	123	192	94	101	178	192	*28	7.2	39	11.5
28	154	252	113	202	87	115	171	156	26	6.8	21	10
29	129	216	103	200	81	149	144	138	24	6.4	15.5	9.2
30	107	180	101	235	-----	178	127	127	24	6.8	14	8.8
31	92	-----	94	219	-----	175	-----	125	-----	7.4	14	-----
Total	3,997	7,499	5,857	3,370	6,728	4,590	5,282	5,477	1,520	376.1	397.5	377.1
Mean	129	250	189	109	232	148	176	177	50.7	12.1	12.8	12.6
Ac-ft	7,930	14,870	11,620	6,680	13,340	9,100	10,480	10,860	3,010	746	788	748

Calendar year 1959: Max 1,300 Min 6.0 Mean 132 Ac-ft 95,490  
Water year 1959-60: Max 1,090 Min 4.5 Mean 124 Ac-ft 90,170

Peak discharge (base, 900 cfs).--Nov. 21 (1 to 2:30 a.m.) 915 cfs (6.19 ft); Nov. 23 (3 a.m.) 1,390 cfs (7.04 ft).

\* Discharge measurement made on this day.

2380. Cowlitz River near Mayfield, Wash.

Location.--Lat 46°30'40", long 122°36'50", in NE $\frac{1}{4}$  sec.24, T 12 N., R.1 E., on right bank 1 mile upstream from Mill Creek, 2 miles downstream from Winston Creek, and 2 $\frac{1}{4}$  miles west of Mayfield.

Drainage area.--1,400 sq mi.

Records available.--August to October 1910, December 1910 to September 1911, October to November 1911 (monthly discharge only), April 1934 to September 1960. Published as "at Mayfield" 1910-11.

Gage.--Water-stage recorder. Datum of gage is 226.6 ft above mean sea level, datum of 1929. August 1910 to November 1911 staff gage at site 2 $\frac{1}{4}$  miles upstream at different datum. Apr. 27 to June 30, 1934, staff gage at present site and datum.

Average discharge.--26 years (1934-60), 6,170 cfs (4,467,000 acre-ft per year).

Extremes.--Maximum discharge during year, 60,800 cfs Nov. 24 (gage height, 23.71 ft); minimum, 1,430 cfs Sept. 30 (gage height, 8.20 ft).

1910-11, 1934-60: Maximum discharge, 67,000 cfs (revised) Dec. 13, 1946 (gage height, 24.75 ft; minimum, 698 cfs Nov. 30, 1952; minimum gage height, 7.18 ft Nov. 30, Dec. 1, 1936.

Flood in December 1933 is known to have exceeded that of Dec. 13, 1946.

Revisions.--The figures of maximum discharge for the water years 1943 and 1947 have been revised to 47,500 cfs Nov. 24, 1942 (gage height, 21.50 ft) and 67,000 cfs Dec. 13, 1946 (gage height, 24.75 ft), superseding those published in WSP 984, 1094, and 1318, respectively.

Remarks.--Records excellent except those for period of no gage-height record, which are good. Minor diversions for domestic and farm use above station. No regulation. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1318: 1949(M). WSP 1348: Drainage area. Revised figures of discharge, in cubic feet per second, for high-water periods in the water years 1943 and 1947, superseding those published in WSP 984, 1094, and 1318, are given herewith:

1942	1946-Con.
Nov. 24..... 43,800	Dec. 12..... 60,300
	13..... 66,000
1946	14..... 63,800
Dec. 11..... 44,000	15..... 58,900
	16..... 38,000

Month	Maximum	Minimum	Mean	Per square mile	Runoff	
					Inches	Acre-feet
November 1942.....	43,800	2,780	10,050	7.18	8.01	597,900
Calendar year 1942.....	43,800	890	4,988	3.56	48.36	3,611,000
Water year 1942-43.....	43,800	890	6,532	4.67	63.54	4,729,000
December 1946.....	66,000	4,810	18,700	13.4	15.40	1,150,000
Calendar year 1946.....	66,000	1,090	7,843	5.80	76.04	5,678,000
Water year 1946-47.....	66,000	1,090	6,567	4.70	63.88	4,769,000

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	4,440	5,760	8,720	4,240	8,800	3,720	10,200	7,690	*12,600	5,600	2,420	1,950
2	3,930	5,340	8,000	4,040	8,550	3,610	9,750	8,100	12,200	5,100	2,320	1,890
3	3,600	5,670	7,570	3,900	8,200	3,460	9,650	8,100	13,200	4,800	2,220	2,010
4	3,310	6,480	6,850	3,730	7,520	3,390	9,480	7,740	13,400	4,800	*2,180	2,810
5	3,090	5,810	6,230	3,640	7,260	3,500	9,880	7,180	12,100	4,800	2,090	2,340
6	2,940	5,380	5,880	3,860	7,570	3,750	10,500	7,210	11,400	4,900	2,080	2,430
7	2,900	5,030	5,840	3,720	15,700	3,700	11,200	10,200	10,400	5,100	2,050	2,190
8	3,070	4,750	5,400	3,570	17,600	4,260	12,500	11,700	9,180	5,000	2,050	2,000
9	6,870	4,520	5,120	3,430	14,500	4,240	12,600	10,100	8,380	4,600	2,070	1,860
10	7,340	4,300	5,120	3,260	12,800	4,020	11,000	9,580	8,220	4,300	2,050	1,780
11	11,800	4,080	6,100	3,240	*11,000	3,820	9,520	10,600	8,420	3,900	2,070	1,760
12	17,700	3,930	9,120	3,140	9,850	3,700	8,520	13,200	8,350	3,700	2,040	1,720
13	12,800	3,740	8,500	3,020	9,520	3,680	7,760	13,800	8,120	3,700	1,940	*1,740
14	9,550	3,540	8,700	*2,950	10,100	3,720	8,200	11,400	8,400	3,700	1,890	1,730
15	7,790	3,560	21,400	2,940	12,500	5,310	8,520	9,720	9,380	3,600	1,890	1,720
16	6,550	3,450	27,500	2,970	10,800	5,310	7,980	9,300	10,100	3,500	1,820	1,670
17	5,650	3,700	20,900	2,900	9,300	*5,060	7,520	9,780	11,400	3,400	1,800	1,600
18	5,030	6,550	15,000	2,760	8,250	4,940	7,260	9,980	8,550	3,400	1,810	1,580
19	4,600	8,510	11,700	*2,650	7,350	5,000	7,280	9,480	7,330	3,500	1,840	1,540
20	5,050	11,100	9,880	2,630	6,640	5,840	8,750	14,300	7,260	3,400	1,840	1,580
21	6,580	25,900	8,680	2,580	6,440	7,520	*9,220	16,300	6,730	3,200	1,780	1,540
22	9,800	27,400	7,700	2,550	5,900	9,120	8,350	13,900	6,250	3,000	1,610	1,450
23	22,300	49,200	7,010	2,780	5,440	9,900	7,740	11,900	6,100	2,800	1,890	1,500
24	16,900	55,600	6,820	3,950	5,100	9,900	7,420	10,600	6,540	2,600	2,400	1,640
25	14,900	*39,400	6,630	4,320	4,960	9,980	7,020	9,720	6,730	2,500	2,740	1,800
26	*11,900	26,100	5,990	5,310	4,600	10,800	6,800	9,480	6,210	2,490	2,970	1,780
27	9,800	17,900	5,550	5,100	4,220	11,000	6,730	10,200	*5,860	2,580	3,050	1,640
28	8,590	14,100	5,225	4,900	4,020	10,950	6,570	10,746	5,900	2,760	2,550	1,550
29	7,790	11,700	4,940	9,600	3,860	10,700	7,020	9,800	5,800	2,600	2,280	1,530
30	6,670	9,650	4,780	12,700	-----	12,600	7,260	10,100	5,700	2,480	2,090	1,470
31	6,220	-----	4,580	10,400	-----	11,500	-----	12,700	-----	2,460	2,040	-----
Total	249,600	382,350	271,430	130,780	248,340	198,050	262,300	324,080	260,110	114,240	66,150	52,800
Mean	8,052	12,740	8,756	4,219	8,563	6,389	8,743	10,450	8,670	3,665	2,134	1,760
Cfs/m	5.75	9.10	6.225	5.01	6.12	4.58	6.24	7.46	6.19	2.63	1.52	1.26
In.	6.63	10.16	7.11	3.47	6.60	5.26	6.97	8.61	6.91	3.03	1.76	1.40
Ac-ft	495,100	758,400	538,400	259,400	492,600	392,800	520,300	642,800	515,900	226,600	131,200	104,700
Calendar year 1959: Max	55,600	Min	1,760	Mean	7,576	Cfs/m	5.41	In.	73.45	Ac-ft	5,485,000	
Water year 1959-60: Max	55,600	Min	1,450	Mean	6,995	Cfs/m	5.00	In.	68.01	Ac-ft	5,078,000	

Peak discharge (base, 16,000 cfs).--Oct. 12 (2 a.m.), 19,500 cfs (15.66 ft); Oct. 23 (9:30 a.m.), 24,000 cfs (16.77 ft); Nov. 24 (10 a.m.), 60,800 cfs (23.71 ft); Dec. 16 (11 a.m.), 28,400 cfs (17.68 ft); Feb. 7 (7:30 p.m.), 19,800 cfs (15.52 ft); May 21 (1 a.m.), 16,900 cfs (14.69 ft).

\* Discharge measurement made on this day. Note.--No gage-height record June 14, June 28 to July 24; discharge estimated on basis of recorded range in stage and records for station near Kosmos.

## 2420. Silver Lake at Sliver Lake, Wash.

Location--Lat 46°17'15", long 122°48'30", in NE $\frac{1}{4}$  sec.4, T.9 N., R.1 W., on left shore at Silver Lake, 5 miles east of Castle Rock.

Drainage area--41.5 sq mi.

Records available--July 1949 to September 1950 (fragmentary), August 1953 to September 1960.

Gage--Water-stage recorder. Altitude of gage is 480 ft (from topographic map). Prior to Sept. 30, 1950, staff gage at same site and datum.

Extremes--Maximum gage height during year, 4.62 ft Feb. 16, 17; minimum, 1.49 ft Aug. 20, 21, 22.

1949-50, 1953-60: Maximum gage height, 5.90 ft Dec. 23, 24, 1955; minimum observed, 0.18 ft Sept. 22, 1950.

Remarks--No regulation or diversion above station.

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	2.10	2.70	3.86	3.62	3.49	3.46	3.84	3.86	3.10	2.27	1.72	1.73
2	2.10	2.70	3.82	3.56	3.57	3.39	3.85	3.78	3.05	2.25	1.72	1.72
3	2.10	2.70	3.77	3.49	3.71	3.36	3.82	3.71	3.00	2.23	1.70	1.74
4	2.10	2.69	3.70	3.44	3.77	3.30	3.77	3.64	2.95	2.22	1.69	1.77
5	2.10	2.68	3.64	3.37	3.79	3.28	3.72	3.57	2.89	2.20	1.68	1.77
6	2.12	2.66	3.59	3.34	3.88	3.27	3.65	3.55	2.84	2.19	1.67	1.76
7	2.12	2.65	3.54	3.29	4.02	3.29	3.59	3.49	2.78	2.16	1.66	1.75
8	2.18	2.64	3.48	3.24	4.19	3.46	3.56	3.42	2.73	2.13	1.65	1.75
9	2.20	2.63	3.43	3.18	4.30	3.59	3.49	3.36	2.69	2.11	1.62	1.74
10	2.28	2.62	3.44	3.14	4.33	3.68	3.43	3.33	2.64	2.09	1.60	1.74
11	2.42	2.60	3.53	3.11	4.29	3.71	3.41	3.30	2.61	2.07	1.59	1.72
12	2.50	2.60	3.69	3.07	4.29	3.70	3.37	3.28	2.58	2.05	1.57	1.72
13	2.53	2.59	3.76	3.04	4.25	3.69	3.38	3.23	2.55	2.04	1.55	1.72
14	2.55	2.58	3.91	2.99	4.47	3.71	3.53	3.19	2.56	2.02	1.55	1.71
15	2.55	2.57	4.20	2.96	4.60	3.90	3.75	3.16	2.53	2.01	1.54	1.72
16	2.55	2.56	4.32	2.95	4.62	3.96	3.84	3.15	2.52	2.00	1.54	1.70
17	2.55	2.53	4.34	2.92	4.58	3.95	3.88	3.15	2.50	1.97	1.54	1.70
18	2.55	2.71	4.30	2.91	4.50	3.94	3.89	3.14	2.48	1.95	1.53	1.70
19	2.57	2.81	4.26	2.92	4.42	3.88	3.89	3.17	2.47	1.93	1.52	1.69
20	2.62	3.10	4.21	2.90	4.33	3.82	4.02	3.30	2.44	1.91	1.51	1.68
21	2.65	3.50	4.14	2.87	4.25	3.76	4.14	3.37	2.43	1.90	1.54	1.69
22	2.68	3.81	4.06	2.86	4.15	3.69	4.17	3.40	2.41	1.88	1.53	1.70
23	2.71	4.08	4.02	2.93	4.05	3.62	4.23	3.42	2.39	1.85	1.63	1.70
24	2.75	4.19	4.03	3.03	3.96	3.56	4.25	3.40	2.37	1.84	1.66	1.74
25	2.75	4.20	4.03	3.13	3.87	3.49	4.24	3.37	2.35	1.82	1.69	1.74
26	2.76	4.17	3.99	3.18	3.79	3.43	4.20	3.35	2.35	1.81	1.73	1.74
27	2.77	4.12	3.94	3.22	3.70	3.38	4.15	3.32	2.33	1.80	1.74	1.73
28	2.76	4.06	3.87	3.33	3.60	3.36	4.08	3.29	2.31	1.78	1.73	1.73
29	2.75	4.01	3.81	3.43	3.54	3.54	4.01	3.24	2.29	1.75	1.73	1.72
30	2.73	3.94	3.76	3.46	-----	3.69	3.95	3.19	2.28	1.74	1.72	1.72
31	2.72	-----	3.69	3.48	-----	3.80	-----	3.14	-----	1.73	1.74	-----

2425. Toutle River near Silver Lake, Wash.

Location.--Lat 46°20'10", long 122°43'30", in SE $\frac{1}{4}$  sec.19, T.10 N, R.1 E., on right bank just downstream from highway bridge, half a mile downstream from confluence of North and South Forks and 5 miles northeast of Silver Lake.

Drainage area.--474 sq mi.

Records available.--September 1909 to August 1912, October 1919 to October 1921, May to November 1922, December 1922 (monthly discharge only), January to December 1923, September 1929 to September 1960. Published as "near Castle Rock" 1909-12.

Gage.--Water-stage recorder. Datum of gage is 407.3 ft above mean sea level (river-profile survey). Prior to Aug. 4, 1912, staff gage at site 2 miles downstream at datum 307.3 ft above mean sea level, unadjusted. Oct. 9, 1919, to Dec. 14, 1923, water-stage recorder at site 300 ft downstream at different datum. Sept. 25 to Nov. 10, 1929, chain gage; Nov. 11, 1929, to Oct. 5, 1938, and Oct. 4, 1950, to Apr. 16, 1952, water-stage recorder; all at site 50 ft upstream at present datum. Oct. 6, 1938, to Oct. 3, 1950, and since Apr. 17, 1952, water-stage recorder at present site and datum.

Average discharge.--36 years (1909-11, 1919-21, 1922-23, 1929-60), 2,024 cfs (1,465,000 acre-ft per year).

Extremes.--Maximum discharge during year, 14,100 cfs Nov. 23 (gage height, 10.94 ft, from high-water mark in well; minimum, 386 cfs Aug. 13, 14 (gage height, 1.81 ft). 1909-12, 1919-23, 1929-60: Maximum discharge, 37,600 cfs Mar. 2, 1910 (gage height, 11.3 ft, from graph based on gage readings, site and datum then in use); maximum gage height recorded, 22.7 ft Dec. 23, 1933; minimum discharge, 240 cfs Nov. 21, 1929.

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

Revisions (water years).--WSP 292: 1909 (calendar year). WSP 754: 1930-32. WSP 1348: 1910(M), 1930-32(M), 1945.

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

1.8	380	4.0	2,540
2.2	620	6.0	6,070
3.0	1,290	11.0	14,200

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	1,270	1,520	1,900	1,390	2,690	1,270	3,760	2,250	*2,240	1,010	471	550
2	1,140	1,420	1,800	1,330	3,540	1,240	3,450	2,250	2,180	930	471	530
3	1,030	1,710	1,700	1,270	3,710	1,200	3,220	2,140	2,240	882	465	520
4	959	1,530	1,600	1,220	3,240	1,190	2,990	2,040	2,210	866	453	850
5	890	1,580	1,500	1,200	3,310	1,260	2,870	1,900	2,040	858	441	780
6	850	1,300	1,450	1,270	3,330	1,500	2,750	2,010	1,950	858	435	700
7	948	1,230	1,450	1,240	7,050	1,480	2,700	3,130	1,800	842	424	640
8	1,010	1,160	1,400	1,190	8,140	1,990	2,680	2,800	1,660	810	418	580
9	3,040	1,110	1,350	1,130	5,710	2,020	2,680	2,420	1,540	770	408	540
10	2,330	1,060	*1,480	1,090	*4,970	1,930	2,310	2,310	1,520	746	402	520
11	5,150	1,010	2,440	1,090	4,080	1,780	2,320	2,540	1,520	706	402	500
12	3,708	1,000	5,700	1,060	4,470	1,680	2,220	2,630	1,500	676	396	*495
13	2,800	959	3,850	1,020	4,470	1,620	2,190	2,970	1,460	662	391	480
14	2,220	906	3,240	*1,020	3,920	1,630	3,040	2,730	1,540	655	386	470
15	1,900	957	6,340	1,010	5,590	3,020	3,780	2,440	1,830	627	435	450
16	1,700	914	7,020	1,060	4,410	*2,750	3,400	2,730	1,860	620	441	440
17	1,550	1,070	4,980	1,070	3,620	2,510	3,040	2,920	1,740	607	441	430
18	1,450	2,520	4,010	1,010	3,040	2,320	2,770	2,970	1,500	594	418	430
19	1,400	3,110	3,240	975	2,640	2,220	2,840	2,920	1,390	568	408	460
20	1,750	3,800	2,650	959	2,530	2,390	*4,410	5,630	1,500	555	402	460
21	1,720	9,300	2,510	930	2,290	2,770	4,570	5,510	1,380	549	413	450
22	3,080	8,310	2,250	914	2,030	2,960	4,390	4,390	1,280	525	525	430
23	5,360	13,000	2,060	1,120	1,840	2,870	3,580	3,620	1,230	507	*620	460
24	4,010	8,000	2,310	1,800	1,730	2,680	3,380	3,150	1,240	507	1,110	550
25	4,280	6,000	2,380	1,770	1,720	2,600	3,020	2,750	1,220	501	1,000	700
26	3,390	4,500	2,070	2,310	1,570	2,620	2,720	2,590	*1,160	495	890	550
27	*2,720	3,500	1,890	2,060	1,440	2,590	2,540	2,750	1,110	501	1,070	480
28	2,390	2,800	1,770	1,980	1,380	2,730	2,510	2,520	1,070	495	800	450
29	2,100	2,400	1,650	5,090	1,310	4,160	2,390	2,320	1,050	483	650	430
30	1,840	2,100	1,600	4,480	---	5,360	2,260	2,260	1,030	489	600	420
31	1,670	---	1,500	3,380	---	4,320	---	2,350	---	469	580	---
Total	69,597	89,556	81,270	48,418	95,930	72,660	90,370	88,310	46,990	20,583	16,766	15,725
Mean	2,245	2,985	2,622	1,562	3,508	2,344	3,012	2,849	1,568	658	541	524
Cfsm	4.74	6.30	5.53	3.30	6.98	4.95	6.35	6.01	3.30	1.39	1.14	1.11
In.	5.46	7.03	6.38	3.80	7.53	5.70	7.09	6.93	3.69	1.60	1.32	1.23
Ac-ft	138,000	177,600	161,200	96,040	190,300	144,100	179,200	175,200	93,200	40,430	33,250	31,190

Calendar year 1959: Max 16,300 Min 386 Mean 2,226 Cfsm 4.70 In. 63.74 Ac-ft 1,611,000  
 Water year 1959-60: Max 13,000 Min 386 Mean 2,011 Cfsm 4.24 In. 57.76 Ac-ft 1,460,000

Peak discharge (base, 9,000 cfs).--Nov. 21 (2:30 a.m.) 11,400 cfs (9.33 ft); Nov. 23 (time unknown) 14,100 cfs (10.94 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 12-19, Nov. 23 to Dec. 9, Aug. 28 to Sept. 11, Sept. 13-30: discharge estimated on basis of high-water mark in well, recorded range in stage, and records for the Kalama River below Italian Creek, near Kalama.

## 2430. Cowlitz River at Castle Rock, Wash.

Location.--Lat 46°16'30", long 122°54'50", in SE $\frac{1}{4}$  sec.10, T.9 N., R.2 W., on right bank at highway bridge in Castle Rock, 2 $\frac{1}{2}$  miles downstream from Toutle River and 14 miles upstream from mouth.

Drainage area.--2,238 sq mi.

Records available.--December 1926 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 19.73 ft above mean sea level, datum of 1929. Prior to Dec. 18, 1933, staff gage at site 2 miles upstream at datum 14.93 ft higher. Dec. 18, 1933, to June 13, 1934, staff or wire-weight gage and June 14 to Sept. 30, 1934, water-stage recorder, at present site at datum 5 ft higher.

Average discharge.--33 years (1927-60), 9,069 cfs (6,566,000 acre-ft per year).

Extremes.--Maximum discharge during year, 62,700 cfs Nov. 24 (gage height, 21.16 ft); minimum, 2,050 cfs Sept. 22, 23, 30 (gage height, 7.50 ft).  
1926-60: Maximum discharge observed, 139,000 cfs Dec. 23, 1933 (gage height, 31.6 ft, present datum), from rating curve extended above 65,000 cfs; minimum, 998 cfs Nov. 7, 8, 1935.

Remarks.--Records excellent. Minor diversions for domestic and farm use above station. No regulation. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1218: Drainage area. WSP 1638: 1947(P), 1951 (correction).

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

7.5	2,050	11.0	11,800
8.0	3,050	13.0	19,400
9.0	5,650	16.0	33,200
10.0	8,500	21.0	61,600

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	6,320	7,860	12,300	6,740	14,600	5,650	17,100	10,900	16,200	6,940	3,010	2,750
2	5,540	7,280	11,000	6,320	14,800	5,430	15,500	11,200	15,100	8,600	2,980	2,640
3	5,000	7,370	10,900	6,070	15,900	5,300	14,800	11,200	16,000	5,990	2,850	2,540
4	4,570	8,470	9,840	5,680	14,300	5,110	14,100	10,800	16,500	5,900	2,770	2,750
5	4,250	7,800	8,990	5,460	13,100	5,380	14,000	10,000	15,500	5,930	2,680	3,280
6	3,950	7,110	8,330	5,650	13,300	6,350	14,400	9,710	14,200	5,900	2,620	3,420
7	3,950	6,690	8,410	5,710	24,100	6,270	14,800	13,300	13,500	6,040	2,600	3,120
8	3,820	6,290	7,890	5,430	29,400	8,770	15,600	15,900	11,900	6,040	2,580	2,850
9	8,310	5,990	7,400	5,240	26,000	10,100	16,200	14,100	10,700	5,710	2,560	2,640
10	10,700	5,650	7,340	5,000	*21,800	9,260	14,900	12,800	10,300	5,300	2,580	2,520
11	14,400	5,380	9,170	4,920	18,400	8,120	13,300	13,800	10,400	5,000	2,580	2,460
12	23,900	5,160	16,400	4,870	16,000	*7,310	12,400	16,300	10,500	4,730	2,580	*2,400
13	18,400	4,920	15,400	*4,680	16,100	6,850	11,400	18,400	10,200	4,490	2,520	2,360
14	14,000	4,620	13,400	4,490	16,800	6,910	12,800	16,000	10,100	4,540	2,440	2,360
15	*11,200	4,600	28,600	4,440	23,600	10,900	16,000	13,700	11,500	4,490	2,460	2,310
16	9,420	4,570	38,900	4,620	19,400	11,400	15,200	13,200	12,200	4,270	2,440	2,250
17	8,150	4,410	31,000	4,790	16,200	9,900	13,000	14,200	14,400	4,160	2,380	2,210
18	7,170	9,530	22,400	4,490	13,900	9,110	12,100	15,000	11,500	4,110	*2,360	2,180
19	6,520	13,900	17,900	4,270	12,200	8,680	*12,300	14,100	9,550	4,160	2,380	2,100
20	6,740	15,500	15,300	4,160	10,800	9,110	16,200	20,600	9,330	4,110	2,380	2,140
21	9,110	39,800	13,500	4,060	10,300	10,800	18,000	24,800	8,830	3,930	2,380	2,140
22	22,100	39,000	11,800	4,030	9,450	12,800	16,200	21,400	8,150	3,700	2,440	2,070
23	26,820	58,300	10,700	4,580	8,560	15,700	14,300	18,000	7,800	3,500	2,500	2,100
24	23,000	61,000	11,000	8,270	7,950	13,700	13,500	15,900	7,950	3,330	3,540	2,250
25	20,000	*52,000	11,300	8,590	7,780	13,500	12,600	14,500	8,410	3,160	4,110	2,640
26	17,100	35,000	10,000	9,680	7,170	14,000	11,500	13,500	*8,040	3,070	4,080	2,580
27	14,000	24,500	9,080	9,360	6,600	14,500	10,800	*14,200	7,460	3,100	4,620	2,390
28	12,000	19,400	8,380	8,580	6,210	14,800	10,700	14,500	7,250	3,300	3,350	2,230
29	10,900	16,500	7,850	17,300	5,930	16,400	10,600	13,400	7,140	3,230	3,300	2,160
30	9,450	14,200	7,540	21,000	-----	21,400	10,500	13,300	7,080	3,120	2,960	2,090
31	8,530	-----	7,220	17,500	-----	19,300	-----	15,200	-----	3,050	2,810	-----
Total	338,600	500,800	409,250	216,090	420,650	320,810	414,800	453,610	327,690	140,900	88,460	73,880
Mean	10,920	16,690	13,200	6,971	14,510	10,350	13,830	14,630	10,920	4,545	2,854	2,463
Cfsm	4.88	7.46	5.90	3.11	6.48	4.62	6.18	6.54	4.88	2.03	1.28	1.10
In.	5.63	8.32	6.80	3.59	6.99	5.33	6.89	7.54	5.45	2.34	1.47	1.23
Ac-ft	671,600	993,300	811,700	428,600	834,300	636,300	822,700	899,700	650,000	278,500	175,500	146,500
Calendar year 1959: Max	61,000	Min	2,190	Mean	10,750	Cfsm	4.80	In.	65.19	Ac-ft	7,780	900
Water year 1959-60: Max	61,000	Min	2,070	Mean	10,120	Cfsm	4.52	In.	61.58	Ac-ft	7,350	000

Peak discharge (base, 32,000 cfs).--Nov. 24 (7:30 p.m.) 62,700 cfs (21.16 ft); Dec. 16 (5 a.m.) 40,000 cfs (17.35 ft).

\* Discharge measurement made on this day.

## 2435. Delameter Creek near Castle Rock, Wash.

Location.--Lat 46°15'50", long 122°58'00", in W $\frac{1}{2}$  sec.17, T.9 N., R.2 W., on right bank 3 miles upstream from mouth and 3 miles west of Castle Rock.

Drainage area.--19.4 sq mi.

Records available.--May 1949 to September 1960. Prior to October 1958, published as Arkansas Creek near Castle Rock.

Gage.--Water-stage recorder. Altitude of gage is 75 ft (from topographic map).

Average discharge.--11 years, 94.2 cfs (68,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,260 cfs Nov. 22 (gage height, 4.81 ft); minimum, 3.1 cfs Aug. 20, 21 (gage height, 0.40 ft).  
1949-60: Maximum discharge, 2,270 cfs Dec. 9, 1953 (gage height, 6.26 ft), from rating curve extended above 700 cfs on basis of summation of culvert measurements on two main tributaries a quarter of a mile upstream from station; minimum, 1.3 cfs Aug. 22, 1951; minimum gage height, 0.37 ft Aug. 25, 26, 1958.

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

Revisions (water years).--WSP 1448: 1954.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Oct. 14-21)

Oct. 1 to Nov. 22

Nov. 22 to Sept. 30

1.2	22	3.0	305	0.39	3.2	2.0	98
1.5	40	3.5	500	.6	7.2	2.5	165
2.0	90	4.0	770	.8	12.5	3.0	318
2.5	173			1.1	24	3.5	517
				1.5	48	4.5	1,070

Discharge, in cubic 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	56	98	59	154	57	226	88	55	15.5	5.5	11.5
2	26	52	92	54	179	54	206	79	50	15.5	5.6	11
3	26	77	85	51	234	56	179	74	46	14	5.8	9.7
4	24	59	76	48	206	53	154	68	43	13	5	13
5	23	52	69	47	194	69	134	61	40	12	5.2	15.5
6	23	51	65	51	218	77	118	68	37	11	4.6	15
7	24	46	63	47	318	93	103	60	36	10	4.4	12
8	39	44	60	45	*345	168	93	54	34	10	4	11
9	55	42	62	42	335	163	87	49	32	9.7	4	8.6
10	52	39	*66	40	284	170	76	47	30	10	4	6.5
11	212	36	116	42	231	147	87	49	29	10	3.9	*4.4
12	157	36	208	39	214	*124	80	57	28	9.4	3.8	4.4
13	113	33	156	*39	206	116	82	49	26	9.2	3.7	5.1
14	*84	32	368	38	451	122	110	45	34	9.2	4	4.9
15	*70	32	685	39	481	253	162	43	33	8.2	4.2	4.6
16	59	30	425	41	338	218	177	55	30	7.6	4.4	4.6
17	51	60	278	41	258	185	143	76	28	7.2	4.6	4.6
18	45	121	211	40	201	166	133	73	26	6.9	*4.0	4.6
19	42	142	166	40	166	152	*147	88	26	6.7	3.6	4.9
20	76	340	143	39	147	141	234	143	26	6.7	3.2	5.1
21	74	462	122	38	131	126	236	133	23	6.5	10.5	4.9
22	184	655	106	40	112	114	*204	118	22	6.3	11.5	5.5
23	167	855	97	68	99	103	190	110	20	6.3	17.5	6.5
24	140	478	111	99	92	92	183	104	19	6.3	24	8.1
25	119	328	101	111	84	84	177	101	*19	6.1	17	8.4
26	104	247	92	112	76	79	160	92	19	5.9	15.5	6.3
27	96	194	86	106	69	76	140	*86	17	5.4	13.5	5.7
28	84	160	78	136	64	79	124	77	16	5.2	11.5	5.5
29	76	133	73	270	60	260	108	70	15.5	5	11	5.1
30	68	112	71	228	---	264	97	66	16	5	10.5	5.1
31	61	---	65	183	---	258	---	61	---	5.5	11	---
Total	2,404	5,002	4,494	2,273	5,947	4,139	4,350	2,344	875.5	265.3	241.0	222.1
Mean	77.5	167	145	73.3	205	134	145	75.6	29.2	8.56	7.77	7.40
Cfsm	3.99	8.61	7.47	3.78	10.6	6.91	7.47	3.90	1.51	0.441	0.401	0.381
In.	4.61	9.59	8.62	4.36	11.40	7.93	8.34	4.49	1.68	0.51	0.46	0.43
Ac-ft	4,770	9,920	8,920	4,510	11,800	8,210	8,630	4,650	1,740	526	478	441

Calendar year 1959: Max 855 Min 4.5 Mean 104 Cfsm 5.36 In. 72.44 Ac-ft 74,940

Water year 1959-60: Max 855 Min 3.2 Mean 89.0 Cfsm 4.59 In. 62.42 Ac-ft 64,580

Peak discharge (base, 1,000 cfs).--Nov. 22 (10 p.m.) 1,260 cfs (4.81 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record July 27 to Aug. 17; discharge estimated on basis of records for nearby stations.

2450. Coweman River near Kelso, Wash.

Location.--Lat 46°07'40", long 122°50'10", in S $\frac{1}{2}$  sec.32, T.8 N., R.1 W., on right bank 3 miles downstream from Goble Creek, 3.8 miles southeast of Kelso, and 7 miles upstream from mouth.

Drainage area.--119 sq mi.

Records available.--July 1950 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 100 ft (from topographic map).

Average discharge.--10 years, 436 cfs (315,700 acre-ft per year).

Extremes.--Maximum discharge during year, 3,460 cfs Nov. 22 (gage height, 9.72 ft); minimum, 34 cfs Aug. 10 (gage height, 3.67 ft).

1950-60: Maximum discharge, 7,490 cfs Dec. 9, 1953 (gage height, 12.75 ft), from rating curve extended above 3,900 cfs as explained below; minimum, 22 cfs Sept. 22, 1951; minimum gage height, 3.62 ft Aug. 25, 26, Sept. 8, 1958.

Flood of Feb. 24, 1950, reached a stage of 12.8 ft, from floodmarks (discharge, 7,730 cfs, from rating curve extended above 3,900 cfs on basis of slope-area measurement of peak flow).

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

3.7	37	6.0	690
4.0	76	7.0	1,210
4.5	167	8.0	1,950
5.0	301	10.0	3,760

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	152	225	386	307	614	260	1,080	431	*304	105	48	*66
2	135	212	386	286	805	251	920	410	280	102	53	61
3	121	316	392	268	1,180	245	788	392	263	96	54	57
4	112	277	354	254	950	246	654	361	249	93	52	116
5	107	238	330	249	865	274	564	327	230	90	46	111
6	107	222	317	295	845	311	499	344	214	84	44	85
7	141	207	320	*271	1,490	307	445	515	204	79	42	72
8	192	196	292	271	1,500	523	414	420	194	76	41	83
9	663	184	286	251	1,650	591	586	568	184	*76	38	56
10	454	174	327	243	1,250	578	340	344	172	76	37	50
11	1,230	165	645	254	*935	531	420	350	165	75	41	49
12	955	163	2,050	238	800	479	406	386	160	72	*42	45
13	650	152	1,120	227	704	456	414	468	152	69	41	49
14	471	147	1,040	222	1,240	*445	614	414	184	73	39	49
15	389	147	2,030	222	1,850	1,320	1,130	372	209	66	45	47
16	311	141	1,570	288	1,250	1,060	*990	453	209	63	48	45
17	265	132	1,100	320	955	795	830	640	172	61	52	44
18	235	622	835	292	766	676	744	717	154	59	43	42
19	214	766	658	268	627	600	776	654	163	58	42	41
20	283	894	568	249	535	560	1,320	1,200	177	57	41	45
21	274	1,950	491	235	519	535	1,380	1,060	158	57	53	42
22	628	2,160	438	225	445	495	1,090	875	143	56	99	39
23	766	2,820	406	271	403	445	1,040	735	135	54	127	54
24	*622	1,720	539	456	375	403	1,070	640	127	54	207	66
25	573	*1,220	609	475	372	375	920	543	125	53	158	85
26	471	905	531	573	333	354	762	495	121	52	109	58
27	400	708	475	503	304	340	654	495	116	49	120	50
28	344	586	424	511	283	389	609	438	109	48	79	45
29	301	503	389	1,210	268	926	519	396	105	45	73	42
30	265	431	375	940	-----	1,340	468	361	105	47	66	41
31	243	-----	347	722	-----	1,250	-----	340	-----	50	66	-----
Total	12,054	18,643	20,030	11,394	24,093	17,361	22,224	15,944	5,283	2,095	2,048	1,715
Mean	389	621	646	368	831	560	741	514	176	67.6	66.1	57.2
Cfsm	5.27	5.22	5.43	3.09	6.98	4.71	6.23	4.32	1.48	0.568	0.555	0.481
In.	3.77	5.83	6.26	3.56	7.53	5.43	6.95	4.98	1.65	0.65	0.64	0.54
Ac-ft	23,910	36,980	39,730	22,600	47,790	34,440	44,080	31,620	10,480	4,160	4,060	3,400

Calendar year 1959: Max 3,680 Min 42 Mean 454 Cfsm 3.82 In. 51.76 Ac-ft 328,400  
 Water year 1959-60: Max 2,820 Min 37 Mean 418 Cfsm 3.51 In. 47.79 Ac-ft 303,200

Peak discharge (base, 2,600 cfs).--Nov. 22 (10 p.m.) 3,460 cfs (9.72 ft).

\* Discharge measurement made on this day.

2475. Elochoman River near Cathlamet, Wash.  
(Formerly published as Elokomin River near Kathlamet)

Location.--Lat 46°13'10", long 123°20'30", in SE $\frac{1}{4}$  sec.31, T.9 N., R.5 W., on right bank 125 ft upstream from railroad bridge, 2 $\frac{1}{2}$  miles northeast of Cathlamet, and 4 $\frac{1}{2}$  miles upstream from mouth.

Drainage area.--65.8 sq mi.

Records available.--October 1940 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 29.60 ft above mean sea level, datum of 1929. Prior to June 25, 1941, staff gage at same site and datum.

Average discharge.--20 years, 375 cfs (271,500 acre-ft per year).

Extremes.--Maximum discharge during year, 5,440 cfs Nov. 22 (gage height, 9.73 ft); minimum, 31 cfs Aug. 20, 21, Sept. 30 (gage height, 1.13 ft).

1940-60: Maximum discharge, 7,300 cfs Feb. 17, 1949 (gage height, 12.66 ft), from rating curve extended above 2,100 cfs on basis of slope-area measurement of peak flow; minimum, 18 cfs Oct. 6, 7, 15, 16, 1952; minimum gage height, 1.01 ft Sept. 22-26, 1957. Maximum stage known, 17.2 ft in December 1933, from information by local residents.

Remarks.--Records excellent. Some diversions for irrigation and domestic use. No regulation. Records of water temperatures for the water year 1960 are given in WSP 1744.

Revisions (water years).--WSP 1154: 1948. WSP 1218: Drainage area. WSP 1318: 1942-47(M). WSP 1638: 1943(P), 1945(P).

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

1.1	28	3.0	485
1.4	59	4.5	1,270
1.7	105	6.0	2,580
2.3	246	8.0	3,980

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	238	287	433	249	610	238	805	338	224	79	42	46
2	215	266	402	238	805	224	745	311	208	76	43	43
3	195	346	380	224	927	226	628	290	187	72	40	41
4	182	281	342	218	790	224	537	272	175	70	41	45
5	166	252	308	210	805	284	465	249	163	66	58	72
6	168	238	296	226	1,070	332	413	272	154	62	36	58
7	168	224	284	208	1,760	402	370	255	147	59	35	47
8	308	210	*260	197	1,460	565	335	229	141	58	34	43
9	509	197	249	187	*1,280	557	311	210	134	58	33	39
10	377	190	314	182	1,090	574	284	202	128	57	33	37
11	1,320	180	610	178	888	*533	308	210	122	57	33	*37
12	1,040	182	815	*173	888	485	311	238	120	55	33	37
13	725	166	619	170	966	469	332	215	111	54	32	37
14	574	161	1,510	168	1,890	525	549	195	143	54	37	36
15	*481	166	3,850	170	1,910	1,510	730	187	145	52	36	36
16	398	150	2,020	187	1,320	1,080	628	221	166	51	37	35
17	335	287	1,240	195	978	845	583	445	143	47	40	35
18	299	655	916	175	780	710	537	398	120	48	*35	35
19	278	805	715	175	642	632	691	421	124	46	33	36
20	457	2,150	624	168	545	578	*1,300	770	124	46	32	37
21	449	2,580	525	163	553	529	1,130	664	109	45	43	35
22	1,400	3,390	461	163	457	485	856	561	102	44	47	34
23	1,110	3,200	413	283	405	421	795	481	96	44	85	44
24	872	2,010	421	592	370	380	750	421	93	43	182	54
25	770	1,430	402	698	338	342	696	394	*91	42	102	55
26	628	1,060	363	720	308	323	610	*346	88	40	113	43
27	541	822	332	646	281	311	525	308	86	40	80	38
28	477	673	308	746	263	363	477	278	84	39	60	35
29	402	578	293	1,350	249	931	409	252	80	38	54	32
30	352	485	296	384	-----	938	374	246	80	38	49	32
31	314	-----	269	750	-----	863	-----	249	-----	41	49	-----
Total	15,748	23,619	20,270	10,991	24,628	16,899	17,484	10,128	3,868	1,619	1,582	1,234
Mean	508	787	654	355	849	545	585	327	130	52.2	51.0	41.1
Cfsm	7.72	12.0	9.94	5.40	12.9	8.28	8.86	4.97	19.8	0.795	0.775	0.625
In.	4.90	13.35	11.46	6.21	13.92	9.55	9.88	5.72	2.20	0.92	0.89	0.70
Ac-ft	31,240	46,850	40,200	21,800	48,850	33,520	34,680	20,090	7,710	3,210	3,140	2,450

Calendar year 1959: Max 3,850 Min 37 Mean 463 Cfsm 7.04 In. 95.46 Ac-ft 335,000  
Water year 1959-60: Max 3,850 Min 32 Mean 405 Cfsm 6.16 In. 83.70 Ac-ft 293,700

Peak discharge (base, 3,600 cfs).--Nov. 20 (11 p.m.) 4,270 cfs (8.36 ft); Nov. 22 (7:30 p.m.) 5,440 cfs (9.73 ft); Dec. 15 (2 a.m.) 4,380 cfs (8.50 ft).

\* Discharge measurement made on this day.

2490. Grays River above South Fork, near Grays River, Wash.

Location.--Lat 46°23'35", long 123°28'35", in NW¼ sec.31, T.11 N., R.6 W., on right bank 500 ft upstream from South Fork and 7 miles northeast of town of Grays River.

Drainage area.--33.4 sq mi.

Records available.--October 1955 to September 1960.

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

Average discharge.--5 years, 353 cfs (255,600 acre-ft per year).

Extremes.--Maximum discharge during year, 5,230 cfs Dec. 15 (gage height, 9.10 ft), from rating curve extended above 2,700 cfs on basis of contracted-opening measurement of peak flow; minimum, 24 cfs Aug. 20, 21 (gage height, 2.95 ft).  
1955-60: Maximum discharge, 7,050 cfs Dec. 9, 1956 (gage height, 10.23 ft), from rating curve extended above 1,600 cfs on basis of contracted-opening measurement of peak flow; minimum, 18.5 cfs Aug. 23-27, 1958 (gage height, 2.89 ft).

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)

2.9	19	5.0	680
3.2	51	6.0	1,400
3.6	119	7.0	2,410
4.0	239	9.0	5,080

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	225	201	269	158	512	139	764	208	208	64	34	47
2	194	178	258	147	669	132	686	191	185	63	34	44
3	169	254	232	139	722	139	550	178	166	61	31	40
4	150	194	208	134	615	139	435	166	150	60	30	45
5	136	169	188	124	610	214	371	150	139	59	29	79
6	124	158	175	142	1,410	272	311	194	124	58	28	58
7	122	142	172	126	1,880	379	272	178	117	54	27	51
8	322	134	158	117	1,280	453	232	164	110	52	27	45
9	395	122	*152	112	*944	403	208	144	99	52	26	43
10	323	115	218	108	746	395	191	147	95	51	26	40
11	1,100	110	837	101	575	*363	204	144	92	51	25	*39
12	812	106	860	*99	620	343	288	175	90	50	26	38
13	550	95	565	97	610	335	299	172	86	49	25	37
14	431	92	1,680	99	1,700	436	462	158	101	47	25	36
15	351	101	4,010	97	1,380	1,460	*550	144	104	46	26	35
16	284	90	1,620	104	842	895	480	191	178	45	26	32
17	239	225	854	119	595	698	440	440	124	43	*27	32
18	204	570	805	110	476	585	482	387	106	41	28	31
19	185	692	471	104	387	540	636	458	117	40	25	32
20	695	2,800	415	97	347	545	1,360	782	115	38	24	32
21	575	2,360	347	95	367	484	916	615	99	38	38	29
22	1,090	2,550	303	112	311	415	652	507	93	38	41	29
23	*824	2,400	276	284	276	359	565	419	86	37	59	38
24	740	1,330	296	610	243	519	516	359	*81	37	83	49
25	669	881	280	698	222	272	444	327	79	36	147	44
26	520	630	250	740	191	261	395	*269	78	35	119	37
27	431	502	232	680	175	243	347	265	73	35	79	31
28	371	423	214	1,060	164	315	311	236	70	34	63	29
29	311	359	198	1,970	150	1,160	269	204	67	34	58	27
30	265	307	194	1,030	---	1,120	236	211	66	32	52	27
31	232	---	172	647	---	909	---	243	---	34	52	---
Total	13,039	18,290	16,709	10,260	18,919	14,722	13,852	8,426	3,298	1,414	1,339	1,176
Mean	421	610	539	331	652	475	462	272	110	45.6	43.2	39.2
Cfs/m	12.6	18.3	16.1	9.91	19.5	14.2	13.8	8.14	3.29	1.37	1.29	1.17
In.	14.52	20.37	18.61	11.42	21.07	16.39	15.42	9.38	3.67	1.57	1.49	1.31
Ac-ft	25,860	36,280	33,140	20,350	37,530	29,200	27,480	16,710	6,540	2,800	2,660	2,330

Calendar year 1959: Max 4,010 Min 29 Mean 392 Cfs/m 11.7 In. 159.47 Ac-ft 284,000  
Water year 1959-60: Max 4,010 Min 24 Mean 332 Cfs/m 9.94 In. 135.22 Ac-ft 240,900

Peak discharge (base, 2,900 cfs).--Nov. 20 (9:30 p.m.) 4,810 cfs (8.82 ft); Nov. 22 (7 p.m.) 3,900 cfs (8.18 ft); Dec. 15 (11 a.m.) 5,230 cfs (9.10 ft); Feb. 6 (9:30 p.m.) 5,830 cfs (8.13 ft).

\* Discharge measurement made on this day.

2495. Grays River below South Fork, near Grays River, Wash.

Location.--Lat 46°23'30", long 123°28'35", in SW¼ sec.31, T.11 N., R.6 W., on right bank 400 ft downstream from South Fork and 7 miles northeast of town of Grays River.

Drainage area.--56.3 sq mi.

Records available.--September 1955 to September 1960 (discontinued).

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

Average discharge.--5 years, 527 cfs (381,500 acre-ft per year).

Extremes.--Maximum discharge during year, 8,120 cfs Dec. 15 (gage height, 9.25 ft), from rating curve extended above 4,400 cfs by logarithmic plotting; minimum, 28 cfs Aug. 20, 21 (gage height, 2.03 ft).  
1955-60: Maximum discharge, 10,700 cfs Dec. 9, 1956 (gage height, 10.4 ft, from high-water mark in well), from rating curve extended above 2,400 cfs by logarithmic plotting; minimum, 23 cfs Aug. 20-27, 1958; minimum gage height, that of Aug. 20, 21, 1960.

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 Feb. 7 to May 31, Aug. 23 to Sept. 1, Sept. 5-8, 24, 25)

2.0	26	4.0	690
2.2	42	5.0	1,520
2.5	81	6.0	2,640
3.0	195	8.0	5,610
3.5	590	10.0	9,770

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	337	297	354	220	718	226	1,220	321	301	88	40	78
2	297	269	333	209	1,030	209	1,120	297	273	83	40	70
3	265	350	325	195	1,120	212	872	281	248	81	38	63
4	240	293	289	183	950	212	669	254	220	78	38	72
5	223	262	273	180	926	321	537	240	206	74	38	140
6	212	240	258	198	2,380	386	456	289	183	68	35	102
7	202	223	254	183	2,890	588	390	281	171	66	33	84
8	548	206	234	174	1,860	697	358	251	160	65	33	75
9	753	195	*234	162	1,510	600	329	234	145	63	32	66
10	555	189	325	160	1,180	562	297	234	136	62	32	62
11	1,940	177	1,300	155	918	*549	325	237	129	61	32	61
12	1,400	171	1,380	*148	934	478	425	277	118	60	32	57
13	926	162	918	140	1,010	473	462	281	114	57	32	58
14	*683	152	2,380	145	2,630	624	683	258	131	54	32	53
15	513	168	6,290	142	2,260	2,210	880	244	140	53	32	50
16	425	148	2,430	152	1,370	1,380	760	313	226	52	33	49
17	350	305	1,280	168	974	1,090	718	711	160	51	*34	48
18	309	842	902	155	725	950	760	624	139	49	32	46
19	289	1,130	614	152	562	880	1,100	707	145	48	30	49
20	965	4,360	531	148	501	865	2,280	1,280	148	46	29	48
21	910	3,520	425	140	525	768	1,520	1,030	131	45	49	46
22	1,830	3,990	363	162	440	648	1,080	820	122	42	58	46
23	1,400	3,880	337	407	395	555	910	641	114	42	150	61
24	1,180	2,090	363	910	358	473	812	519	110	42	155	83
25	1,070	1,400	341	1,070	333	420	704	468	108	41	237	75
26	828	1,020	321	1,130	305	400	588	*415	104	40	226	58
27	648	760	297	1,050	277	381	507	386	100	40	152	49
28	525	600	285	1,650	254	507	435	350	96	39	122	45
29	430	495	269	2,850	---	1,880	386	313	91	38	108	42
30	358	415	262	1,500	---	1,710	345	317	90	38	91	41
31	321	---	240	990	---	1,450	---	350	---	39	88	---
Total	20,932	28,309	24,387	15,228	29,575	22,704	21,928	13,213	4,558	1,705	2,113	1,877
Mean	675	944	787	491	1,020	732	731	426	152	55.0	68.2	62.6
Cfsm	12.0	16.8	14.0	8.72	18.1	13.0	13.0	7.57	2.70	0.977	1.21	1.11
In.	13.83	18.70	16.11	10.06	19.54	15.00	14.48	8.73	3.01	1.13	1.40	1.24
Ac-ft	41,520	56,150	48,370	30,200	58,660	45,030	43,490	26,210	9,040	3,380	4,190	3,720

Calendar year 1959: Max 6,290 Min 46 Mean 597 Cfsm 10.6 In. 143.84 Ac-ft 431,900  
Water year 1959-60: Max 6,290 Min 29 Mean 510 Cfsm 9.06 In. 123.23 Ac-ft 370,000

Peak discharge (base, 5,000 cfs).--Nov. 20 (9:30 p.m.) 7,310 cfs (8.92 ft); Nov. 22 (7 p.m.) 6,220 cfs (8.35 ft); Dec. 15 (12:30 p.m.) 8,120 cfs (9.25 ft); Feb. 6 (9 p.m.) 6,150 cfs (8.26 ft).

\* Discharge measurement made on this day.

2505. West Fork Grays River near Grays River, Wash.

Location.--Lat 46°23'10", long 123°33'30", on line between sec.33, T.11 N., R.7 W., and sec.4, T.10 N., R.7 W., on right bank 1 mile upstream from mouth and 3 1/4 miles northeast of town of Grays River.

Drainage area.--16.3 sq mi.

Records available.--April 1949 to September 1960. Prior to October 1958, published as West Branch Grays River near Grays River.

Gage.--Water-stage recorder. Altitude of gage is 71 ft (by barometer).

Average discharge.--11 years, 129 cfs (93,390 acre-ft per year).

Extremes.--Maximum discharge during year, 2,680 cfs Feb. 6 (gage height, 6.21 ft), from rating curve extended above 1,000 cfs on basis of slope-area measurement at gage height 6.89 ft; minimum, 3.7 cfs Sept. 20 (gage height, 2.21 ft, result of bulldozing upstream). 1949-60: Maximum discharge, 2,970 cfs Feb. 9, 1951 (gage height, 6.45 ft), from rating curve extended above 460 cfs on basis of slope-area measurement at gage height 6.89 ft; minimum, that of Sept. 20, 1960; minimum gage height, 1.78 ft Sept. 5, 1951. Flood of Feb. 22, 1949, reached a stage of 6.89 ft, from floodmarks (discharge, 3,700 cfs, from rating curve extended above 460 cfs on basis of slope-area measurement of peak flow).

Remarks.--Records good except those below 10 cfs, 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 Nov. 22

Nov. 23 to Sept. 30

2.5	33	4.0	495	2.3	6.4	3.5	250
3.0	108	4.5	840	2.4	11.5	4.0	495
3.5	250	6.0	2,400	2.6	31	4.5	840
				3.0	107	6.0	2,400

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	91	74	84	51	175	51	232	78	99	28	11.5	21
2	77	68	84	47	222	47	232	76	84	26	11	19.5
3	69	91	78	45	232	51	180	71	75	24	10.5	18.5
4	63	75	71	42	*196	53	145	65	67	23	9.5	23
5	57	66	65	40	196	96	121	80	62	22	9.5	49
6	56	62	63	45	937	118	105	90	56	21	9.5	36
7	53	58	60	*42	849	138	92	92	51	20	9.5	26
8	115	54	54	40	473	169	84	80	47	20	9.0	21
9	138	52	*53	38	355	158	76	71	44	18.5	8.4	15
10	102	49	*78	36	266	*169	73	67	40	17.5	9.0	*13.5
11	391	47	312	36	205	161	78	65	38	17.5	8.4	13
12	278	47	270	35	218	148	107	71	36	16.5	7.9	13
13	180	42	169	33	226	142	114	71	33	16.5	7.9	12.5
14	138	40	676	36	685	181	132	65	44	16	8.4	12.5
15	*112	44	1,320	40	490	546	*169	60	45	15	8.4	11.5
16	97	40	543	51	286	294	155	80	90	15	9.5	11.5
17	84	78	286	69	205	229	142	196	60	14	*10.5	11
18	74	205	186	62	158	183	150	150	47	13	10	11
19	70	254	142	54	132	166	215	208	49	13	9.0	11.5
20	246	1,120	128	49	118	142	525	370	51	13	8.4	10.5
21	189	961	107	45	123	123	312	250	42	12.5	27	10
22	589	1,320	94	53	107	105	215	202	38	12.5	21	10
23	355	1,130	84	119	94	92	186	158	35	12.5	37	16
24	335	562	88	254	86	82	172	130	*33	12.5	71	24
25	282	340	90	229	78	75	150	*114	31	11.5	88	22
26	193	222	86	278	71	73	135	103	30	11.5	78	16.5
27	150	166	78	270	63	69	118	103	28	11.5	58	13
28	128	138	71	449	58	92	105	96	29	11	40	12.5
29	108	116	65	888	54	364	94	86	29	11	33	11
30	93	99	63	407	-----	355	84	92	28	11.5	27	10.5
31	82	-----	56	236	-----	299	-----	121	-----	11.5	22	-----
Total	4,985	7,620	5,584	4,119	7,358	4,971	4,698	3,541	1,441	499.0	687.8	506.0
Mean	161	254	180	133	254	160	157	114	48.0	16.1	22.2	16.9
Cfs/m	9.88	15.6	11.0	8.16	15.6	9.82	9.63	6.99	2.94	0.988	1.36	1.04
In.	11.37	17.39	12.74	9.40	16.79	11.34	10.72	8.08	3.29	1.14	1.57	1.15
Ac-ft	9,890	15,110	11,080	8,170	14,590	9,860	9,320	7,020	2,860	990	1,360	1,000

Calendar year 1959: Max 1,410 Min 12.5 Mean 140 Cfs/m 8.59 In. 116.96 Ac-ft 101,700  
 Water year 1959-60: Max 1,320 Min 7.9 Mean 126 Cfs/m 7.73 In. 104.98 Ac-ft 91,250

Peak discharge (base, 1,500 cfs).--Nov. 20 (9 p.m.) 2,160 cfs (5.81 ft); Nov. 22 (6:30 p.m.) 2,220 cfs (5.86 ft); Dec. 15 (1:30 a.m.) 1,570 cfs (5.28 ft); Feb. 6 (7 p.m.) 2,680 cfs (6.21 ft).

\* Discharge measurement made on this day.

## NEHALEM RIVER BASIN

3010. Nehalem River near Foss, Oreg.

Location (revised).--Lat 45°42'15", long 123°45'15", in NW $\frac{1}{4}$  sec.35, T.3 N., R.9 W., on right bank 0.2 mile upstream from Cook Creek and 2.2 miles northeast of Foss.

Drainage area.--667 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 32.60 ft above mean sea level, datum of 1929 (State Highway Department bench mark). Prior to Nov. 11, 1939, staff gage at same site and datum.

Average discharge.--21 years, 2,714 cfs (1,965,000 acre-ft per year).

Extremes.--Maximum discharge during year, 21,600 cfs Nov. 23 (gage height, 14.19 ft); minimum, 94 cfs Sept. 17, 18.

1939-60: Maximum discharge, 39,300 cfs Dec. 21, 1955 (gage height, 19.67 ft); minimum, 54 cfs Sept. 22-24, 1951.

Remarks.--Records good except those for period of shifting control, which are fair. No regulation. Several small diversions for irrigation and domestic use above station.

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. 23 to Sept. 30

2.2	450	6.0	4,240
2.6	690	9.0	9,660
3.0	970	12.0	15,900
4.0	1,840		

1.3	86	4.0	1,770
1.7	190	6.0	4,050
2.0	305	9.0	9,220
2.5	565	12.0	15,900
3.0	920	14.0	21,000

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	1,060	928	*2,330	2,140	7,430	1,630	8,970	2,430	1,590	375	138	154
2	900	844	2,120	1,950	8,210	1,540	7,450	2,240	1,470	370	140	146
3	788	1,060	2,030	1,780	10,300	1,560	6,040	2,060	1,330	350	140	158
4	704	1,190	1,880	1,650	11,500	1,800	4,930	1,900	1,230	336	146	143
5	642	1,070	1,710	1,550	10,000	1,840	4,080	*1,770	1,150	318	146	160
6	594	949	1,590	1,550	10,700	2,480	3,430	1,730	1,070	297	143	157
7	594	865	1,570	*1,540	16,000	2,930	2,990	1,720	1,000	277	135	146
8	982	785	1,510	1,500	15,800	5,120	2,650	1,610	928	261	129	135
9	3,520	732	1,450	1,410	15,400	7,470	2,390	1,480	880	253	124	*132
10	2,540	678	1,480	1,320	13,000	7,230	2,160	1,400	826	245	119	116
11	6,310	618	4,300	1,310	*9,520	6,330	2,040	1,340	777	241	116	106
12	*5,200	588	10,200	1,270	7,850	5,410	2,060	1,480	749	237	114	102
13	3,580	546	9,920	1,220	7,300	4,700	2,150	1,690	700	229	114	100
14	2,520	510	7,470	1,210	8,610	4,550	2,840	1,640	700	225	111	98
15	1,880	498	9,820	1,220	11,200	7,430	4,670	1,540	756	222	114	96
16	1,430	490	9,420	1,320	10,000	8,560	5,630	1,610	777	218	124	96
17	1,150	558	7,450	1,600	8,190	7,470	5,140	2,260	749	208	127	96
18	856	1,470	6,040	1,640	6,520	6,040	4,820	3,010	665	194	124	96
19	837	2,080	4,820	1,610	5,260	4,990	5,620	3,200	637	190	122	98
20	963	5,020	4,050	1,550	4,300	4,220	8,350	5,180	651	181	116	98
21	949	13,300	3,520	1,470	3,800	3,610	9,050	5,680	624	175	124	96
22	*2,460	15,600	3,060	1,490	3,380	3,130	8,000	5,230	578	172	154	96
23	3,070	20,000	2,760	2,000	2,960	2,740	6,670	4,420	*517	166	194	98
24	2,580	12,800	2,760	3,600	2,680	*2,460	6,180	3,730	472	160	297	114
25	2,350	8,420	3,040	4,050	2,480	2,210	5,670	3,210	450	160	265	135
26	1,920	6,200	3,000	5,300	2,280	2,060	4,850	2,870	445	154	245	138
27	1,630	4,670	2,870	5,490	2,070	1,920	4,080	2,580	435	152	237	132
28	1,490	3,740	2,690	6,600	1,890	1,950	3,520	2,310	415	149	204	124
29	1,310	3,100	2,490	14,900	1,730	6,340	3,070	2,080	395	*143	181	119
30	1,170	2,660	2,420	15,400	-----	10,100	2,700	1,890	380	143	166	109
31	1,030	-----	2,340	10,100	-----	10,400	-----	1,740	-----	138	160	-----
Total	57,709	111,969	122,110	100,750	220,140	140,030	142,200	77,040	23,346	6,939	4,769	3,574
Mean	1,862	3,732	3,939	3,250	7,491	4,517	4,740	2,485	778	224	154	119
Cfsm	2.79	5.60	5.91	4.87	11.4	6.77	7.11	3.73	1.17	0.336	0.231	0.178
In.	3.22	6.24	6.81	5.62	12.27	7.81	7.93	4.30	1.30	0.39	0.27	0.20
Ac-ft	114,500	222,100	242,200	199,800	436,600	277,700	282,000	152,800	46,310	13,760	9,460	7,090

Calendar year 1959: Max 20,100 Min 130 Mean 2,836 Cfsm 4.25 In. 57.72 Ac-ft 2,053,000  
 Water year 1959-60: Max 20,000 Min 96 Mean 2,761 Cfsm 4.14 In. 56.36 Ac-ft 2,004,000

Peak discharge (base, 19,000 cfs).--Nov. 23 (2:30 a.m.) 21,600 cfs (14.19 ft).

\* Discharge measurement made on this day.

Note.--Shifting-control method used Oct. 8 to Nov. 22.

## WILSON RIVER BASIN

3015. Wilson River near Tillamook, Oreg.

Location (revised).--Lat 45°28'35", long 123°43'20", in SE<sup>1</sup>/<sub>4</sub> sec.13, T.1 S., R.9 W., on right bank 1.0 mile upstream from Little North Fork and 6.0 miles east of Tillamook.

Drainage area.--161 sq mi (revised).

Records available.--October 1914 to September 1915, August to November 1916, July 1931 to September 1960. Prior to January 1915 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 42.13 ft above mean sea level, datum of 1929. Dec. 18, 1914, to Nov. 4, 1916, staff gage at site three-quarters of a mile downstream at different datum. July 30, 1931, to Sept. 30, 1938, staff gage at site 100 ft downstream at datum 0.93 ft higher.

Average discharge.--30 years (1914-15, 1931-60), 1,218 cfs (881,800 acre-ft per year).

Extremes.--Maximum discharge during year, 11,500 cfs Nov. 22 (gage height, 10.32 ft); minimum, 73 cfs Sept. 29, 30.

1914-16, 1931-60: Maximum discharge, 30,000 cfs Dec. 21, 1933 (gage height, 19.28 ft, site and datum then in use), from rating curve extended above 15,000 cfs; minimum, 45 cfs Oct. 15, 16, 17, 18, 1952.

Flood in February 1916 reached a stage of 20.8 ft, from floodmarks, site and datum then in use.

Remarks.--Records excellent. No regulation. Small diversions for domestic use above station.

Revisions (water years).--WSP 1398: 1953.

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

Oct. 1-10		Oct. 11 to Sept. 30			
1.5	428	0.3	61	2.0	695
2.0	675	.7	138	3.0	1,340
3.0	1,340	1.0	226	5.0	3,310
5.0	3,360	1.5	432	9.0	9,200

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	730	690	*942	728	2,280	602	3,550	876	684	194	104	107
2	640	640	882	695	3,080	568	3,070	810	629	194	107	100
3	570	854	840	651	3,680	612	2,420	750	565	185	104	96
4	520	804	762	607	3,560	706	1,900	700	536	179	102	117
5	475	706	695	585	3,360	1,070	1,530	*646	505	170	104	136
6	452	646	662	640	4,180	1,540	1,280	739	470	164	102	131
7	428	602	662	*624	7,020	1,540	1,110	792	442	156	100	115
8	1,340	563	596	596	5,300	2,240	996	695	418	151	98	102
9	3,240	530	580	558	5,500	2,040	900	634	394	151	96	*92
10	2,450	495	696	556	4,240	1,780	816	607	380	148	96	92
11	5,860	466	2,160	552	*3,090	1,540	804	596	353	146	94	89
12	*3,830	446	5,170	525	2,720	1,380	858	673	340	143	94	87
13	2,520	413	2,900	500	2,720	1,360	978	744	324	141	92	87
14	1,820	394	2,650	515	4,660	1,420	1,480	750	344	143	90	87
15	1,420	418	5,500	515	5,920	3,290	2,090	706	362	138	50	83
16	1,140	375	4,330	568	3,790	3,040	1,840	774	380	133	92	81
17	966	500	2,850	678	2,750	2,330	1,710	1,470	332	129	89	80
18	846	1,130	2,170	646	2,140	2,000	1,820	2,010	307	126	89	78
19	774	1,440	1,670	612	1,720	1,720	2,320	1,950	307	120	85	80
20	882	2,320	1,430	563	1,440	1,580	3,960	2,980	315	117	83	80
21	822	5,360	1,210	530	1,290	1,440	3,510	2,740	288	115	102	78
22	2,400	7,510	1,080	580	1,140	1,260	2,620	2,360	265	115	164	78
23	2,370	8,030	990	943	1,010	1,120	2,100	1,880	*258	115	213	83
24	1,850	4,430	1,090	2,190	930	*996	1,730	1,540	244	111	269	89
25	1,540	2,900	1,220	2,140	888	900	1,460	1,320	233	109	210	94
26	1,280	2,180	1,120	2,840	804	840	1,310	1,180	226	109	200	85
27	1,130	1,720	1,030	2,540	728	786	1,190	1,060	223	107	159	80
28	1,010	1,440	960	3,560	678	888	1,170	960	213	104	136	76
29	906	1,210	882	7,640	634	4,110	1,050	870	204	*102	126	76
30	816	1,060	870	4,580	-----	4,850	946	804	200	102	117	73
31	750	-----	798	2,890	-----	4,000	-----	756	-----	102	113	-----
Total	45,757	50,252	49,397	42,127	81,052	53,548	52,540	35,272	10,761	4,219	3,720	2,732
Mean	1,476	1,675	1,593	1,359	2,795	1,727	1,751	1,138	359	136	120	91.1
Cfs/m	9.17	10.4	9.89	8.44	17.4	10.7	10.9	7.07	2.23	0.845	0.745	0.566
In.	10.57	11.61	11.41	9.73	12.37	12.37	12.14	8.15	2.49	0.97	0.86	0.63
Ac-ft	90,760	99,670	97,980	83,560	160,800	106,200	104,200	69,960	21,340	8,370	7,380	5,420

Calendar year 1959: Max 10,400 Min 73 Mean 1,263 Cfs/m 7.84 In. 108.52 Ac-ft 914,500  
 Water year 1959-60: Max 8,030 Min 74 Mean 1,179 Cfs/m 7.32 In. 99.65 Ac-ft 855,600

Peak discharge (base, 12,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

3029. Nestucca River near Fairdale, Oreg.

Location.--Lat 45°18'40", long 123°25'05", in SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec.15, T.3 S., R.6 W., on right bank 100 ft upstream from Meadow Lake, 0.4 mile downstream from Walker Creek, and 5.3 miles southwest of Fairdale.

Drainage area.--6.18 sq mi.

Records available.--June to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,809.20 ft above mean sea level (levels by Bureau of Public Roads).

Extremes.--Maximum discharge during period June to September, 16 cfs June 20 (gage height, 2.85 ft); minimum, 1.5 cfs Sept. 30.

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)

2.2	1.3
2.3	2.2
2.4	3.8
2.5	5.8
2.7	11

Discharge, in cubic feet per second, 1960

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1	-	5.6	2.5	2.2	11	-	3.6	2.2	1.8	21	8.2	2.8	2.2	1.8
2	-	5.8	2.5	2.2	12	-	3.6	2.2	1.8	22	7.5	2.8	3.8	1.7
3	-	5.4	2.6	2.4	13	-	3.6	2.1	1.9	23	7.2	2.8	3.6	1.7
4	-	5.4	2.8	3.8	14	-	4.1	2.1	1.9	24	6.8	2.8	5.4	1.8
5	-	4.5	2.5	2.9	15	-	3.6	2.1	1.8	25	6.5	2.6	4.1	2.0
6	-	4.3	2.5	2.5	16	-	3.4	2.0	1.8	26	6.5	2.6	3.1	1.8
7	-	4.1	2.4	2.2	17	*8.8	3.1	2.0	1.8	27	6.2	2.5	2.6	1.6
8	-	3.9	2.2	2.1	18	8.5	3.1	2.0	1.8	28	6.0	*2.4	2.5	1.6
9	-	3.9	2.1	2.1	19	8.8	2.9	2.0	1.8	29	5.8	2.4	2.5	1.6
10	-	3.8	2.1	1.9	20	9.9	2.8	1.9	1.8	30	6.0	*2.2	2.4	1.5
										31		2.5	2.2	
Total.....	-									-	108.9	79.0	59.6	
Mean.....	-									-	3.51	2.55	1.99	
Cubic feet per second per square mile.....	-									-	0.589	0.413	0.322	
Runoff in inches.....	-									-	0.86	0.48	0.36	
Runoff in acre-feet.....	-									-	218	157	118	

Peak discharge (base, 190 cfs).--No peak above base.

\* Discharge measurement made on this day.

## 3055. Siletz River at Siletz, Ore.

Location (revised).--Lat 44°42'55", long 123°53'10", in NW¼SW¼ sec.11, T.10 S., R.10 W., on right bank 1.5 miles east of Siletz and 1.8 miles downstream from Baker Creek.

Drainage area.--202 sq mi.

Records available.--October 1905 to November 1911, January to May 1912, January to June 1924, November 1924 to September 1960. Prior to December 1905 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 102.32 ft above mean sea level, datum of 1929. Oct. 1, 1905, to May 4, 1912, staff gage, Jan. 1 to Nov. 5, 1924, chain gage, and Nov. 6, 1924, to Sept. 30, 1938, staff or wire-weight gage, all at sites within 2½ miles downstream at different datums.

Average discharge.--41 years (1905-11, 1925-60), 1,598 cfs (1,157,000 acre-ft per year).

Extremes.--Maximum discharge during year, 14,200 cfs Feb. 9 (gage height, 15.20 ft); minimum, 72 cfs Sept. 30.

1905-12, 1924-60: Maximum discharge, 37,000 cfs Feb. 17, 1949 (gage height, 25.17 ft), from rating curve extended above 15,000 cfs by logarithmic plotting; minimum observed, 51 cfs Dec. 6, 7, 1929.

Maximum discharge known, 40,800 cfs Nov. 20, 1921 (gage height, 31.6 ft, site and datum then in use), from rating curve extended above 17,000 cfs.

Remarks.--Records excellent. Slight regulation from logponds. Small diversions above station for irrigation of not more than 600 acres.

Revisions (water years).--WSP 754: 1922 (maximum gage height). WSP 814: 1935.

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

Oct. 1-22

Oct. 23 to Sept. 30

3.7	580	2.1	62	6.0	2,060
5.0	1,340	2.5	135	8.0	3,830
7.0	2,900	3.0	275	11.0	7,600
9.0	4,950	4.0	705	15.0	13,800

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	1,130	912	1,190	966	2,920	798	4,910	1,040	960	236	*117	131
2	972	*832	1,110	894	3,980	771	4,560	954	878	230	115	122
3	864	1,120	1,040	832	3,850	1,090	3,510	900	804	221	115	115
4	770	1,030	942	782	4,170	1,920	2,760	894	722	215	113	122
5	695	894	864	744	4,380	3,390	2,220	798	665	209	113	138
6	645	826	815	832	4,940	3,460	*1,840	906	620	197	109	126
7	615	772	*620	793	9,560	2,970	1,560	1,130	565	189	105	115
8	1,080	1,110	738	1,040	7,890	3,470	1,370	978	550	185	102	105
9	2,320	660	710	1,010	12,600	3,570	1,200	888	528	178	100	100
10	1,840	620	815	948	8,860	3,060	1,070	815	501	175	102	98
11	3,980	590	1,960	960	5,310	2,530	1,080	798	474	172	98	98
12	3,300	565	5,050	912	4,010	2,170	1,170	876	449	170	98	98
13	2,460	528	3,560	864	3,440	1,960	1,370	1,160	425	168	96	96
14	1,940	510	3,160	930	4,570	1,830	1,880	1,160	445	168	94	94
15	1,590	519	5,780	954	6,920	2,620	2,490	1,080	510	160	98	92
16	1,350	492	5,010	1,190	4,730	2,960	2,220	*1,230	470	152	98	89
17	1,160	474	3,530	3,530	3,470	2,460	2,040	1,590	425	150	96	89
18	1,040	940	2,610	*1,800	2,840	2,120	2,060	2,000	389	148	92	89
19	960	1,140	2,220	1,800	2,280	1,840	2,580	1,870	385	140	89	*89
20	1,160	1,160	1,900	1,650	1,920	1,620	3,680	2,940	*389	135	87	92
21	1,090	3,290	1,620	1,500	1,740	1,460	3,690	3,020	349	135	96	87
22	3,620	5,920	1,450	1,450	1,530	1,310	2,940	2,740	331	133	182	82
23	4,130	8,640	1,320	1,780	*1,360	1,180	2,420	2,400	317	128	289	92
24	2,950	5,070	1,630	2,500	1,200	1,060	2,080	2,130	300	126	441	94
25	2,340	3,420	1,760	2,300	1,160	954	1,850	1,990	286	124	278	87
26	1,890	2,550	1,600	2,600	1,070	954	1,730	1,880	275	124	200	82
27	1,620	2,060	1,450	2,600	966	942	1,530	1,680	266	124	168	79
28	1,440	1,840	1,510	3,980	894	1,100	1,380	1,480	257	120	148	79
29	930	1,550	1,180	7,890	4,460	1,230	1,320	2,320	245	113	140	77
30	1,100	1,350	1,150	5,020	--- 932	5,420	1,120	1,160	242	113	135	74
31	996	---	1,080	3,510	---	5,110	---	1,060	---	113	133	---
Total	52,297	50,983	59,544	56,821	113,282	70,759	65,520	44,867	14,040	4,950	4,247	2,931
Mean	1,687	1,699	1,921	1,833	3,906	2,283	2,184	1,447	468	160	137	97.7
Cfsm	8.35	8.41	9.51	9.07	19.3	11.3	10.8	7.16	2.32	0.792	0.678	0.484
In.	9.63	9.39	10.96	10.46	20.86	13.03	12.06	8.26	2.58	0.91	0.78	0.54
Ac-ft	103,700	101,100	118,100	112,700	224,700	140,300	130,000	88,990	27,850	9,820	8,420	5,810

Calendar year 1959: Max 11,700 Min 703 Mean 1,582 Cfsm 7.83 In. 106.30 Ac-ft 1,145,000  
 Water year 1959-60: Max 12,600 Min 104 Mean 1,476 Cfsm 7.31 In. 99.46 Ac-ft 1,071,000

Peak discharge (base, 14,000 cfs).--Feb. 9 (10:30 a.m.) 14,200 cfs (15.20 ft).

\* Discharge measurement made on this day.

3060.36. Mill Creek near Toledo, Oreg.

Location.--Lat 44°34'25", long 123°54'30", near center of sec.33, T.11 S., R.10 W., on left bank 175 ft downstream from diversion dam, 200 ft downstream from small tributary, and 3.6 miles southeast of Toledo.

Drainage area.--4.15 sq mi.

Records available.--October 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 90 ft (from topographic map).

Extremes.--Maximum discharge during year, 283 cfs Feb. 6 (gage height, 3.01 ft), from rating curve extended above 78 cfs by logarithmic plotting; minimum, 0.7 cfs Sept. 22.

Remarks.--Records fair. Monthly figures only are adjusted for diversion for city of Toledo municipal supply. Occasional fluctuation caused by city of Toledo diversion dam 175 ft upstream.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Dec. 11 to Feb. 18, Mar. 3-9)

1.1	0.4	1.8	42
1.2	2.0	2.0	68
1.3	4.9	2.5	165
1.4	9.2	3.0	310
1.6	22		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.4	10	13	8.8	37	13	71	15	13	3.0	1.4	1.3
2	6.0	9.2	13	8.2	47	14	59	15	12	3.0	*.9	1.3
3	5.3	*11	11	6.9	43	24	46	14	11	3.0	1.78	1.3
4	4.9	8.8	11	6.0	50	39	39	14	10	2.8	1.6	1.4
5	4.3	7.8	10	5.7	72	39	28	13	9.8	2.5	1.6	1.3
6	4.6	7.4	9.8	5.7	106	34	*25	16	9.2	2.0	1.4	1.1
7	4.3	6.9	9.2	5.7	169	27	22	19	8.8	2.3	1.8	1.1
8	9.1	6.5	*8.8	14	127	41	20	18	7.8	2.5	1.6	.9
9	14	6.5	8.8	13	235	*44	19	16	7.4	2.0	2.0	.9
10	13	6.0	9.2	11	154	41	17	15	6.9	2.0	2.0	1.1
11	39	5.7	21	11	85	33	16	15	6.5	2.3	1.6	1.1
12	30	5.7	75	10	53	27	16	16	6.5	2.0	1.4	.9
13	22	5.3	43	9.8	44	16	22	22	6.0	2.3	2.0	.9
14	17	4.8	30	10	48	22	20	24	6.5	2.3	2.0	.9
15	14	4.9	33	10	*76	24	31	21	6.0	1.8	1.8	.8
16	12	4.6	39	14	58	24	25	*23	6.0	1.6	1.8	.8
17	10	4.6	31	34	47	22	22	32	5.3	2.0	1.8	.9
18	9.2	7.8	25	*31	43	19	27	33	4.9	1.6	1.3	.9
19	9.8	6.0	21	28	37	18	39	27	4.9	1.6	1.4	.9
20	9.8	7.8	19	26	32	17	57	52	*4.9	1.4	1.4	*.9
21	9.8	13	17	20	28	16	57	49	4.6	1.3	2.3	.9
22	35	36	15	17	24	15	44	43	3.9	1.3	2.5	.9
23	47	62	14	16	*21	14	38	37	3.9	1.6	2.0	.9
24	32	41	16	16	19	13	30	30	3.6	1.3	2.5	1.1
25	26	28	21	15	19	12	26	26	3.9	1.3	1.6	1.1
26	22	22	20	17	17	13	23	22	3.6	1.3	1.4	.9
27	19	19	16	21	16	12	21	21	3.3	1.1	1.4	.9
28	17	18	14	40	15	13	19	19	3.3	1.1	1.3	.9
29	15	16	12	79	14	51	18	17	3.0	1.1	1.3	.9
30	13	14	11	58	-----	74	16	16	3.3	1.3	1.3	.9
31	11	-----	9.8	41	-----	80	-----	14	-----	1.6	1.3	-----
Total	492.5	406.1	606.6	608.8	1,736	859	907	714	189.8	58.3	51.5	30.1
Mean	15.9	13.5	19.6	19.6	59.9	27.7	30.2	23.0	6.33	1.88	1.66	1.00
Ac-ft	977	805	1,200	1,210	3,440	1,700	1,800	1,420	376	116	102	60

Adjusted for diversion to city of Toledo

Mean	15.9	13.5	19.7	19.7	60.0	27.6	30.3	23.1	6.37	2.08	1.77	1.04
Cfs/m	3.83	3.25	4.75	4.75	14.5	6.85	7.30	5.57	1.53	0.501	0.427	0.251
In.	4.42	3.84	5.47	5.47	15.58	7.68	8.14	6.42	1.71	0.58	0.49	0.28
Ac-ft	978	806	1,210	1,210	3,450	1,700	1,800	1,420	378	128	109	62

Observed

Calendar year 1959: Max	-	Min	-	Mean	-	Ac-ft	-
Water year 1959-60: Max	235	Min	0.8	Mean	18.2	Ac-ft	13,210

Adjusted

Calendar year 1959: Mean	-	Cfs/m	-	In.	-	Ac-ft	-
Water year 1959-60: Mean	18.3	Cfs/m	4.41	In.	59.88	Ac-ft	13,250

Peak discharge (base, 250 cfs)--Feb. 6 (12 p.m.) 283 cfs (3.01 ft); Feb. 9 (10 a.m.) 262 cfs (2.94 ft).

\* Discharge measurement made on this day.

## 3061. North Fork Alsea River at Alsea, Oreg.

Location (revised).--Lat 44°22'45", long 123°35'40", in SE $\frac{1}{4}$  sec.1, T.14 S., R.8 W., on left bank at Alsea, 0.2 mile upstream from bridge on Lobster Valley Road and 0.7 mile upstream from confluence with South Fork.

Drainage area.--63.0 sq mi.

Records available.--October 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 272.31 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 4,290 cfs Feb. 9 (gage height, 9.17 ft); minimum, 16 cfs Sept. 30.

1957-60: Maximum discharge, that of Feb. 9, 1960; minimum, 13 cfs Sept. 6, 7, 1958. Maximum stage known, 13.30 ft in December 1955 (discharge, about 9,000 cfs, from rating curve extended above 2,500 cfs), from information by local resident.

Remarks.--Records excellent except those for periods of no gage-height record, which are good. No regulation. Some diversions by pumping above station. Records of 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)

1.4	12	3.5	455
1.6	26	4.0	690
2.0	69	5.0	1,250
2.5	155	7.0	2,560
3.0	280	9.0	4,140

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	68	109	210	407	193	1,130	250	208	64	34	32
2	57	66	102	200	839	186	856	235	193	61	34	31
3	54	96	97	180	756	261	655	228	179	59	33	28
4	49	94	91	170	960	475	500	222	168	57	33	38
5	47	*79	86	160	944	922	411	202	153	55	*33	31
6	46	72	83	170	1,030	900	347	202	147	53	32	28
7	48	69	82	160	1,840	700	307	215	137	50	30	26
8	84	64	79	330	2,360	1,060	*277	200	131	49	30	23
9	173	62	77	300	3,670	1,030	248	188	124	46	29	22
10	122	59	*76	260	2,020	800	230	177	118	48	29	22
11	188	57	144	240	1,180	620	240	175	113	46	29	21
12	179	58	821	220	856	518	232	198	108	49	30	21
13	139	55	497	210	700	493	248	358	99	48	29	21
14	113	53	325	220	762	443	334	358	101	46	28	21
15	96	52	337	230	1,020	753	513	298	101	44	27	21
16	83	52	358	260	795	773	435	286	96	42	27	21
17	75	50	295	350	620	575	375	310	91	40	26	21
18	69	64	259	380	522	467	375	337	86	42	26	21
19	66	96	225	400	423	391	500	*513	85	40	25	20
20	79	85	212	580	358	337	715	399	83	40	24	23
21	69	335	200	*325	328	298	800	487	80	38	27	20
22	177	451	190	307	301	268	655	500	79	38	37	*20
23	193	540	190	354	274	242	518	435	*77	38	40	21
24	141	340	250	375	250	225	415	379	75	36	47	22
25	120	250	400	340	248	210	361	387	72	38	36	21
26	106	198	350	313	*240	210	383	431	70	38	33	20
27	96	166	300	319	220	205	347	372	69	36	30	20
28	91	153	260	383	210	222	328	322	86	35	29	18
29	83	131	230	690	200	759	298	277	68	35	27	17
30	76	120	230	595	-----	1,460	271	248	66	33	27	17
31	70	-----	230	475	-----	1,390	-----	225	-----	35	28	-----
Total	3,055	4,033	6,985	9,506	24,333	17,375	15,304	9,214	3,243	1,374	949	688
Mean	98.5	134	225	307	859	561	443	297	108	44.3	30.6	22.9
Cfsm	1.56	2.13	3.57	4.87	13.3	8.90	7.03	4.71	1.71	0.705	0.486	0.363
In.	1.80	2.38	4.12	5.61	14.36	10.26	7.85	5.44	1.91	0.81	0.56	0.41
Ac-ft	6,060	8,000	15,850	18,850	48,260	34,460	26,390	18,280	6,430	2,730	1,880	1,560

Calendar year 1959: Max 3,220 Min 17 Mean 255 Cfsm 4.05 In. 55.04 Ac-ft 185,000

Water year 1959-60: Max 3,670 Min 17 Mean 257 Cfsm 4.08 In. 55.51 Ac-ft 186,600

Peak discharge (base, 2,000 cfs).--Feb. 9 (5:30 a.m.) 4,290 cfs (9.17 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Dec. 22 to Jan. 20, July 9 to Aug. 4; discharge estimated on basis of recorded range in stage and records for Fall Creek near Alsea and South Fork Alsea River near Alsea.

3062. South Fork Alsea River near Alsea, Oreg.

Location.--Lat 44°21'55", long 123°35'55", in NE<sup>1</sup>/<sub>4</sub>SE<sup>1</sup>/<sub>4</sub> sec.12, T.14 S., R.8 W., on left bank 0.8 mile upstream from confluence with North Fork and 1.1 miles south of Alsea.

Drainage area.--49.5 sq mi.

Records available.--October 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 300 ft (by barometer).

Extremes.--Maximum discharge during year, 2,750 cfs Feb. 9 (gage height, 7.08 ft); minimum, 11 cfs Sept. 29, 30.

1957-60: Maximum discharge, 3,050 cfs Jan. 12, 1959 (gage height, 7.38 ft); minimum, 7.2 cfs Sept. 2, 3, 1959.

Remarks.--Records excellent except those for period of no gage-height record, which are good. No regulation. Some diversions by pumping above station. Records of 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 Feb. 8

Feb. 9 to Sept. 30

1.6	13	4.0	590	1.5	11	4.0	590
2.0	45	5.0	1,120	1.7	22	5.0	1,120
2.5	120	6.0	1,810	2.0	46	6.0	1,810
3.0	240			2.5	120	7.0	2,670
				3.0	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	19	24	40	82	200	122	650	148	140	38	19	17
2	18	23	38	78	435	120	494	140	130	38	18	17
3	17	28	37	72	396	160	407	138	120	36	18	16
4	17	33	34	68	599	330	*340	140	110	35	17	23
5	17	*26	33	66	550	612	285	128	104	34	*17	20
6	17	23	32	68	568	546	243	124	100	31	17	16
7	19	22	32	86	1,010	452	210	130	94	30	16	15
8	37	21	30	130	1,540	608	192	122	90	28	16	15
9	94	20	30	120	2,380	655	175	114	86	28	16	14
10	58	19	*29	110	1,260	514	160	108	84	29	16	14
11	53	18	60	100	685	418	170	106	80	27	16	13
12	56	18	278	96	506	358	158	114	74	28	16	13
13	42	17	228	92	418	327	162	175	72	27	16	13
14	34	17	134	96	386	303	219	168	70	27	15	13
15	29	17	104	90	428	382	334	148	73	26	16	13
16	27	17	90	110	376	382	270	154	70	24	16	13
17	24	17	80	150	*324	321	231	172	65	23	15	13
18	22	19	79	160	294	282	228	200	62	24	15	13
19	22	35	73	170	255	249	282	*180	60	23	14	13
20	33	34	72	140	219	216	327	208	60	23	13	14
21	32	129	69	*130	200	192	393	252	58	22	14	13
22	39	147	64	134	182	175	351	243	*53	22	18	*13
23	65	172	64	150	168	165	297	219	50	22	20	13
24	46	114	136	158	158	154	252	200	47	21	22	14
25	39	85	192	148	156	146	222	225	44	22	20	13
26	35	67	156	142	*154	150	228	282	44	21	18	13
27	31	57	126	175	142	146	202	240	44	21	17	12
28	29	52	108	202	136	162	185	210	20	16	12	
29	28	47	94	276	128	165	185	185	38	20	15	11
30	26	43	91	282	128	1,040	156	162	38	19	15	11
31	25	-----	88	222	-----	884	-----	150	-----	20	16	-----
Total	1,050	1,361	2,719	4,083	14,253	11,191	7,988	5,285	2,202	807	513	423
Mean	33.9	45.4	87.7	132	491	361	266	170	73.4	26.0	16.5	14.1
Cfsm	0.685	0.917	1.77	2.67	9.92	7.29	5.37	3.43	1.48	0.525	0.333	0.285
In.	0.79	1.02	2.04	3.07	10.71	8.41	6.00	3.97	1.65	0.61	0.39	0.32
Ac-ft	2,080	2,700	5,590	8,100	28,270	22,200	15,840	10,480	4,570	1,600	1,020	859

Calendar year 1959: Max 2,800 Min 7.5 Mean 146 Cfsm 2.95 In. 40.15 Ac-ft 106,000  
Water year 1959-60: Max 2,380 Min 11 Mean 142 Cfsm 2.87 In. 38.98 Ac-ft 102,900

Peak discharge (base, 1,400 cfs).--Feb. 9 (5:30 a.m.) 2,750 cfs (7.08 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Dec. 31 to Jan. 20; discharge estimated on basis of recorded range in stage and records for Fall Creek near Alsea.

## 3063. Fall Creek near Alsea, Oreg.

Location.--Lat 44°23'50", long 123°44'50", in S½NE¼ sec.35, T.13 S., R.9 W., on left bank 2.0 miles upstream from mouth and 8.0 miles west of Alsea. Inflow between gage and measuring section 1.9 miles downstream is included in records.

Drainage area.--29.4 sq mi at measuring section 1.9 miles downstream.

Records available.--August 1958 to September 1960.

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

Extremes.--Maximum discharge during year, 2,440 cfs Feb. 9 (gage height, 6.65 ft); minimum, 10 cfs Sept. 30, 1958-60; Maximum discharge, that of Feb. 9, 1960; minimum, 10 cfs Sept. 6, 7, Oct. 14, 1958, Sept. 30, 1960.

Remarks.--Records excellent except those for period of shifting control, which are good. No regulation or diversion above station.

Rating table, water year 1959-60, except period of shifting control (gage height, in feet, and discharge, in cubic feet per second)

1.4	10	3.0	260
1.6	19	4.0	650
1.8	32	5.0	1,190
2.1	62	6.0	1,880
2.5	128	7.0	2,770

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	63	70	104	128	248	120	515	143	122	38	24	19
2	55	68	99	120	542	118	415	135	115	36	24	18
3	50	122	94	111	415	183	332	130	107	36	23	18
4	46	100	87	106	503	257	272	124	102	35	23	18
5	43	*86	82	102	503	370	230	115	97	35	23	18
6	41	78	79	111	631	360	203	124	92	33	23	17
7	45	72	78	111	943	284	182	130	90	31	22	16
8	103	68	73	227	1,190	427	*168	122	86	31	23	16
9	175	63	72	192	1,900	399	152	113	82	31	21	15
10	126	60	*72	160	1,080	336	141	107	79	31	*21	14
11	251	58	136	146	655	275	139	106	75	31	20	14
12	182	56	354	130	499	242	139	139	72	31	19	14
13	135	52	248	124	423	224	150	314	70	31	18	14
14	109	51	200	128	491	212	206	245	73	31	19	14
15	92	50	294	124	605	384	257	188	69	31	18	14
16	81	48	290	143	435	339	221	185	65	30	18	14
17	73	46	224	198	350	263	195	200	61	30	18	14
18	68	71	200	212	308	224	221	*215	59	29	18	14
19	65	79	178	248	257	198	278	195	59	29	18	14
20	70	85	165	224	224	180	419	275	58	28	18	14
21	66	195	150	*190	209	168	388	294	54	28	19	14
22	334	566	137	172	192	150	311	272	*51	27	25	*14
23	260	589	143	172	175	139	251	236	48	27	29	14
24	178	318	221	165	165	128	218	212	46	26	31	14
25	139	224	278	155	*168	122	198	209	44	26	23	14
26	118	180	227	160	152	124	200	206	43	26	21	14
27	104	152	195	175	143	118	188	188	41	25	18	13
28	97	143	172	270	135	139	175	170	41	25	18	13
29	87	124	152	415	126	450	165	155	40	24	18	13
30	81	115	150	336	---	605	150	141	38	24	18	13
31	75	---	141	263	---	528	---	132	---	24	18	---
Total	3,412	3,989	5,095	5,516	13,667	8,166	7,079	5,520	2,079	920	649	445
Mean	110	133	164	178	471	263	236	178	69.3	29.7	20.9	14.8
Cfsm	3.74	4.52	5.58	6.05	16.0	8.95	8.03	6.05	2.36	1.01	0.711	0.503
In.	4.32	5.05	6.45	6.98	17.29	10.33	8.95	6.98	2.63	1.16	0.82	0.56
Ac-ft	6,770	7,910	10,110	10,940	27,110	16,200	14,040	10,950	4,120	1,820	1,290	883

Calendar year 1959: Max 1,770 Min 15 Mean 163 Cfsm 5.54 In. 75.10 Ac-ft 117,700  
 Water year 1959-60: Max 1,900 Min 13 Mean 154 Cfsm 5.24 In. 71.52 Ac-ft 112,100

Peak discharge (base, 1,500 cfs).--Feb. 9 (3 a.m.) 2,440 cfs (6.65 ft).

\* Discharge measurement made on this day.

Note.--Shifting-control method used Oct. 1 to Dec. 12.

3064. Five Rivers near Fisher, Oreg.

Location.--Lat 44°20'15", long 123°49'35", in  $\frac{1}{2}$  sec. 19, T. 14 S., R. 9 W., on left bank at downstream side of county road bridge, 500 ft downstream from Lobster Creek, 3.2 miles north of Fisher, and 12 miles west of Alsea.

Drainage area.--114 sq mi.

Records available.--August 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

Extremes.--Maximum discharge during year, 7,510 cfs Feb. 9 (gage height, 13.98 ft); minimum, 28 cfs Sept. 28-30.

1958-60: Maximum discharge, 7,820 cfs (revised) Jan. 12, 1959 (gage height, 14.24 ft); minimum, 17 cfs Oct. 6, 7, 1958.

Revisions.--The figure of maximum discharge for the water year 1959 has been revised to 7,820 cfs Jan. 12, 1959 (gage height, 14.24 ft), superseding that published in WSP 1638.

Remarks.--Records excellent except those for period of shifting control, which are good. No regulation or diversion above station.

Revisions.--The figures of peak discharges for the water year 1959 have been revised, superseding those published in WSP 1638, are given herewith: Jan. 9 (1:30 a.m.) 7,350 cfs (13.82 ft); Jan. 12 (2 to 3 a.m.) 7,820 cfs (14.24 ft); Jan. 27 (2 p.m.) 4,880 cfs (11.24 ft).

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

Oct. 1 to Jan. 10

Jan. 11 to Sept. 30

1.9	72	1.6	28	5.0	900
2.5	197	1.9	74	7.0	1,850
3.5	441	2.5	188	10.0	3,860
5.0	980	3.5	420	14.0	7,530

Discharge, in cubic 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	122	223	405	992	378	2,180	488	452	112	61	48
2	100	116	212	379	1,660	378	1,580	460	418	108	61	47
3	92	150	204	354	1,460	644	1,210	455	382	105	61	42
4	84	*148	190	331	2,270	1,070	980	450	355	99	60	45
5	80	129	179	311	2,170	1,620	824	412	332	97	56	45
6	75	122	171	321	2,230	1,510	720	418	308	92	52	41
7	88	116	168	316	4,590	1,170	630	458	290	90	48	39
8	190	110	158	628	4,900	1,700	*569	418	270	88	45	38
9	408	106	*154	618	6,860	1,660	520	385	257	88	*42	36
10	280	102	154	509	4,220	1,330	485	365	244	87	45	35
11	318	98	300	480	2,470	1,060	490	360	234	85	44	34
12	324	96	330	470	1,770	912	485	442	224	83	45	34
13	257	90	848	455	1,450	804	505	828	212	81	44	34
14	212	88	590	482	1,370	720	661	734	212	81	42	34
15	179	86	554	488	1,770	984	976	581	212	74	44	32
16	156	86	521	510	*1,420	1,020	796	590	200	72	42	31
17	139	86	476	686	1,150	820	686	654	188	71	42	29
18	127	102	464	788	996	706	710	*738	180	68	42	31
19	120	167	416	824	836	622	988	658	172	66	41	31
20	162	178	395	*756	728	563	1,260	896	168	64	39	32
21	158	604	366	647	664	520	1,420	1,040	160	61	42	*31
22	243	638	348	590	596	485	1,140	1,030	*152	58	61	31
23	276	748	344	644	545	458	944	900	146	58	66	31
24	234	544	569	636	510	428	784	816	142	58	101	32
25	208	421	900	590	*505	400	696	848	136	56	69	32
26	179	348	772	581	482	430	717	940	128	58	56	31
27	164	301	628	668	445	420	658	796	126	58	52	29
28	180	287	521	1,080	420	485	644	686	123	58	45	29
29	148	259	458	1,860	388	2,250	572	599	119	58	44	28
30	135	241	453	1,450	---	3,480	522	538	117	58	42	28
31	127	---	447	1,110	---	2,900	---	492	---	58	42	---
Total	5,534	6,689	13,114	19,967	49,877	31,907	25,352	19,475	6,659	2,350	1,576	1,040
Mean	179	223	423	644	1,720	1,029	845	628	222	75.8	50.8	34.7
Cfsm	1.57	1.96	3.71	5.65	15.1	9.03	7.41	5.51	1.95	0.665	0.446	0.304
In.	1.81	2.18	4.28	6.51	16.27	10.41	8.27	6.35	2.17	0.77	0.51	0.34
Ac-ft	10,980	13,270	26,010	39,600	98,930	63,290	50,280	38,630	13,210	4,660	3,130	2,060

Calendar year 1959: Max 6,220 Min 28 Mean 459 Cfsm 4.03 In. 54.70 Ac-ft 332,600  
Water year 1959-60: Max 6,860 Min 26 Mean 501 Cfsm 4.39 In. 59.87 Ac-ft 364,000

Peak discharge (base, 4,000 cfs).--Feb. 9 (7 a.m.) 7,510 cfs (13.98 ft); Mar. 29 (9 p.m.) 4,000 cfs (10.17 ft).

\* Discharge measurement made on this day.

Note.--Shifting-control method used Oct. 9 to Jan. 10.

## 3065. Alsea River near Tidewater, Oreg.

Location.--Lat 44°23'10", long 123°49'50", in NW<sup>1</sup>/<sub>4</sub> sec.6, T.14 S., R.9 W., on right bank 1.0 mile (revised) downstream from Grass Creek, 2.3 miles upstream from Scott Creek, and 3.8 miles southeast of Tidewater.

Drainage area.--334 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 48.16 ft above mean sea level, datum of 1929. Prior to Nov. 16, 1939, staff gage at same site and datum..

Average discharge.--21 years, 1,547 cfs (1,120,000 acre-ft per year).

Extremes.--Maximum discharge during year, 20,700 cfs Feb. 9 (gage height, 18.71 ft); minimum, 83 cfs Sept. 30.

1939-60: Maximum discharge, 32,200 cfs Dec. 21, 1955 (gage height, 23.80 ft); minimum, 56 cfs Sept. 6, 1956.

Maximum stage known, 29.5 ft, from floodmark shown by old resident, on or about Feb. 3, 1890.

Remarks.--Records excellent. No regulation. A few small diversions for irrigation above station.

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

1.4	79	4.0	1,050
1.6	117	6.0	2,430
2.0	222	9.0	5,230
2.5	380	13.0	10,500
3.0	570	18.0	19,200

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	338	366	628	1,000	2,490	1,020	6,100	1,360	1,210	335	156	128
2	300	348	592	935	4,150	990	4,220	1,250	1,100	322	156	155
3	273	426	566	875	3,920	1,430	3,620	1,200	1,020	312	156	128
4	255	*498	530	810	5,200	2,730	2,970	1,220	940	303	*149	126
5	240	415	502	765	5,320	4,280	2,490	1,090	885	294	139	142
6	231	380	478	780	5,100	4,580	2,120	1,060	830	282	139	130
7	243	359	470	790	10,400	3,560	1,850	1,180	780	270	135	117
8	392	338	454	1,450	11,400	4,790	*1,680	1,090	741	261	130	111
9	945	322	*443	1,640	18,900	5,120	1,480	1,020	710	252	128	105
10	770	312	440	1,340	12,200	4,160	1,350	950	678	252	132	101
11	865	303	670	1,250	7,100	3,320	1,370	930	651	249	130	101
12	950	294	2,250	1,190	5,100	2,810	1,320	1,070	624	243	130	99
13	741	285	2,570	1,100	4,220	2,530	1,340	2,080	592	237	128	99
14	602	276	1,660	1,150	3,950	2,280	1,730	2,090	579	237	128	97
15	514	273	1,560	1,150	5,020	3,000	2,560	1,660	597	228	126	95
16	450	267	1,560	1,210	4,230	3,380	2,330	1,610	558	219	126	93
17	404	261	1,370	1,680	3,410	2,730	1,960	1,700	522	213	119	95
18	370	285	1,270	2,120	2,990	2,290	1,900	*1,960	498	207	115	93
19	352	436	1,130	2,120	2,530	1,980	2,630	1,800	482	201	111	95
20	408	440	1,040	*2,070	2,170	1,750	3,260	2,250	474	195	105	95
21	418	1,300	980	1,780	1,970	1,560	3,890	2,710	454	192	107	*95
22	769	2,010	905	1,800	1,780	1,420	3,320	2,810	458	189	139	93
23	1,030	2,890	885	1,700	1,600	1,300	2,760	2,490	418	184	175	93
24	785	1,860	1,340	1,740	1,480	1,210	2,310	2,250	404	181	228	97
25	660	1,350	2,330	1,620	*1,430	1,120	1,990	2,190	394	178	192	95
26	570	1,050	2,070	1,560	1,390	1,150	2,050	2,490	380	175	156	95
27	510	895	1,660	1,690	1,240	1,130	1,870	2,170	373	170	137	93
28	490	835	1,390	2,340	1,160	1,240	1,810	1,870	359	164	128	92
29	446	741	1,220	4,140	1,090	4,280	1,610	1,650	348	159	119	92
30	412	678	1,160	3,540	-----	8,580	1,470	1,460	338	156	115	84
31	397	-----	1,130	2,890	-----	7,710	-----	1,330	-----	156	117	-----
Total	16,120	20,493	35,253	50,115	132,940	89,410	71,740	51,990	18,375	7,016	4,251	3,114
Mean	520	683	1,137	1,617	4,564	2,884	2,591	1,677	612	226	137	104
Cfsm	1.56	2.04	3.40	4.84	13.7	8.63	7.16	5.02	1.83	0.677	0.410	0.311
In.	1.79	2.28	3.93	5.58	14.80	9.96	7.99	5.79	2.05	0.78	0.47	0.35
Ac-ft	31,970	40,650	69,920	99,400	263,700	177,300	142,300	103,100	36,450	13,920	8,430	6,180

Calendar year 1959: Max 17,400 Min 90 Mean 1,331 Cfsm 3.99 In. 54.12 Ac-ft 963,800  
 Water year 1959-60: Max 18,900 Min 84 Mean 1,368 Cfsm 4.10 In. 55.77 Ac-ft 993,300

Peak discharge (base, 13,000 cfs).--Feb. 9 (10:30 a.m.) 20,700 cfs (18.71 ft).

\* Discharge measurement made on this day.

3066. Drift Creek near Salado, Oreg.

Location.--Lat 44°30'50", long 123°50'50", in NE $\frac{1}{4}$  sec.24, T.12 S., R.10 W., on right bank 0.3 mile downstream from Cape Horn Creek, 4.1 miles southwest of Salado, and 8.5 miles southeast of Toledo.

Drainage area.--20.6 sq mi.

Records available.--September 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 460 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,580 cfs Feb. 9 (gage height, 7.33 ft), from rating curve extended above 520 cfs by logarithmic plotting; minimum, 5.4 cfs Sept. 30, 1958-60: Maximum discharge, 1,680 cfs Jan. 9, 1959 (gage height, 7.47 ft), from rating curve extended above 520 cfs by logarithmic plotting; minimum, 3.8 cfs Sept. 7, 8, 1958.

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

2.2	4.9	4.0	210
2.4	12	5.0	450
2.7	30	6.0	820
3.0	59	7.0	1,360
3.5	125	8.0	2,100

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	57	55	70	83	245	73	395	88	79	22	12	9.6
2	50	51	67	77	538	72	306	84	73	21	*12	9.3
3	45	*95	63	72	382	118	232	81	69	21	12	9.0
4	42	67	58	67	422	226	188	78	63	21	11	9.3
5	38	59	55	64	444	306	157	72	58	20	11	9.0
6	36	54	51	69	542	258	*154	79	55	19	10	8.6
7	37	48	51	87	771	210	118	91	51	19	10	8.2
8	71	45	*47	134	792	308	104	86	49	18	10	7.9
9	132	44	46	120	1,450	284	95	78	46	18	10	7.9
10	99	41	47	100	815	234	87	72	44	17	10	7.6
11	206	39	110	93	486	194	87	72	43	17	10	7.2
12	157	37	284	84	365	189	87	84	41	16	10	7.2
13	116	35	205	79	320	155	102	210	39	16	9.6	7.2
14	92	34	164	81	352	145	162	185	41	16	9.6	7.2
15	78	34	253	81	*411	268	226	140	39	16	9.6	7.2
16	69	33	238	104	318	247	181	154	37	15	9.6	6.9
17	60	32	179	174	251	188	157	*185	34	15	9.3	6.9
18	55	45	155	185	210	157	185	205	33	14	9.3	6.9
19	52	49	132	*205	176	134	260	171	33	14	9.0	7.2
20	63	55	124	181	152	118	381	260	32	14	8.6	*6.6
21	54	128	110	145	138	104	340	255	*29	14	9.6	6.3
22	234	278	100	126	122	95	258	230	29	14	13	6.3
23	206	352	102	136	110	86	206	194	28	13	16	6.3
24	140	205	164	138	*102	79	174	171	26	13	19	6.3
25	113	145	210	128	102	73	152	166	26	13	13	6.3
26	96	114	174	134	95	73	148	157	25	13	12	6.3
27	86	96	142	164	87	72	134	137	24	12	10	6.0
28	79	95	120	286	82	81	118	120	24	12	9.6	5.7
29	71	82	106	495	77	370	106	106	23	12	9.6	5.7
30	65	76	103	368	---	456	96	95	22	12	9.3	5.7
31	59	---	92	271	---	471	---	88	---	12	9.6	---
Total	2,758	2,521	3,822	4,511	10,357	5,804	5,376	4,194	1,215	489	333.3	217.8
Mean	89.0	84.0	123	146	357	187	179	135	40.5	15.8	10.8	7.26
Cfsam	4.32	4.08	5.97	7.09	17.3	9.08	8.69	6.55	1.97	0.767	0.524	0.352
In.	4.98	4.55	6.90	8.14	18.70	10.48	9.71	7.57	2.19	0.88	0.60	0.39
Ac-ft	5,470	5,000	7,580	8,950	20,540	11,510	10,660	8,320	2,410	970	661	432

Calendar year 1959: Max 1,400 Min 6.9 Mean 113 Cfsam 5.49 In. 74.70 Ac-ft 82,070  
 Water year 1959-60: Max 1,450 Min 5.7 Mean 114 Cfsam 5.53 In. 75.09 Ac-ft 82,500

Peak discharge (base, 1,000 cfs).--Feb. 6 (11 p.m.) 1,110 cfs (6.58 ft); Feb. 9 (7:30 a.m.) 1,580 cfs (7.33 ft).

\* Discharge measurement made on this day.

## 3067. Needle Branch near Salado, Oreg.

Location.--Lat 44°30'35", long 123°51'20", in SW  $\frac{1}{4}$  sec. 24, T.12 S., R.10 W., on right bank 500 ft upstream from mouth, 4.6 miles southwest of Salado, and 8.5 miles southeast of Toledo.

Drainage area.--0.32 sq mi.

Records available.--October 1958 to September 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 440 ft (from topographic map).

Extremes.--Maximum discharge during year, 20 cfs Feb. 9 (gage height, 2.61 ft); practically no flow for many days in August and September.

1958-60: Maximum discharge, 22 cfs (revised) Jan. 9, 1959 (gage height, 2.67 ft); practically no flow for many days in October 1958, August and September 1960.

Revisions.--The figure of maximum discharge for the water year 1959 has been revised to 22 cfs Jan. 9, 1959 (gage height, 2.67 ft), superseding that published in WSP 1638.

Remarks.--Records excellent except those for periods of shifting control, which are good.

No regulation or diversion above station. Records of suspended sediment loads 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 periods in the water year 1959, superseding those published in WSP 1638, are given herewith:

1958	1959	1959-Con.
Nov. 18..... 4.3	Jan. 8..... 12	Jan. 27..... 16
19..... 11	9..... 18	28..... 10
20..... 12	10..... 8.9	
21..... 7.4	12..... 11	

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
November 1958.....	111.7	12	0.1	3.72	11.6	12.98	222
January 1959.....	157.8	18	1.7	5.09	15.9	18.34	313
Water year 1958-59.....	-	18	0	1.67	5.22	70.89	1,210

Revised peak discharge.--1959: Jan. 9 (3:30 a.m.) 22 cfs (2.67 ft); Jan. 27 (1 p.m.) 19 cfs (2.60 ft).

## Discharge, in cubic 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	1.0	1.2	1.0	2.8	0.8	4.8	0.9	0.8	0.2	0.1	0.1
2	.7	.9	1.1	.9	4.9	.8	4.0	.9	.7	.2	*.1	.1
3	.6	*1.2	1.0	.8	3.9	1.2	3.0	.8	.7	.2	.1	0
4	.6	.9	1.0	.8	3.8	2.8	2.3	.8	.6	.2	.1	.1
5	.6	.9	.9	.8	5.3	3.5	1.8	.7	.6	.2	.1	.1
6	.5	.8	.8	.8	6.0	3.0	1.4	.9	.5	.1	.1	0
7	.6	.8	.8	.8	8.7	2.7	*1.2	1.1	.5	.1	.1	0
8	1.3	.7	*.8	1.4	7.6	3.3	1.0	1.2	.5	.1	.1	0
9	2.0	.7	.7	1.4	18	3.4	.9	1.0	.4	.1	.1	.1
10	1.8	.6	.7	1.2	11	2.9	.8	.9	.4	.1	.1	0
11	3.7	.6	1.6	1.2	5.5	2.4	.8	.9	.4	.1	.1	0
12	2.9	.6	3.0	1.2	3.9	1.9	.8	1.1	.4	.1	.1	0
13	2.3	.6	2.7	1.2	3.4	1.6	.9	2.3	.4	.1	0	0
14	1.8	.5	2.5	1.2	3.8	1.4	1.3	2.3	.4	.1	0	.1
15	1.5	.5	3.8	1.2	5.6	2.6	2.2	1.9	.4	.1	.1	.1
16	1.2	.5	3.6	1.6	*4.6	2.7	1.8	2.0	.4	.1	0	.1
17	1.1	.5	2.8	3.0	3.3	2.2	1.6	*2.9	.3	.1	0	.1
18	.9	.8	2.2	3.2	2.5	1.8	1.8	3.2	.3	.1	0	0
19	1.0	.6	1.8	*3.1	1.9	1.4	2.6	2.6	.3	.1	0	0
20	.9	.7	1.6	2.6	1.6	1.3	4.4	4.4	.3	.1	0	*0
21	.9	1.0	1.4	2.2	1.4	1.1	4.2	4.5	*.3	.1	.1	0
22	3.5	3.3	1.3	1.8	1.2	1.0	3.2	3.8	.2	.1	.1	0
23	4.0	5.2	1.3	1.6	1.1	.9	2.5	2.9	.2	.1	.2	0
24	2.8	3.2	1.7	1.4	*1.0	.8	2.0	2.3	.2	.1	.2	0
25	2.3	2.3	2.4	1.4	1.0	.7	1.6	1.9	.2	.1	.1	0
26	2.0	1.9	2.2	1.4	.9	.7	1.4	1.6	.2	.1	.1	0
27	1.6	1.6	1.8	1.6	.8	.7	1.3	1.4	.2	.1	.1	0
28	1.5	1.6	1.5	2.7	.8	.8	1.2	1.2	.2	.1	.1	0
29	1.3	1.4	1.3	4.8	.8	2.4	1.0	1.1	.2	.1	.1	0
30	1.2	1.3	1.3	4.0	-----	3.8	1.0	1.0	.2	.1	.1	0
31	1.1	-----	1.1	3.0	-----	5.1	-----	.9	-----	.1	-----	-----
Total	49.0	37.2	51.9	55.3	117.1	61.7	58.8	55.4	11.4	3.6	2.6	0.9
Mean	1.58	1.24	1.67	1.78	4.04	1.99	1.96	1.79	0.38	0.12	0.08	0.03
Cfsm	4.94	3.88	5.22	5.56	12.6	6.22	6.12	5.59	1.19	0.375	0.250	0.094
In.	5.69	4.32	6.03	6.43	13.61	7.17	6.83	6.44	1.32	0.42	0.30	0.10
Ac-ft	97	74	103	110	232	122	117	110	23	7.1	5.2	1.8

Calendar year 1959: Max 18 Min 0.1 Mean 1.53 Cfsm 4.78 In. 64.78 Ac-ft 1,110  
 Water year 1959-60: Max 18 Min 0 Mean 1.58 Cfsm 4.31 In. 58.66 Ac-ft 1,000

Peak discharge (base, 15 cfs).--Feb. 9 (11 a.m.) 20 cfs (2.61 ft).

\* Discharge measurement made on this day.

Note.--Shifting-control method used Oct. 22 to Dec. 10, Dec. 15.

3068. Flynn Creek near Salado, Oreg.

Location.--Lat 44°32'20", long 123°51'05", in SW $\frac{1}{4}$  sec.12, T. 12 S., R.10 W., on right bank 1,000 ft upstream from mouth, 3.4 miles west of Salado, and 6.9 miles southeast of Toledo.

Drainage area.--0.84 sq mi.

Records available.--September 1958 to September 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 685 ft (from topographic map).

Extremes.--Maximum discharge during year, 43 cfs Feb. 9 (gage height, 3.88 ft); minimum, 0.1 cfs Sept. 29, 30.  
1958-60: Maximum discharge, 53 cfs Jan. 9, 1959 (gage height, 4.00 ft); minimum, 0.1 cfs Sept. 2-10, Sept. 30 to Oct. 4, 1958, Sept. 29, 30, 1960.

Remarks.--Records good. No regulation or diversion above station. Records of suspended sediment loads 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 Feb. 8

Feb. 9 to Sept. 30

2.2	1.0	3.1	10	1.85	0.1	2.8	6.1
2.3	1.4	3.4	18	1.9	.2	3.1	11
2.5	2.6	3.7	32	2.1	.6	3.4	20
2.8	5.7			2.3	1.5	3.9	44
				2.5	2.8		

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	1.8	2.5	2.9	3.2	8.8	3.2	15	3.5	3.2	0.8	0.4	0.3
2	1.6	2.4	2.8	3.0	11	3.2	13	3.2	2.9	.7	.4	.2
3	1.4	*2.6	2.6	2.8	10	4.1	11	3.2	2.8	.7	*.4	.2
4	1.4	2.3	2.4	2.6	10	6.7	8.9	3.0	2.5	.7	.4	.3
5	1.3	2.1	2.3	2.5	13	8.5	7.4	2.8	2.3	.7	.3	.2
6	1.2	2.0	2.3	2.5	18	8.9	6.2	3.2	2.1	.6	.3	.2
7	1.2	1.9	2.2	2.5	28	8.9	*5.3	3.3	2.0	.6	.3	.2
8	2.3	1.8	*2.1	3.6	25	11	4.7	3.2	1.9	.6	.3	.2
9	2.8	1.8	2.0	3.5	39	12	4.1	3.2	1.8	.6	.3	.2
10	2.8	1.7	2.0	3.5	34	11	3.8	3.1	1.7	.6	.3	.2
11	6.1	1.7	3.6	3.6	21	9.8	3.7	3.2	1.6	.6	.3	.2
12	5.7	1.6	8.1	3.4	16	8.4	3.6	3.2	1.6	.6	.3	.2
13	4.7	1.6	7.8	3.4	14	7.2	3.7	4.5	1.5	.6	.3	.2
14	3.9	1.4	7.2	3.4	15	6.2	4.6	4.8	1.6	.6	.3	.2
15	3.3	1.4	8.8	3.3	17	7.1	6.1	4.8	1.5	.6	.3	.2
16	2.9	1.4	9.4	4.1	*16	7.2	6.0	5.3	1.5	.5	.3	.2
17	2.5	1.4	8.3	6.7	13	6.9	5.7	*6.8	1.3	.5	.3	.2
18	2.3	1.8	7.0	8.0	11	6.4	6.4	7.7	1.3	.5	.2	.2
19	2.3	1.6	6.0	*7.3	8.5	5.7	7.7	7.4	1.3	.5	.2	.2
20	2.2	1.8	5.3	6.4	7.1	5.1	12	11	1.2	.4	.2	*.2
21	2.1	2.3	4.7	5.7	6.4	4.6	13	11	*1.1	.4	.4	.2
22	5.1	4.6	4.3	5.2	5.6	4.1	11	11	1.1	.4	.4	.2
23	6.4	8.4	4.1	5.0	4.9	3.8	9.2	9.4	1.0	.4	.7	.2
24	5.5	6.9	4.4	4.6	*4.5	3.4	7.7	8.0	1.0	.4	.6	.2
25	4.9	5.7	4.7	4.4	4.4	3.2	6.7	6.8	.9	.4	.4	.2
26	4.4	4.9	4.9	4.5	4.0	3.1	6.0	5.8	.9	.4	.4	.2
27	4.0	4.2	4.6	4.9	3.7	3.0	5.2	5.2	.9	.4	.3	.2
28	3.7	3.9	4.3	6.7	3.5	3.1	4.6	4.6	.9	.4	.3	.2
29	3.2	3.4	4.0	12	3.4	6.5	4.1	4.0	.8	.4	.3	.4
30	3.0	3.1	3.9	12	10	3.8	3.8	3.7	.5	.4	.3	.1
31	2.7	3.5	9.9		15			3.4		.4	.3	
Total	98.7	84.2	142.5	154.2	373.8	207.3	210.2	163.3	47.0	16.4	10.5	6.0
Mean	3.18	2.81	4.60	4.97	12.9	6.69	7.01	5.27	1.57	0.53	0.34	0.20
Cfsm	3.79	3.35	5.46	5.92	15.4	7.96	8.35	6.27	1.87	0.631	0.405	0.236
In.	4.37	3.75	6.31	6.83	16.55	9.18	9.31	7.25	2.08	0.75	0.46	0.27
Ac-ft	196	167	283	306	741	411	417	324	93	33	21	12

Calendar year 1959: Max 47 Min 0.2 Mean 4.15 Cfsm 4.94 In. 67.02 Ac-ft 3,000  
Water year 1959-60: Max 39 Min 0.1 Mean 4.14 Cfsm 4.93 In. 67.05 Ac-ft 3,000

Peak discharge (base, 40 cfs).--Feb. 9 (4 p.m.) 43 cfs (3.88 ft).

\* Discharge measurement made on this day.

## ALSEA RIVER BASIN

3068.1. Deer Creek near Salado, Oreg.

Location.--Lat 44°32'05", long 123°52'35", in SW<sup>1</sup> sec.11, T.12 S., R.10 W., on right bank 1,000 ft upstream from mouth, 4.6 miles west of Salado, and 6.5 miles southeast of Toledo.

Drainage area.--1.20 sq mi.

Records available.--September 1958 to September 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 600 ft (from topographic map).

Extremes.--Maximum discharge during year, 67 cfs Feb. 9 (gage height, 3.18 ft); minimum, 0.3 cfs Sept. 8-30.

1958-60: Maximum discharge, 83 cfs (revised) Jan. 9, 1959 (gage height, 3.37 ft); minimum daily, 0.3 cfs Sept. 2-9, Sept. 30 to Oct. 7, Oct. 16, 1958, Sept. 13-18, 21-30, 1960.

Revisions.--The figure of maximum discharge for the water year 1959 has been revised to 83 cfs Jan. 9, 1959 (gage height, 3.37 ft), superseding that published in WSP 1638.

Remarks.--Records good. No regulation or diversion above station. Records of suspended sediment loads 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 the water year 1959, superseding those published in WSP 1638, are given herewith:

Jan. 9, 1959..... 67

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
January 1959.....	621.9	67	6.0	20.1	16.8	19.27	1,230
Water year 1958-59.....	-	67	.3	6.78	5.65	76.69	4,900

Revised peak discharge.--1959: Jan. 9 (3 a.m.) 83 cfs (3.37 ft); Jan. 27 (1 p.m.) 71 cfs (3.22 ft).

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

Oct. 1-10

Oct. 11 to Sept. 30

1.2	1.5	0.85	0.3	1.4	2.5	2.6	28
1.4	2.6	.9	.4	1.7	5.0	2.9	46
1.7	5.1	1.0	.6	2.0	8.6	3.1	61
		1.2	1.3	2.3	15		

Discharge, in cubic 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	3.3	4.1	4.5	12	4.6	22	4.5	4.0	1.0	0.6	0.4
2	2.5	3.0	4.0	4.1	14	4.6	18	4.3	3.6	1.0	.5	.4
3	2.3	3.5	3.7	3.9	14	6.0	14	4.1	3.4	1.0	.5	.4
4	2.0	*2.9	3.5	3.6	14	10	11	3.9	3.1	1.0	*.5	.4
5	1.9	2.8	3.3	3.6	19	14	8.6	3.6	2.8	.9	.5	.4
6	1.8	2.6	3.2	3.6	28	14	7.5	4.5	2.7	.9	.5	.4
7	1.8	2.5	3.2	3.6	46	13	*6.5	4.9	2.6	.8	.4	.4
8	3.3	2.4	2.9	3.5	38	15	5.8	5.1	2.4	.8	.4	.4
9	4.4	2.2	*2.8	5.5	61	17	5.1	4.9	2.3	.8	.5	.4
10	4.8	2.2	3.1	5.6	47	14	4.7	4.6	2.2	.8	.4	.4
11	11	2.0	5.8	5.6	28	11	4.6	4.6	2.1	.8	.4	.4
12	10	2.0	15	5.2	21	9.4	4.6	4.7	2.0	.8	.4	.4
13	7.9	1.8	14	5.1	18	8.2	4.8	6.5	1.8	.8	.4	.3
14	6.0	1.8	11	5.2	17	7.1	5.9	7.3	2.2	.8	.4	.3
15	4.8	1.7	13	4.9	25	8.2	8.5	7.1	2.0	.7	.4	.3
16	4.0	1.7	14	6.2	22	8.8	8.5	7.3	2.0	.7	.4	.3
17	3.5	1.6	12	10	17	8.3	7.8	9.1	1.7	.7	.4	.3
18	3.0	2.6	10	12	14	7.3	8.5	*10	1.6	.7	.4	.3
19	3.0	2.2	8.2	11	11	6.4	11	9.6	1.6	.7	.4	.4
20	3.1	2.6	7.6	*9.4	9.8	5.7	18	15	1.6	.6	.4	.4
21	2.8	3.7	7.0	8.2	8.8	5.0	18	16	*1.5	.6	.5	*.3
22	8.7	8.7	6.4	7.2	7.8	4.6	14	14	1.4	.6	.6	.3
23	12	18	6.4	6.8	7.0	4.3	11	11	1.3	.6	1.0	.3
24	10	13	6.8	6.2	*6.2	4.0	8.9	9.4	1.3	.6	.9	.3
25	8.3	9.1	7.5	6.0	6.2	3.7	7.8	8.0	1.2	.6	.6	.3
26	7.0	7.1	7.6	6.7	5.6	3.7	7.1	7.0	1.2	.6	.6	.3
27	6.0	5.9	7.2	7.1	5.2	3.6	6.2	6.4	1.2	.6	.5	.3
28	5.2	5.6	6.5	10	4.9	4.0	5.6	5.7	1.1	.5	.4	.3
29	4.6	4.7	5.6	18	4.7	10	5.1	5.1	1.1	.5	.4	.3
30	4.0	4.4	5.5	18	---	17	4.6	4.6	1.1	.5	.4	.3
31	3.6	---	4.8	13	---	24	---	4.5	---	.6	.5	---
Total	156.2	127.6	215.7	225.2	532.2	276.5	273.7	217.3	60.1	22.6	15.2	10.4
Mean	5.04	4.25	6.96	7.26	18.4	8.92	9.12	7.01	2.00	0.73	0.49	0.35
Cfs/m	4.20	3.54	5.80	6.05	15.3	7.43	7.60	5.84	1.67	0.608	0.408	0.292
In.	4.84	3.95	6.68	6.98	16.49	8.57	8.48	6.75	1.86	0.70	0.47	0.32
Ac-ft	310	253	428	447	1,060	548	545	431	119	45	30	21

Calendar year 1959: Max 67 Min 0.5 Mean 6.12 Cfs/m 5.10 In. 69.17 Ac-ft 4,420  
 Water year 1959-60: Max 61 Min 0.3 Mean 5.83 Cfs/m 4.86 In. 66.07 Ac-ft 4,240

Peak discharge (base, 60 cfs).--Feb. 9 (1 p.m.) 67 cfs (3.18 ft).

\* Discharge measurement made on this day.

## 3077. Jackson Creek near Tiller, Oreg.

Location.--Lat 42°57'15", long 122°49'40", in SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec.21, T.30 S., R.1 W., on right bank 0.5 mile upstream from Chapman Creek, 0.8 mile downstream from Beaver Creek, and 6.5 miles northeast of Tiller. Records include flow in Chapman Creek.

Drainage area.--152 sq mi, including Chapman Creek basin.

Records available.--October 1955 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,240.25 ft above mean sea level (levels by Douglas County Water Resources Survey).

Average discharge.--5 years, 341 cfs (246,900 acre-ft per year).

Extremes.--Maximum discharge during year, 2,460 cfs Mar. 7 (gage height, 6.11 ft); minimum, 14 cfs Sept. 19-30.

1955-60: Maximum discharge, 10,600 cfs Dec. 22, 1955 (gage height, 13.55 ft), from rating curve extended above 5,100 cfs by slope-area measurement of peak flow; minimum daily, 12 cfs Oct. 2-4, 1955.

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)

0.5	14	1.5	87	4.0	920
.6	16	2.0	169	5.0	1,550
.8	26	2.5	284	6.0	2,360
1.0	39	3.0	435		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	31	34	69	371	*134	1,690	264	*446	61	23	19
2	24	30	33	62	591	130	1,510	307	418	80	23	20
3	22	33	33	58	450	145	1,260	318	390	57	22	20
4	21	52	31	51	448	254	1,070	428	353	55	22	24
5	20	40	29	51	465	599	926	410	316	53	22	22
6	20	34	28	54	461	889	788	405	287	*51	21	19
7	23	31	27	161	1,030	1,910	680	711	257	47	21	19
8	111	30	27	410	2,070	1,280	560	600	233	*45	20	18
9	160	29	*27	272	1,890	996	488	516	212	44	20	17
10	112	28	25	194	1,220	732	414	480	194	41	19	16
11	87	26	30	205	744	573	418	468	184	41	19	16
12	77	26	82	194	564	586	404	512	171	38	19	16
13	60	25	102	154	508	810	378	428	158	37	19	16
14	48	24	67	132	461	733	*472	374	148	36	18	15
15	41	23	68	110	492	655	484	341	145	36	18	15
16	36	23	69	102	465	865	476	330	134	34	18	15
17	33	23	68	147	397	596	460	313	124	33	18	15
18	30	23	68	276	359	620	480	318	115	32	18	15
19	29	24	60	279	310	670	488	313	108	31	*18	14
20	31	24	52	249	272	685	484	501	102	30	*17	14
21	*45	51	48	264	247	640	551	832	96	30	18	14
22	143	72	43	272	228	605	508	804	92	29	23	14
23	100	114	41	266	203	573	450	772	87	28	36	14
24	72	87	106	302	190	551	397	777	82	28	35	14
25	58	68	173	324	184	521	359	760	76	27	30	14
26	50	56	122	330	175	472	327	876	74	27	24	14
27	44	48	95	294	160	465	305	926	71	26	22	14
28	40	43	87	*347	146	472	279	755	67	26	20	14
29	37	39	83	394	139	439	264	630	65	24	20	14
30	34	36	88	439	-----	1,200	234	546	62	25	19	*14
31	32	-----	83	341	-----	1,150	-----	488	-----	25	18	-----
Total	1,665	1,193	1,929	6,803	15,236	20,750	17,644	18,503	5,267	1,157	660	485
Mean	53.7	39.8	62.2	219	525	669	588	532	176	37.3	21.3	16.2
Cfsm	0.353	0.262	0.409	1.44	3.45	4.40	3.87	3.50	1.16	0.245	0.140	0.107
In.	0.41	0.29	0.47	1.68	3.73	5.08	4.32	4.04	1.29	0.28	0.16	0.12
Ac-ft	3,300	2,370	3,830	13,490	30,220	41,160	35,000	32,730	10,450	2,290	1,310	962

Calendar year 1959: Max 3,080 Min 16 Mean 217 Cfsm 1.43 In. 19.33 Ac-ft 156,800

Water year 1959-60: Max 2,070 Min 14 Mean 244 Cfsm 1.61 In. 21.85 Ac-ft 177,100

Peak discharge (base, 2,500 cfs).--No peak above base.

\* Discharge measurement made on this day.

## UMPQUA RIVER BASIN

3080. South Umpqua River at Tiller, Oreg.

Location.--Lat 42°55'50", long 122°56'50", in NE $\frac{1}{4}$  sec.33, T.30 S., R.2 W., on right bank 0.2 mile upstream from bridge on State Highway 42 at Tiller and 0.3 mile upstream from Elk Creek.

Drainage area.--449 sq mi.

Records available.--October 1910 to December 1911, October 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Prior to December 1911, published as South Fork of Umpqua River at Tiller.

Gage.--Water-stage recorder. Datum of gage is 991.8 ft above mean sea level, datum of 1929 (river-profile survey). Prior to Oct. 1, 1939, staff gage at site 0.2 mile downstream at different datum.

Average discharge.--22 years, 1,034 cfs (748,600 acre-ft per year).

Extremes.--Maximum discharge during year, 10,700 cfs Mar. 7 (gage height, 10.65 ft, referred to outside gage); minimum, 40 cfs Sept. 23.  
1910-11, 1939-60: Maximum discharge, 46,400 cfs Dec. 11, 1956 (gage height, 22.7 ft, referred to outside gage); minimum observed, 20 cfs Sept. 3, 4, 1911.

Remarks.--Records good. No regulation. Small diversions above station for irrigation.

Revisions (water years).--WSP 1448: 1911(M), 1912, drainage area.

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

0.9	37	1.5	196	5.0	2,400
1.0	53	2.0	390	7.0	4,600
1.2	100	3.0	870	10.0	9,400

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	84	120	136	298	1,210	*466	6,040	730	*1,240	207	86	63
2	78	118	130	266	2,150	450	5,800	820	1,150	196	86	65
3	73	124	121	243	1,740	545	4,250	826	1,070	189	84	67
4	71	218	118	214	1,770	2,080	3,400	1,100	1,040	186	81	76
5	67	169	109	203	2,080	3,910	2,890	1,060	894	176	81	76
6	65	146	106	210	2,050	4,310	2,440	1,020	800	*165	78	69
7	67	130	103	515	3,980	7,890	2,110	1,770	730	156	73	63
8	335	124	*103	1,380	8,420	5,120	1,780	1,710	655	149	71	61
9	741	115	100	1,040	7,990	4,110	1,530	1,430	590	146	67	55
10	470	109	100	715	5,000	2,920	1,310	1,290	550	143	69	53
11	302	103	106	750	2,980	2,240	1,280	1,250	520	143	65	51
12	330	100	218	700	2,310	2,100	1,210	1,380	492	136	63	51
13	236	100	382	550	2,140	2,930	1,110	1,280	462	133	63	50
14	182	97	290	474	2,000	2,550	1,360	1,110	438	130	65	50
15	149	92	278	410	2,350	2,250	*1,440	978	434	130	65	50
16	133	89	306	366	2,120	2,520	1,450	942	414	124	65	48
17	112	89	318	600	1,660	2,170	1,410	900	366	121	63	48
18	106	86	310	990	1,420	2,230	1,490	954	366	118	61	47
19	97	92	274	1,050	1,190	2,380	1,690	942	342	112	*61	45
20	100	97	236	966	996	2,360	1,670	1,530	326	109	59	43
21	*127	169	207	954	888	2,210	1,800	2,820	310	112	59	43
22	703	290	182	1,130	805	2,070	1,630	2,530	294	109	69	43
23	506	515	172	1,160	735	1,940	1,410	2,270	286	106	66	40
24	350	394	310	1,350	680	1,820	1,220	2,130	270	103	118	42
25	255	290	735	1,410	655	1,700	1,080	2,010	262	100	109	42
26	214	236	515	1,460	630	1,530	990	2,490	255	100	86	42
27	179	196	402	1,300	560	1,490	906	2,830	240	97	76	43
28	159	172	362	*1,470	520	1,520	820	2,170	228	95	71	50
29	146	156	358	1,650	510	1,470	750	1,800	225	92	67	45
30	133	143	378	1,710	488	3,650	725	1,560	218	89	65	*43
31	125	-----	350	1,320	-----	3,740	-----	1,370	-----	92	63	-----
Total	6,695	4,879	7,815	26,874	61,517	78,971	56,801	47,002	15,487	4,064	2,310	1,564
Mean	216	163	252	867	2,121	2,547	1,893	1,516	516	131	74.5	52.1
Cfsm	0.481	0.363	0.561	1.93	4.72	5.67	4.22	3.38	1.15	0.292	0.166	0.116
In.	0.56	0.40	0.65	2.23	5.10	6.54	4.70	3.89	1.28	0.34	0.19	0.13
Ac-ft	13,280	9,680	15,500	53,300	122,000	156,600	112,700	93,230	30,720	8,060	4,580	3,100
Calendar year 1959:	Max	7,340	Min	47	Mean	686	Cfsm	1.53	In.	20.72	Ac-ft	496,400
Water year 1959-60:	Max	8,420	Min	40	Mean	858	Cfsm	1.91	In.	26.00	Ac-ft	622,800

Peak discharge (base, 7,000 cfs).--Feb. 8 (12:30 p.m.) 10,500 cfs (10.57 ft); Mar. 7 (10 a.m.) 10,700 cfs (10.65 ft); Apr. 1 (3:30 p.m.) 7,260 cfs (8.80 ft).

\* Discharge measurement made on this day.

## 3085. Elk Creek near Drew, Oreg.

Location (revised).--Lat 42°53'25", long 122°55'00", in SW<sup>1</sup> sec.11, T.31 S., R.2 W., on right bank 100 ft downstream from Dixon Creek, 0.2 mile upstream from Drew Creek, 1.3 miles northwest of Drew, and 3.3 miles southeast of Tillier.

Drainage area.--54.4 sq mi.

Records available.--September 1954 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,279.25 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--6 years, 87.3 cfs (63,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,670 cfs Feb. 8 (gage height, 5.87 ft); minimum, 0.6 cfs Aug. 20.

1954-60: Maximum discharge, 7,500 cfs Dec. 21, 1955 (gage height, 10.34 ft), from rating curve extended above 1,700 cfs on basis of slope-area measurement of peak flow; minimum, that of Aug. 20, 1960.

Maximum stage known, 11.8 ft, from floodmarks, probably for flood in January or November 1953 (discharge, about 11,000 cfs).

Remarks.--Records good. No regulation. Several diversions for irrigation above station.

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

1.3	0.6	2.1	28	4.0	490
1.4	1.1	2.4	56	5.0	1,000
1.5	2.2	2.7	101	6.0	1,770
1.6	4.2	3.0	169		
1.8	12	3.5	309		

Discharge, in cubic 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	3.2	3.8	12	137	*35	454	38	55	5.8	1.4	1.1
2	2.8	3.2	3.6	11	294	33	360	48	*47	5.4	1.4	1.5
3	2.6	3.6	3.8	10	219	49	250	49	40	5.0	1.4	1.5
4	2.4	4.0	3.6	8.6	312	123	182	94	35	5.0	1.3	1.8
5	2.4	3.8	3.4	8.6	309	285	137	82	31	4.6	1.3	1.8
6	2.4	3.6	3.2	11	252	371	117	72	27	*4.0	1.3	1.5
7	2.6	3.4	3.2	32	587	804	89	86	24	3.8	1.1	1.5
8	1.2	3.2	3.0	152	1,320	434	76	72	23	3.6	1.0	1.4
9	1.1	3.2	*3.2	78	*850	364	68	60	22	3.6	.9	1.5
10	9.1	3.0	3.2	45	446	259	60	50	20	3.6	1.0	1.0
11	7.8	3.0	3.8	78	284	195	66	43	18	3.6	1.0	.8
12	7.0	3.0	1.3	61	225	200	59	41	17	3.0	.8	1.5
13	5.8	3.0	1.8	39	203	267	54	38	16	3.0	.8	.8
14	4.2	3.0	1.2	29	172	244	74	33	15	2.8	1.0	.8
15	3.8	2.8	9.9	24	200	219	*69	31	14	2.8	.9	1.0
16	3.6	2.8	11	23	192	242	66	31	14	2.6	1.0	.8
17	3.4	2.8	10	126	149	198	61	30	13	2.2	.8	.8
18	3.2	2.8	10	128	132	177	57	33	12	2.1	.9	.7
19	3.0	2.8	9.9	103	109	162	54	30	12	2.0	*.8	.8
20	3.2	2.8	8.6	82	89	142	54	62	11	1.9	.8	.8
21	*4.6	4.6	7.4	80	80	123	70	135	10	2.0	.8	.8
22	11	9.5	6.6	70	72	109	75	144	9.9	1.8	1.0	.8
23	9.9	12	6.2	70	62	96	69	146	9.5	1.8	2.1	.8
24	6.6	9.5	30	86	56	87	62	182	9.1	1.8	2.1	.8
25	4.6	7.4	42	91	54	78	56	195	8.6	1.6	1.8	.8
26	4.2	5.8	25	96	52	69	53	317	8.2	1.8	1.5	.9
27	3.6	5.0	18	89	46	72	47	236	7.8	1.6	1.3	.9
28	3.4	4.6	16	*105	41	72	43	146	7.4	1.5	1.1	.9
29	3.2	4.0	14	115	38	72	40	109	6.6	1.4	1.0	.8
30	3.2	4.0	15	137	378	378	82	62	6.8	1.5	1.0	*.7
31	3.4	-----	14	94	-----	288	-----	65	-----	1.4	1.0	-----
Total	153.0	129.4	334.4	2,094.2	6,982	6,247	2,958	2,780	549.7	88.6	35.6	30.7
Mean	4.94	4.31	10.8	67.6	241	202	98.6	89.7	18.3	2.86	1.15	1.02
Ac-ft	303	257	663	4,150	13,850	12,390	5,870	5,510	1,090	176	71	61

Calendar year 1959: Max 1,080 Min 0.9 Mean 57.2 Ac-ft 41,410  
 Water year 1959-60: Max 1,320 Min 0.7 Mean 61.2 Ac-ft 44,390

Peak discharge (base, 1,000 cfs).--Feb. 8 (7:30 p.m.) 1,670 cfs (5.87 ft); Mar. 7 (6:30 a.m.) 1,200 cfs (5.29 ft).

\* Discharge measurement made on this day.

3087. Days Creek at Days Creek, Oreg.

Location.--Lat 42°58'55", long 123°08'55", in NE $\frac{1}{4}$  sec.10, T.30 S., R.4 W., on downstream side of bridge 20 ft upstream from Wood Creek, 1 mile northeast of town of Days Creek, and 1.3 miles (revised) upstream from mouth.

Drainage area.--55.3 sq mi.

Records available.--October 1955 to September 1960.

Gage.--Wire-weight gage read once or twice daily, and crest-stage gage. Altitude of gage is 810 ft (from topographic map).

Average discharge.--5 years, 49.1 cfs (35,550 acre-ft per year).

Extremes.--Maximum discharge during year, 1,230 cfs Feb. 9 (gage height, 6.03 ft); minimum observed, 0.1 cfs Aug. 14.

1955-60: Maximum discharge, 3,450 cfs Feb. 21, 1956 (gage height, 11.24 ft), from rating curve extended above 1,100 cfs on basis of slope-area measurement of peak flow; minimum observed, 0.1 cfs Aug. 26, Sept. 1, 1959, Aug. 14, 1960.

Remarks.--Records fair. No regulation. Several diversions 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 Feb. 8, 9)

Oct. 1 to Feb. 9

Feb. 10 to Sept. 30

0.7	1.0	2.2	79	0.3	0.1	1.5	24
.8	2.3	2.5	125	.4	.3	1.8	41
1.0	5.7	3.0	223	.5	.9	2.1	66
1.2	10	4.0	465	.6	1.8	2.5	125
1.5	22	6.0	1,220	.8	3.9	3.0	223
1.9	46			1.0	7.2	4.0	465
				1.2	12		

Discharge, in cubic 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	3.1	3.4	9.3	25	*17	183	18	*18	2.1	0.4	1.5
2	1.5	2.9	a3.2	8.8	62	17	163	20	14	2.0	.5	a1.5
3	2.0	4.6	a3.0	6.7	66	17	108	20	a13	1.6	.3	2.9
4	a1.8	3.9	2.6	7.7	50	41	72	23	a12	1.5	.6	3.2
5	1.6	3.7	2.9	7.3	133	100	53	28	11	1.8	.6	2.2
6	2.5	2.5	a2.8	6.9	100	134	a45	24	12	*1.5	.7	1.6
7	2.2	2.5	2.8	52	148	420	a35	22	11	1.4	.4	1.7
8	10	3.1	*2.8	125	492	255	30	43	9.3	1.2	.4	1.1
9	7.1	2.9	2.8	66	*860	345	28	a30	7.8	a1.2	.5	1.0
10	a6	3.1	2.9	44	333	245	a27	a25	7.4	1.2	.4	1.1
11	a4.6	2.9	a4.4	79	163	134	32	a22	7.6	1.0	.3	1.2
12	a4.4	2.9	23	82	108	123	30	a20	a6.5	1.0	a.5	1.2
13	2.9	2.9	50	44	80	a123	26	18	5.4	.7	.7	1.1
14	3.1	3.1	42	30	79	122	*34	16	a5.2	1.5	.1	.8
15	2.8	2.9	20	28	63	120	a45	15	4.6	1.2	.2	.8
16	2.2	2.8	12	33	78	116	a55	15	5.1	.6	.4	.7
17	2.5	2.6	8.6	223	69	98	44	15	a4.8	.8	.2	.6
18	2.5	2.8	8.2	255	61	113	a40	15	4.5	.8	.2	.7
19	*2.6	3.4	7.7	116	50	52	37	12	4.4	.8	*.4	.7
20	2.6	2.8	5.9	75	47	46	34	a30	a4.0	.7	.5	.8
21	a5.3	3.1	5.7	53	a42	37	34	59	a3.8	.8	.4	.7
22	14	6.9	a5.5	a40	a38	32	34	66	a3.6	.5	1.2	a.8
23	8.2	5.7	a5	a35	56	28	31	56	a3.4	.5	1.6	.8
24	5.7	7.7	a10	32	29	26	28	47	a3.0	.5	1.5	.5
25	a4.6	a5.5	a25	22	28	23	28	a40	a2.8	.7	.2	.7
26	4.3	a5	a20	*26	26	22	a26	48	a2.6	.8	1.1	.7
27	3.9	a4.5	a15	28	22	24	25	24	2.4	.8	1.1	.3
28	3.4	4	12	26	22	21	21	a40	2.2	.5	.8	.9
29	3.3	3.7	10	26	20	24	17	32	1.9	.8	.6	a1.0
30	3.6	4.4	11	23	-----	228	17	26	2.2	.7	.3	*1.0
31	3.4	-----	11	19	-----	116	-----	20	-----	.7	.4	-----
Total	128.6	111.9	341.2	1,628.7	3,353	3,217	1,581	920	195.7	31.9	17.3	35.8
Mean	4.08	3.73	11.0	52.5	116	104	46.0	29.7	6.52	1.03	0.56	1.13
Ac-ft	261	222	677	3,230	6,650	6,380	2,740	1,820	368	63	34	67

Calendar year 1959: Max 900 Min 0.1 Mean 25.5 Ac-ft 18,500  
Water year 1959-60: Max 860 Min 0.1 Mean 31.0 Ac-ft 22,520

Peak discharge (base, 900 cfs).--Feb. 9 (12 m.) 1,230 cfs (6.03 ft).

\* Discharge measurement made on this day.

a Doubtful or no gage-height record; discharge interpolated or estimated on basis of weather records and records for North Myrtle Creek near Myrtle Creek.

3090. Cow Creek near Azalea, Oreg.

Location.--Lat 42°49'30", long 123°10'40", in N½ sec.4, T.32 S., R.4 W., on right bank 0.8 mile upstream from Whitehorse Creek and 4.5 miles northeast of Azalea.

Drainage area.--78.0 sq mi.

Records available.--April 1926 to September 1928 (no winter records), April 1929 to December 1931, April 1932 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,685 ft (by barometer). Prior to July 19, 1949, staff gage at same site and datum.

Average discharge.--30 years (1929-31, 1932-60), 107 cfs (77,460 acre-ft per year).

Extremes.--Maximum discharge during year, 2,080 cfs Feb. 8 (gage height, 7.00 ft); minimum, 7.9 cfs Dec. 6, 7, Sept. 28.

1926-60: Maximum discharge, 5,920 cfs Oct. 29, 1950 (gage height, 14.37 ft), from rating curve extended above 2,000 cfs on basis of slope-area measurement of peak flow; minimum observed, 4 cfs Sept. 9-19, 1929, Aug. 26-28, 1931, Aug. 21 to Sept. 6, 1934.

Remarks.--Records good. No regulation. Diversions for irrigation of 400 acres above station.

Revisions (water years).--WSP 984: 1933-36. WSP 1154: 1946(M), 1948(M). WSP 1448: Drainage area.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Sept. 29, 30)

0.6	7.5	1.2	50	3.0	430
0.8	16	1.5	85	4.0	770
1.0	31	2.0	175	6.0	1,580

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	13	13	12	15	109	57	475	80	83	22	12	11
2	13	14	12	14	341	56	379	*65	74	22	12	13
3	13	14	12	14	175	89	298	63	69	20	12	12
4	13	14	12	14	260	140	232	80	65	20	12	17
5	13	14	12	18	358	283	195	71	59	*20	12	14
6	13	13	11	20	238	343	167	67	54	19	11	13
7	13	13	*12	28	699	1,020	145	74	52	17	11	12
8	25	13	12	90	1,560	578	128	67	50	17	10	12
9	23	13	12	58	1,250	570	114	62	48	16	9.9	12
10	18	13	12	36	564	388	105	58	45	16	9.9	11
11	16	13	14	40	308	292	108	54	44	16	9.9	11
12	15	13	31	38	232	275	96	53	41	16	9.5	10
13	14	13	39	28	207	315	*92	53	39	16	9.9	9.9
14	13	13	25	29	175	262	126	50	37	16	10	10
15	13	12	22	25	181	235	108	49	36	17	9.9	*10
16	13	12	21	25	171	258	99	50	35	16	9.9	10
17	13	12	20	52	145	211	93	49	34	15	9.9	10
18	13	12	20	85	137	203	89	53	33	14	*9.9	9.5
19	13	12	18	67	118	199	85	49	32	14	10	9.5
20	*14	12	17	67	102	191	82	73	30	14	9.9	8.7
21	16	14	16	82	94	175	87	97	29	13	9.9	8.7
22	25	17	15	76	89	163	89	93	29	13	11	8.7
23	20	18	15	71	82	149	82	94	28	13	14	8.7
24	16	15	36	78	77	133	78	108	27	13	13	8.3
25	15	14	57	77	74	120	77	114	26	13	13	8.7
26	15	13	32	*82	73	111	76	290	25	13	12	8.3
27	14	12	24	77	68	116	72	262	24	13	12	8.3
28	14	12	21	83	63	113	67	177	24	12	11	8.7
29	14	12	19	87	*59	110	65	137	23	12	11	*8.7
30	14	12	20	106	---	490	61	111	22	13	10	8.7
31	13	---	20	80	---	343	---	*94	---	13	9.9	---
Total	468	397	621	1,660	8,009	7,968	3,968	2,777	1,217	484	337.4	311.4
Mean	15.1	13.2	20.0	53.5	276	257	132	89.6	40.6	15.6	10.9	10.4
Cfsm	0.194	0.169	0.256	0.686	3.54	3.29	1.69	1.15	0.521	0.200	0.140	0.133
In.	0.22	0.19	0.30	0.79	3.82	3.80	1.89	1.32	0.58	0.23	0.16	0.15
Ac-ft	928	787	1,230	3,290	15,890	15,800	7,870	5,510	2,410	960	669	618

Calendar year 1959: Max 1,640 Min 9.9 Mean 86.0 Cfsm 1.10 In. 14.96 Ac-ft 62,280  
Water year 1959-60: Max 1,560 Min 8.3 Mean 77.1 Cfsm 0.99 In. 13.45 Ac-ft 55,960

Peak discharge (base, 1,500 cfs).--Feb. 8 (10 p.m.) 2,080 cfs (7.00 ft); Mar. 7 (8:30 a.m.) 1,760 cfs (6.35 ft).

\* Discharge measurement made on this day.

3095. West Fork Cow Creek near Glendale, Oreg.

Location.--Lat 42°48'10", long 123°37'10", in NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.11, T.32 S., R.8 W., on left bank 1 mile upstream from mouth and 11 miles northwest of Glendale.

Drainage area.--83.6 sq mi.

Records available.--August 1955 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,035.14 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--5 years, 293 cfs (212,100 acre-ft per year).

Extremes.--Maximum discharge during year, 4,890 cfs Feb. 9 (gage height, 12.71 ft); minimum, 8.3 cfs Sept. 21.

1955-60: Maximum discharge, 10,600 cfs Dec. 21, 1955 (gage height, 18.60 ft), from rating curve extended above 4,300 cfs on basis of slope-area measurement of peak flow; minimum, 6.3 cfs Oct. 2, 1958.

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)  
(Shifting-control method used Feb. 13 to Mar. 4, Mar. 18-29, Apr. 5 to May 25)

Oct. 1 to Feb. 8

Feb. 9 to Sept. 30

3.8	11	6.0	470	3.4	6.5	5.0	195
4.0	24	7.0	780	3.6	13	6.0	470
4.3	61	9.0	1,850	3.8	22	7.0	780
4.6	112	11.0	3,320	4.0	36	9.0	1,850
5.0	191			4.3	71	12.0	4,250
				4.6	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	19	15	18	57	424	100	1,160	112	191	38	16	13
2	16	15	18	53	1,310	97	808	107	168	36	16	15
3	16	15	17	48	902	161	587	103	148	35	16	13
4	15	15	16	46	1,280	373	431	105	135	34	15	15
5	15	15	16	43	1,450	670	327	97	124	34	15	15
6	14	14	16	43	924	728	255	92	115	32	15	13
7	14	14	*15	68	1,690	1,600	213	100	107	30	14	12
8	47	13	15	668	3,230	1,460	182	92	98	*29	13	12
9	41	12	15	404	4,050	1,890	164	88	92	28	13	11
10	35	12	15	201	1,760	981	150	85	88	28	13	11
11	27	11	20	171	840	653	146	82	84	27	13	10
12	25	11	150	157	575	554	135	85	78	26	13	9.8
13	21	11	169	130	485	587	*141	110	75	26	13	9.5
14	20	11	94	117	416	521	276	103	71	26	13	9.5
15	19	11	71	99	386	557	410	100	70	25	12	9.5
16	18	11	60	91	347	662	377	100	64	24	12	9.2
17	16	11	54	159	304	539	289	100	62	23	12	8.9
18	15	11	46	347	268	455	242	121	59	22	*12	8.9
19	14	11	42	252	222	389	224	122	56	21	12	8.9
20	*16	12	39	218	189	309	206	256	52	20	11	8.6
21	19	36	34	249	166	252	210	479	51	20	11	8.6
22	56	40	32	339	152	215	217	380	48	19	12	8.6
23	40	54	30	377	141	189	206	284	47	18	13	8.6
24	31	41	311	371	133	168	187	242	47	18	14	8.6
25	24	34	281	317	128	156	170	444	45	18	14	8.6
26	22	28	141	*328	124	150	168	1,930	44	18	13	8.9
27	21	23	101	339	115	158	156	975	43	18	12	8.9
28	20	22	80	551	108	162	139	560	41	17	11	8.9
29	18	21	71	717	*103	359	126	380	40	17	11	*8.9
30	16	20	64	581	-----	1,620	117	278	39	17	11	8.6
31	15	-----	64	383	-----	1,270	-----	*226	-----	16	11	-----
Total	705	570	2,115	7,924	22,202	17,985	8,419	8,368	2,382	760	402	310.0
Mean	22.7	19.0	68.2	256	786	580	281	270	79.4	24.5	13.0	10.3
Cfs/m	0.272	0.227	0.816	3.06	9.16	6.94	3.36	3.23	0.950	0.293	0.156	0.123
In.	0.31	0.25	0.94	3.53	9.88	8.00	3.75	3.72	1.06	0.34	0.18	0.14
Ac-ft	1,400	1,130	4,200	15,720	44,040	35,670	16,700	16,590	4,720	1,510	797	615

Calendar year 1959: Max 4,850 Min 6.6 Mean 213 Cfs/m 2.55 In. 34.63 Ac-ft 154,500  
Water year 1959-60: Max 4,050 Min 8.6 Mean 197 Cfs/m 2.36 In. 32.10 Ac-ft 143,100

Peak discharge (base, 2,500 cfs).--Feb. 9 (5 a.m.), 4,890 cfs (12.71 ft); May 26 (10 a.m.) 2,700 cfs (10.22 ft).

\* Discharge measurement made on this day.

3100. Cow Creek near Riddle, Oreg.

Location.--Lat 42°55'25", long 123°25'40", in NE $\frac{1}{4}$  sec.32, T.30 S., R.6 W., on left bank 1,500 ft upstream from Council Creek and 3.8 miles (revised) southeast of Riddle.

Drainage area.--456 sq mi.

Records available.--September 1954 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 682.60 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--6 years, 971 cfs (703,000 acre-ft per year).

Extremes.--Maximum discharge during year, 18,000 cfs Feb. 9 (gage height, 16.62 ft); minimum, 25 cfs Sept. 20, 21.  
1954-60: Maximum discharge, 38,200 cfs Dec. 26, 1955 (gage height, 27.35 ft); minimum, 23 cfs Sept. 8, 1955.  
Maximum discharge known, 41,100 cfs Oct. 29, 1950 (gage height, about 28.5 ft, present site and datum), from slope-area measurement.

Remarks.--Records good. No regulation. Many small diversions for irrigation above station.

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

1.2	23	3.0	770
1.4	47	5.0	2,750
1.6	86	8.0	5,900
2.0	210	12.0	11,100
2.5	445	15.0	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	59	59	68	156	748	*325	3,630	344	*573	100	38	33
2	56	59	66	140	3,250	311	2,970	339	489	100	37	37
3	54	61	62	151	2,180	375	2,150	334	454	94	37	39
4	52	59	62	119	3,210	642	1,600	349	390	91	36	40
5	50	61	62	113	3,680	1,450	1,260	349	354	86	37	42
6	49	59	62	108	2,620	2,410	1,030	330	325	*86	37	39
7	52	59	61	139	4,410	6,250	884	339	301	79	37	37
8	75	57	*61	966	8,760	5,200	740	344	283	73	34	34
9	131	56	61	1,050	14,900	7,100	681	320	266	68	33	34
10	110	54	64	554	6,610	4,220	625	297	253	68	33	33
11	94	54	68	440	3,140	2,770	586	283	237	68	33	33
12	82	54	201	450	2,020	2,130	560	279	214	66	33	33
13	75	54	467	364	1,660	2,090	518	316	200	64	32	32
14	68	54	279	320	1,340	1,840	*740	283	186	64	31	32
15	66	52	192	279	1,170	1,660	901	283	182	64	31	31
16	62	52	159	249	1,070	1,840	918	283	175	64	31	30
17	59	52	140	283	955	1,580	786	279	169	61	*32	28
18	57	50	131	639	867	1,380	702	297	165	59	31	28
19	*56	50	116	632	770	1,210	674	311	162	54	30	28
20	57	54	108	566	667	1,030	612	434	156	50	28	27
21	62	68	102	580	599	901	612	955	149	47	28	26
22	100	116	97	660	554	786	625	826	143	47	31	27
23	119	116	89	698	512	702	612	686	143	47	33	27
24	97	119	291	674	472	639	560	639	140	47	35	27
25	86	102	630	632	445	586	512	748	134	47	37	27
26	77	89	380	625	428	548	489	3,530	125	47	37	27
27	71	82	262	*606	390	554	472	2,880	119	49	35	27
28	68	75	206	786	364	566	434	1,660	113	46	35	27
29	64	71	175	1,260	339	580	390	1,130	113	43	33	27
30	62	68	162	1,180	-----	4,000	364	850	105	40	32	*26
31	61	-----	162	884	-----	3,930	-----	674	-----	39	32	-----
Total	2,231	2,016	5,046	16,273	68,110	59,605	27,637	20,953	6,798	1,958	1,041	938
Mean	72.0	67.2	163	525	2,349	1,923	921	676	227	63.2	33.6	31.3
Ac-ft	4,430	4,000	10,010	32,280	135,100	118,200	54,820	41,560	13,480	3,880	2,060	1,860

Calendar year 1959: Max 20,800 Min 24 Mean 734 Ac-ft 530,500  
Water year 1959-60: Max 14,900 Min 26 Mean 581 Ac-ft 421,700

Peak discharge (base, 10,000 cfs).--Feb. 9 (7:30 a.m.) 18,000 cfs (16.62 ft).

\* Discharge measurement made on this day.

## 3107. South Myrtle Creek near Myrtle Creek, Oreg.

Location.--Lat 43°01'55", long 123°11'30", in SE $\frac{1}{4}$  sec.20, T.29 S., R.4 W., on left bank 0.6 mile downstream from School Hollow and 5.5 miles east of town of Myrtle Creek.

Drainage area.--43.9 sq mi.

Records available.--October 1955 to September 1960.

Gage.--Staff gage read once or twice daily, and crest-stage gage. Datum of gage is 775.25 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--5 years, 72.4 cfs (52,420 acre-ft per year).

Extremes.--Maximum discharge during year, 1,600 cfs Feb. 9 (gage height, 5.25 ft); minimum observed, 0.5 cfs Aug. 10.  
1955-60: Maximum discharge, 3,050 cfs Dec. 11, 1956 (gage height, 7.72 ft), from rating curve extended above 1,100 cfs by logarithmic plotting; minimum observed, 0.4 cfs Aug. 18, 1959.

Remarks.--Records fair. No regulation. Several diversions for irrigation of about 600 acres above station.

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

0.2	0.4	1.0	14	3.0	440
.3	.8	1.2	25	4.0	915
.5	2.4	1.5	53	5.0	1,460
.6	3.6	2.0	132		
.8	7.3	2.5	255		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.9	8.5	9.1	18	50	31	281	38	39	5.7	0.6	5.0
2	6.5	8.5	9.1	18	106	29	234	41	35	6.9	2.5	6.3
3	6.5	8.5	9.4	17	89	36	170	49	32	5.3	1.5	6.3
4	6.3	12	9.1	16	81	53	132	60	30	4.4	1.5	16
5	6.3	10	8.8	16	156	112	97	51	28	*5.0	1.5	9.4
6	6.7	9.1	8.5	16	138	152	84	48	25	6.9	2.4	7.3
7	6.9	8.5	8.5	61	225	581	70	76	23	4.3	1.6	7.1
8	32	8.2	*8.2	156	628	288	61	65	22	4.8	1.1	5.3
9	20	8.2	8.2	87	970	432	60	57	21	4.3	1.0	4.8
10	20	7.9	8.2	57	448	246	51	51	20	5.3	.5	4.8
11	19	7.9	10	114	203	186	51	46	18	4.8	1.6	5.7
12	13	7.9	32	97	154	174	53	43	18	4.8	1.3	5.5
13	11	7.3	48	63	132	225	49	43	18	3.4	2.6	4.3
14	9.7	7.6	29	50	127	186	*61	39	14	3.6	2.5	4.4
15	8.8	7.3	21	41	132	179	78	36	16	2.3	1.6	4.4
16	8.5	7.6	19	50	121	174	81	37	14	1.5	1.8	3.4
17	8.2	7.3	17	320	109	152	74	35	14	2.1	1.6	3.8
18	7.6	7.5	16	264	94	127	74	41	13	1.5	2.1	3.8
19	*7.3	9.1	15	132	78	112	68	40	12	1.6	*1.8	3.9
20	7.9	8.2	14	107	66	95	61	69	11	2.2	2.4	4.6
21	13	14	13	92	54	84	66	97	11	1.9	1.7	3.2
22	40	16	12	95	52	72	68	111	11	2.1	4.1	4.8
23	22	24	12	68	49	63	69	97	10	2.1	6.5	4.6
24	16	18	16	65	42	56	66	91	9.1	3.0	5.3	4.4
25	13	14	46	65	42	51	63	78	9.1	1.9	5.3	4.8
26	12	13	39	60	40	48	60	91	9.7	2.8	3.6	5.1
27	11	11	29	*53	32	48	53	86	5.5	2.5	2.4	5.1
28	9.7	10	22	52	32	51	48	78	4.4	2.1	2.9	5.3
29	9.4	10	20	52	*31	63	44	56	2.1	1.5	1.6	4.8
30	8.8	9.7	19	52	-----	306	40	48	7.1	1.1	1.9	4.8
31	8.5	-----	22	45	-----	198	-----	*42	-----	1.4	2.9	-----
Total	382.5	397.2	558.1	2,397	4,481	4,610	2,467	1,840	502.0	103.1	71.7	163.0
Mean	12.3	10.2	18.0	77.3	155	149	82.2	59.4	16.7	3.33	2.31	5.43
Ac-ft	759	609	1,110	4,750	8,890	9,140	4,890	3,650	996	204	142	323

Calendar year 1959: Max 755  
Water year 1959-60: Max 970

Min 0.4  
Min 0.5

Mean 39.4  
Mean 48.9

Ac-ft 28,540  
Ac-ft 35,460

Peak discharge (base, 1,000 cfs).--Feb. 9 (about 2 p.m.) 1,600 cfs (5.25 ft).

\* Discharge measurement made on this day.

3110. North Myrtle Creek near Myrtle Creek, Oreg.

Location.--Lat 43°02'30", long 123°15'30", in SW<sup>1</sup> sec.14, T.29 S., R.5 W., on right bank 0.1 mile downstream from Bilger Creek, 1.5 miles northeast of town of Myrtle Creek, and 2.5 miles upstream from confluence with South Myrtle Creek.

Drainage area.--54.2 sq mi.

Records available.--October 1955 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 660 ft (from topographic map).

Average discharge.--5 years, 82.1 cfs (59,440 acre-ft per year).

Extremes.--Maximum discharge during year, 1,910 cfs Feb. 9 (gage height, 7.64 ft); minimum, 1.2 cfs Aug. 20.

1955-60: Maximum discharge, 3,170 cfs Feb. 21, 1956 (gage height, 9.87 ft), from rating curve extended above 680 cfs by logarithmic plotting; maximum gage height, 11.58 ft Dec. 26, 1955 (backwater from debris); minimum discharge, 0.4 cfs Aug. 8, 1959.

Remarks.--Records good. No regulation. Several diversions 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 Nov. 26 to Dec. 8, July 2-5)

Oct. 1 to Feb. 9

Feb. 10 to Sept. 30

1.4	2.6	2.5	85	1.2	1.4	2.1	35
1.5	4.0	3.0	199	1.3	2.2	2.5	87
1.7	9.0	4.0	535	1.4	3.7	3.0	199
1.9	18	5.0	910	1.5	5.5	4.0	535
2.1	32	7.0	1,650	1.7	10	5.0	910
				1.9	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	4.0	8.2	8.7	20	37	38	283	40	52	8.7	3.2	6.5
2	4.0	8.2	8.4	19	128	36	256	39	44	6.1	2.6	7.3
3	3.9	8.7	8.7	18	127	42	199	44	41	7.8	2.5	7.1
4	4.0	10	8.7	17	114	74	148	67	37	7.3	2.6	13
5	5.1	8.4	8.4	16	181	143	117	56	33	*7.0	2.8	7.3
6	7.3	8.4	7.9	17	176	202	100	51	33	6.1	2.8	6.7
7	7.6	8.2	7.9	41	265	538	84	73	30	6.3	3.2	6.1
8	22	8.2	*8.4	159	595	448	73	74	28	5.7	2.5	5.7
9	17	7.9	8.4	110	*1,450	648	64	64	27	5.9	2.2	5.3
10	14	7.9	8.2	75	*879	466	58	55	23	5.5	2.1	5.3
11	11	7.9	9.8	123	325	315	60	47	23	5.7	1.9	5.1
12	9.0	7.6	36	125	227	242	56	45	21	*5.5	2.4	5.0
13	7.9	7.6	58	89	183	216	*52	44	19	5.1	2.4	3.7
14	7.6	7.6	34	68	150	189	58	39	19	5.3	2.0	4.2
15	7.3	7.6	24	52	148	186	68	36	18	5.0	1.9	4.2
16	7.0	7.6	19	56	138	178	73	35	17	5.1	2.2	3.7
17	6.8	7.6	17	232	121	156	71	35	17	5.0	3.1	3.4
18	6.5	7.6	15	351	109	136	67	39	15	4.4	2.6	3.2
19	*6.5	7.9	13	202	92	111	61	35	14	4.8	*2.5	3.2
20	7.3	8.4	13	146	74	92	61	60	13	4.6	2.1	3.4
21	12	14	12	119	70	81	70	96	13	3.9	3.0	3.2
22	28	16	12	89	65	70	77	115	13	3.9	4.8	3.9
23	15	21	11	56	70	85	79	107	12	3.9	6.9	4.1
24	11	17	19	56	51	58	79	96	11	3.1	5.7	4.2
25	11	14	41	48	51	55	74	85	11	3.4	5.5	4.1
26	9.4	12	38	42	46	51	68	107	10	5.1	4.6	3.6
27	8.7	9.8	30	*41	43	52	61	121	10	3.1	4.1	3.9
28	8.4	10	24	41	39	50	52	105	9.9	2.8	3.9	4.1
29	8.2	9.8	21	39	*37	59	46	87	9.6	2.6	3.4	3.7
30	8.2	9.0	21	37	-----	287	43	70	9.7	3.1	2.5	3.4
31	8.2	-----	23	35	-----	283	-----	*58	-----	3.0	2.8	-----
Total	291.9	294.1	574.5	2,551	5,771	5,587	2,658	2,023	632.2	156.8	96.6	147.6
Mean	9.42	9.80	18.5	81.6	199	180	88.6	65.3	21.1	5.06	3.12	4.92
Ac-ft	579	583	1,140	5,020	11,450	11,080	5,270	4,010	1,250	311	192	293

Calendar year 1959: Max 852 Min 1.5 Mean 48.7 Ac-ft 35,240  
 Water year 1959-60: Max 1,450 Min 1.9 Mean 56.7 Ac-ft 41,180

Peak discharge (base, 1,100 cfs).--Feb. 9 (12 m.) 1,910 cfs (7.64 ft).

\* Discharge measurement made on this day.

3112. Olalla Creek near Termile, Oreg.

Location.--Lat 43°02'20", long 123°32'35", in NW¼ sec.21, T.29 S., R.7 W., on left bank 0.5 mile downstream from Berry Creek and 4.4 miles south of Termile.

Drainage area.--60.5 sq mi.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 749.53 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to June 21, 1957, wire-weight gage at site 0.3 mile downstream at datum 7.83 ft lower.

Extremes.--Maximum discharge during year, 2,880 cfs Feb. 9 (gage height, 7.30 ft); minimum, 0.4 cfs Sept. 25, 26.

1956-60: Maximum discharge, 6,640 cfs Jan. 12, 1959 (gage height, 11.15 ft), from rating curve extended above 2,500 cfs by logarithmic plotting; no flow Aug. 13, 1959.

Flood of Dec. 26, 1955, reached a stage of 13.6 ft, present site and datum, from floodmarks (discharge, about 9,000 cfs), from rating curve extended above 2,500 cfs by logarithmic plotting. This was the highest known flood for at least the preceding 35 years.

Remarks.--Records good. Some diversions for irrigation above station.

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

Oct. 1 to Mar. 5					Mar. 6 to Sept. 30						
	0.2	0.8	2.0	106		0.1	0.4	0.8	14	2.5	202
	.3	1.5	2.5	188		.2	.8	1.0	23	5.0	318
	.5	3.8	3.0	298		.3	2.0	1.2	35	4.0	630
	.7	8.3	4.0	625		.4	3.6	1.5	58	5.0	1,140
	.9	16	5.0	1,140		.6	8.0	2.0	117	6.0	1,810
	1.1	25	6.0	1,810							
	1.5	51	7.0	2,620							

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.5	1.9	3.4	11	73	22	359	29	57	6.8	0.7	0.8
2	1.4	2.0	3.3	10	438	21	282	26	46	6.5	.7	.6
3	1.3	2.0	3.4	9.6	286	27	217	28	40	5.8	.7	1.6
4	1.2	2.0	3.3	8.3	346	62	163	36	35	5.3	.8	2.5
5	1.2	2.0	3.2	7.8	*429	215	122	30	31	5.1	.8	1.8
6	1.2	*1.9	3.2	7.6	313	*396	98	27	27	4.3	.8	1.7
7	1.4	1.9	3.2	18	507	885	77	33	24	3.9	.7	1.3
8	6.8	2.0	3.2	188	1,320	1,030	65	33	22	3.1	.7	1.1
9	7.6	1.9	3.2	149	2,220	1,520	55	30	20	3.1	.7	1.1
10	5.2	2.0	3.0	78	*847	666	48	28	19	3.0	.7	1.1
11	3.5	1.9	4.6	106	364	393	45	25	18	*3.0	.7	.8
12	2.9	1.8	20	112	240	290	40	22	16	2.8	.7	.8
13	2.4	1.8	26	69	202	259	41	22	15	2.8	.6	.8
14	2.1	1.8	*14	51	165	196	67	20	14	2.8	.6	.8
15	*1.9	1.9	8.6	37	138	215	111	18	14	2.8	.6	.8
16	1.8	2.1	7.0	36	110	245	120	20	13	2.6	.6	.8
17	1.7	2.1	5.8	62	96	192	98	20	13	2.2	.6	.8
18	1.7	2.1	4.8	100	85	151	81	27	12	1.8	.6	.7
19	1.7	2.1	4.4	80	72	122	72	29	11	1.7	.7	.7
20	2.1	2.3	3.7	63	59	96	61	90	10	1.7	.6	.7
21	2.6	5.4	3.3	51	50	77	*61	285	10	1.6	.6	.7
22	4.6	8.0	3.2	42	45	64	66	221	9.8	1.4	*.7	.7
23	4.2	11	3.0	36	40	*55	67	150	9.5	1.3	1.0	.7
24	2.9	8.9	35	34	35	48	62	109	9.2	1.0	1.2	.7
25	2.3	6.8	63	30	34	44	57	95	8.8	1.0	1.3	.5
26	2.3	5.2	35	26	32	41	52	440	8.8	1.2	1.2	.4
27	2.3	4.6	22	28	29	38	45	348	8.0	1.2	1.1	.5
28	2.2	4.2	16	45	26	37	38	206	7.5	.8	.8	.6
29	2.2	3.5	12	70	24	59	33	138	7.0	.8	.7	.7
30	2.0	3.5	12	71	-----	649	31	97	7.0	.8	.7	.6
31	2.0	-----	13	60	-----	515	-----	*76	-----	.7	.7	-----
Total	80.2	100.6	348.8	1,696.3	8,625	8,630	2,734	2,758	542.6	82.9	23.6	27.4
Mean	2.59	3.35	11.3	54.7	297	278	91.1	89.0	18.1	2.67	0.76	0.91
Ac-ft	159	200	692	3,360	17,110	17,120	5,420	5,470	1,080	164	47	54

Calendar year 1959: Max 2,960 Min 0 Mean 82.1 Ac-ft 59,470  
 Water year 1959-60: Max 2,220 Min 0.4 Mean 70.1 Ac-ft 50,880

Peak discharge (base, 1,000 cfs).--Feb. 9 (6 a.m.) 2,880 cfs (7.30 ft); Mar. 9 (2:30 a.m.) 2,150 cfs (6.44 ft).

\* Discharge measurement made on this day.

## 3115. Lookingglass Creek at Brockway, Oreg.

Location--Lat 43°07'05", long 123°26'15", in SW $\frac{1}{4}$  sec.20, T.28 S., R.6 W., on right bank 0.4 mile northeast of Brockway and 0.8 mile upstream from mouth.

Drainage area--158 sq mi.

Records available--October 1955 to September 1960.

Gage--Water-stage recorder. Datum of gage is 493.19 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge--5 years, 354 cfs (256,300 acre-ft per year).

Extremes--Maximum discharge during year, 10,200 cfs Feb. 9 (gage height, 16.73 ft); no flow Oct. 1-7, July 19 to Sept. 30.  
1955-60: Maximum discharge, 35,000 cfs Dec. 26, 1955 (gage height, 24.93 ft), from rating curve extended above 7,200 cfs on basis of slope-area measurement of peak flow; no flow at times in each year.

Remarks--Records good except those for period of no gage-height record, which are fair. Many diversions by pumping 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	4.3	a6.6	41	170	119	883	101	159	10		
2	0	4.5	a6.4	39	944	118	710	92	137	10		
3	0	4.5	a6.4	35	656	181	548	104	116	9.2		
4	0	4.3	a6.4	32	844	395	414	94	103	8.2		
5	0	4.1	a6.2	30	*1,120	956	328	91	92	8.0		
6	0	*4.7	a6.2	28	773	*1,170	267	84	82	7.2		
7	0	4.7	a6.2	41	1,270	2,560	222	94	74	5.5		
8	.5	4.5	6.2	431	3,640	2,500	190	88	66	4.3		
9	17	4.7	6.0	534	7,890	*4,060	169	81	59	3.9		
10	17	4.7	5.3	276	*2,590	1,840	154	74	56	3.4		
11	11	3.7	6.2	319	1,070	1,040	148	69	52	*2.6		
12	7.8	3.9	19	356	734	767	137	65	48	2.6		
13	5.1	3.4	104	241	641	632	130	70	44	2.6		
14	4.3	3.0	*67	192	520	501	175	64	40	2.3		
15	3.7	3.0	44	154	471	552	330	59	37	1.3		
16	3.2	3.2	33	140	414	626	334	60	35	.9		
17	2.8	2.9	26	162	370	516	273	61	32	1.4		
18	2.9	3.4	21	256	344	420	235	72	30	.2		
19	3.5	4.1	18	217	298	356	207	77	28	0		
20	4.1	4.3	16	176	257	293	186	111	26	0		
21	3.5	7.0	14	151	225	248	*222	422	24	0		
22	9.0	19	13	130	207	213	228	380	22	0	(*)	
23	26	36	13	112	186	187	210	275	19	0		
24	22	a20	44	102	172	173	192	219	18	0		
25	17	a15	204	91	163	159	181	192	16	0		
26	15	a12	149	85	158	148	172	1,110	15	0		
27	8.8	a10	95	97	146	146	166	828	15	0		
28	5.3	a9	65	143	134	140	137	482	14	0		
29	4.9	a8	49	162	127	149	120	334	12	0		
30	4.3	a7	42	176	-----	1,240	107	246	12	0		
31	3.9	-----	44	162	-----	1,220	-----	*193	-----	-----		
Total	202.6	222.9	1,148.1	4,091	26,534	23,625	7,773	6,292	1,483	83.6	0	0
Mean	6.54	7.43	37.0	184	915	762	259	203	49.4	2.70	0	0
Ac-ft	402	442	2,280	10,100	52,630	46,860	15,420	12,480	2,940	166	0	0
Calendar year 1959: Max 10,200 Min 0 Mean 220 Ac-ft 159,000												
Water year 1959-60: Max 7,890 Min 0 Mean 198 Ac-ft 143,700												

Peak discharge (base, 3,000 cfs).--Feb. 9 (12 m.) 10,200 cfs (16.73 ft); Mar. 9 (6:30 a.m.) 5,170 cfs (13.06 ft).

\* Discharge measurement or observation of no flow made on this day.  
a No gage-height record; discharge estimated on basis of weather records and records for Olalla Creek near Tenmile.

3120. South Umpqua River near Brockway, Oreg.

Location.--Lat 43°08'00", long 123°23'50", in SW¼ sec.15, T.28 S., R.6 W., on downstream side of right pier of Winston Bridge on U. S. Highway 99, 2½ miles northeast of Brockway and 4 miles downstream from Lookingglass Creek.

Drainage area.--1,670 sq mi.

Records available.--December 1905 to June 1912, October 1923 to September 1926, January 1942 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 461.84 ft above mean sea level, datum of 1929 (Oregon State Highway Department bench mark). Prior to June 24, 1949, staff, chain, and wire-weight gages at several sites within 400 ft of present site at various datums.

Average discharge.--26 years (1906-11, 1923-26, 1942-60), 2,866 cfs (2,075,000 acre-ft per year).

Extremes.--Maximum discharge during year, 43,300 cfs Feb. 9 (gage height, 20.43 ft); minimum, 77 cfs Aug. 20.

1905-12, 1923-26, 1942-60: Maximum discharge, 102,000 cfs Oct. 29, 1950 (gage height, 32.4 ft), from rating curve extended above 76,000 cfs on basis of slope-conveyance study; minimum observed, 36 cfs Aug. 12, 13, 1946.

Flood of Feb. 21, 1927, reached a stage of about 31.2 ft, present site and datum (discharge, 101,000 cfs). Flood in February 1890 reached a stage 1.9 ft higher, according to local resident who lived nearby at time of both floods (discharge, about 130,000 cfs).

Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation. Many small diversions for irrigation above station.

Revisions (water years).--WSP 1248: 1946(M), 1948(M), 1951. WSP 1448: 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	197	228	280	665	2,660	1,250	12,800	1,640	2,690	340	124	110
2	176	225	270	585	6,320	1,130	13,000	1,690	2,420	328	121	123
3	167	218	250	523	6,340	1,300	9,900	1,760	2,220	324	114	130
4	156	218	240	487	6,980	2,110	7,580	2,020	2,040	305	108	156
5	154	276	230	442	*8,500	6,540	6,130	2,210	1,850	287	108	181
6	152	*279	220	415	7,700	*10,400	5,200	2,040	1,680	274	107	169
7	154	246	210	478	10,700	19,000	4,530	2,400	1,500	258	108	157
8	183	228	205	2,700	22,800	18,400	3,860	3,020	1,370	238	107	142
9	478	215	205	4,340	32,800	21,200	3,560	2,620	1,240	230	96	133
10	399	210	205	2,540	22,900	14,000	2,960	2,330	1,110	222	85	133
11	630	197	207	2,110	11,500	9,540	2,760	2,160	1,030	*220	83	128
12	460	195	262	2,550	7,640	7,350	2,720	2,090	943	214	80	121
13	460	190	1,010	1,950	6,490	7,660	2,490	2,270	880	207	83	117
14	365	188	*986	1,520	5,440	7,380	2,830	2,030	815	203	79	114
15	301	190	706	1,260	5,240	6,220	3,450	1,840	767	196	85	112
16	262	183	595	1,080	5,250	6,780	3,740	1,710	744	192	85	108
17	240	178	580	1,410	4,470	6,110	3,390	1,660	706	187	85	105
18	220	176	546	3,670	3,910	5,500	3,200	1,650	660	173	87	100
19	210	178	518	3,180	3,420	5,250	3,230	1,740	630	163	83	96
20	210	180	469	2,780	2,900	5,000	3,220	1,810	595	159	79	91
21	230	195	420	2,480	2,530	4,600	*3,330	4,840	555	154	79	91
22	236	252	377	2,510	2,540	4,190	3,420	5,050	523	152	*82	90
23	346	518	349	2,550	2,150	3,860	3,160	4,490	500	142	93	93
24	670	766	386	2,610	1,960	3,520	2,860	4,060	478	142	121	93
25	500	805	1,450	2,700	1,820	3,260	2,620	3,800	456	142	175	95
26	398	474	1,570	2,720	1,770	3,000	2,430	7,140	442	142	165	98
27	337	400	1,080	2,570	1,640	2,870	2,250	8,690	420	144	154	96
28	293	350	810	2,720	1,490	2,960	2,050	6,020	389	144	135	95
29	265	320	700	3,480	1,540	2,650	1,890	4,670	372	155	124	95
30	249	300	660	3,790	---	10,200	1,730	3,750	356	124	114	103
31	240	---	700	3,220	---	12,600	---	*3,140	---	123	105	---
Total	10,580	8,378	16,696	66,035	206,600	216,070	126,080	96,340	30,381	6,264	3,254	3,481
Mean	341	279	539	2,130	7,193	6,970	4,203	3,108	1,013	202	105	116
Cfs/m	0.204	0.167	0.323	1.28	4.93	4.17	2.52	1.86	0.607	0.121	0.063	0.069
In.	0.24	0.19	0.37	1.47	4.65	4.81	2.81	2.15	0.98	0.14	0.07	0.08
Ac-ft	20,390	16,820	33,120	131,000	413,800	428,800	250,100	191,100	60,270	12,420	6,450	6,900
Calendar year 1959: Max	45,000	Min	70	Mean	2,196	Cfs/m	1.31	In.	17.85	Ac-ft	1,590,000	
Water year 1959-60: Max	39,800	Min	79	Mean	2,164	Cfs/m	1.30	In.	17.66	Ac-ft	1,571,000	

Peak discharge (base, 18,000 cfs).--Feb. 9 (12:30 p.m.), 43,300 cfs (20.43 ft); Mar. 7 (5:30 p.m.) 27,200 cfs (15.51 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 18-21, Nov. 27 to Dec. 8; discharge estimated on basis of weather records, recorded range in stage, and records for station at Tiller.

3122. Deer Creek near Roseburg, Oreg.

Location.--Lat 43°13'05", long 123°17'15", in SE<sup>1</sup>/<sub>4</sub> sec.16, T.27 S., R.5 W., on left bank 200 ft upstream from Shick Creek, 2.8 miles east of Roseburg, and 3 miles upstream from mouth.

Drainage area.--54.3 sq mi.

Records available.--October 1955 to September 1960.

Gage.--Staff gage read once daily, twice daily above 4 ft gage height, and crest-stage gage. Datum of gage is 486.1 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--5 years, 87.2 cfs (63,130 acre-ft per year).

Extremes.--Maximum discharge during year, 2,650 cfs Feb. 9 (gage height, 9.00 ft); minimum observed, 0.1 cfs Aug. 19.

1955-60: Maximum discharge, 6,800 cfs Dec. 26, 1955 (gage height, 13.67 ft, from floodmarks), from rating curve extended above 2,200 cfs on basis of slope-area measurements at gage heights 13.38 and 13.67 ft; no flow July 17, 1959.

Remarks.--Records good except those for periods of no gage-height record or shifting control, which are fair. Many small diversions by pumping for irrigation above station; diversions above station for log ponds.

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 Feb. 9

Feb. 10 to Sept. 30

1.3	0.4	3.0	162
1.4	2.0	4.0	370
1.5	5.0	5.0	680
1.7	16	6.0	1,070
2.0	39	8.0	2,050
2.5	88		

1.1	0.1	2.0	34
1.2	.4	2.5	80
1.3	.8	3.0	152
1.4	2.4	4.0	370
1.5	5.2	5.0	680
1.6	9.8	6.0	1,070

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.2	3.3	3.0	16	39	28	320	33	36	a4.8	1.8	3.4
2	2.0	2.7	3.6	14	330	57	230	32	*34	a4.8	2.0	2.6
3	1.6	4.6	4.6	12	*216	240	152	36	28	a4.8	1.3	2.4
4	2.2	4.3	4.6	13	212	491	120	59	26	4.6	2.0	7.6
5	*2.4	4.0	a3.8	9.8	273	645	85	42	22	4.3	2.4	4.0
6	2.7	3.3	a3.4	12	203	425	72	42	20	2.9	1.6	3.4
7	3.3	2.7	a3.2	47	273	902	62	113	26	2.9	.8	2.9
8	10	2.7	a3	162	1,120	645	54	75	20	3.2	.4	2.9
9	7.2	2.7	a3	114	1,880	810	48	60	5.2	3.4	.2	2.4
10	4.6	*3.3	a3	76	575	298	41	33	17	3.4	.8	2.4
11	3.3	4.6	a6	241	270	230	57	32	a15	3.4	.8	2.4
12	4.0	5.0	16	187	226	190	41	40	13	3.4	1.0	1.6
13	3.3	a3.8	23	98	178	194	38	33	13	3.4	1.6	1.4
14	3.3	a3.8	16	62	146	152	49	32	13	2.9	1.6	1.6
15	2.7	a3.8	12	54	165	190	80	29	11	2.9	1.3	2.2
16	2.7	4.0	14	88	122	137	63	31	11	2.9	1.0	2.2
17	2.7	4.0	*8.2	220	104	118	55	30	11	2.4	1.0	2.2
18	2.4	3.3	4.6	235	104	80	53	34	9.8	2.0	.5	2.0
19	2.4	3.3	a4.4	189	80	60	55	31	9.8	*1.6	.1	1.8
20	3.3	5.0	4.3	121	66	62	49	71	9.8	1.2	.7	1.8
21	a5.5	16	4.0	88	60	59	75	137	8.7	.8	.8	1.4
22	10	9.8	4.6	74	54	52	98	131	7.2	1.3	2.0	2.2
23	a6.5	5.0	4.6	65	42	44	87	94	7.2	a1.3	2.4	1.8
24	4.6	6.2	14	51	42	*41	79	104	5.9	a1.3	2.4	1.4
25	5.4	5.0	4.1	45	40	38	*76	106	5.9	1.3	2.0	1.8
26	4.6	5.0	a32	39	40	38	61	352	a5.5	2.9	2.0	2.2
27	4.0	4.6	a20	49	33	44	52	194	a5	1.6	1.6	3.4
28	2.7	4.0	16	48	30	39	44	128	a5	1.3	2.0	2.4
29	3.0	3.0	a15	52	28	63	38	86	a5	a1.2	2.0	2.0
30	2.7	3.0	16	45	-----	503	34	68	a5	a1.1	*2.0	2.0
31	3.6	-----	17	43	-----	325	-----	51	-----	1.0	2.2	-----
Total	120.9	135.8	327.9	2,529.8	6,951	7,200	2,368	2,339	413.0	80.3	44.3	73.8
Mean	3.90	4.53	10.6	81.6	240	232	78.9	75.5	13.8	2.59	1.43	2.46
Ac-ft	240	269	650	5,020	13,790	14,280	4,700	4,840	819	159	88	146

Calendar year 1959: Max 1,630 Min 0 Mean 53.9 Ac-ft 39,020  
 Water year 1959-60: Max 1,880 Min 0.1 Mean 61.7 Ac-ft 44,800

Peak discharge (base, 1,200 cfs).--Feb. 9 (about 8:30 a.m.), 2,650 cfs (9.00 ft); Mar. 7 (about 6 a.m.), 1,200 cfs (6.3 ft).

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Calapooya Creek near Oakland.

Note.--Shifting-control method used Dec. 1-25, Sept. 15-30.

## 3130. Lemolo Reservoir near Toketee Falls, Oreg.

Location.--Lat 43°19'10", long 122°11'20", in SE¼NW¼ sec.11, T.26 S., R.5 E., at Lemolo No. 1 diversion dam, 1.1 miles downstream from Lake Creek and 13 miles east of town of Toketee Falls.

Drainage area.--170 sq mi.

Records available.--July 1954 to September 1960.

Gage.--Staff gage read once daily. Datum of gage is at mean sea level (levels by The California Oregon Power Co.).

Extremes.--Maximum contents observed during year, 13,350 acre-ft June 14-17 (elevation, 4,148.0 ft); minimum observed, 940 acre-ft Mar. 3 (elevation, 4,095.5 ft).  
1954-60: Maximum contents observed, 13,560 acre-ft Aug. 5, 1955, June 13, 14, 1956 (elevation, 4,148.5 ft); minimum observed, 11 acre-ft Mar. 5, 1955 (elevation, 4,055.4 ft).

Remarks.--Reservoir is formed by Lemolo No. 1 diversion dam. Storage began July 15, 1954. Usable capacity for normal operation, 12,520 acre-ft between elevations 4,097.0 and 4,148.5 ft. Dead storage below 4,097.0 ft, 1,040 acre-ft. Water is used for power generation. Figures given herein represent total contents.

Cooperation.--Gage readings furnished by The California Oregon Power Co.

Revisions.--WSP 1448: Drainage area.

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.....	4,147.5	13,140	-
Oct. 31.....	4,146.6	12,770	-370
Nov. 30.....	4,143.3	11,460	-1,310
Dec. 31.....	4,138.6	9,750	-1,710
Calendar year 1959.....	-	-	-2,930
Jan. 31.....	4,126.5	5,970	-3,780
Feb. 29.....	4,097.5	1,080	-4,890
Mar. 31.....	4,113.4	2,900	+1,820
Apr. 30.....	4,134.3	8,330	+5,430
May 31.....	4,144.0	11,730	+3,400
June 30.....	4,147.0	12,930	+1,200
July 31.....	4,147.2	13,010	+80
Aug. 31.....	4,147.1	12,970	-40
Sept. 30.....	4,147.1	12,970	0
Water year 1959-60.....	-	-	-170

† Elevation at 9 a.m.

3135. North Umpqua River below Lemolo Reservoir, near Toketee Falls, Oreg.

Location.--Lat 43°19'20", long 122°11'40", in NW¼NW¼ sec.11, T.26 S., R.5 E., on right bank 1,900 ft downstream from Lemolo Reservoir and 13 miles east of town of Toketee Falls.

Drainage area.--170 sq mi.

Records available.--October 1927 to December 1945, March 1946 to September 1960. Published as "below Lake Creek" prior to October 1952 and as "below Lake Creek, near Toketee Falls" October 1952 to September 1953.

Gage.--Water-stage recorder. Altitude of gage is 4,025 ft (from river-profile map). Prior to July 15, 1954, at site 1 mile upstream at datum about 65 ft higher. July 15, 1954, to Sept. 25, 1955, at site 400 ft upstream at datum 14.11 ft higher.

Average discharge.--32 years, 413 cfs (299,000 acre-ft per year), adjusted for storage.

Extremes.--Maximum discharge during year, 651 cfs June 5; minimum daily, 195 cfs July 17. 1927-60: Maximum discharge, 1,400 cfs June 3, 1956, from river rating curve extended from 450 to 905 cfs; minimum daily, 9.7 cfs May 13, 1955.

Remarks.--Records good. Flow regulated since 1954 by Lemolo Reservoir (see preceding page); also slightly regulated by Diamond Lake. All records presented herein include flow in Lemolo No. 1 power canal which, beginning July 1955, diverts 0.4 mile above station for power generation with return flow 4.3 miles downstream.

Revisions.--WSP 1448: 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	375	324	440	288	518	380	402	464	531	460	370	409
2	361	385	412	384	*499	408	277	463	399	420	391	412
3	358	375	385	304	505	407	205	390	*453	306	377	239
4	346	*328	381	426	510	378	328	456	548	327	383	243
5	352	393	354	436	496	334	324	461	611	411	396	321
6	361	403	347	394	497	301	341	450	640	381	299	404
7	381	389	421	380	475	385	372	405	631	401	237	384
8	359	368	428	378	394	441	403	388	629	401	329	336
9	408	416	403	388	381	*453	403	399	624	313	383	339
10	408	357	420	345	477	467	362	399	611	326	384	340
11	393	403	326	417	493	420	393	408	570	372	344	275
12	375	411	390	452	489	235	411	371	538	360	345	364
13	375	423	341	484	483	199	417	382	516	358	323	354
14	387	416	439	509	476	442	410	487	553	*372	200	276
15	399	360	458	386	471	468	405	518	565	394	392	384
16	405	381	393	350	404	401	397	547	562	334	388	333
17	405	379	*391	303	410	362	394	580	566	195	380	323
18	405	424	378	482	479	395	363	593	533	423	377	213
19	405	471	309	466	487	362	*389	596	523	395	378	364
20	405	411	373	472	475	210	389	595	517	407	258	363
21	408	407	383	512	480	331	400	597	516	410	240	363
22	306	405	399	473	467	386	420	595	519	402	383	349
23	419	313	352	422	374	400	323	586	504	323	369	307
24	434	452	343	315	388	382	419	576	455	230	298	321
25	426	439	347	474	473	364	437	571	466	392	*339	215
26	430	379	401	373	466	360	437	567	296	374	435	363
27	427	428	380	513	461	355	443	566	518	587	327	368
28	340	396	384	502	424	353	454	506	442	377	311	369
29	432	401	392	510	585	416	459	579	436	376	359	347
30	430	435	394	506	-----	396	459	560	431	285	375	360
31	428	-----	402	511	-----	435	-----	541	-----	217	424	-----
Total	12,183	11,892	11,925	13,156	13,337	11,656	11,656	15,594	15,703	11,129	10,854	10,038
Mean	393	396	385	424	460	375	389	503	523	359	350	335
Ac-ft	24,160	23,590	23,650	26,090	26,450	23,080	23,120	30,930	31,150	22,070	21,530	19,910

Adjusted for change in contents of Lemolo Reservoir

Mean	387	374	357	363	375	405	480	558	544	360	350	335
Cfsm	2.28	2.20	2.10	2.14	2.21	2.38	2.82	3.28	3.20	2.12	2.06	1.97
In.	2.62	2.46	2.42	2.46	2.38	2.75	3.15	3.79	3.57	2.44	2.37	2.20
Ac-ft	23,790	22,280	21,940	22,310	21,560	24,900	28,550	34,330	32,350	22,150	21,490	19,910

Observed

Calendar year 1959: Max	550	Min	158	Mean	412	Ac-ft	298,600
Water year 1959-60: Max	640	Min	195	Mean	407	Ac-ft	295,700

Adjusted

Calendar year 1959: Mean	408	Cfsm	2.40	In.	32.61	Ac-ft	295,700
Water year 1959-60: Mean	407	Cfsm	2.39	In.	32.61	Ac-ft	295,500

\* Discharge measurement made on this day.

## 3145. Clearwater River above Trap Creek, near Toketee Falls, Oreg.

Location.--Lat 43°14'40", long 122°17'10", in SE $\frac{1}{4}$  sec.1, T.27 S., R.4 E., on right bank 900 ft downstream from Clearwater No. 1 diversion dam, 0.4 mile upstream from Trap Creek, and 8.7 miles east of town of Toketee Falls.

Drainage area.--41.6 sq mi.

Records available.--October 1927 to December 1945, March 1946 to September 1960. Monthly discharge only December 1927 to March 1928, published in WSP 1318. Prior to October 1952, published as "above Trap Creek."

Gage.--Water-stage recorder. Datum of gage is 3,862.84 ft above mean sea level (levels by The California Oregon Power Co.). Prior to Dec. 1, 1953, at two sites about 0.4 mile downstream at different datums.

Average discharge.--32 years, 166 cfs (120,200 acre-ft per year).

Extremes.--Maximum discharge during year, 265 cfs May 12; minimum daily, 135 cfs Nov. 27. 1927-60: Maximum discharge, 598 cfs Dec. 22, 1955, from river rating curve extended from 58 to 399 cfs by logarithmic plotting; minimum daily, 91 cfs Nov. 4-6, 1931.

Remarks.--Records good. All records given herein include flow in Clearwater No. 1 power canal, completed in June 1953, which diverts 900 ft above station for generation of power and returns water to Clearwater River 2 $\frac{1}{2}$  miles below station.

Revisions.--WSP 1124: 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	159	142	149	141	141	141	186	182	236	180	158	152
2	160	141	149	141	142	142	189	185	245	178	157	152
3	160	146	150	141	*141	143	192	188	*250	177	157	152
4	159	*143	149	141	140	145	198	188	247	177	157	152
5	159	142	149	141	141	147	209	186	243	176	156	152
6	159	142	149	142	141	148	220	191	239	176	156	151
7	160	142	149	144	155	161	225	215	231	176	156	151
8	171	142	149	143	179	*161	227	211	224	174	155	150
9	182	143	148	141	169	157	226	211	218	172	155	150
10	166	143	147	140	159	153	220	219	218	170	155	150
11	154	143	148	141	153	153	216	230	218	169	154	150
12	152	143	147	140	152	153	208	259	218	168	154	150
13	149	143	144	139	150	154	205	242	220	168	154	149
14	148	143	142	139	149	152	205	229	219	*167	154	149
15	148	143	141	138	148	152	198	223	221	167	152	148
16	147	143	*138	138	146	151	194	222	216	166	151	148
17	146	144	137	140	145	152	191	216	120	164	152	149
18	146	145	137	138	145	151	192	211	205	164	152	148
19	146	146	137	137	145	153	*191	205	200	164	152	148
20	148	146	137	137	144	156	195	226	195	164	152	148
21	150	154	137	137	144	160	196	220	192	163	152	148
22	153	154	137	137	144	163	191	213	190	162	153	147
23	148	155	137	137	143	168	188	209	192	162	154	147
24	146	150	140	137	142	173	187	207	194	162	155	146
25	145	149	137	138	143	179	185	210	192	159	*152	147
26	145	149	136	139	143	184	183	225	190	159	152	148
27	144	149	135	138	141	189	185	228	187	159	152	148
28	144	149	136	138	141	189	182	224	185	159	152	149
29	143	148	137	140	141	188	182	226	185	159	152	148
30	143	145	139	141	-----	192	182	230	183	160	151	148
31	142	-----	142	140	-----	185	-----	234	-----	160	151	-----
Total	4,702	4,367	4,409	4,524	4,267	4,995	5,946	6,663	6,363	5,181	4,765	4,475
Mean	152	146	142	139	147	161	198	215	212	167	154	149
Cfsm	3.65	3.51	3.41	3.34	3.53	3.87	4.76	5.17	5.10	4.01	3.70	3.58
In.	4.20	3.90	3.94	3.87	3.81	4.47	5.32	5.96	5.69	4.63	4.26	4.00
Ac-ft	9,330	8,660	8,750	8,580	8,460	9,910	11,790	13,220	12,620	10,280	9,450	8,880
Calendar year 1959: Max	290			Min 135	Mean 172	Cfsm 4.13	In. 56.09	Ac-ft 124,500				
Water year 1959-60: Max	259			Min 135	Mean 165	Cfsm 3.97	In. 54.05	Ac-ft 119,900				

\* Discharge measurement made on this day.

3160. Fish Creek at Big Camas ranger station, near Toketee Falls, Oreg.

Location.--Lat 43°13'50", long 122°26'45", in SE¼ sec.10, T.27 S., R.3 E., on right bank 0.3 mile upstream from Camas Creek, 0.7 mile east of Big Camas ranger station, 3.2 miles south of town of Toketee Falls, and 5 miles upstream from mouth.

Drainage area.--68.8 sq mi.

Records available.--October 1947 to September 1960. Prior to October 1952, published as "at Big Camas ranger station."

Gage.--Water-stage recorder. Datum of gage is 2,858.52 ft above mean sea level, datum of 1929 (levels by The California Oregon Power Co.). Prior to July 10, 1951, water-stage recorder and July 10 to Aug. 10, 1951, staff gage, at site 1,000 ft upstream at datum 13.72 ft higher. Aug. 11 to Nov. 3, 1951, staff gage at site 200 ft downstream at different datum. Nov. 4, 1951, to Sept. 30, 1956, water-stage recorder at same site at datum 1.92 ft higher.

Average discharge.--13 years, 249 cfs (180,300 acre-ft per year).

Extremes.--Maximum discharge during year, 1,280 cfs Feb. 8; minimum daily, 39 cfs Nov. 15-18, Dec. 8.

1947-60: Maximum discharge, 9,880 cfs Dec. 22, 1955, affected by failure of power canal diversion dam 2 miles upstream; minimum daily, 35 cfs Nov. 27, 1952.

Remarks.--Records good except those for periods of ice effect, which are fair. All records given herein include flow in Fish Creek power canal (diversion began June 18, 1952), which diverts water 2 miles above station for power generation at Fish Creek powerplant; diversion discharged to North Umpqua River just below Toketee Falls.

Revisions.--WSP 1448: 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	45	46	45	b45	158	b91	479	260	593	149	79	55
2	44	44	43	b45	194	88	539	299	*619	144	70	56
3	42	63	46	b52	*158	99	578	303	624	138	67	55
4	42	65	42	b50	166	163	670	303	584	135	64	59
5	42	*53	42	b60	180	279	764	299	543	131	64	55
6	42	49	41	b60	197	366	765	342	493	125	62	53
7	44	46	40	61	503	731	715	571	432	120	60	52
8	103	44	59	b68	1,020	*578	657	490	368	117	59	52
9	196	44	40	68	850	444	572	459	359	115	59	50
10	85	43	40	b56	442	359	483	522	354	112	57	51
11	89	41	47	59	344	317	438	596	345	109	57	50
12	74	41	49	b56	290	310	387	825	341	106	57	51
13	61	40	45	b47	248	331	368	619	328	*104	58	50
14	56	40	43	b49	214	300	368	509	321	102	57	50
15	53	39	47	b50	213	278	342	461	324	100	58	48
16	50	39	*46	b51	193	255	312	430	301	97	58	47
17	49	39	47	55	179	249	308	385	278	94	58	45
18	47	39	49	50	169	263	324	348	255	91	56	44
19	47	43	48	46	156	327	352	329	236	90	56	45
20	53	41	46	45	141	405	*395	486	220	89	56	44
21	58	74	46	45	136	467	432	450	204	87	57	44
22	95	66	45	44	128	510	384	398	196	84	67	43
23	78	94	46	47	120	550	350	364	192	82	74	43
24	61	72	96	52	115	578	321	349	189	82	*78	43
25	56	59	77	60	112	588	295	412	182	81	66	43
26	54	55	62	76	107	582	274	624	174	80	61	43
27	48	50	57	71	b95	602	265	642	167	78	60	42
28	52	48	57	86	b92	524	253	582	164	77	58	42
29	49	46	56	124	b93	499	245	580	159	76	57	41
30	48	46	55	158	-----	557	250	582	155	82	55	41
31	46	-----	53	135	-----	475	-----	587	-----	90	55	-----
Total	1,899	1,509	1,535	1,971	6,813	12,165	12,865	14,406	9,720	3,167	1,900	1,437
Mean	61.3	50.3	49.5	63.6	235	392	429	465	324	102	61.3	47.9
Cfs/m	0.891	0.731	0.719	0.924	3.42	5.70	6.24	6.76	4.71	1.48	0.891	0.696
In.	1.03	0.82	0.83	1.07	3.68	6.58	6.95	7.79	5.25	1.71	1.03	0.78
Ac-ft	3,770	2,990	3,040	3,910	13,510	24,130	25,520	28,570	19,280	6,280	3,770	2,850

Calendar year 1959: Max 1,260 Min 39 Mean 180 Cfs/m 2.33 In. 31.53 Ac-ft 115,700  
 Water year 1959-60: Max 1,020 Min 39 Mean 190 Cfs/m 2.76 In. 37.52 Ac-ft 137,600

Peak discharge (base, 900 cfs)--Feb. 8 (8 a.m.) 1,280 cfs.

\* Discharge measurement made on this day.  
 b Stage-discharge relation affected by ice.

## UMPQUA RIVER BASIN

3165. North Umpqua River above Copeland Creek, near Toketee Falls, Oreg.

Location.--Lat 43°17'45", long 122°32'10", in NW $\frac{1}{4}$  sec.24, T.26 S., R.2 E., on right bank 0.6 mile upstream from Copeland Creek and 4.7 miles west of town of Toketee Falls.

Drainage area.--475 sq mi.

Records available.--September 1949 to September 1960. Monthly discharge only for September 1949, published in WSP 1318. Prior to October 1952, published as "above Copeland Creek."

Gage.--Water-stage recorder. Altitude of gage is 1,580 ft (from river-profile map).

Average discharge.--11 years, 1,626 cfs (1,177,000 acre-ft per year).

Extremes.--Maximum discharge during year, 4,260 cfs Feb. 8 (gage height, 7.09 ft); minimum daily, 575 cfs Oct. 4.

1949-60: Maximum discharge, 25,000 cfs Dec. 22, 1955 (gage height, 14.84 ft), from rating curve extended above 10,000 cfs by logarithmic plotting; minimum daily, 565 cfs Sept. 13, 1959.

Remarks.--Records good except those for period of no gage-height record, which are fair. Regulation by powerplants upstream; slightly regulated by Diamond Lake and by storage in Lemolo Reservoir (see p. 245). No diversion above station.

Revisions (water years).--WSP 1448: 1953(M), 1954, drainage area.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-8, Sept. 3-30)

Oct. 1 to Jan. 29				Jan. 30 to Sept. 30			
2.6	540	2.8	590	5.0	2,240		
3.0	750	3.3	880	7.0	4,150		
4.0	1,510	4.0	1,410				

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	605	768	887	670	*1,350	936	2,530	1,510	2,310	1,330	943	831
2	625	786	915	859	1,450	908	2,390	1,810	*2,170	992	964	752
3	580	738	804	685	1,350	978	2,580	1,710	2,220	1,050	922	852
4	575	950	762	915	1,390	1,210	2,620	1,670	2,340	971	824	680
5	645	*915	756	922	1,500	1,930	2,830	1,710	2,300	1,140	798	655
6	665	908	702	943	1,630	1,840	2,930	1,690	2,240	1,140	817	831
7	680	838	915	915	2,270	*3,180	2,740	2,290	2,180	1,010	732	756
8	1,330	720	852	964	3,390	2,820	2,560	2,090	2,030	1,030	894	685
9	1,240	838	901	943	2,830	2,220	2,440	2,040	1,940	957	801	620
10	1,090	866	810	866	2,330	1,960	2,260	2,110	1,780	804	880	620
11	1,100	744	738	1,030	1,790	1,780	2,100	2,180	1,780	1,030	780	655
12	992	726	774	922	1,730	1,550	2,130	2,630	1,670	999	750	620
13	1,010	915	645	1,210	1,690	1,680	1,920	2,510	1,760	*992	720	655
14	908	838	971	845	1,510	1,780	1,800	2,340	1,710	1,010	855	890
15	780	744	957	866	1,450	1,710	al, 700	2,080	1,710	1,040	852	685
16	957	762	*859	866	1,600	1,630	al, 600	2,090	1,650	859	894	645
17	768	831	929	790	1,320	1,670	al, 500	2,120	1,630	810	792	605
18	670	929	750	985	1,380	1,700	*al, 700	1,980	1,600	831	810	600
19	922	908	744	859	1,290	1,860	1,910	1,930	1,230	999	768	650
20	908	915	744	1,010	1,160	1,990	1,920	2,240	1,550	929	792	650
21	1,010	738	936	1,010	1,130	2,130	2,190	2,580	1,470	964	635	696
22	1,020	1,020	873	1,040	1,190	2,300	2,040	2,310	1,360	852	880	798
23	1,020	1,160	768	926	1,060	2,350	1,860	2,200	1,190	786	908	680
24	1,010	1,130	817	1,050	1,020	2,390	1,600	2,200	1,410	680	780	590
25	720	1,170	1,010	1,050	1,040	2,230	1,780	2,070	1,270	1,010	*964	708
26	908	901	901	1,350	1,270	2,330	1,600	2,330	1,100	992	792	696
27	950	838	957	1,240	922	2,270	1,580	2,580	1,230	964	817	810
28	887	824	901	1,190	852	2,300	1,620	2,420	1,390	845	708	887
29	873	894	873	1,450	1,110	2,130	1,510	2,390	1,060	915	760	720
30	768	936	880	1,490	-----	2,480	1,510	2,350	1,270	720	845	720
31	732	-----	831	1,390	-----	2,420	-----	2,240	-----	645	964	-----
Total	26,966	26,250	26,162	31,251	44,014	60,642	62,320	66,220	50,570	29,296	25,561	21,052
Mean	870	875	844	1,008	1,518	1,956	2,077	2,136	1,686	945	825	702
Cfs/m	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-
Ac-ft	53,490	52,070	51,890	61,990	87,300	120,300	123,600	131,300	100,300	58,110	50,700	41,760
Calendar year 1959: Max	3,830	Min	565	Mean	1,207	Cfs/m	2.54	In.	34.48	Ac-ft	873,600	
Water year 1959-60: Max	3,380	Min	575	Mean	1,285	Cfs/m	2.71	In.	36.82	Ac-ft	932,800	

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and records for Fish Creek at Big Camas ranger station, near Toketee Falls.

3167. Steamboat Creek near Glide, Oreg.

Location.--Lat 43°21'00", long 122°43'40", in N½ sec. 32, T. 25½ S., R. 1 E., on right bank in Canton Creek Forest Service Park, 0.5 mile upstream from mouth and 19 miles north-east of Glide.

Drainage area.--227 sq mi.

Records available.--October 1955 to September 1960. Prior to June 1956, supplemental peak discharges and discharge measurements only.

Gage.--Water-stage recorder. Datum of gage is 1,128.55 ft above mean sea level (levels by Bureau of Public Roads). Prior to June 14, 1956, crest-stage gage at site 100 ft upstream.

Extremes.--Maximum discharge during year, 8,400 cfs Feb. 8 (gage height, 9.16 ft); minimum, 35 cfs Sept. 30.  
1955-60: Maximum discharge, 26,900 cfs Dec. 22, 1955 (gage height, 17.96 ft, from floodmarks), from rating curve extended above 13,000 cfs by slope-area measurement of peak flow; minimum, 31 cfs Sept. 24, 1957.

Remarks.--Records good except those for periods of no gage-height record, which are fair.

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

0.4	26	2.0	535
.6	52	3.0	1,110
.8	95	5.0	2,720
1.0	146	7.0	5,160
1.5	327	9.0	8,150

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a80	84	116	218	a900	335	4,670	605	*663	124	63	46
2	a70	75	110	184	a1,700	335	4,240	852	825	121	60	50
3	a60	110	108	174	a1,400	500	3,250	620	571	116	58	50
4	a55	180	96	149	*1,990	3,580	2,260	824	514	110	58	54
5	a48	*121	91	146	1,970	4,260	1,740	842	467	108	56	56
6	a48	100	86	143	1,760	3,780	1,590	770	425	103	56	52
7	52	91	82	248	3,600	*6,160	1,140	1,140	388	98	56	49
8	394	80	80	770	6,740	3,730	938	1,080	347	98	50	44
9	1,130	78	78	658	5,430	2,850	806	890	323	96	50	43
10	425	72	72	454	3,360	1,730	658	770	303	96	50	43
11	315	65	93	408	1,840	1,320	625	712	291	96	47	43
12	303	63	292	351	1,350	1,260	595	932	268	*91	46	41
13	194	60	412	291	1,170	1,800	641	1,070	256	89	47	40
14	149	58	283	264	1,190	1,580	914	1,030	244	89	47	40
15	118	58	*256	226	2,460	1,580	1,220	842	271	84	47	40
16	100	58	303	218	1,820	1,560	1,130	794	252	80	47	40
17	93	56	323	291	1,220	1,370	1,150	830	230	78	47	40
18	86	54	256	535	956	1,640	1,380	1,070	215	75	46	40
19	78	60	208	540	770	1,850	1,580	1,050	204	75	47	38
20	82	60	77	566	625	1,810	*1,660	1,930	187	75	47	40
21	100	390	152	548	571	1,640	2,030	2,610	180	72	46	*38
22	526	598	158	690	544	1,470	1,530	1,840	174	71	58	36
23	421	1,050	124	812	496	1,290	1,170	1,500	171	71	*89	36
24	256	580	325	1,050	454	1,120	938	1,240	165	71	103	36
25	187	367	590	1,240	446	992	848	1,240	158	71	89	36
26	149	268	392	1,510	442	890	818	2,060	152	71	62	36
27	108	208	307	1,250	336	884	782	2,060	146	69	56	36
28	113	174	271	a1,100	367	974	746	1,420	138	65	52	36
29	103	143	275	a1,200	347	1,380	696	1,080	135	63	50	36
30	91	129	287	a1,300	-----	3,640	641	891	129	83	47	35
31	86	-----	271	a1,100	-----	3,040	-----	758	-----	63	47	-----
Total	6,038	5,490	6,654	18,634	46,294	59,950	42,186	35,151	8,592	2,652	1,724	1,250
Mean	195	183	215	601	1,596	1,934	1,406	1,134	286	85.5	55.6	41.7
Cfsm	0.859	0.806	0.947	2.65	7.03	8.52	6.19	5.00	1.26	0.377	0.245	0.184
In.	0.99	0.90	1.09	3.05	7.58	9.82	6.91	5.76	1.41	0.43	0.28	0.20
Ac-ft	11,980	10,890	13,200	36,960	91,820	118,900	83,670	69,720	17,040	5,260	3,420	2,480

Calendar year 1959: Max 8,060 Min 38 Mean 462 Cfsm 2.04 In. 27.65 Ac-ft 334,800  
Water year 1959-60: Max 6,740 Min 35 Mean 641 Cfsm 2.82 In. 38.42 Ac-ft 465,300

Peak discharge (base, 4,800 cfs).--Feb. 8 (9 a.m.) 8,400 cfs (9.16 ft); Mar. 7 (9 a.m.) 8,300 cfs (9.10 ft); Apr. 1 (6 p.m.) 5,020 cfs (6.90 ft).

\* Discharge measurement made on this day.  
A no gage-height record; discharge estimated on basis of weather records, recorded range in stage, and records for Rock Creek near Glide and Little River at Peel.

## UMPQUA RIVER BASIN

3176. Rock Creek near Glide, Oreg.

Location.--Lat 43°20'35", long 122°59'30", in NE<sup>1</sup>/<sub>4</sub>NE<sup>1</sup>/<sub>4</sub> sec.1, T.26 S., R.3 W., on right bank 1 mile upstream from mouth and 6 miles northeast of Glide.

Drainage area.--97.4 sq mi.

Records available.--June 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 933 ft above mean sea level (planetable survey).

Extremes.--Maximum discharge during year, 3,910 cfs Feb. 9 (gage height, 8.57 ft); minimum, 18 cfs Sept. 30.

1957-60: Maximum discharge, 8,230 cfs Dec. 20, 1957 (gage height, 12.22 ft); minimum, 18 cfs Sept. 23-25, 1957, Sept. 30, 1960.

Flood of Dec. 22, 1955, reached a stage of 14.83 ft, from floodmarks (discharge, 12,300 cfs), and that of Dec. 11, 1956, a stage of 15.46 ft, from floodmarks (discharge, 13,400 cfs); discharges from rating curve extended above 5,400 cfs on basis of slope-area measurement at gage height 14.83 ft.

Remarks.--Records good except those for periods of no gage-height record, which are fair. 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 Mar. 7-20, Apr. 21, 22, May 22-28)

0.5	16	2.0	170
.8	20	3.0	410
.8	28	4.0	760
1.0	43	6.0	1,800
1.5	93	9.0	4,300

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	41	69	100	150	494	200	a2,300	274	*356	73	30	29
2	37	66	92	134	996	200	a1,800	255	318	70	30	29
3	35	115	88	123	618	377	a1,300	251	283	69	29	31
4	32	145	81	114	*1,220	1,660	a1,100	308	255	68	29	50
5	30	*98	77	110	1,160	2,020	a700	274	a240	64	29	39
6	30	86	74	123	991	1,870	a600	262	a220	61	28	30
7	34	79	70	a200	1,460	*2,510	a500	410	198	59	28	28
8	344	72	68	a600	2,960	1,950	a450	363	a180	58	26	27
9	941	69	66	a500	3,620	1,780	a350	328	a165	56	26	26
10	372	65	65	a360	2,400	1,180	a320	253	a160	54	26	25
11	206	62	89	a360	1,370	694	a310	253	a190	53	26	24
12	174	59	215	a350	a600	800	a310	269	a140	*51	25	24
13	129	57	271	a300	a650	948	a350	338	a135	51	25	24
14	105	56	186	a220	a650	863	a400	330	132	49	24	24
15	88	55	*170	a180	a1,500	800	a500	290	137	46	24	24
16	78	57	163	a170	a1,100	861	a450	320	122	46	26	23
17	71	53	150	a300	a900	760	a475	366	116	44	24	23
18	66	52	129	a750	a600	748	a550	552	110	43	24	23
19	62	56	116	822	a450	752	a650	504	105	41	24	22
20	72	55	103	570	a360	708	*a675	908	101	41	23	*22
21	159	318	96	549	a360	640	636	1,300	97	41	24	*21
22	604	425	90	598	a340	570	708	1,000	93	40	35	21
23	590	756	65	616	325	504	a600	792	90	39	*61	21
24	206	438	285	656	295	446	a500	664	86	37	52	21
25	152	278	419	648	286	398	455	700	84	37	44	21
26	124	206	305	668	274	362	413	1,160	82	37	33	21
27	106	166	237	616	244	362	374	1,130	79	35	30	20
28	96	138	216	594	224	416	345	784	77	34	29	20
29	85	122	202	656	212	a600	318	608	75	33	28	20
30	78	109	194	672	-----	a1,500	290	494	73	31	28	19
31	74	-----	174	556	-----	a1,200	-----	416	-----	30	21	-----
Total	4,791	4,380	4,676	13,105	26,979	29,099	18,929	16,246	4,459	1,493	916	752
Mean	155	146	151	423	930	939	631	524	149	46.2	29.5	25.1
Cfs/m	1.59	1.50	1.55	4.34	9.55	9.64	6.48	5.38	1.53	0.494	0.303	0.256
In.	1.63	1.67	1.79	5.00	10.30	11.11	7.23	6.20	1.70	0.57	0.35	0.29
Ac-ft	9,500	8,690	9,270	25,990	53,510	57,720	37,550	32,220	8,840	2,960	1,820	1,490

Calendar year 1959: Max 3,300 Min 21 Mean 267 Cfs/m 2.74 In. 37.17 Ac-ft 193,000  
Water year 1959-60: Max 3,620 Min 19 Mean 344 Cfs/m 3.53 In. 46.04 Ac-ft 249,600

Peak discharge (base, 3,000 cfs).--Feb. 9 (6 p.m.) 3,910 cfs (8.57 ft); Mar. 7 (10 a.m.) 3,060 cfs (7.76 ft).

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records, recorded range in stage, and records for Steamboat Creek near Glide and Little River at Peel.

3180. Little River at Peel, Oreg.

Location.--Lat 43°15'10", long 123°01'30", in NW<sup>1</sup>/<sub>4</sub> sec.2, T.27 S., R.3 W., on left bank 0.6 mile southeast of Peel and 0.8 mile downstream from Cavitt Creek.

Drainage area.--177 sq mi.

Records available.--August 1954 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 828.33 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--6 years, 485 cfs (351,100 acre-ft per year).

Extremes.--Maximum discharge during year, 6,100 cfs Mar. 7 (gage height, 9.46 ft); minimum, 19 cfs Sept. 24.

1954-60: Maximum discharge, 21,100 cfs Dec. 11, 1956 (gage height, 19.63 ft), from rating curve extended above 5,900 cfs on basis of slope-area measurement at gage height 16.55 ft; minimum, 15 cfs Sept. 24, 25, 1957.

Maximum discharge known, 22,700 cfs Nov. 22, 23, 1953 (gage height, 20.6 ft, from floodmark), from rating curve extended above 5,900 cfs as explained above.

Remarks.--Records good except those for period of no gage-height record, which are fair. No regulation. Small diversions for rural domestic use and irrigation above station.

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

1.5	18	3.0	335
1.7	34	4.0	820
2.0	70	6.0	2,300
2.3	122	9.0	5,500
2.6	202		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	60	80	132	482	199	2,430	339	*403	72	35	31
2	56	56	75	116	1,020	190	2,240	367	355	70	34	34
3	34	70	70	108	778	297	1,640	371	321	67	32	36
4	34	112	65	97	*922	1,230	1,220	724	297	64	32	49
5	33	79	60	92	1,410	2,020	982	640	266	63	31	40
6	33	*67	58	102	1,200	1,970	814	570	243	60	30	34
7	37	59	55	389	2,210	4,090	700	994	218	57	29	30
8	216	55	52	1,010	4,040	2,860	585	844	199	56	27	29
9	389	54	50	570	4,480	2,330	505	655	185	55	27	27
10	240	52	50	395	2,360	*1,480	431	540	170	54	27	26
11	160	50	70	625	1,310	1,060	496	473	162	54	27	25
12	132	49	200	482	988	1,010	473	473	151	*50	27	24
13	100	45	250	343	904	1,600	443	464	141	49	27	24
14	82	44	200	276	910	1,400	610	403	136	48	27	24
15	69	44	*173	224	1,190	1,260	680	363	141	48	27	24
16	60	44	151	214	1,010	1,450	706	391	129	46	28	23
17	56	42	144	818	766	1,130	724	403	124	44	27	22
18	52	41	129	1,200	645	1,040	808	565	114	43	26	22
19	48	45	114	826	515	1,030	838	565	110	42	25	22
20	55	44	102	640	431	976	*850	1,110	104	41	24	21
21	102	122	92	570	395	880	1,010	1,550	100	40	24	21
22	500	200	85	545	363	796	898	1,270	95	39	39	21
23	304	400	78	525	318	718	724	1,040	92	38	*69	20
24	198	305	205	580	297	650	610	958	87	37	57	20
25	154	200	367	590	286	590	555	910	85	37	48	20
26	110	150	266	630	276	535	505	1,180	82	40	40	21
27	95	130	205	565	246	555	455	1,270	78	37	35	21
28	84	110	188	560	224	590	411	910	76	37	33	21
29	74	100	176	665	208	624	375	695	73	34	31	21
30	69	90	176	685	-----	2,190	347	560	72	36	29	21
31	63	-----	160	515	-----	1,680	-----	468	-----	36	28	-----
Total	3,627	2,914	4,146	15,089	30,204	38,230	24,065	22,065	4,809	1,494	1,002	774
Mean	117	97.1	134	487	1,042	1,233	802	712	160	48.2	32.3	25.8
Cfs/m	0.661	0.549	0.757	2.75	5.89	6.97	4.53	4.02	0.904	0.272	0.182	0.146
In.	0.76	0.61	0.87	3.17	8.35	8.03	5.06	4.64	1.01	0.31	0.21	0.16
Ac-ft	7,190	5,780	8,220	29,930	59,910	75,830	47,730	43,770	9,540	2,960	1,990	1,540
Calendar year 1959: Max	3,630	Min	21	Mean	322	Cfs/m	1.82	In.	24.66	Ac-ft	232,900	
Water year 1959-60: Max	4,480	Min	20	Mean	406	Cfs/m	2.29	In.	31.18	Ac-ft	294,400	

Peak discharge (base, 6,000 cfs).--Mar. 7 (8 a.m.) 6,100 cfs (9.46 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Nov. 22 to Dec. 14; discharge estimated on basis of weather records, recorded range in stage, and records for Rock Creek near Glide and Steamboat Creek near Glide.

## 3192. Sutherlin Creek at Sutherlin, Oreg.

Location.--Lat 43°23'20", long 123°18'10", in SW $\frac{1}{4}$  sec.16, T.25 S., R.5 W., on right bank at downstream side of Waite Street bridge in Sutherlin,  $\frac{1}{2}$  miles upstream from Cooper Creek.

Drainage area.--16.4 sq mi.

Records available.--October 1955 to September 1960.

Gage.--Staff gage read once daily, twice daily at stages over 4.0 ft, and crest-stage gage. Datum of gage is 512.46 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--5 years, 29.2 cfs (21,140 acre-ft per year).

Extremes.--Maximum discharge during year, 854 cfs Feb. 9 (gage height, 4.91 ft); no flow Oct. 1-8, 16-19, July 8 to Sept. 30.  
1955-60: Maximum discharge, 1,560 cfs Dec. 21, 1957 (gage height, 8.24 ft), from rating curve extended above 560 cfs on basis of slope-area measurement at gage height 7.77 ft; no flow for several months in each year.

Remarks.--Records good except those for periods of backwater from weeds or shifting control, which are fair. No regulation. A few small diversions by pumping for irrigation above station.

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

Oct. 1 to Feb. 9				Feb. 10 to Sept. 30			
0.3	0	2.0	110	0.5	0	1.0	9.0
.4	.1	2.5	190	.6	.1	1.2	20
.5	.7	3.0	290	.7	.3	1.5	43
.8	9.0	4.0	550	.8	1.5	2.0	110
1.1	24	5.0	885	.9	4.4		
1.5	55						

Note.--Same as preceding table above 2.0 ft.

Discharge, in cubic 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	0.1	0.1	3.8	20	5.2	143	9.0	11	0.1		
2	0	.1	.1	3.2	*105	4.8	70	7.4	*7.4	.1		
3	0	.1	.2	2.7	*66	36	45	6.9	4.4	.1		
4	0	.1	.2	2.4	99	132	30	16	3.4	.1		
5	0	.1	.2	2.1	98	310	22	12	2.4	.1		
6	0	.1	.1	1.9	54	116	19	10	2.0	.1		
7	0	.1	.1	2.7	64	390	18	46	1.3	.1		
8	0	.1	.1	31	*514	210	14	28	1.0	0		
9	.1	.1	.1	34	*610	268	11	21	.7	0		
10	.1	*.1	.1	50	155	98	12	15	.6	0		
11	.2	.1	.2	33	64	54	29	10	.5	0		
12	.2	.1	7.2	48	42	51	22	9.0	.4	0		
13	.1	.1	7.8	36	38	37	16	10	.4	0		
14	.1	.1	4.6	25	34	28	34	9.0	.4	0		
15	.1	.1	2.7	21	42	80	74	7.4	.4	0		
16	0	.1	1.4	30	40	47	38	14	.4	0		
17	0	.1	*.9	41	28	33	28	10	.3	0		
18	0	.1	.7	55	32	28	32	22	.3	0		
19	0	.1	.6	39	22	21	24	18	.2	0		
20	.1	.1	.4	28	21	18	21	74	.2	0		
21	.1	.9	.3	22	19	14	28	45	.2	0		
22	1.1	.7	.3	19	16	11	52	53	.2	0		
23	.4	2.9	.2	16	14	*9.0	35	35	.1	0		
24	.2	2.4	7.5	13	12	7.8	27	54	.1	0		
25	.2	1.1	12	14	11	6.9	*29	125	.1	0		
26	.1	.4	8.4	15	16	6.4	25	450	.1	0		
27	.1	.3	6.3	16	12	12	20	110	.1	0		
28	.1	.2	4.9	16	8.4	13	15	49	.1	0		
29	.1	.2	3.8	18	6.4	12	12	27	.1	0		
30	.1	.2	3.2	25	25	194	10	20	.1	0		
31	.1	---	4.3	22	---	144	---	15	---	0		
Total	3.6	11.3	79.0	665.8	2,260.8	2,397.1	955	1,337.7	38.9	0.7	0	0
Mean	0.12	0.38	2.55	21.5	78.0	77.3	31.8	43.2	1.30	0.02	0	0
Cfs/m	0.0073	0.023	0.155	1.31	4.76	4.71	1.94	2.63	0.079	0.0012	0	0
In.	0.008	0.03	0.18	1.51	5.13	5.44	2.17	3.03	0.09	0.002	0	0
Ac-ft	7.1	22	157	1,320	4,480	4,750	1,890	2,650	77	1.4	0	0

Calendar year 1959: Max 760 Min 0 Mean 18.7 Cfs/m 1.14 In. 15.49 Ac-ft 13,540  
Water year 1959-60: Max 610 Min 0 Mean 21.2 Cfs/m 1.29 In. 17.59 Ac-ft 15,350

Peak discharge (base, 400 cfs).--Feb. 9 (about 10 a.m.) 854 cfs (4.91 ft); Mar. 9 (about 6 a.m.) 745 cfs (4.60 ft); May 26 (about 5 p.m.) 484 cfs (3.76 ft).

\* Discharge measurement or observation of no flow made on this day.

Note.--Backwater from weeds Nov. 19 to Jan. 7. Shifting-control method used May 26 to July 8.

## 3195. North Umpqua River at Winchester, Oreg.

Location.--Lat 43°16'20", long 123°24'40", in NW¼NE¼ sec.33, T.26 S., R.6 W., on right bank at Browns Bridge, 1.8 miles upstream from confluence with South Umpqua River and 3 miles west of Winchester.

Drainage area.--1,344 sq mi.

Records available.--October 1908 to December 1913, October 1923 to September 1929, August 1954 to September 1960. Prior to December 1908 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Altitude of gage is 370 ft (from river-profile map). Oct. 1, 1908, to Dec. 31, 1913, and Oct. 1, 1923, to Sept. 30, 1929, staff gage at site 4.8 miles upstream at different datums.

Average discharge.--17 years, 3,575 cfs (2,588,000 acre-ft per year).

Extremes.--Maximum discharge during year, 30,000 cfs Feb. 8 (gage height, 12.70 ft); minimum, 383 cfs Sept. 25.

1908-13, 1923-29, 1954-60: Maximum discharge, 100,000 cfs Nov. 23, 1909 (gage height, 28.1 ft, site and datum then in use), from rating curve extended above 42,000 cfs by logarithmic plotting; minimum, that of Sept. 25, 1960.

Flood of Nov. 23, 1953, reached a stage of 28.4 ft, from floodmarks, present site and datum (discharge, 89,000 cfs).

Remarks.--Records excellent except those for periods of shifting control, which are good. Some regulation by powerplants upstream and flow slightly affected by storage in Lemolo Reservoir (see p. 245) and Diamond Lake. Small diversions for irrigation above station.

Revisions (water years).--WSP 1448: 1909-12, drainage area.

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

1.8	610	4.0	3,300
2.0	780	6.0	7,600
3.0	1,840	13.0	31,000

Discharge, in cubic feet per second, water year October 1953 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	880	970	1,230	1,610	4,120	2,230	16,500	3,460	*4,680	1,680	798	1,160
2	843	1,000	1,150	1,420	*6,860	2,090	17,000	3,390	4,485	1,700	1,100	1,050
3	861	1,050	1,120	1,470	6,180	2,410	13,100	3,370	3,960	1,360	1,130	910
4	798	1,290	1,060	1,260	7,070	7,640	10,300	4,420	4,200	1,440	1,080	1,160
5	*798	1,420	990	1,440	8,330	14,900	8,690	4,440	3,860	1,350	1,000	1,000
6	910	1,260	960	1,440	7,780	16,300	7,630	4,120	3,700	1,490	980	910
7	920	1,200	890	1,700	11,800	21,400	6,850	5,590	3,550	1,450	970	1,080
8	1,530	1,110	1,020	4,220	22,900	19,100	5,980	6,290	3,320	1,320	870	1,040
9	3,460	*950	1,010	4,580	28,600	17,000	5,320	5,120	3,090	1,310	1,050	960
10	3,125	1,060	1,040	3,080	18,500	10,800	4,750	4,750	2,950	1,260	1,050	852
11	1,870	1,070	990	3,590	10,100	7,830	4,710	4,560	2,770	1,090	1,020	807
12	1,600	950	1,230	3,530	7,220	6,660	4,600	4,930	2,740	1,300	930	852
13	1,580	900	2,400	2,700	6,620	8,280	4,240	5,390	2,580	1,290	900	852
14	1,420	1,070	1,670	2,590	6,090	8,380	4,950	5,300	2,590	1,290	854	861
15	1,250	1,010	1,680	2,020	8,250	7,290	5,980	4,730	2,590	1,280	798	890
16	1,120	920	1,660	2,050	8,120	8,250	6,000	4,300	2,580	1,290	980	920
17	1,200	900	1,820	3,580	6,180	6,980	5,540	4,540	2,470	1,130	1,050	870
18	1,010	990	*1,580	5,230	5,170	6,880	5,940	5,210	2,340	1,050	960	834
19	880	1,090	1,500	4,540	4,360	7,120	6,640	5,390	2,230	*1,060	940	798
20	1,150	1,090	1,250	3,800	3,770	7,190	6,590	6,110	1,840	1,210	900	880
21	1,180	1,210	1,170	3,570	3,350	6,810	8,250	12,400	2,240	1,120	920	852
22	2,440	2,060	1,280	3,640	3,120	6,590	7,600	9,920	2,040	1,180	816	950
23	2,710	3,410	1,180	3,640	3,000	*6,290	6,330	8,120	1,890	1,050	1,170	940
24	2,010	3,010	1,240	4,000	2,680	5,980	5,230	7,290	1,730	980	1,280	789
25	1,660	2,170	2,900	4,240	2,660	5,590	*4,860	6,830	1,900	861	1,180	610
26	1,260	1,900	2,600	4,640	2,650	5,150	4,640	9,470	1,680	1,180	1,250	744
27	1,350	1,440	2,100	5,080	2,640	5,150	4,100	11,100	1,610	1,180	1,010	762
28	1,320	1,300	1,890	4,600	2,230	5,540	4,000	8,170	1,720	1,130	1,020	890
29	1,230	1,220	1,790	5,010	2,090	5,300	3,700	6,890	1,740	1,040	900	900
30	1,180	1,210	1,780	5,960	-----	13,800	3,480	5,850	1,480	1,100	*900	807
31	1,080	-----	1,850	4,900	-----	12,800	-----	5,150	-----	900	1,020	-----
Total	44,820	40,250	45,700	104,710	212,440	267,730	203,480	186,580	80,530	38,071	50,766	26,930
Mean	1,446	1,341	1,474	3,378	7,326	8,636	6,763	6,019	2,684	1,228	992	898
Ac-ft	86,900	79,800	90,640	207,700	421,400	531,000	403,600	370,100	159,700	75,510	61,020	53,410

Calendar year 1959: Max 24,300 Min 578 Mean 2,837 Ac-ft 2,054,000

Water year 1959-60: Max 28,600 Min 610 Mean 3,503 Ac-ft 2,545,000

Peak discharge (base, 20,000 cfs).--Feb. 8 (6 p.m.) 30,000 cfs (12.70 ft); Mar. 7 (4 p.m.) 28,600 cfs (12.31 ft).

\* Discharge measurement made on this day.

Note.--Shifting-control method used Nov. 23 to Dec. 25, July 24 to Sept. 30.

## 3207. Calapooya Creek near Oakland, Oreg.

Location.--Lat 43°24'10", long 123°21'45", in NW $\frac{1}{4}$  sec.13, T.25 S., R.6 W., near center of span on downstream side of county bridge, 0.5 mile downstream from Williams Creek, 2.5 miles northwest of Sutherlin, and 3.5 miles southwest of Oakland.

Drainage area.--210 sq mi.

Records available.--October 1955 to September 1960.

Gage.--Wire-weight gage read once daily, twice daily above 4.0 ft gage height, and crest-stage gage. Datum of gage is 371.26 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--5 years, 562 cfs (406,900 acre-ft per year).

Extremes.--Maximum discharge during year, 7,820 cfs Feb. 9 (gage height, 16.21 ft); minimum observed, 8.5 cfs Aug. 17.

1955-60: Maximum discharge, 20,300 cfs Dec. 26, 1955 (gage height, 20.47 ft), from rating curve extended above 5,000 cfs on basis of contracted-opening measurement of peak flow; minimum observed, 5.4 cfs Sept. 24, 25, 1957.

Remarks.--Records good. No regulation. Diversion above station for municipal supply of cities of Sutherlin and Oakland. Small diversions by pumping for irrigation above station.

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

Oct. 1 to Feb. 8				Feb. 9 to May 25				May 26 to Sept. 30			
2.0	18	4.0	365	3.3	215	1.7	8.2	3.5	245		
2.4	46	5.0	740	4.0	440	1.9	16	4.0	390		
2.8	90	10.0	3,100	8.0	2,100	2.2	33	5.0	770		
3.4	200	13.0	4,800	13.0	4,800	2.5	62	11.0	3,600		
				16.0	7,500	3.0	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	*25	40	54	131	347	239	2,630	327	411	44	12	15
2	23	36	50	112	1,870	222	1,900	294	*343	39	13	18
3	21	35	50	108	1,110	396	1,390	270	290	39	13	19
4	20	78	49	92	1,740	1,640	1,050	452	252	38	12	22
5	20	54	42	86	1,710	3,450	828	368	218	36	11	50
6	18	45	43	89	1,270	2,800	680	327	187	32	11	25
7	19	41	41	136	1,640	3,800	584	988	165	30	11	20
8	31	58	40	952	4,580	3,100	460	788	151	29	11	17
9	122	*37	37	732	7,060	3,650	444	620	137	25	9.5	15
10	172	34	37	465	3,180	2,130	400	508	126	25	10	15
11	117	34	39	830	*1,790	1,470	524	420	117	26	9.8	15
12	98	32	126	794	1,300	1,200	524	382	111	26	9.2	14
13	76	31	202	524	1,190	1,210	504	460	98	26	11	14
14	64	30	198	420	1,200	1,130	788	408	91	26	10	13
15	55	30	144	317	1,180	1,380	1,280	351	98	25	9.8	13
16	49	30	126	389	1,140	1,380	1,180	386	87	24	8.8	13
17	44	31	*108	1,450	976	1,140	976	393	86	23	8.5	11
18	36	30	*88	1,630	892	944	868	704	79	21	9.8	11
19	37	29	76	1,110	712	804	808	636	74	*20	8.8	12
20	38	30	65	749	584	640	796	588	68	18	9.2	12
21	46	34	64	604	540	588	972	1,670	67	17	10	12
22	112	166	60	493	472	508	1,070	1,440	63	16	11	12
23	109	218	55	416	416	*448	908	1,210	62	16	17	12
24	93	172	79	389	376	390	760	1,110	61	15	29	13
25	66	136	200	365	344	337	688	1,110	55	14	20	12
26	60	101	368	350	368	303	*624	3,300	54	14	18	11
27	54	83	281	353	306	1,120	520	1,970	51	16	16	12
28	50	72	184	371	270	456	448	1,250	48	14	14	12
29	44	63	156	347	252	560	436	850	45	14	13	11
30	41	59	142	406	225	2,250	358	654	44	13	*11	9.2
31	44	---	148	374	---	2,250	---	502	---	13	13	---
Total	1,806	1,849	3,352	15,584	38,825	41,934	25,438	24,736	3,739	736	380.4	460.2
Mean	58.3	61.6	108	503	1,339	1,353	848	798	125	23.7	12.3	15.3
Cfs/m	0.276	0.293	0.514	2.40	6.38	6.44	4.04	3.80	0.595	0.113	0.059	0.073
In.	0.32	0.33	0.59	2.76	6.88	7.43	4.50	4.39	0.66	0.13	0.07	0.08
Ac-ft	3,580	3,670	6,650	30,910	77,010	83,170	50,460	49,060	7,420	1,460	755	913

Calendar year 1959: Max 6,620 Min 7.1 Mean 355 Cfs/m 1.69 In. 22.92 Ac-ft 256,800  
 Water year 1959-60: Max 7,060 Min 8.5 Mean 434 Cfs/m 2.07 In. 28.13 Ac-ft 315,100

Peak discharge (base, 6,300 cfs).--Feb. 9 (about 12 m.) 7,820 cfs (16.21 ft).

\* Discharge measurement made on this day.

## 3210. Umpqua River near Elkton, Oreg.

Location.--Lat 43°35'10", long 123°33'30", in NW¼ sec.8, T.23 S., R.7 W., on right bank 8.5 miles south of Elkton and 8 miles upstream from Elk Creek.

Drainage area.--3,683 sq mi.

Records available.--October 1905 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 90.42 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Jan. 1, 1910, staff gage at site 1,700 ft upstream at datum 2.63 ft higher, Jan. 1, 1910, to Sept. 30, 1929, at datum 2.11 ft higher, and Oct. 1, 1929, to Nov. 1, 1956, at datum 1.15 ft higher.

Average discharge.--55 years, 7,432 cfs (5,381,000 acre-ft per year).

Extremes.--Maximum discharge during year, 91,700 cfs Feb. 9 (gage height, 26.17 ft); minimum daily, 900 cfs Aug. 15.

1905-60: Maximum discharge, 218,000 cfs Dec. 22, 1955 (gage height, 46.0 ft, from floodmark, present site and datum); minimum observed, 640 cfs July 18, 1926.

Maximum stage known since at least 1861, that of Dec. 22, 1955; flood in 1861 reached a stage about 0.1 ft lower, from information by local residents.

Remarks.--Records good. Powerplants on North Umpqua River ordinarily do not affect discharge at this station. Some diversions for irrigation from streams in South Umpqua River basin, but flow probably only slightly affected.

Revisions (water years).--WSP 1184: 1927(M), 1938(M), 1943(M), 1946(M). WSP 1448: 1911-13, drainage area.

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

Oct. 1-10

Oct. 11 to Sept. 30

1.9	1,130	1.8	860	8.0	12,500
3.0	2,400	3.0	2,240	15.0	38,000
5.0	4,980	5.0	4,980	25.0	85,500

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	1,420	1,370	1,610	2,740	*8,070	3,960	29,800	5,570	8,760	*1,920	1,200	1,200
2	1,270	1,250	1,590	2,500	10,700	3,900	34,800	*5,380	7,900	2,090	1,100	1,300
3	1,230	1,300	1,540	2,250	17,300	3,970	27,400	5,550	7,230	2,040	1,200	1,200
4	1,220	1,280	1,510	2,200	15,900	6,320	21,700	6,040	6,580	1,730	1,300	1,100
5	1,150	1,510	1,420	1,940	18,900	23,000	17,400	7,130	6,580	1,840	1,200	1,400
6	1,160	1,620	1,340	2,010	20,200	33,300	15,000	6,940	5,840	1,670	1,200	1,300
7	1,180	1,540	1,290	2,050	21,000	38,300	13,100	7,200	5,400	1,780	1,200	1,160
8	1,320	1,430	1,280	3,620	43,100	50,500	11,500	10,300	5,120	1,700	1,100	1,220
9	2,070	1,340	1,340	10,600	85,100	48,500	10,100	9,410	4,720	1,560	1,100	*1,220
10	4,490	1,200	1,340	8,220	63,200	35,900	9,100	8,120	4,380	1,540	1,200	1,200
11	3,680	1,210	1,370	6,110	31,800	29,300	8,140	7,420	4,170	1,480	1,200	1,150
12	2,670	1,200	1,520	7,740	20,000	18,100	8,170	7,060	3,960	1,350	1,100	1,050
13	2,390	1,150	2,170	6,610	16,600	16,600	7,870	7,940	3,790	1,480	1,100	1,070
14	2,140	1,100	3,680	5,240	14,500	18,300	7,900	8,040	3,640	1,480	1,000	1,100
15	1,930	1,170	3,080	4,490	14,000	16,400	10,400	7,420	3,580	1,480	900	1,090
16	1,670	1,190	2,690	3,820	16,600	17,100	12,000	6,700	3,550	1,470	1,000	1,100
17	1,470	1,140	2,450	3,970	13,900	16,300	11,000	6,520	3,370	1,500	1,100	1,100
18	1,470	1,070	2,440	8,760	11,500	14,200	10,500	7,060	3,270	1,400	1,200	1,100
19	1,340	1,130	2,320	10,100	10,100	13,700	10,600	7,870	3,150	1,310	1,100	1,070
20	1,260	1,200	2,020	8,220	8,680	13,400	11,000	7,800	2,960	1,300	1,100	1,030
21	1,400	1,310	1,930	7,250	7,470	12,700	11,800	14,800	2,600	1,400	1,100	1,050
22	1,510	1,550	1,810	6,700	6,750	11,800	13,400	18,300	2,880	1,300	1,100	1,050
23	2,740	2,520	1,830	6,750	6,290	11,100	11,600	15,400	2,630	1,400	1,000	1,080
24	3,460	4,310	1,870	6,720	5,720	10,300	10,100	13,400	2,500	1,300	1,300	1,090
25	2,790	3,640	2,400	7,320	5,140	9,570	8,860	12,600	2,360	1,200	1,500	1,070
26	2,280	2,930	5,100	7,470	5,000	8,840	8,300	17,400	2,440	1,100	1,400	970
27	1,810	2,500	4,230	7,220	4,940	8,420	7,540	26,600	2,210	1,400	1,500	937
28	1,790	2,050	3,410	7,840	4,590	8,550	6,940	19,600	2,140	1,400	1,300	1,020
29	1,670	1,840	2,960	7,740	*4,090	8,780	*6,490	14,600	2,220	*1,300	1,200	1,080
30	*1,520	*1,660	2,740	9,700	-----	17,100	5,950	11,800	2,190	1,200	1,100	*1,090
31	1,440	-----	*2,720	9,510	-----	*31,400	-----	*10,100	-----	1,300	*1,000	-----
Total	58,940	49,710	69,000	188,610	511,140	559,810	378,660	320,070	121,920	46,420	36,100	33,597
Mean	1,901	1,657	2,226	6,084	17,630	18,060	12,620	10,320	4,064	1,497	1,165	1,120
Cfs/m	0.516	0.450	0.604	1.65	4.79	4.90	3.43	2.80	1.10	0.406	0.316	0.304
In.	0.60	0.50	0.70	1.90	5.16	5.65	3.82	3.23	1.23	0.47	0.36	0.34
Ac-ft	116,900	98,600	136,900	374,100	*1,014	*1,110	751,100	634,800	241,800	92,070	71,600	66,640

Calendar year 1959: Max 73,600 Min 960 Mean 5,817 Cfs/m 1.58 In. 21.45 Ac-ft 4,212,000  
 Water year 1959-60: Max 85,100 Min 900 Mean 6,486 Cfs/m 1.76 In. 23.96 Ac-ft 4,709,000

Peak discharge (base, 52,000 cfs).--Feb. 9 (5:30 p.m.) 91,700 cfs (26.17 ft); Mar. 8 (1:30 a.m.) 60,700 cfs (20.05 ft).

\* Discharge measurement made on this day.

† Expressed in thousands.

Note.--No gage-height record July 20 to Sept. 6; discharge estimated on basis of 2 discharge measurements, weather records, and records for South Umpqua River near Brockway and North Umpqua River at Winchester.

3220. Elk Creek near Drain, Oreg.

Location.--Lat 43°38'30", long 123°17'50", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.21, T.22 S., R.5 W., on right bank at downstream side of county bridge, 1,000 ft downstream from Yoncalla Creek and 1.7 miles southeast of Drain.

Drainage area.--104 sq mi.

Records available.--October 1955 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 305.96 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--5 years, 245 cfs (177,400 acre-ft per year).

Extremes.--Maximum discharge during year, 3,930 cfs Feb. 9 (gage height, 12.38 ft); minimum, 0.2 cfs Nov. 14, result of temporary diversion upstream.

1955-60: Maximum discharge, 9,100 cfs Dec. 26, 1955 (gage height, 19.06 ft); minimum, that of Nov. 14, 1959; minimum daily, 0.5 cfs for several days in August and September 1959.

Remarks.--Records excellent except those for periods of backwater from leaves and moss, which are fair. Small diversions by pumping for irrigation above station. Municipal supply for town of Yoncalla is diverted from Wilson Creek above station.

Rating tables, water year 1959-60, except periods of backwater from leaves and moss (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 9					Feb. 10 to Sept. 30				
0.7	2.6	2.0	152		0.5	0.4	1.5	73	
.8	5.0	4.0	564		.6	1.3	2.0	145	
.9	11	6.0	1,050		.7	2.6	3.0	314	
1.1	26	10.0	2,600		.8	5.0	6.0	1,050	
1.5	78	12.0	3,700		.9	11	10.0	2,600	
					1.1	26			

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*5.0	7.3	8.0	41	133	76	1,060	104	163	14	1.3	2.0
2	5.0	8.0	8.0	36	684	75	775	96	133	13	1.4	2.2
3	5.0	9.0	8.0	34	524	168	518	103	110	13	1.3	2.2
4	5.0	12	6.0	30	753	540	356	139	96	12	1.3	5.5
5	5.0	12	6.0	28	700	1,940	269	114	85	11	1.3	8.0
6	5.5	10	6.0	27	509	1,520	212	110	*73	10	1.3	4.6
7	8.0	9.7	6.0	40	777	1,750	178	374	65	9.0	1.3	3.7
8	15	8.5	6.0	234	2,100	1,560	151	340	60	8.0	1.1	3.1
9	37	8.0	6.0	272	3,400	2,580	140	244	55	6.6	1.0	2.8
10	27	*6.6	6.0	168	1,610	1,150	120	184	50	7.3	.9	2.6
11	16	6.6	7.3	221	*768	730	145	151	49	8.0	.9	2.6
12	11	6.6	70	297	548	538	144	140	43	8.0	1.2	2.6
13	9.0	6.6	102	206	485	418	133	144	41	6.6	1.2	2.6
14	8.0	3.3	50	157	376	334	233	132	38	6.0	1.0	3.0
15	7.3	3.1	32	122	455	470	515	116	38	6.0	.9	3.1
16	6.6	3.3	23	130	398	542	450	120	35	6.0	1.2	3.1
17	6.6	3.3	19	357	334	409	340	126	34	5.0	1.2	3.0
18	6.6	3.3	16	451	296	314	280	166	31	4.3	.9	2.8
19	6.6	3.7	13	287	231	254	238	157	29	3.7	1.1	2.6
20	7.3	4.0	12	210	188	206	254	235	27	*2.4	.9	2.8
21	11	8.5	12	165	169	174	310	485	24	2.6	.9	2.2
22	14	20	*12	130	148	149	356	462	24	2.6	1.2	2.2
23	14	22	12	110	130	127	302	383	22	2.4	2.1	2.6
24	13	18	51	98	115	*115	254	330	20	2.4	2.8	2.8
25	9.7	13	142	89	110	104	242	332	19	2.2	3.0	3.0
26	8.5	11	107	89	110	97	*204	1,620	18	2.2	2.8	3.0
27	8.0	9.0	75	103	96	103	182	1,130	17	2.1	2.6	3.1
28	6.6	8.0	58	113	85	118	154	800	16	2.0	2.4	3.1
29	6.6	6.6	49	114	81	142	130	585	15	1.5	1.8	3.1
30	6.6	6.0	42	130	---	845	116	272	14	1.4	1.6	3.1
31	6.6	---	42	120	---	988	---	203	---	1.3	*1.7	---
Total	302.1	257.0	1,006.3	4,619	16,313	18,533	8,761	9,495	1,444	182.6	45.6	93.1
Mean	9.75	8.57	32.5	149	563	598	292	306	48.1	5.89	1.47	3.10
Cfs/m	0.094	0.082	0.312	1.43	5.41	5.75	2.81	2.94	0.462	0.057	0.014	0.030
In.	0.11	0.09	0.36	1.65	5.83	6.63	3.13	3.40	0.52	0.07	0.02	0.03
Ac-ft	599	510	2,000	9,160	32,360	36,760	17,380	18,830	2,860	562	90	185

Calendar year 1959: Max 4,330 Min 0.5 Mean 164 Cfs/m 1.58 In. 21.36 Ac-ft 118,400  
 Water year 1959-60: Max 3,400 Min 0.9 Mean 167 Cfs/m 1.61 In. 21.84 Ac-ft 121,100

Peak discharge (base, 3,100 cfs).--Feb. 9 (12:30 p.m.), 3,930 cfs (12.38 ft); Mar. 9 (6 a.m.), 3,270 cfs (11.28 ft).

\* Discharge measurement made on this day.

Note.--Backwater from leaves and moss Oct. 10 to Dec. 24, June 9 to Sept. 30.

## 3232. Tenmile Creek near Lakeside, Oreg..

Location.--Lat 43°34'40", long 124°11'30", near center of sec.13, T.23 S., R.13 W., near left bank on downstream side of highway bridge, 200 ft upstream from Bel Creek, 0.8 mile upstream from Saunders Creek, and 1 mile west of Lakeside. Records include flow of Bel and Saunders Creeks.

Drainage area.--About 87 sq mi at measuring section 1.2 miles downstream.

Records available.--August 1957 to September 1960.

Gage.--Water-stage recorder. Auxiliary staff gage 1.4 miles upstream from base gage, read twice daily. Datum of both gages is at mean sea level.

Extremes.--Maximum discharge during year, 1,850 cfs Feb. 10 (elevation, 13.98 ft at base gage, 16.70 ft at auxiliary gage, from floodmarks); minimum, 11 cfs Sept. 29, 30. 1957-60: Maximum discharge, 2,750 cfs Jan. 12, 1959 (elevation, 15.56 ft at base gage, 18.27 ft at auxiliary gage, from floodmarks); minimum, 5.8 cfs Sept. 23-26, 1957.

Remarks.--Records excellent except those for period of shifting control, which are fair. Flow regulated by natural storage in Tenmile Lake and other lakes tributary to Bel and Saunders Creeks.

Revisions.--Revised figures of discharge, in cubic feet per second, for the water year 1959, superseding those published in WSP 1638, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1959		1959-Con.		1959-Con.		1959-Con.		1959-Con.	
Sept. 1	9.2	Sept. 7	12	Sept. 13	12	Sept. 19	17	Sept. 25	21
2	9.0	8	12	14	12	20	19	26	23
3	9.0	9	12	15	12	21	19	27	28
4	9.4	10	12	16	12	22	20	28	31
5	10	11	12	17	13	23	20	29	32
6	11	12	12	18	15	24	20	30	34

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
September 1959.....	489.6	34	9.0	16.3	971
Water year 1958-59.....	-	2,620	7.2	325	235,200

## 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	34	107	104	254	519	366	668	291	490	85	32	18
2	34	102	101	245	534	354	769	*279	452	82	31	17
3	34	104	100	236	579	368	784	272	422	82	30	16
4	34	102	98	227	690	416	740	269	392	80	30	16
5	34	101	96	216	834	608	688	260	364	78	29	15
6	35	98	95	210	882	882	638	258	340	72	29	*14
7	36	97	93	209	1,040	958	585	265	314	69	29	14
8	42	94	90	233	1,540	985	535	265	296	66	29	14
9	52	92	87	360	1,690	1,040	490	265	277	63	29	14
10	66	89	86	408	1,820	1,010	454	260	260	60	29	13
11	76	86	89	420	*1,660	934	432	262	243	60	28	13
12	*79	84	107	447	1,490	850	406	279	226	58	27	13
13	82	82	131	462	1,370	769	384	303	214	54	27	13
14	84	78	151	498	1,230	710	380	333	*201	52	27	12
15	85	76	160	513	1,160	668	376	346	189	49	27	12
16	84	*76	164	522	1,080	652	370	346	177	46	26	12
17	83	75	166	615	976	628	360	348	167	45	26	12
18	81	74	174	830	901	592	350	344	155	43	25	12
19	80	75	175	848	811	548	350	342	148	42	24	13
20	81	76	175	788	740	508	356	366	140	40	24	13
21	82	76	175	704	678	472	366	428	134	40	24	12
22	90	77	174	648	625	440	370	482	128	39	24	12
23	105	86	172	600	578	412	366	500	122	38	24	12
24	113	97	190	552	532	392	358	518	116	38	24	12
25	118	104	232	498	495	366	346	542	110	35	24	12
26	120	105	263	477	465	350	338	618	106	*36	23	12
27	120	105	275	507	434	346	328	660	101	36	23	12
28	120	106	*277	573	408	350	321	648	94	34	20	12
29	118	106	270	594	386	378	309	612	91	34	19	12
30	113	106	268	573	-----	480	301	570	87	33	19	11
31	109	-----	263	537	-----	*572	-----	530	-----	32	18	-----
Total	2,424	2,736	5,001	14,830	25,947	18,384	13,518	12,061	6,556	1,621	798	395
Mean	78.2	91.2	161	478	895	593	451	389	219	52.3	25.7	13.2
Ac-ft	4,810	5,430	9,920	29,410	51,470	36,460	26,810	23,920	13,000	3,220	1,580	783

Calendar year 1959: Max	2,620	Min	9.0	Mean	277	Ac-ft	200,600
Water year 1959-60: Max	1,820	Min	11	Mean	285	Ac-ft	206,800

\* Discharge measurement made on this day.

Note.--Shifting-control method used Aug. 14 to Sept. 30.

3245. West Fork Millicoma River near Allegany, Oreg.

Location.--Lat 43°28'35", long 124°03'20", in SW<sup>1</sup>/<sub>4</sub> NW<sup>1</sup>/<sub>4</sub> sec.19, T.24 S., R.11 W., on left bank at highway bridge, 40 ft upstream from Daggett Creek and 3.8 miles (revised) north of Allegany.

Drainage area.--46.5 sq mi.

Records available.--September 1954 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 76.95 ft above mean sea level, datum of 1929.

Average discharge.--6 years, 272 cfs (196,900 acre-ft per year).

Extremes.--Maximum discharge during year, 3,920 cfs Feb. 9 (gage height, 9.89 ft); minimum, 3.9 cfs Aug. 20, 21.

1954-60: Maximum discharge, 7,990 cfs (revised) Dec. 30, 1954 (gage height, 15.70 ft); minimum, 2.1 cfs Sept. 19, 20, 1956.

Flood in January or November 1953 reached a stage of about 17.9 ft, from information by local resident.

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)
1398	1955	Dec. 30, 1954	7,990	15.70
1448	1956	Oct. 9, 1955	5,540	12.20
1518	1957	Dec. 11, 1956	7,740	15.35
1568	1958	Dec. 20, 1957	6,930	14.18
1638	1959	Jan. 27, 1959	6,530	13.61

Remarks.--Records good except those for periods of backwater from brush, beaver dam, or leaves, and those above 3,500 cfs, which are fair. Only minor diversions for irrigation above station.

Revisions.--Revised figures of discharge, in cubic feet per second, for the water years 1955-59, superseding those published in WSP 1398, 1448, 1518, 1568, and 1638, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1954		1955-Con.		1956		1956-Con.		1958	
Dec. 30	4,980	Dec. 12	2,380	Jan. 4	2,470	Mar. 4	2,010	Feb. 15	2,730
31	3,430	19	2,870	5	1,490	Dec. 11	4,420	16	3,280
		20	2,150	14	1,070	12	2,360	25	2,400
1955		21	4,860	15	3,110	13	2,510		
Jan. 1	2,220	22	3,780	16	2,920			1959	
Mar. 1	2,290	23	2,070	17	1,390	Feb. 26	2,410	Jan. 12	3,870
2	1,770	24	1,270	22	2,110	Dec. 19	4,340	27	3,960
24	1,910	25	1,200	23	1,730	20	5,950		
Oct. 9	2,850	26	3,550	Feb. 20	2,070	21	3,080		
10	2,010	27	1,800	21	2,780	28	2,420		
Nov. 19	3,790	28	921	22	1,390				

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
December 1954.....	18,510	4,980	73	597	12.8	14.80	36,710
January 1955.....	14,828	2,220	136	478	10.3	11.86	29,410
March.....	19,399	2,290	142	626	13.5	15.52	38,480
Water year 1954-55..	-	4,980	2.9	253	5.44	73.87	183,200
October 1955.....	8,991.1	2,850	7.5	290	6.24	7.19	17,830
November.....	17,461	3,790	125	582	12.5	13.97	34,630
December.....	41,754	4,860	296	1,347	29.0	33.39	82,620
Calendar year 1955..	-	4,860	2.9	360	7.74	105.07	260,500
January 1956.....	33,058	3,110	221	1,066	22.9	26.44	65,570
February.....	16,783	2,780	105	579	12.5	13.42	33,290
March.....	14,650	2,010	139	473	10.2	11.72	29,060
Water year 1955-56..	-	4,860	2.4	365	8.28	112.67	279,400
December 1956.....	18,900	4,420	53	610	13.1	15.12	37,490
Calendar year 1956..	-	4,420	2.4	263	6.09	82.99	205,800
February 1957.....	16,136	2,410	122	576	12.4	12.91	32,010
Water year 1956-57..	-	4,420	3.2	229	4.92	66.86	165,800
December 1957.....	30,804	5,950	38	994	21.4	24.64	61,100
Calendar year 1957..	-	5,950	3.5	242	5.20	70.54	174,900
February 1958.....	23,697	3,280	198	853	18.3	19.11	47,400
Water year 1957-58..	-	5,950	2.2	269	5.78	78.57	194,800
Calendar year 1958..	-	3,280	2.2	249	5.35	72.81	180,600
January 1959.....	28,770	3,960	192	928	20.0	23.01	57,060
Water year 1958-59..	-	3,960	3.7	260	5.59	75.82	188,000

Revised peak discharge.--1954-55: Dec. 30 (8:30 p.m.) 7,990 cfs (15.70 ft); Mar. 2 (12:30 a.m.) 2,830 cfs (8.33 ft).

1955-56: Oct. 9 (9:30 p.m.) 5,540 cfs (12.20 ft); Nov. 19 (5:30 a.m.) 5,440 cfs (12.05 ft); Dec. 12 (6:30 a.m.) 3,330 cfs (9.04 ft); Dec. 21 (7:30 a.m.) 5,440 cfs (12.06 ft); Dec. 26 (9 a.m.) 4,010 cfs (10.02 ft); Jan. 4 (1 p.m.) 3,700 cfs (9.57 ft); Jan. 15 (11:30 a.m.) 4,220 cfs (10.32 ft); Feb. 20 (7 p.m.) 3,260 cfs (8.95 ft).

1956-57: Dec. 11 (11 a.m.) 7,740 cfs (15.35 ft); Feb. 26 (7:30 a.m.) 3,240 cfs (8.91 ft).

1957-58: Dec. 20 (3:30 a.m.) 6,930 cfs (14.18 ft); Dec. 28 (7:30 a.m.) 3,450 cfs (9.21 ft); Feb. 15 (10:30 p.m.) 6,560 cfs (13.66 ft); Feb. 25 (3:30 a.m.) 3,550 cfs (9.36 ft).

1958-59: Nov. 19 (5 p.m.) 4,250 cfs (10.36 ft); Jan. 8 (5:30 p.m.) 3,790 cfs (8.70 ft); Jan. 12 (2:30 a.m.) 6,400 cfs (13.43 ft); Jan. 27 (1:30 p.m.) 6,530 cfs (13.61 ft).

## 3245. West Fork Milllicoma River near Allegany, Oreg.

Rating table, water year 1959-60, except periods of backwater from brush, beaver dam, or leaves (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 9

Feb. 10 to Sept. 30

2.7	22	4.0	325	2.3	2.0	3.5	169
2.8	32	5.0	750	2.4	5.0	4.0	325
3.1	72	6.0	1,300	2.5	9.6	5.0	750
3.5	167	9.0	3,300	2.6	16	6.0	1,300
				2.7	25	8.0	2,600
				3.0	64		

Discharge, in cubic 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	61	90	c125	257	90	1,120	119	156	21	6.6	c6.2
2	40	56	80	c118	1,120	100	875	113	130	20	6.6	c7.6
3	32	84	78	c110	760	317	531	*115	115	19	6.6	c7.6
4	29	104	72	104	1,420	968	367	169	100	19	6.6	c10
5	26	78	64	94	1,190	2,130	274	144	89	18	6.2	c12
6	24	67	59	c108	912	1,650	216	144	81	17	5.8	c11
7	30	59	56	c178	1,760	1,140	180	241	72	16	5.4	c9.6
8	c237	53	55	c789	*2,690	1,140	156	213	67	15	5.0	c8.1
9	c744	48	52	720	3,200	1,350	159	169	64	15	5.0	c7.6
10	c350	46	51	c388	1,570	770	121	164	60	14	5.0	c7.1
11	c280	43	c90	c328	*780	487	126	130	55	13	5.0	c6.6
12	*c260	40	c483	c356	539	370	121	180	52	13	5.0	*c6.1
13	c184	38	655	c304	495	300	128	442	48	13	5.0	6.2
14	c130	36	c350	c304	451	257	267	455	*45	13	5.0	6.2
15	*106	36	c231	c280	815	576	339	294	44	13	5.0	6.2
16	86	*38	c181	c339	535	655	300	267	42	12	5.0	5.8
17	72	36	c145	1,270	381	403	247	301	40	11	5.0	5.8
18	61	37	c159	970	300	294	238	368	36	11	5.0	5.8
19	55	50	c146	535	241	235	280	318	34	11	4.6	5.4
20	72	56	c135	378	202	191	374	632	32	11	4.2	6.2
21	c93	c217	c120	287	180	162	467	890	28	10	c4.6	c5.4
22	c451	c252	c110	238	159	139	370	650	27	9.6	c6.6	c5.0
23	c403	690	c110	207	137	126	300	447	25	8.6	c14	c5.0
24	c244	c411	c356	181	126	115	241	487	25	8.6	c19	c5.0
25	c189	c244	615	184	121	104	205	680	25	8.6	c14	c5.0
26	c145	c181	c415	231	121	117	205	1,130	25	8.6	c9.6	c5.0
27	c118	c143	c280	406	108	164	182	670	24	8.6	c7.6	c4.6
28	c104	c125	c207	455	100	308	166	427	23	*8.6	c6.6	c4.6
29	92	c108	c167	364	96	720	152	304	22	8.1	c5.0	c4.6
30	80	101	c154	336	-----	*1,230	132	235	22	7.1	c4.6	c4.6
31	70	-----	*c145	267	-----	930	-----	191	-----	5.6	c5.0	-----
Total	4,855	3,538	5,913	10,914	20,766	17,538	8,619	11,109	1,608	388.0	204.2	195.9
Mean	157	118	191	352	716	566	294	358	53.6	12.5	6.59	6.53
Cfs/m	3.38	2.54	4.11	7.57	15.4	12.2	6.32	7.70	1.15	0.269	0.142	0.140
In.	3.88	2.83	4.73	8.73	16.61	14.03	7.05	8.88	1.29	0.31	0.16	0.16
Ac-ft	9,630	7,020	11,730	21,650	41,190	34,790	17,490	22,030	3,190	770	405	389

Calendar year 1959: Max 3,960 Min 3.7 Mean 221 Cfs/m 4.75 In. 64.47 Ac-ft 159,900  
 Water year 1959-60: Max 3,200 Min 4.2 Mean 235 Cfs/m 5.05 In. 68.66 Ac-ft 170,300

Peak discharge (base, 3,000 cfs).--Feb. 9 (10 a.m.) 3,920 cfs (9.89 ft.)

\* Discharge measurement made on this day.

c Backwater from brush, beaver dam, or leaves.

3246. South Fork Coquille River above Panther Creek, near Illahe, Oreg.

Location (revised).--Lat 42°45'30", long 123°59'10", in SE $\frac{1}{4}$  sec.28, T.32 S., R.11 W., on left bank 0.7 mile upstream from Panther Creek and 10 miles northeast of Illahe.

Drainage area.--31.2 sq mi (revised).

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,117.30 ft above mean sea level (levels by Pacific Power & Light Co.).

Extremes.--Maximum discharge during year, 2,390 cfs Feb. 9 (gage height, 9.98 ft); minimum, 1.5 cfs Sept. 28-30.

1956-60: Maximum discharge, 4,190 cfs Dec. 11, 1956 (gage height, 12.75 ft), from rating curve extended above 2,400 cfs on basis of slope-area measurement of peak flow; minimum daily, 1.4 cfs Oct. 8, 9, 1956.

Flood of Dec. 21, 1955, reached a stage of about 15.7 ft (discharge, about 6,300 cfs).

Remarks.--Records excellent except those for periods of shifting control, which are good. No regulation or diversion above station.

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 Feb. 8

Feb. 9 to Sept. 30

3.2	59	6.0	480
4.0	127	7.0	800
5.0	267	9.0	1,800

1.5	1.5	4.0	120
1.6	2.4	5.0	244
1.9	7.5	6.0	450
2.3	17	7.0	770
2.7	32	8.0	1,250
3.2	59	10.0	2,400

Note.--Same as following table below 3.2 ft.

Discharge, in cubic 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	8.7	14	45	367	61	605	95	118	14	5.4	2.7
2	9.1	8.3	13	41	674	61	460	88	100	13	5.4	3.0
3	8.1	8.9	13	38	535	133	354	83	87	12	5.1	2.8
4	7.7	9.1	12	34	678	267	244	86	76	12	4.9	2.8
5	6.9	8.3	11	32	800	450	*194	*75	68	11	4.8	2.7
6	6.7	7.7	10	32	580	485	154	74	61	10	4.6	2.7
7	6.7	7.3	10	52	928	644	130	88	57	9.9	4.4	*2.6
8	17	7.1	9.5	274	1,790	611	112	80	52	9.7	4.1	2.4
9	20	6.7	9.5	205	*2,190	620	99	75	48	9.5	3.6	2.2
10	19	6.6	9.3	145	986	394	86	70	44	9.3	3.6	2.2
11	17	6.2	15	119	488	290	89	67	40	9.1	3.4	2.2
12	15	6.0	81	97	348	262	79	77	39	8.5	3.4	2.0
13	*13	5.8	97	81	264	330	87	116	35	8.3	3.2	1.8
14	12	5.6	65	74	223	314	160	107	32	8.3	3.2	1.8
15	11	5.6	56	62	238	368	220	100	31	8.1	3.2	1.8
16	10	5.6	53	60	230	452	209	106	29	7.7	3.3	1.6
17	9.3	5.4	51	156	203	358	185	111	*28	7.3	3.4	1.6
18	8.7	*5.4	44	258	178	302	174	155	26	7.1	3.4	1.6
19	8.3	5.6	38	201	150	252	174	157	24	6.9	3.2	1.6
20	9.1	6.7	33	174	133	210	175	281	23	6.6	3.0	1.6
21	12	32	29	195	118	169	192	386	21	6.0	2.8	1.6
22	25	28	25	295	106	141	188	336	20	6.2	3.6	1.6
23	21	41	26	374	97	119	168	276	19	5.8	4.1	1.6
24	18	34	129	400	89	103	150	249	18	5.8	4.6	1.6
25	16	26	134	374	85	92	139	388	17	5.8	4.2	1.6
26	14	22	99	402	79	89	152	1,150	16	6.0	3.6	1.6
27	13	19	76	390	72	104	141	582	16	*5.6	3.3	1.6
28	11	17	65	526	67	116	129	342	15	5.6	3.2	1.6
29	11	16	*58	532	64	298	119	240	15	5.6	2.8	1.5
30	9.9	15	56	488	-----	758	105	182	14	5.4	2.7	1.5
31	9.3	-----	52	340	-----	608	-----	144	-----	5.4	2.6	-----
Total	385.8	386.8	1,393.3	6,596	12,758	9,479	5,453	6,366	1,188	251.5	116.1	59.5
Mean	12.4	12.9	44.9	213	440	306	182	205	39.6	8.11	3.75	1.98
Cfs/m	0.397	0.413	1.44	6.83	14.1	9.81	5.83	6.57	1.27	0.260	0.120	0.063
In.	0.46	0.46	1.66	7.86	15.21	11.30	6.50	7.59	1.42	0.30	0.14	0.07
Ac-ft	765	767	2,760	13,080	25,310	18,800	10,820	12,630	2,360	499	230	118

Calendar year 1959: Max 2,510 Min 1.5 Mean 115 Cfs/m 3.69 In. 50.04 Ac-ft 83,240  
 Water year 1959-60: Max 2,190 Min 1.5 Mean 121 Cfs/m 3.88 In. 52.37 Ac-ft 88,140

Peak discharge, (base, 1,200 cfs).--Feb. 9 (6:30 a.m.) 2,390 cfs (9.98 ft); May 26 (10:30 a.m.) 1,400 cfs (8.30 ft).

\* Discharge measurement made on this day.

Note.--Shifting-control method used Oct. 27 to Nov. 20, Aug. 3 to Sept. 30.

3247. South Fork Coquille River near Illahe, Oreg.

Location.--Lat 42°43'30", long 124°00'40", in NW $\frac{1}{4}$  sec.16, T.33 S., R.11 W., on left bank 1.5 miles downstream from Lockhart Creek and 7 miles north of Illahe. Records of discharge presented herein are for measuring section site 1.2 miles upstream.

Drainage area.--40.6 sq mi at measuring section 1.2 miles upstream from gage.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,871.04 ft above mean sea level (levels by Pacific Power & Light Co.).

Extremes.--Maximum discharge during year, 3,030 cfs Feb. 9 (gage height, 8.33 ft); minimum, 2.6 cfs Sept. 28-30.

1956-60: Maximum discharge, 5,960 cfs Jan. 12, 1959 (gage height, 9.78 ft), from rating curve extended above 3,000 cfs on basis of slope-area measurement at gage height 9.54 ft; minimum, 1.7 cfs Sept. 3, 1959.

Flood of Dec. 21, 1955, reached a stage of about 10.8 ft (discharge, about 8,600 cfs).

Remarks.--Records excellent except those for period of shifting control, which are good. No regulation or diversion above station.

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 Feb. 8				Feb. 9 to Sept. 30			
1.9	6.8	4.5	390	1.6	1.9	3.5	154
2.2	17	5.0	570	1.7	3.2	4.0	255
2.5	34	6.0	1,050	1.8	5.4	4.5	390
2.8	57	7.0	1,830	2.0	12	5.0	570
3.3	122	8.0	2,870	2.2	20	6.0	1,050
4.0	255			2.6	44	7.0	1,830
				3.0	81	8.0	2,870

Discharge, in cubic 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	11	16	53	433	74	920	132	156	20	7.0	4.1
2	13	10	15	48	840	74	708	119	135	20	7.0	4.6
3	11	11	15	44	864	185	486	113	114	19	6.8	4.6
4	10	11	14	42	875	367	325	113	101	18	6.5	4.6
5	9.8	10	13	40	955	710	*255	*101	89	17	6.2	4.6
6	9.5	9.5	12	39	714	732	208	97	80	17	5.9	4.3
7	9.5	9.2	12	70	1,100	970	177	112	73	16	5.7	*4.1
8	19	8.9	11	342	2,220	920	154	104	67	16	5.4	3.9
9	27	8.6	11	255	*2,730	930	135	97	63	15	5.1	3.9
10	24	8.0	11	181	1,220	574	118	89	58	15	5.1	3.7
11	22	7.7	16	149	656	367	124	87	55	14	4.9	3.7
12	19	7.4	101	118	417	342	110	106	51	14	4.9	3.7
13	*17	7.4	119	99	312	434	127	177	47	13	4.6	3.5
14	15	7.1	79	90	280	411	235	159	44	13	4.3	3.4
15	14	6.8	68	72	302	483	320	141	43	13	4.3	3.4
16	13	6.8	64	72	295	628	288	141	40	12	4.3	3.2
17	12	6.8	59	156	255	472	255	149	*39	12	4.3	3.2
18	11	*7.1	52	280	226	387	250	200	36	11	4.1	3.2
19	10	7.1	44	220	196	315	255	200	35	11	3.9	3.1
20	11	9.5	40	198	172	258	268	384	32	10	3.7	3.1
21	15	40	36	220	152	210	280	526	31	9.8	3.7	3.1
22	26	33	32	345	138	179	260	452	30	9.5	4.6	2.9
23	25	41	35	462	125	151	230	369	27	9.2	5.1	2.9
24	22	37	176	494	114	130	208	351	26	8.9	6.2	2.9
25	19	31	170	455	108	116	190	668	25	8.5	5.9	2.8
26	18	26	124	490	100	114	214	1,620	24	8.9	5.4	2.8
27	16	23	94	486	91	138	198	860	24	*8.9	5.1	2.8
28	15	20	78	692	83	168	183	466	22	8.2	4.6	2.8
29	14	19	*68	825	76	461	163	315	22	7.6	4.1	2.6
30	13	17	66	628	-----	1,170	143	232	21	7.3	4.1	2.6
31	12	-----	60	396	-----	960	-----	192	-----	7.0	3.9	-----
Total	485.8	457.9	1,709	8,061	15,851	13,470	7,764	8,872	1,612	389.8	156.7	104.1
Mean	15.7	15.3	55.1	260	547	435	259	286	53.7	12.6	5.05	3.47
Cfsm	0.387	0.377	1.36	6.40	13.5	10.7	6.38	7.04	1.32	0.310	0.124	0.085
In.	0.44	0.42	1.57	7.38	14.52	12.34	7.11	8.13	1.48	0.36	0.14	0.10
Ac-ft	964	908	3,390	15,990	31,440	26,720	15,400	17,600	3,200	773	311	206

Calendar year 1959: Max 3,290 Min 1.8 Mean 148 Cfsm 3.65 In. 49.62 Ac-ft 107,400  
 Water year 1959-60: Max 2,730 Min 2.6 Mean 161 Cfsm 3.97 In. 53.99 Ac-ft 116,900

Peak discharge (base, 1,700 cfs).--Feb. 9 (9:30 a.m.) 3,030 cfs (8.33 ft); May 26 (8 a.m.) 2,070 cfs (7.24 ft).

\* Discharge measurement made on this day.

Note.--Shifting-control method used Jan. 28 to Feb. 16.

3249. South Fork Coquille River near Powers, Oreg.

Location.--Lat 42°47'05", long 124°02'25", in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.18, T. 32 S., R.11 W., on right bank three-quarters of a mile upstream from Hall Creek and 7 miles southeast of Powers.

Drainage area.--93.2 sq mi.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 585.32 ft above mean sea level (levels by Pacific Power & Light Co.).

Extremes.--Maximum discharge during year, 9,150 cfs Feb. 9 (gage height, 12.78 ft); minimum, 7.5 cfs Sept. 29, 30.  
1956-60: Maximum discharge, 13,800 cfs Jan. 11, 1959 (gage height, 15.36 ft); minimum, that of Sept. 29, 30, 1960.

Remarks.--Records excellent except those for period of backwater from leaves, which are good. No regulation or diversion above station. Records of water temperatures for the water year 1960 are given in WSP 1744.

Rating tables, water year 1959-60, except period of backwater from leaves (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 7

Feb. 8 to Sept. 30

2.9	26	4.5	350	2.6	5.5	4.5	350
3.0	33	5.0	560	2.7	10	5.0	560
3.3	62	6.0	1,190	2.9	25	6.0	1,190
3.6	102	8.0	2,900	3.1	44	8.0	2,900
4.0	185	10.0	5,100	3.5	95	10.0	5,100
				4.0	200	12.0	7,900

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	44	40	55	170	1,130	202	1,960	334	394	65	24	16
2	39	39	51	151	2,500	210	1,340	307	334	62	24	16
3	36	43	51	138	1,780	555	952	289	295	61	24	16
4	33	52	49	129	2,440	1,270	720	295	265	59	23	16
5	32	46	46	122	2,490	2,000	570	*271	242	56	22	16
6	31	41	44	124	2,020	1,720	478	262	222	54	22	15
7	32	39	41	344	3,330	2,520	422	334	205	52	22	*14
8	107	35	41	1,420	7,150	2,420	370	298	192	51	20	14
9	218	33	41	810	*7,480	2,560	330	265	180	51	19	13
10	133	32	41	530	3,230	1,410	292	250	167	50	19	13
11	102	31	67	520	1,640	952	318	242	159	47	18	12
12	92	30	489	450	1,120	840	322	338	149	46	18	11
13	*77	29	474	396	882	938	390	610	143	45	18	10
14	64	28	278	370	750	840	750	478	135	45	18	10
15	59	26	225	318	854	924	910	406	129	44	17	10
16	53	26	195	310	732	1,090	720	398	119	42	17	10
17	50	26	172	450	625	861	620	406	*115	40	17	10
18	46	*26	151	655	550	726	640	498	111	39	16	10
19	43	29	131	555	474	615	690	470	103	37	16	9.5
20	53	53	116	502	430	510	702	913	97	36	16	9.0
21	63	272	102	525	402	442	726	1,190	94	35	15	9.0
22	133	153	93	726	350	386	655	1,080	90	34	18	8.5
23	109	131	98	682	310	330	560	1,030	88	33	22	8.5
24	84	115	765	945	286	295	490	1,020	82	32	22	8.5
25	72	98	600	868	271	268	446	1,960	79	31	23	8.5
26	63	83	406	945	259	280	530	3,880	77	31	20	8.0
27	58	74	290	1,080	242	382	474	1,970	74	*30	18	8.0
28	53	68	240	1,580	228	502	454	1,100	72	28	16	8.0
29	50	62	*208	1,720	215	1,850	430	750	68	27	16	8.0
30	46	60	202	1,350	-----	*3,300	374	570	66	25	15	7.5
31	43	-----	198	910	-----	2,380	-----	466	-----	24	14	-----
Total	2,118	1,800	5,960	19,985	44,170	33,568	18,635	22,680	4,546	1,312	589	333.0
Mean	68.3	60.0	192	645	1,523	1,083	621	732	152	42.3	19.0	11.1
Cfs/m	0.753	0.644	2.06	6.92	16.3	11.6	6.66	7.85	1.63	0.454	0.204	0.119
In.	0.85	0.72	2.38	7.97	17.63	13.39	7.44	9.05	1.81	0.52	0.24	0.13
Ac-ft	4,200	3,570	11,820	39,640	87,610	66,580	36,960	44,990	9,020	2,600	1,170	660

Calendar year 1959: Max 7,420 Min 8.0 Mean 387 Cfs/m 4.15 In. 56.39 Ac-ft 280,300  
Water year 1959-60: Max 7,480 Min 7.5 Mean 425 Cfs/m 4.56 In. 62.13 Ac-ft 308,800

Peak discharge (base, 4,000 cfs).--Feb. 9 (3 a.m.) 9,150 cfs (12.78 ft); Mar. 29 (10 p.m.) 4,660 cfs (9.63 ft); May 26 (8 a.m.) 5,260 cfs (10.12 ft).

\* Discharge measurement made on this day.

Note.--Backwater from leaves Oct. 26 to Nov. 20.

## 3250. South Fork Coquille River at Powers, Oreg.

Location.--Lat 42°53'30", long 124°04'10", in SE $\frac{1}{4}$  sec.12,T.31 S., R.12 W., on left bank 0.7 mile downstream from highway bridge at Powers and 0.8 mile upstream from Woodward Creek.

Drainage area.--169 sq mi.

Records available.--September 1916 to September 1926, October 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 197.42 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Nov. 17, 1938, staff or wire-weight gages at various sites within 1 mile of present site at different datums.

Average discharge.--41 years (1916-26, 1929-60), 770 cfs (557,500 acre-ft per year).

Extremes.--Maximum discharge during year, 13,900 cfs Feb. 9 (gage height, 12.85 ft); minimum, 14 cfs Sept. 30.

1916-26, 1928-60: Maximum discharge, 30,500 cfs Dec. 28, 1945 (gage height, 20.57 ft), from rating curve extended above 14,000 cfs on basis of contracted-opening measurement at gage height 18.14 ft; minimum, 12 cfs Sept. 22-25, 27-30, 1939.

Remarks.--Records excellent except those for periods of backwater from moss, which are good. No regulation. Small diversions for irrigation above station.

Revisions (water years).--WSP 1184: 1946(M). WSP 1448: 1917-18(M), 1919, 1920(M), 1925.

Rating tables, water year 1959-60, except periods of backwater from moss (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 8

Feb. 9 to Sept. 30

1.2	28	4.0	1,230	0.95	14	2.5	390
1.5	59	6.0	3,200	1.0	18	3.0	630
1.8	111	9.0	7,400	1.1	28	4.0	1,310
2.2	250	12.0	12,400	1.2	41	5.0	2,170
3.0	595			1.5	90	7.0	4,500
				2.0	210	12.0	12,400

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	55	51	71	282	1,550	247	2,870	530	600	100	38	29
2	51	47	68	246	4,320	250	2,120	500	510	96	36	31
3	47	47	68	220	2,700	720	1,560	470	454	90	34	31
4	44	60	64	195	3,690	1,790	*1,180	*500	410	88	34	31
5	42	57	59	179	4,140	3,270	926	450	362	85	34	31
6												
7	41	51	57	185	3,010	2,850	768	426	326	79	34	27
8	40	45	55	478	5,350	3,900	666	540	296	76	34	26
9	106	43	54	2,720	11,100	4,300	576	490	275	72	34	24
10	257	42	53	1,620	11,900	5,000	520	442	261	72	33	*22
11	182	41	53	964	*5,310	2,620	470	402	240	70	33	21
12												
13	125	40	74	915	2,650	1,760	490	374	228	69	32	20
14	113	38	617	868	1,860	1,500	490	490	213	66	31	18
15	*93	37	749	722	1,500	1,690	545	919	201	64	31	18
16	84	36	436	760	1,210	1,510	1,140	774	183	62	29	18
17	74	35	324	628	1,290	1,630	1,440	656	180	61	29	18
18												
19	68	35	278	622	1,120	1,940	1,190	636	*175	58	29	18
20	62	35	242	880	926	1,520	982	648	172	56	29	17
21	55	*35	216	1,230	822	1,250	954	884	159	54	29	17
22	53	38	179	992	690	1,050	1,080	846	154	53	29	17
23	58	42	155	856	588	870	1,050	1,620	147	52	28	17
24												
25	70	317	138	850	520	750	1,140	2,170	141	50	28	17
26	133	234	125	1,080	470	630	1,090	1,920	136	47	31	17
27	133	173	123	1,310	426	550	940	1,840	132	47	36	16
28	101	157	1,160	1,370	390	490	816	1,720	128	44	36	16
29	89	128	1,080	1,230	362	446	732	2,600	125	44	38	16
30												
31	81	109	650	1,360	342	442	846	6,240	119	46	36	16
2	72	37	470	1,560	510	600	774	3,200	114	*46	32	16
3	66	88	378	2,270	286	828	714	1,680	110	41	31	16
4	59	82	314	2,560	268	2,380	672	1,280	108	41	29	16
5	55	76	*310	2,130	-----	5,610	582	940	104	41	26	16
6	53	-----	319	1,450	-----	3,610	-----	756	-----	40	26	-----
Total	2,562	2,316	8,919	32,732	69,100	56,003	29,323	37,103	6,763	1,910	989	613
Mean	82.6	77.2	288	1,056	2,383	1,807	977	1,197	225	61.6	31.9	20.4
Cfs/m	0.489	0.457	1.70	6.25	14.1	10.7	5.78	7.08	1.33	0.364	0.189	0.121
In.	0.56	0.51	1.96	7.20	15.21	12.32	6.45	8.16	1.49	0.42	0.22	0.13
Ac-ft	5,080	4,590	17,690	64,920	137,100	111,100	58,160	73,590	13,410	3,790	1,960	1,220
Calendar year 1959: Max	13,000	Min	16	Mean	639	Cfs/m	3.78	In.	51.31	Ac-ft	462,600	
Water year 1959-60: Max	11,900	Min	16	Mean	679	Cfs/m	4.02	In.	54.63	Ac-ft	492,600	

Peak discharge (base, 9,300 cfs).--Feb. 9 (3 a.m.) 13,900 cfs (12.85 ft).

\* Discharge measurement made on this day.

Note.--Backwater from moss Oct. 1-8, Oct. 18 to Nov. 21

## 3280. Rogue River above Prospect, Ore.

Location (revised).--Lat 42°46'30", long 122°29'55", in NE $\frac{1}{4}$  sec.19, T.32 S., R.3 E., on left bank 1.5 miles upstream from The California Oregon Power Co. diversion dam, 1.8 miles northwest of Prospect, and at mile 169.7 (river-profile survey).

Drainage area.--332 sq mi.

Records available.--January 1908 to February 1912, October 1923 to September 1960.

Monthly discharge only for some periods, published in WSP 1318. Prior to October 1925, published as "near Prospect."

Gage.--Water-stage recorder. Altitude of gage is 2,620 ft (from river-profile map).

Prior to Feb. 17, 1912, staff gage at several sites within a few hundred feet upstream at various datums.

Average discharge.--40 years (1908-11, 1923-60), 801 cfs (579,900 acre-ft per year).

Extremes.--Maximum discharge during year, 3,160 cfs Feb. 8 (gage height, 4.30 ft); minimum, 294 cfs Jan. 1.

1908-12, 1923-60: Maximum discharge, 16,600 cfs Dec. 22, 1955 (gage height, 10.01 ft), from rating curve extended above 6,400 cfs on basis of slope-area measurement of peak flow; minimum observed, 200 cfs Nov. 20, 1931.

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

Cooperation.--Water-stage-recorder graph furnished by The California Oregon Power Co.

Revisions (water years).--WSP 709: Drainage area. WSP 1248: 1925, 1927(M).

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

1.4	330	3.0	1,460
2.0	660	4.0	2,700
2.5	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	430	405	405	330	690	486	1,550	992	1,760	600	455	405
2	430	405	400	405	762	*518	1,750	1,050	*1,800	588	435	410
3	430	445	395	390	660	534	1,870	1,090	1,790	582	430	405
4	430	504	385	375	672	606	2,030	1,120	1,710	570	425	425
5	425	425	380	390	720	808	2,250	1,070	1,640	558	420	415
6	425	415	385	440	737	1,170	2,230	1,120	1,560	546	420	405
7	435	410	380	445	1,530	2,280	2,150	1,620	1,420	534	415	400
8	660	405	370	470	2,560	1,830	1,960	1,540	1,300	522	415	395
9	810	405	370	435	1,760	1,380	1,860	1,450	1,220	510	410	390
10	582	405	*365	415	1,240	1,130	1,640	1,560	1,180	504	405	390
11	558	400	390	430	997	1,020	1,500	1,750	1,150	504	405	390
12	546	400	405	400	885	984	1,360	2,190	1,110	498	*400	390
13	475	395	390	365	822	1,080	1,260	1,880	1,090	492	400	385
14	455	395	390	405	774	1,010	1,330	1,600	1,050	486	400	385
15	450	390	380	390	801	944	1,230	1,480	1,030	480	400	380
16	435	385	380	385	762	906	*1,130	1,380	984	475	400	380
17	425	380	380	400	726	913	1,090	1,330	920	470	400	380
18	425	385	385	390	702	1,020	1,120	1,250	864	465	390	380
19	415	400	380	390	660	1,220	1,190	1,180	829	460	385	380
20	430	390	380	390	624	1,400	1,210	1,450	794	455	390	385
21	455	475	380	390	612	1,560	1,290	1,620	762	450	390	380
22	*678	475	375	375	588	1,660	1,170	1,410	738	445	425	380
23	534	600	380	390	564	1,780	1,090	1,350	726	445	460	380
24	470	518	492	410	558	1,870	1,020	1,350	708	445	460	380
25	450	470	475	450	564	1,900	984	1,400	696	445	435	380
26	430	445	420	475	552	1,830	960	1,700	672	445	420	380
27	425	430	410	480	498	1,770	944	1,910	654	440	410	380
28	420	415	405	475	492	1,690	936	1,750	636	435	410	*380
29	415	410	400	*552	480	1,490	913	1,750	*624	430	405	375
30	410	410	400	684	-----	2,020	960	1,770	612	445	405	375
31	410	-----	400	630	-----	1,600	-----	1,770	-----	475	400	-----
Total	14,768	12,790	12,212	13,331	23,992	40,407	41,977	45,862	32,029	15,199	12,820	11,665
Mean	476	426	394	430	827	1,303	1,399	1,479	1,068	490	414	389
Cfs/m	1.43	1.28	1.19	1.30	2.49	3.92	4.21	4.45	3.22	1.48	1.25	1.17
In.	1.65	1.43	1.37	1.49	2.69	4.53	4.70	5.14	3.59	1.70	1.44	1.31
Ac-ft	29,290	25,370	24,220	26,440	47,590	80,150	83,260	90,970	63,530	30,150	25,430	23,140

Calendar year 1959: Max 2,740 Min 365 Mean 717 Cfs/m 2.16 In. 29.31 Ac-ft 519,200  
 Water year 1959-60: Max 2,560 Min 330 Mean 757 Cfs/m 2.28 In. 31.04 Ac-ft 549,500

Peak discharge (base, 2,700 cfs).--Feb. 8 (12 m.) 3,160 cfs (4.30 ft).

\* Discharge measurement made on this day.

3320. South Fork Rogue River near Prospect, Oreg.

Location.--Lat 42°42'25", long 122°23'20", in NE $\frac{1}{4}$  sec.18, T.83 S., R.4 E., on right bank 500 ft downstream from diversion dam and intake of South Fork power canal, 0.1 mile downstream from Imnaha Creek, and 6 miles southeast of Prospect.

Drainage area.--79 sq mi, approximately.

Records available.--April 1924 to September 1931, October 1949 to September 1960. Equivalent records for period October 1931 to September 1949 may be obtained from combined flow of South Fork Rogue River above Imnaha Creek, near Prospect and Imnaha Creek near Prospect.

Gage.--Water-stage recorder. Altitude of gage is 3,330 ft (from topographic map). Apr.1, 1924, to Sept. 30, 1931, at site an eighth of a mile downstream at different datum.

Average discharge.--18 years, 180 cfs (130,300 acre-ft per year).

Extremes.--Maximum discharge during year, 513 cfs May 7; minimum daily, 58 cfs Jan. 1. 1924-31, 1949-60: Maximum discharge, 3,180 cfs Dec. 22, 1955 (no flow in canal), from rating curve extended above 410 cfs on basis of computation of peak flow over dam; minimum daily, about 35 cfs in September 1931, during period of no gage-height record.

Remarks.--Records good. All records presented herein include flow in South Fork power canal (completed in March 1932) which diverts 500 ft above station and returns water to Rogue River above South Fork Rogue River; practically no storage above diversion dam.

Revisions (water years).--WSP 1318: 1925(M), 1927(M), 1930(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	65	62	65	58	81	84	316	218	442	146	100	66
2	64	62	65	62	84	*84	367	256	*456	143	97	86
3	64	67	65	61	80	86	362	245	465	140	96	88
4	64	72	64	59	80	89	385	248	451	137	94	87
5	63	67	62	59	84	109	423	236	430	134	94	84
6	63	65	62	61	86	181	434	241	413	131	94	83
7	65	65	62	74	168	294	433	452	381	129	94	81
8	97	64	62	89	340	280	414	410	340	125	93	81
9	87	63	61	77	266	237	410	371	321	124	93	79
10	77	63	*61	71	204	207	375	392	312	121	91	78
11	78	62	63	70	171	196	354	*430	308	118	91	77
12	77	62	65	67	154	200	317	468	302	116	*91	77
13	70	62	63	65	144	217	305	396	297	114	91	77
14	68	62	64	66	136	202	313	345	286	114	91	76
15	66	61	64	65	134	190	290	326	286	114	91	76
16	65	61	63	64	125	184	268	334	270	112	90	76
17	63	61	63	65	118	185	262	310	253	111	90	75
18	63	61	63	65	117	185	271	286	232	108	89	74
19	63	62	61	64	111	192	*277	271	220	106	90	73
20	62	62	61	63	105	205	279	328	208	106	89	73
21	71	75	60	64	101	222	285	351	201	103	90	71
22	*94	72	61	62	99	243	263	311	194	102	100	71
23	80	79	62	62	96	265	247	295	186	101	102	70
24	72	75	64	94	289	234	287	182	100	95	69	69
25	69	72	68	67	92	300	226	302	177	98	94	69
26	68	69	64	70	91	306	218	344	172	98	92	69
27	66	67	64	69	86	312	216	424	166	98	91	*68
28	65	65	64	73	85	297	213	389	*159	98	91	68
29	64	66	63	*80	84	282	207	394	154	98	88	68
30	64	65	63	80	---	297	214	412	148	104	87	68
31	63	---	62	77	---	275	---	426	---	102	86	---
Total	2,160	1,973	1,965	2,093	3,616	6,695	9,178	10,478	8,414	3,551	2,865	2,278
Mean	69.7	65.8	63.4	67.5	125	216	306	338	280	115	92.4	75.9
Cfsm	0.882	0.833	0.803	0.854	1.58	2.73	3.87	4.28	3.54	1.46	1.17	0.961
In.	1.02	0.93	0.93	0.99	1.70	3.15	4.32	4.93	3.96	1.67	1.35	1.07
Ac-ft	4,280	3,910	3,900	4,150	7,170	13,280	18,200	20,780	16,690	7,040	5,680	4,520
Calendar year 1959: Max	291	291	291	Min 60	Mean 122	Cfsm 1.54	In. 20.92	Ac-ft 68,070				
Water year 1959-60: Max	468	468	468	Min 58	Mean 151	Cfsm 1.91	In. 26.02	Ac-ft 109,600				

\* Discharge measurement made on this day.

## 3335. Red Blanket Creek near Prospect, Oreg.

Location.--Lat 42°46'40", long 122°25'35", in NW<sup>1</sup>/<sub>4</sub> sec. 23, T.32 S., R.3 E., on right bank 1.8 miles downstream from Lick Creek and 3.7 miles northeast of Prospect.

Drainage area.--40 sq mi, approximately.

Records available.--May 1925 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,780 ft (from river-profile map). Prior to Sept. 7, 1949, staff gage at several sites within  $\frac{1}{2}$  miles of present site at various datums.

Average discharge.--35 years, 115 cfs (83,260 acre-ft per year).

Extremes.--Maximum discharge during year, 366 cfs Feb. 8 (gage height, 3.85 ft); minimum, 56 cfs Sept. 26, 29, 30.  
1925-60: Maximum discharge, 1,840 cfs Dec. 22, 1955 (gage height, 7.30 ft), from rating curve extended above 360 cfs on basis of slope-area measurement of peak flow; minimum observed, 34 cfs Sept. 3, 4, 25, Oct. 9, 16, 1931.

Remarks.--Records good except those for period of no gage-height record, which are fair. One diversion above station for irrigation below.

Revisions (water years).--WSP 1318: 1926-28, 1930. WSP 1348: 1943(M), 1946(M), 1948(M), 1953.

Rating tables, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1 to Nov. 27, Jan. 4 to Feb. 9)

Oct. 1 to Mar. 6

Mar. 7 to Sept. 30

2.4	53	2.4	48
2.7	85	2.7	79
3.0	127	3.0	121
3.5	275	3.6	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	83	60	61	61	84	76	185	121	250	107	74	64
2	83	59	61	61	87	*78	191	125	*262	108	73	64
3	63	71	61	60	83	81	200	129	278	103	72	64
4	62	68	60	59	83	82	217	127	278	103	71	64
5	62	63	60	59	86	102	235	123	266	100	70	62
6	62	62	61	60	88	156	239	127	262	97	70	62
7	64	61	61	74	152	278	228	179	235	94	69	62
8	90	60	61	91	275	211	214	184	211	93	69	60
9	98	60	60	68	200	170	a200	160	204	93	69	60
10	76	60	*60	65	150	144	a190	176	197	91	68	60
11	81	59	62	68	127	134	a175	194	197	87	68	60
12	75	60	65	64	117	136	a165	224	197	85	*66	60
13	69	60	62	63	109	140	a150	200	200	85	66	60
14	66	59	62	62	106	129	160	192	194	84	66	60
15	64	59	63	61	104	125	150	173	191	*84	66	60
16	62	59	62	61	100	121	*141	170	185	82	66	60
17	60	59	62	63	98	119	140	164	170	81	64	60
18	60	59	61	62	95	125	147	152	162	81	64	58
19	60	59	61	61	92	134	152	142	154	80	64	58
20	61	60	60	61	90	144	152	197	144	80	64	60
21	89	70	60	59	88	160	154	197	142	78	66	58
22	*88	66	60	60	88	164	147	176	136	77	71	58
23	74	71	61	62	84	173	138	167	136	76	72	58
24	68	66	79	64	83	179	134	167	134	76	66	58
25	65	63	69	69	82	182	134	185	129	76	66	58
26	64	62	64	74	82	179	129	231	125	74	66	57
27	63	61	63	73	80	179	127	243	*123	74	64	*57
28	62	61	63	78	79	162	125	221	*118	76	64	58
29	62	61	63	*79	78	167	119	224	114	75	64	58
30	61	62	63	81	-----	191	119	231	111	78	64	58
31	60	-----	62	81	-----	170	-----	239	-----	76	64	-----
Total	2,097	1,860	1,933	2,054	3,068	4,591	4,955	5,510	5,505	2,652	2,086	1,796
Mean	67.6	62.0	62.4	66.3	106	148	165	178	183	85.5	67.3	59.9
Ac-ft	4,160	3,690	3,830	4,070	6,090	9,110	9,830	10,930	10,920	5,260	4,140	3,560

Calendar year 1959: Max 250 Min 59 Mean 94.5 Ac-ft 68,390  
Water year 1959-60: Max 278 Min 57 Mean 104 Ac-ft 75,590

Peak discharge (base, 300 cfs).--Feb. 8 (10:30 a.m.) 366 cfs (3.85 ft); Mar. 7 (11:30 a.m.) 326 cfs (3.64 ft).

\* Discharge measurement made on this day.

No gage-height record; discharge estimated on basis of weather records, recorded range in stage, and records for Rogue River below South Fork Rogue River, near Prospect, and Rogue River above Prospect.

3350. Rogue River below South Fork Rogue River, near Prospect, Oreg.

Location.--Lat 42°42'00", long 122°35'40", in SW 1/4 sec. 16, T.33 S., R.2 E., on left bank at downstream side of highway bridge, 0.5 mile downstream from Cascade Gorge, 6.6 miles (revised) southwest of Prospect, and at mile 160.4 (river-profile survey).

Drainage area.--643 sq mi.

Records available.--October 1928 to September 1960. Prior to May 1929 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 1,707.26 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Aug. 31, 1957, at datum 1.00 ft higher.

Average discharge.--32 years, 1,777 cfs (1,286,000 acre-ft per year).

Extremes.--Maximum discharge during year, 5,750 cfs Feb. 8 (gage height, 5.47 ft); minimum, 546 cfs Jan. 5.

1928-60: Maximum discharge, 34,000 cfs Dec. 22, 1955 (gage height, 18.3 ft, present datum), from rating curve extended above 12,000 cfs on basis of slope-area measurement of peak flow; minimum since intake was lowered Aug. 18, 1934, 493 cfs Sept. 1, 1934 (prior to Aug. 18, 1934, minimum not determined).

Remarks.--Records good. Considerable diurnal fluctuation caused by powerplant 5.5 miles above station. Small diversions for irrigation above station.

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

1.3	800
2.0	1,310
3.0	2,330
5.0	5,000

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	933	940	940	877	1,310	1,140	3,280	1,880	3,260	1,460	1,130	1,020	
2	961	961	926	898	1,560	1,130	3,490	1,980	*3,340	1,430	1,090	1,020	
3	947	996	940	933	1,400	*1,180	3,520	2,040	3,390	1,410	1,090	1,020	
4	940	1,110	926	856	1,370	1,250	3,620	2,110	3,300	1,390	1,090	1,040	
5	926	982	919	870	1,460	1,520	3,870	2,010	3,150	1,380	1,080	1,020	
6	947	975	912	982	1,480	2,310	3,840	2,040	3,030	1,350	1,070	996	
7	954	961	926	1,090	2,520	3,980	3,730	2,950	2,860	1,340	1,060	975	
8	1,260	940	898	1,190	4,480	3,450	3,480	2,890	2,630	1,310	1,050	1,020	
9	1,430	968	898	1,070	3,750	2,810	3,320	2,700	2,500	1,300	1,050	982	
10	1,180	954	898	1,020	2,690	2,330	3,030	2,830	2,450	1,300	1,030	989	
11	1,140	919	*912	1,030	2,160	2,090	2,870	3,100	2,390	1,250	1,030	989	
12	1,150	947	975	1,010	1,950	2,080	2,610	3,700	2,350	1,250	1,030	961	
13	1,040	933	933	954	1,810	2,260	2,470	3,280	2,330	1,230	1,010	996	
14	989	926	919	989	1,710	2,070	2,580	2,860	2,270	1,230	1,020	975	
15	982	926	926	954	1,720	1,990	*2,430	2,710	2,260	1,240	a1,020	996	
16	982	919	933	961	1,640	1,890	2,220	2,680	2,160	1,200	a1,020	982	
17	933	912	940	954	1,550	1,870	2,200	2,500	2,070	1,180	a1,020	982	
18	968	912	919	989	1,520	1,950	2,210	2,370	1,940	1,160	a1,020	968	
19	947	954	933	968	1,440	2,140	2,350	2,220	1,870	1,170	a1,020	975	
20	968	940	912	975	1,370	2,380	2,340	2,690	1,800	1,160	*1,020	989	
21	1,020	1,020	912	975	1,300	2,510	2,440	3,000	1,740	1,140	1,000	982	
22	1,350	1,020	926	968	1,290	2,700	2,270	2,680	1,690	1,140	1,070	975	
23	*1,180	1,180	933	968	1,250	2,830	2,140	2,570	1,670	1,140	1,100	975	
24	1,050	1,100	1,140	1,040	1,200	2,970	2,040	2,560	1,650	1,130	1,100	954	
25	996	1,030	1,070	*1,040	1,240	3,000	1,980	2,620	1,640	1,120	1,090	982	
26	1,020	989	996	1,170	1,210	2,940	1,950	3,080	1,590	1,120	1,030	996	
27	975	989	982	1,170	1,120	2,870	1,880	3,470	1,570	1,120	1,030	954	
28	982	982	954	1,170	1,110	2,800	1,670	3,210	1,520	1,110	1,030	*989	
29	982	947	975	1,250	1,080	2,580	1,820	3,180	*1,500	1,090	1,020	961	
30	954	954	954	1,360	-----	3,450	1,870	3,240	1,480	1,120	1,020	968	
31	961	-----	954	1,330	-----	2,990	-----	32,60	-----	1,140	1,020	-----	
Total	32,047	29,286	29,281	32,011	49,690	73,460	79,720	84,410	67,400	38,110	32,460	29,631	
Mean	1,034	976	945	1,033	1,713	2,370	2,657	2,723	2,247	1,229	1,047	988	
Cfsm	1.61	1.52	1.47	1.61	2.66	3.69	4.15	4.23	3.49	1.91	1.63	1.54	
In.	1.85	1.69	1.69	1.85	2.87	4.25	4.61	4.98	3.90	2.20	1.88	1.71	
Ac-ft	63,560	58,090	58,080	63,490	98,560	145,700	158,100	167,400	133,700	75,590	64,380	58,770	
Calendar year 1959: Max	4,250			Min	898	Mean	1,503	Cfsm	2.34	In.	31.71	Ac-ft	1,088,000
Water year 1959-60: Max	4,480			Min	856	Mean	1,578	Cfsm	2.45	In.	33.38	Ac-ft	1,145,000

Peak discharge (base, 5,300 cfs).--Feb. 8 (1:30 p.m.), 5,750 cfs (5.47 ft).

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for station above Prospect.

## 3355. South Fork Big Butte Creek near Butte Falls, Oreg.

Location.--Lat 42°32'25", long 122°33'15", in NE 1/4 sec. 11, T.35 S., R.2 E., on right bank 10 ft downstream from Ginger Creek and 1 mile east of town of Butte Falls.

Drainage area.--138 sq mi (revised).

Records available.--September 1910 to October 1911 (published as "at Butte Falls"), August to October 1915, October 1917 to September 1922, March 1925 to September 1960. Monthly discharge only for August and September 1915, published in WSP 1318.

Gage.--Water-stage recorder. Altitude of gage is 2,360 ft (from river-profile map). Sept. 21, 1910, to Sept. 30, 1922, staff gage at site 300 ft upstream at different datums.

Average discharge.--41 years (1910-11, 1917-22, 1925-60), 162 cfs (117,300 acre-ft per year).

Extremes.--Maximum discharge during year, 445 cfs Apr. 1 (gage height, 1.67 ft); minimum, 56 cfs Jan. 4.  
1910-11, 1915, 1917-22, 1925-60: Maximum discharge, 2,770 cfs Dec. 22, 1955 (gage height, 4.50 ft), from rating curve extended above 1,600 cfs by logarithmic plotting; minimum, 39 cfs Oct. 14, 1931 (gage height, 0.32 ft).

Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation. Diversions for irrigation of 1,000 acres above station and for municipal water supply for Medford (since 1927) and Butte Falls.

Revisions (water years).--WSP 1288: 1911, 1918-19, 1921-22, 1929. WSP 1318: 1918-19.

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

Oct. 1 to Feb. 8		Feb. 9 to Sept. 30	
0.4	54	0.5	64
.7	115	.7	102
1.0	195	1.0	180
1.5	400	1.5	275
		1.7	460

Discharge, in cubic 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	80	68	59	84	82	420	131	160	80	71	75
2	84	80	68	59	115	84	415	136	152	80	71	73
3	84	82	68	63	94	92	375	136	147	78	71	73
4	84	80	68	61	88	92	342	147	142	78	71	73
5	84	78	68	860	97	107	320	156	134	78	71	73
6	86	78	68	84	94	144	287	*131	131	78	71	71
7	86	78	68	860	151	222	268	180	124	77	71	71
8	99	78	68	8120	330	216	240	186	119	77	73	69
9	90	76	68	8100	*375	216	225	177	112	77	73	69
10	86	76	*8	890	234	189	213	172	109	77	73	69
11	84	76	70	82	177	174	216	169	104	77	73	69
12	84	74	76	*78	8160	195	198	183	100	77	69	69
13	84	74	76	72	8150	247	189	174	98	77	73	71
14	76	72	70	72	8140	244	213	160	94	77	73	69
15	*74	70	70	70	139	240	201	152	92	77	75	69
16	76	72	70	70	8125	*228	183	152	92	75	78	69
17	76	70	70	875	8120	213	177	147	88	73	77	69
18	76	72	68	880	8125	201	180	142	88	73	75	71
19	76	76	68	878	8120	192	189	134	86	75	71	71
20	76	76	68	875	8110	192	183	152	86	77	71	*71
21	84	76	68	885	8105	186	*180	177	88	77	71	71
22	88	74	68	80	100	183	180	177	88	*75	75	71
23	84	76	68	80	98	180	180	177	*86	73	*75	71
24	82	*72	76	84	94	177	172	174	84	73	75	71
25	80	70	74	84	92	177	163	177	82	73	77	71
26	82	70	67	88	90	174	155	183	80	71	75	71
27	82	70	67	88	88	177	149	198	80	71	75	71
28	80	70	65	86	82	189	144	189	82	71	75	73
29	80	70	65	82	80	172	139	183	82	71	73	71
30	80	70	63	84	84	234	134	177	82	73	73	71
31	80	-----	83	80	-----	275	-----	166	-----	73	73	-----
Total	2,551	2,236	2,130	2,435	3,857	5,694	6,630	5,075	3,092	2,339	2,268	2,126
Mean	82.3	74.5	68.7	78.5	133	184	221	164	103	75.5	73.2	70.9
Ac-ft	5,060	4,440	4,220	4,830	7,650	11,290	13,150	10,070	6,130	4,640	4,500	4,220
Calendar year 1959: Max	269			Min 63		Mean 111		Ac-ft 80,540				
Water year 1959-60: Max	420			Min 59		Mean 110		Ac-ft 80,200				

Peak discharge (base, 450 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of unpublished records for South Fork Big Butte Creek above Willow Creek, near Butte Falls.

## 3380. Elk Creek near Trail, Ore.

Location.--Lat 42°39'50", long 122°44'50", in SW $\frac{1}{4}$  sec.30 (revised), T.33 S., R.1 E., on right bank 0.4 mile upstream from mouth and 3.3 miles northeast of Trail.

Drainage area.--133 sq mi.

Records available.--October 1945 to September 1960. Prior to March 1946 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 1,456.56 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to July 5, 1946, staff gage at various sites within 1 mile of present site at different datums. July 5, 1946, to June 22, 1950, staff gage and June 23, 1950, to May 23, 1954, water-stage recorder, at site 0.3 mile upstream at datum 12.14 ft higher.

Average discharge.--15 years, 242 cfs (175,200 acre-ft per year).

Extremes.--Maximum discharge during year, 3,350 cfs Feb. 8 (gage height, 7.85 ft); minimum, 1.8 cfs Sept. 27.

1945-60: Maximum discharge, 13,700 cfs Dec. 22, 1955 (gage height, 14.34 ft), from rating curve extended above 3,000 cfs on basis of slope-area measurement of peak flow; minimum observed, 0.9 cfs Aug. 29, 1946.

Remarks.--Records good except those for period of no gage-height record, which are fair. No regulation. Six diversions above station for irrigation of about 250 acres of which about 100 acres is below station.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Feb. 25 to Mar. 3, Mar. 7, 8)

2.3	1.8	2.9	33	5.0	765
2.4	4.0	3.2	66	6.0	1,400
2.5	7.2	4.5	118	7.0	2,380
2.7	18	4.0	260	8.0	3,670

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	8.2	16	18	38	246	108	1,610	108	169	16	4.0	3.3
2	6.9	15	17	39	711	104	1,390	114	*145	19	4.0	4.0
3	6.9	15	16	34	445	*140	1,060	112	106	15	4.6	3.5
4	6.6	19	15	28	596	380	789	158	108	15	4.9	4.9
5	6.6	18	14	28	596	783	612	153	98	15	4.9	5.6
6	6.9	16	14	29	511	1,230	491	140	90	14	5.9	4.9
7	8.2	15	14	57	1,340	2,300	412	210	83	14	4.6	5.2
8	35	14	13	398	2,780	1,220	340	201	75	13	4.3	4.6
9	53	14	14	207	*2,140	903	287	172	66	13	4.6	4.0
10	43	14	13	129	1,210	645	250	148	61	12	4.3	4.9
11	29	13	*14	116	777	502	253	133	57	12	4.3	4.9
12	29	13	19	100	584	460	223	140	54	11	4.6	4.3
13	23	12	30	76	601	574	204	131	49	10	4.3	3.3
14	19	12	26	66	535	524	226	116	44	9.1	3.1	2.9
15	16	12	25	56	628	470	*220	104	42	8.2	2.7	3.1
16	15	12	26	50	606	552	201	100	39	7.7	4.3	2.7
17	14	12	27	53	465	486	195	93	38	5.9	5.6	2.9
18	13	12	31	86	390	465	198	100	37	5.9	3.5	2.7
19	a13	12	31	129	315	465	233	91	33	5.6	3.1	2.7
20	a15	13	28	131	253	430	229	133	30	5.2	*2.5	2.7
21	a50	18	24	140	226	390	260	283	31	4.9	2.5	2.5
22	a90	34	22	175	210	349	250	308	31	4.9	3.1	2.3
23	*57	54	22	214	189	315	220	365	33	5.6	5.9	2.3
24	37	44	57	264	172	294	198	380	29	4.9	9.1	2.7
25	29	34	166	*279	166	264	178	394	27	4.6	8.2	2.3
26	24	29	88	294	158	240	166	601	24	4.9	8.2	2.3
27	21	24	62	246	145	226	150	693	24	5.2	5.6	2.3
28	20	22	51	294	127	240	151	450	22	4.9	4.6	*2.3
29	18	20	45	319	114	217	118	354	*23	5.2	4.9	2.9
30	17	18	46	403	-----	903	108	268	21	4.6	3.3	2.9
31	16	-----	45	283	-----	945	-----	204	-----	4.0	2.9	-----
Total	746.3	578	1,033	4,761	17,214	17,124	11,202	7,005	1,689	280.3	142.4	101.9
Mean	24.1	19.2	33.3	154	594	552	373	226	56.3	9.04	4.59	3.40
Ac-ft	1,480	1,140	2,050	9,440	34,140	33,960	22,220	13,890	3,350	556	282	202

Calendar year 1959: Max 1,470 Min 2.7 Mean 141 Ac-ft 101,900  
Water year 1959-60: Max 2,760 Min 2.3 Mean 169 Ac-ft 122,700

Peak discharge (base, 2,700 cfs).--Feb. 8 (8 p.m.) 3,350 cfs (7.85 ft); Mar. 7 (8 a.m.) 3,080 cfs (7.75 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 Grave Creek at Pease Bridge, near Placer.

## 3390. Rogue River at Dodge Bridge, near Eagle Point, Oreg.

Location.--Lat 42°31'30", long 122°50'30", in SE $\frac{1}{4}$  sec.17, T.35 S., R.1 W., on right bank just upstream from Dodge Bridge, 0.6 mile downstream from Reese Creek,  $4\frac{1}{2}$  miles north-west of Eagle Point, and at mile 134.9 (river-profile survey).

Drainage area.--1,210 sq mi, approximately.

Records available.--October 1938 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,273.66 ft above mean sea level, datum of 1929. Prior to Dec. 21, 1938, staff gage at same site and datum.

Average discharge.--22 years, 2,660 cfs (1,926,000 acre-ft per year).

Extremes.--Maximum discharge during year, 15,800 cfs Feb. 8 (gage height, 6.41 ft); minimum, 772 cfs Jan. 4.

1938-60: Maximum discharge, 75,000 cfs Dec. 22, 1955 (gage height, 12.90 ft), from rating curve extended above 16,000 cfs on basis of peak flow at stations upstream and downstream; minimum, 611 cfs Aug. 6, 14, 29, Sept. 9, 1940.

Remarks.--Records good. Some diurnal fluctuation caused by powerplant 30 miles upstream. Diversions for irrigation above station; most of flow of Big Butte Creek is diverted near Butte Falls.

Revisions (water years).--WSP 1094: 1942(M), 1943, 1945(M), 1946.

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

0.9	940	3.0	4,700
1.0	1,060	4.0	7,400
2.0	2,560	6.0	14,100

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	1,150	1,180	1,120	1,070	2,030	1,540	7,930	2,400	4,060	1,630	1,260	1,100
2	1,140	1,160	1,140	1,050	3,540	1,540	7,180	2,540	4,060	1,570	1,220	*1,110
3	1,140	1,110	1,120	1,140	2,580	1,640	6,360	*2,560	4,060	1,560	1,190	1,070
4	1,140	1,320	1,110	1,040	2,710	2,110	5,830	2,770	3,980	1,530	1,200	1,110
5	1,150	1,190	1,110	1,050	3,080	3,290	5,750	2,600	3,820	1,500	1,200	1,090
6	1,150	1,150	1,100	1,140	2,850	5,610	5,500	2,580	3,670	1,460	1,180	1,040
7	1,180	1,140	1,120	1,470	5,920	9,760	5,160	3,540	3,480	1,450	1,180	1,040
8	1,490	1,110	1,100	2,260	*11,300	7,150	4,750	3,730	3,180	1,420	1,180	1,050
9	1,670	1,110	1,100	1,710	11,400	5,830	4,450	3,430	3,030	1,420	1,160	1,040
10	1,610	1,100	1,090	1,460	6,500	4,450	4,110	3,450	2,910	1,390	1,140	1,040
11	1,350	1,100	1,100	1,530	4,460	3,780	4,040	3,760	2,830	1,380	1,120	1,040
12	1,400	1,100	1,220	1,460	3,600	3,800	3,690	4,310	2,770	1,360	1,140	1,000
13	1,350	1,110	1,220	1,280	3,480	4,310	3,380	4,110	2,750	1,330	1,120	1,010
14	1,310	1,100	1,150	1,240	3,120	3,840	3,520	3,540	2,660	1,330	1,110	964
15	1,240	1,100	1,140	1,200	3,240	3,580	3,330	3,330	2,600	1,330	1,120	1,020
16	1,240	1,100	1,120	1,230	3,120	3,670	3,060	3,260	2,520	1,320	1,090	1,020
17	1,200	1,120	1,140	1,270	2,710	3,350	2,950	3,080	*2,350	1,280	1,110	1,000
18	1,190	1,090	*1,150	1,420	2,580	3,290	2,990	2,950	2,230	1,270	1,110	1,000
19	1,220	1,110	1,150	1,430	2,400	3,430	3,240	2,750	2,180	1,280	1,100	1,000
20	1,220	1,110	1,110	1,400	2,150	3,580	3,160	3,080	2,080	1,280	1,100	1,000
21	1,280	1,200	1,100	1,380	2,020	*3,710	3,330	4,090	2,100	1,240	1,100	976
22	1,640	1,290	1,090	1,450	1,970	3,840	3,200	3,670	2,020	1,270	1,180	988
23	*1,630	1,390	1,100	1,450	1,860	3,910	2,990	3,650	1,990	1,260	1,260	964
24	1,400	1,360	1,320	1,570	1,770	3,980	2,810	3,600	1,940	1,260	1,240	952
25	1,320	1,270	1,560	1,630	1,710	4,020	2,670	3,710	1,880	*1,240	1,240	976
26	1,310	1,220	1,330	1,780	1,730	3,830	2,620	4,610	1,780	1,220	1,180	1,000
27	1,240	1,190	1,250	1,840	1,600	3,820	2,540	5,190	1,740	1,220	1,120	1,000
28	1,220	1,190	1,190	1,950	1,530	3,890	2,470	4,560	1,700	1,220	1,140	988
29	1,240	1,160	1,180	*1,950	1,470	3,410	2,360	4,240	1,680	1,230	1,110	976
30	1,220	1,120	1,190	2,230	-----	6,250	2,360	4,170	1,660	1,230	1,100	976
31	1,220	-----	1,180	2,070	-----	6,220	-----	4,110	-----	1,290	1,090	-----
Total	40,240	35,000	36,080	46,150	99,030	126,530	117,740	109,370	79,690	41,770	35,790	30,540
Mean	1,298	1,167	1,164	1,484	3,415	4,082	3,825	3,528	2,658	1,347	1,155	1,018
Ac-ft	79,810	69,420	71,560	91,540	196,400	251,000	235,500	216,900	158,100	82,850	70,990	60,580
Calendar year 1959: Max			8,100	Min	1,060	Mean	1,983	Ac-ft	1,436,000			
Water year 1959-60: Max			11,900	Min	952	Mean	2,180	Ac-ft	1,583,000			

Peak discharge (base, 9,000 cfs)--Feb. 8 (12 p.m.) 15,800 cfs (6.41 ft); Mar. 7 (9 a.m.) 11,300 cfs (5.28 ft).

\* Discharge measurement made on this day.

3394. South Fork Little Butte collection canal near Pinehurst, Oreg.

Location.--Lat 42°17'00", long 122°24'00" in SW¼ sec.7, T.38 S., R.4 E., on right bank along Dead Indian Road, 1,400 ft downstream from outlet portal of Deadwood Tunnel and 11.6 miles north of Pinehurst.

Records available.--December 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 4,640 ft (from topographic map).

Extremes.--1959-60: Maximum daily discharge during period December to September, 57 cfs May 12; minimum daily, 0.1 cfs for many days in December and January.

Remarks.--Records good except those for periods of backwater from debris or bridge construction, which are fair. Canal diverts from South Fork Little Butte Creek in SW¼ sec.16, T.37 S., R.4 E., Daley Creek in SE¼ sec.34, T.37 S., R.4 E., and Beaver Dam Creek in SW¼ sec.4, T.38 S., R.4 E., in Rogue River basin, and empties into Howard Prairie Reservoir in Klamath River basin. Water is later returned to Rogue River basin for irrigation of lands in the Ashland-Medford area and for power development enroute. Diversion began Dec. 14, 1959.

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			0.2	0.2	0.6	0.6	14	22	30	0.2	0.2	0.2
2			.2	.2	.6	.6	19	25	27	.3	.2	*.2
3			.2	.1	.4	.6	22	28	25	.3	.2	.2
4			.1	.4	*.4	.6	26	31	23	.4	.2	.2
5			.1	.5	.4	1.0	31	*29	21	.4	.2	.2
6			.1	.2	.5	1.4	33	31	12	.4	.2	.2
7			.2	.2	1.3	3.0	35	49	.8	.4	.2	.2
8			.2	.1	2.0	3.4	35	50	.8	.4	.2	.2
9			.2	.1	1.3	3.5	35	50	*.6	.4	.2	.2
10			.2	.1	.9	3.5	34	52	.6	.4	.2	.2
11			.1	.2	.8	3.7	36	*56	.6	.4	.2	.2
12			.2	.2	.8	4.0	*58	57	.5	.5	.2	.2
13			.2	.2	.9	4.8	34	54	.4	.3	.2	.2
14			.1	.2	.9	5.2	35	50	.4	.4	.2	.2
15			.1	.1	.8	5.2	31	46	.4	.3	.2	.2
16			.1	.1	.6	4.8	27	45	.4	.3	.2	.2
17			.1	.2	.6	5.3	27	40	*.4	.3	.2	.2
18			.1	.2	.6	6.7	26	38	.4	.3	.2	.2
19			.1	.2	.6	6.9	26	33	.4	*.3	.2	.2
20			.1	.2	.6	6.2	26	35	.4	.5	.2	.2
21			.1	.2	.8	6.2	28	*36	.4	.3	.2	.2
22			.1	.2	.8	5.8	25	32	.4	.2	.2	.2
23			.2	.2	.8	6.2	24	31	.4	.2	.2	.2
24			.2	.4	.8	10	22	30	.4	.2	.2	.2
25			.1	.4	.9	12	22	30	.3	.2	.2	.2
26			.1	.4	.8	14	21	31	.3	.2	.2	.2
27			.1	.3	.6	15	22	35	.2	.2	.2	.2
28			.1	.4	.6	15	*21	34	.2	.2	.2	.2
29			.1	.5	.6	*12	20	33	.2	.2	.2	.2
30			.2	.4	-----	13	21	33	.2	.2	.2	.2
31			.4	.4	-----	10	-----	32	-----	.2	.2	.2
Total			4.6	7.7	22.3	190.2	816	1,178	148.1	9.1	6.2	6.0
Mean			0.15	0.25	0.77	6.14	27.2	38.0	4.94	0.29	0.20	0.20
Ac-ft			9.1	15	44	377	1,620	2,340	294	18	12	12
Calendar year		: Max			Min		Mean		Ac-ft			
Water year		: Max			Min		Mean		Ac-ft			

\* Discharge measurement made on this day.

Note.--Backwater from debris or bridge construction Dec. 1-10, Mar. 17-24, Aug. 3 to Sept. 30.

3404. Dead Indian collection canal near Pinehurst, Oreg.

Location.--Lat 42°15'50", long 122°26'55", in NW¼SE¼ sec.15, T.38 S., R.3 E., on left bank at Howard Prairie road crossing, 2,400 ft downstream from Dead Indian Creek diversion dam and 11 miles northwest of Pinehurst.

Records available.--December 1958 to September 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,540 ft (from topographic map).

Extremes.--1958-60: Maximum daily discharge, 57 cfs Apr. 5, 6, 1960; no flow at times in each year.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. Canal diverts from Conde Creek in SW¼SW¼ sec.9, T.38 S., R.3 E., and from Dead Indian Creek in NE¼SW¼ sec.15, T.38 S., R.3 E., in Rogue River basin, and empties into Howard Prairie Reservoir in Klamath River basin. Water is later returned to Rogue River basin for irrigation of lands in the Ashland-Medford area and for power development enroute. Diversion began Dec. 3, 1958.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.5	b0.6	b0.4	b2.0	2.3	45	15	8.1	0.3	0.1	a0.1
2	.3	.5	.6	b.4	b3.0	2.4	50	18	7.3	.3	.1	*a.1
3	.3	.9	.7	b.4	b2.6	2.2	52	21	*6.3	.3	.1	.1
4	.3	.9	.4	b.4	*b2.4	2.7	56	27	5.8	.3	.1	.1
5	.3	.8	.4	b.4	b3.0	4.7	57	*23	1.5	.3	.1	.1
6	.4	.8	.4	b.6	b4.5	11	57	26	.5	.3	.1	.1
7	.4	.5	.3	1.6	b15	43	53	40	.6	.3	.1	.1
8	.9	.6	.3	3.2	b35	33	48	36	.5	.3	0	.1
9	.6	*.5	.4	2.0	24	23	45	33	*.5	.3	0	.1
10	.6	.5	.4	1.3	20	b18	38	31	.5	.3	0	.1
11	.8	.5	.6	1.1	15	15	38	*28	.4	.2	0	.1
12	.6	.5	.5	1.1	9.4	16	*32	28	.4	.2	0	.1
13	.5	.4	.7	1.0	12	24	28	24	.4	.2	0	.1
14	.4	.4	.8	1.0	6.0	b19	28	20	.4	.2	0	.1
15	.4	.4	.7	1.0	5.1	16	25	18	.3	.2	0	.1
16	.5	.4	.7	1.0	b4.7	15	22	19	.3	.2	0	.1
17	.4	.4	.7	1.1	b4.5	*18	20	16	*.3	.1	0	.1
18	.4	.4	.7	2.5	4.2	22	20	15	.3	.1	.1	.1
19	.4	.6	.6	1.4	4.0	29	20	12	.3	*.1	0	.1
20	.6	.6	.6	1.1	b3.8	35	18	16	.3	.1	0	.1
21	1.1	1.1	.5	1.0	b3.7	41	21	*14	.3	.1	0	.1
22	1.1	.9	.6	b1.0	b3.5	*47	20	14	.3	.1	.1	.1
23	.8	.9	.9	b1.0	b3.4	52	19	14	.3	0	.1	.1
24	.7	.7	1.3	b1.0	b3.3	*55	16	13	.3	0	.2	.1
25	.6	.7	1.1	b1.0	3.2	55	16	13	.3	0	.5	.1
26	.6	.6	.9	b1.0	b3.0	56	16	13	.3	0	.6	.1
27	.6	.6	.9	b1.0	2.6	56	15	13	.3	0	.5	.1
28	.6	.6	b.8	b1.0	2.4	51	*14	11	.3	.1	a.4	.1
29	.6	.6	b.7	b1.0	2.3	*42	14	11	.3	.1	a.3	.1
30	.5	b.6	b.6	b1.0	-----	42	-----	9.9	.3	.1	a.2	.1
31	.5	-----	b.5	b1.3	-----	36	-----	9.0	-----	.1	a.1	-----
Total	17.2	18.4	19.9	34.3	207.6	884.3	916	598.9	38.0	5.2	3.8	3.0
Mean	0.55	0.61	0.64	1.11	7.16	28.5	30.5	19.3	1.27	0.17	0.12	0.10
Ac-ft	34	36	39	68	412	1,750	1,820	1,190	75	10	7.5	6.0
Calendar year 1959: Max	40			Min 0		Mean 5.17		Ac-ft 3,740				
Water year 1959-60: Max	57			Min 0		Mean 7.50		Ac-ft 5,450				

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records, recorded range in stage, and records for nearby stations.

b Stage-discharge relation affected by ice.

3415. South Fork Little Butte Creek near Lakecreek, Oreg.

Location.--Lat 42°24'30", long 122°36'00", in SE $\frac{1}{4}$  sec.29, T.36 S., R.2 E., on left bank a quarter of a mile upstream from intake of Rogue River Valley Canal and 1.4 miles southeast of Lakecreek.

Drainage area.--138 sq mi.

Records available.--April 1921 to September 1960. Prior to October 1958, sometimes published as Lake Creek near Lakecreek.

Gage.--Water-stage recorder. Altitude of gage is 1,720 ft (by barometer). Prior to June 17, 1921, staff gage at same site and datum.

Average discharge.--39 years, 107 cfs (77,460 acre-ft per year).

Extremes.--Maximum discharge during year, 620 cfs Feb. 8 (gage height, 2.80 ft); minimum, 6.1 cfs Jan. 1.

1921-60: Maximum discharge, 3,920 cfs Jan. 7, 1948 (gage height, 6.48 ft), from rating curve extended above 840 cfs by logarithmic plotting; minimum, 2 cfs Aug. 10, 1931.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No regulation. Diversions for irrigation of about 1,000 acres above station; also, in December 1958 Dead Indian collection canal (see p. 272) began diverting above station from Conde Creek and Dead Indian Creek and in December 1959 South Fork Little Butte collection canal (see p. 271) began diverting above station from South Fork Little Butte Creek, Daley Creek, and Beaver Dam Creek. These are transbasin diversions to Howard Prairie Reservoir in Klamath River basin, but eventually this water is diverted back to Rogue River basin for irrigation of lands in the Ashland-Medford area and power development enroute.

Revisions (water years).--WSP 934: 1925(M). WSP 1398: 1922, 1927(M), 1937, 1941-42.

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

Oct. 1 to Feb. 8				Feb. 9 to Sept. 30			
1.1	12	1.7	102	0.9	6.0	1.5	82
1.2	19	2.0	210	1.0	11	1.7	130
1.3	27	2.6	500	1.1	18	2.0	235
1.5	55			1.2	28	2.4	415
				1.3	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	19	18	*16	14	28	38	356	112	100	26	17	17
2	18	17	17	15	47	38	306	122	94	25	17	17
3	18	20	16	15	35	42	280	133	82	25	15	16
4	18	18	16	12	*32	45	287	188	74	24	14	17
5	18	17	16	14	45	56	*263	*157	67	23	14	16
6	18	16	16	16	44	115	251	170	72	22	13	14
7	*18	15	15	24	170	390	247	370	84	21	12	15
8	23	15	16	*34	476	*311	231	275	76	20	10	13
9	21	15	16	24	*410	235	223	223	69	20	10	13
10	21	14	16	20	227	188	199	192	65	20	12	14
11	21	15	16	21	151	164	207	174	61	20	11	14
12	21	15	18	20	125	188	181	178	59	19	*11	14
13	20	*14	18	18	128	334	164	157	54	18	11	15
14	19	14	17	18	115	271	188	136	50	17	12	15
15	19	14	15	17	112	219	181	122	47	16	12	13
16	19	14	12	16	103	223	164	125	*45	15	14	15
17	19	14	17	25	89	195	154	112	42	15	14	14
18	19	14	14	45	87	192	151	102	40	15	14	*14
19	19	15	14	34	80	207	157	103	40	15	13	14
20	20	15	14	31	69	219	148	118	38	15	12	15
21	25	16	14	27	67	223	154	151	36	*14	13	15
22	22	16	14	25	61	227	154	142	35	15	17	15
23	20	18	14	25	57	223	145	139	35	16	22	16
24	20	18	18	27	52	219	136	133	34	16	21	16
25	20	17	21	27	52	227	128	130	32	17	18	15
26	20	16	18	26	50	223	125	142	31	16	17	14
27	20	16	17	25	43	223	122	184	30	14	17	15
28	20	16	16	25	42	219	118	151	29	17	16	15
29	20	16	16	26	40	188	112	136	28	16	17	*15
30	20	16	16	27	-----	231	110	122	27	19	16	15
31	19	-----	16	25	-----	302	-----	112	-----	18	16	-----
Total	614	474	490	718	3,037	6,175	5,622	4,821	1,576	569	448	446
Mean	19.8	15.8	15.8	23.2	105	199	187	156	52.5	18.4	14.5	14.9
Ac-ft	1,220	940	972	1,420	6,020	12,250	11,150	9,560	3,130	1,150	889	885

Calendar year 1959: Max 286 Min 12 Mean 55.5 Ac-ft 40,150  
 Water year 1959-60: Max 476 Min 10 Mean 68.3 Ac-ft 49,570

Peak discharge (base, 500 cfs).--Feb. 8 (1 p.m.) 620 cfs (2.80 ft); Mar. 31 (8 p.m.) 508 cfs (2.57 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 20 to Nov. 12, June 17 to July 20; discharge estimated on basis of unpublished records for South Fork Little Butte Creek at Big Elk ranger station, near Lakecreek and Rogue River Valley Canal at South Fork intake, near Lakecreek.

3425. North Fork Little Butte Creek at Fish Lake, near Lakecreek, Oreg.

Location.--Lat 42°22'35", long 122°21'20", in SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T.37 S., R.4 E., on right bank 0.5 mile downstream from Fish Lake and 14 miles east of Lakecreek.

Drainage area.--18 sq mi, approximately.

Records available.--October 1914 to July 1915, June 1916 to September 1960. Monthly discharge only November 1916 to May 1917, published in WSP 1318. Prior to October 1958, sometimes published as Lake Creek near Lakecreek.

Gage.--Water-stage recorder. Concrete control since Nov. 8, 1955. Datum of gage is 4,571.41 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Oct. 1, 1914, to July 31, 1915, staff gage at site half a mile upstream at different datum. June 1, 1916, to July 9, 1918, staff gage and July 10, 1918, to Oct. 28, 1932, water-stage recorder, at site a quarter of a mile upstream at different datums.

Average discharge.--44 years (1916-60), 36.4 cfs (26,350 acre-ft per year).

Extremes.--Maximum discharge during year, 128 cfs Aug. 7 (gage height, 2.00 ft); minimum, 0.1 cfs Oct. 1, 2, 4.

1914-60: Maximum discharge, about 940 cfs June 5, 1917, computed from rate of change in contents in reservoir after break in dam occurred; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Since 1915, Fish Lake (see p. 288) has stored water for irrigation by Medford Irrigation District. Cascade Canal diverts from Fourmile Lake in Klamath River basin and discharges into lava bed  $1\frac{1}{2}$  miles above Fish Lake; diversion began August 1923. No diversion from creek above station.

Revisions (water years).--WSP 654: Drainage area. WSP 1218: 1917(M).

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

0.0	0	0.6	2.0	1.6	89
.1	.2	.8	4.0	1.8	112
.2	.4	1.0	10	2.0	128
.3	.6	1.2	28		
.4	1.0	1.4	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	0.1	1.1	3.9	8.0	11	12	20	22	27	99	116	66
2	.1	1.2	4.0	8.0	11	12	20	22	27	97	115	75
3	.3	1.4	4.0	8.0	11	12	19	24	*27	96	115	81
4	.1	1.3	4.2	8.0	11	12	18	24	27	95	110	75
5	.2	1.4	4.4	8.0	11	12	18	24	27	94	*102	66
6	.2	1.4	4.4	8.0	11	13	17	*24	27	94	97	66
7	.2	1.5	4.6	8.4	12	14	17	26	27	95	88	76
8	.3	1.6	4.6	8.8	13	15	17	25	27	101	112	83
9	.2	1.6	4.8	8.8	12	14	17	25	27	96	112	73
10	.2	1.7	5.0	8.8	11	13	17	25	27	94	116	64
11	.3	1.8	5.2	8.8	11	13	17	25	27	91	114	62
12	.3	1.9	5.6	8.8	*11	13	17	26	32	90	111	*62
13	**3	2.0	5.6	*8.8	11	14	17	26	37	90	106	62
14	.3	2.1	5.8	8.8	11	15	18	26	37	88	101	62
15	.3	2.1	5.8	8.8	11	15	20	26	40	90	97	62
16	.2	2.3	5.8	8.8	11	14	21	26	44	99	72	64
17	.2	2.5	6.0	8.8	11	14	21	26	56	99	97	62
18	.3	2.6	6.0	8.8	11	*14	21	26	67	104	90	60
19	.3	2.7	6.0	8.8	11	14	21	26	67	106	88	58
20	.3	2.9	6.4	8.8	11	14	*21	27	75	110	83	*58
21	.6	3.2	6.4	8.8	11	14	21	26	78	111	79	50
22	.5	3.3	6.4	8.8	11	14	21	26	89	*114	76	58
23	.5	3.3	6.8	9.2	11	14	21	26	97	115	76	64
24	.6	3.4	7.2	9.6	11	14	21	26	101	116	67	62
25	.6	3.5	7.2	10	12	14	21	26	103	116	64	54
26	.7	3.6	7.2	10	12	14	21	26	102	116	64	41
27	.8	3.7	7.2	10	12	14	21	27	101	116	62	40
28	.8	3.9	7.2	10	12	14	21	27	100	116	60	46
29	.9	3.9	7.6	11	12	14	21	27	100	118	60	40
30	**9	3.9	8.0	11	-----	15	21	27	99	118	62	34
31	1.0	-----	8.0	11	-----	16	-----	27	-----	118	64	-----
Total	12.6	72.7	181.3	280.2	328	426	584	792	1,722	3,203	2,756	1,826
Mean	0.41	2.42	5.85	9.04	11.3	13.7	19.5	25.5	57.4	103	88.9	60.9
Ac-ft	25	144	360	556	651	845	1,160	1,570	3,470	6,350	5,470	3,620
Calendar year 1959: Max	160				Min 0.1		Mean 44.3		Ac-ft 32,090			
Water year 1959-60: Max	118				Min 0.1		Mean 33.3		Ac-ft 24,170			

\* Discharge measurement made on this day.

\*\* Field estimate made on this day.

Note.--No gage-height record Mar. 2-17, Mar. 19 to Apr. 15, Apr. 17-19, July 31 to Aug. 4; discharge estimated on basis of recorded range in stage and records for station near Lakecreek.

3430. North Fork Little Butte Creek near Lakecreek, Oreg.

Location.--Lat 42°24'10", long 122°32'20", in SW<sup>1</sup>/<sub>4</sub>SW<sup>1</sup>/<sub>4</sub> sec.25, T.36 S., R.2 E., on right bank a quarter of a mile upstream from Hanley South Canal diversion and 4<sup>1</sup>/<sub>2</sub> miles east of Lakecreek.

Drainage area.--38 sq mi, approximately.

Records available.--September 1911 to March 1913, July to September 1917, May 1922 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Published as "above Medford intake, near Lakecreek" 1922-28, 1931-40. Prior to October 1958, sometimes published as Lake Creek near Lakecreek. Records for April to September 1916, May 1917 to September 1919, April to September 1921, and October 1923 to September 1924 at site 3 miles upstream not equivalent owing to diversions and difference in drainage areas.

Gage.--Water-stage recorder. Datum of gage is 2,125.01 ft above mean sea level, datum of 1929. Sept. 10, 1911, to Mar. 31, 1913, and July 1 to Sept. 30, 1917, staff gages near present site at different datums.

Average discharge.--39 years (1911-12, 1922-60), 72.9 cfs (52,760 acre-ft per year).

Extremes.--Maximum discharge during year, 240 cfs July 27 (gage height, 2.10 ft); minimum, 22 cfs Oct. 1-21.

1911-13, 1917, 1922-60: Maximum discharge, 1,430 cfs Dec. 11, 1956 (gage height, 3.56 ft), from rating curve extended above 170 cfs; minimum, 11 cfs Oct. 29 to Nov. 8, 1931.

Remarks.--Records good except those for period of no gage-height record, which are poor. Flow regulated by Fish Lake since 1915 (see p. 288). Diversions for irrigation of 100 acres above station; some water diverted into Fish Lake from Pourmille Lake, in Klamath River basin, since 1923.

Revisions (water years).--WSP 1518: 1912-13.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Nov. 30 to Mar. 29)

1.1	21	1.5	51
1.2	24	1.7	86
1.3	31	2.0	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	22	23	28	30	39	38	96	62	68	142	146	89
2	22	24	28	32	40	38	84	63	68	142	146	84
3	22	24	28	30	38	40	79	66	66	142	142	99
4	22	24	*28	31	*36	40	74	72	a65	139	135	95
5	*22	24	28	30	42	44	*70	*66	a65	139	131	86
6	22	24	28	31	40	50	68	70	a65	139	131	84
7	22	24	28	*40	63	*70	66	102	a65	142	95	91
8	23	24	28	40	104	57	63	84	a65	146	139	99
9	22	25	28	34	94	57	64	78	a65	146	139	89
10	22	25	28	33	66	51	*62	74	a65	142	139	80
11	22	25	29	34	54	51	68	72	a65	139	142	78
12	22	26	30	33	51	60	63	74	a66	139	135	78
13	22	*26	29	32	54	80	64	70	a70	139	131	78
14	22	26	30	31	51	63	72	68	a80	135	127	78
15	22	27	30	31	50	64	72	66	a85	135	120	78
16	22	27	30	31	48	70	70	66	a90	146	101	80
17	22	27	30	44	46	60	66	64	*91	146	*127	*80
18	22	27	30	43	47	57	68	64	91	154	112	78
19	22	27	30	38	44	56	70	63	94	150	109	76
20	22	27	30	37	43	52	68	76	102	150	104	76
21	23	28	30	37	42	51	68	82	107	150	102	66
22	23	28	30	36	41	51	66	82	120	*150	104	80
23	23	28	31	36	40	50	64	80	131	150	102	80
24	23	28	31	37	40	49	63	78	139	150	94	80
25	23	28	31	38	40	49	63	76	146	150	89	76
26	23	28	30	37	39	49	62	80	146	150	89	64
27	23	28	30	37	38	49	63	82	146	154	86	58
28	23	28	30	37	38	49	62	78	146	146	84	64
29	23	28	30	39	38	48	62	76	146	150	84	62
30	23	28	31	37	68	60	72	142	150	84	58	58
31	23	-----	31	36	-----	82	-----	70	-----	150	86	-----
Total	694	786	917	1,092	1,406	1,693	2,039	2,276	2,858	4,502	3,555	2,375
Mean	22.4	26.2	29.6	35.2	48.5	54.6	68.0	73.4	95.3	145	115	79.2
Ac-ft	1,380	1,560	1,820	2,170	2,790	3,360	4,040	4,510	5,670	8,930	7,050	4,710

Calendar year 1959: Max 195

Min 22

Mean 73.5

Ac-ft 53,250

Water year 1959-60: Max 154

Min 22

Mean 66.1

Ac-ft 47,990

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage and records for station at Fish Lake.

## 3500. Emigrant Creek near Ashland, Oreg.

Location.--Lat 42°10'30", long 122°37'15", in SE $\frac{1}{4}$  sec.18, T.39 S., R.2 E., on right bank 6,000 ft downstream from Emigrant Dam and  $4\frac{1}{2}$  miles southeast of Ashland.

Drainage area.--67.2 sq mi.

Records available.--January to June 1920, October 1920 to July 1922, February 1923 to May 1924 (incomplete), October 1924 to November 1925, February to August 1926, October 1926 to September 1928, April 1929 to September 1930, April 1931 to October 1932 (incomplete), April 1933 to September 1935, April 1936 to September 1939 (incomplete), April 1940 to September 1947, January 1948 to October 1952 (incomplete), December 1952 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Altitude of gage is 1,990 ft (from topographic map). Prior to Oct. 1, 1926, water-stage recorder or staff gage at several sites about 1 mile upstream at various datums. Oct. 1, 1926, to Feb. 24, 1959, water-stage recorder at site 5,000 ft upstream at datum 2,053.73 ft above mean sea level.

Average discharge.--21 years (1924-28, 1929-30, 1933-35, 1940-47, 1953-60), 24.2 cfs (17,520 acre-ft per year).

Extremes.--Maximum discharge during year, 640 cfs Feb. 8 (gage height, 3.90 ft, from flood-marks), from rating curve extended above 160 cfs by logarithmic plotting; no flow Dec. 9, 11.

1920-60: Maximum discharge, 5,260 cfs Feb. 20, 1927, by computation of peak flow over dam; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Figures of daily discharge do not include water diverted from Emigrant Reservoir above station by East lateral or from Emigrant Creek above reservoir by Ashland lateral. Flow regulated since 1924 by Emigrant Reservoir (see p. 288). Several diversions above station for irrigation; the principal diversion canals are Ashland lateral and East lateral. From June 1923 to August 1960, water diverted by Keene Creek Canal from Klamath River basin into Emigrant Creek above station. Beginning with May 1960, water from Klamath River basin diverted to Emigrant Creek above station via Green Springs Powerplant diversion.

Revisions (water years).--WSP 1448: 1921, 1927-28, 1937, 1953(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	0.5	0.1	0.1	0.5	17	21	132	6.8	6.8	23	34	6
2	.5	.1	.1	.5	72	19	114	8.4	12	39	24	7
3	.5	.1	.1	.5	*56	22	94	6.0	13	41	21	2
4	.5	.1	.1	.5	118	43	84	14	13	47	23	1.5
5	.5	.1	.1	.5	33	63	80	9.3	12	*50	22	2
6	.5	.1	1.1	.4	25	123	71	4.0	20	49	22	1.6
7	.7	.1	2.2	*15	168	302	67	*34	29	46	26	3.3
8	4.2	.1	.1	470	218	60	26	26	26	45	30	4.5
9	6.0	.1	*0	14	530	123	56	11	17	46	30	5.4
10	.4	.1	.1	4.5	*238	87	51	5.1	15	46	32	5.6
11	.4	.4	0	2.5	*108	71	64	.7	13	45	33	5.4
12	.4	**4	3.6	3.2	80	82	*50	2.2	13	44	35	3.1
13	.4	.2	6.3	2.8	75	167	45	.4	15	41	35	1.1
14	.4	5.0	1.9	2	64	129	47	.2	20	40	30	1.6
15	.4	2.1	.1	1.4	67	93	42	.7	22	41	15	1.6
16	.4	.2	.1	1.6	70	82	39	.2	24	49	9	2.1
17	.4	.1	.1	2.5	50	73	38	1.0	25	51	10	*1.6
18	.4	.1	**1	3.9	41	75	38	1.6	24	50	10	1.1
19	.4	**1	.1	5.0	37	78	36	.6	24	*49	8	.6
20	.4	.2	.1	5.7	34	84	34	.9	23	49	8	.3
21	.4	2.1	.1	.4	32	84	34	8.0	20	50	8	.3
22	.4	6.7	.1	7.5	29	84	33	28	20	50	8.5	.2
23	.4	17.0	.1	6.5	26	85	29	36	27	45	8.4	.1
24	.4	.1	.1	12	24	*85	29	34	28	44	8.5	.1
25	.4	.1	.1	7.7	24	80	20	29	26	43	8.5	.3
26	.2	3.6	.1	12	22	76	5.2	37	20	41	9	.1
27	.2	.4	.1	9.9	20	71	11	34	5.6	41	9	**1
28	*1	1.7	.1	10	19	69	23	19	24	40	9	.2
29	.1	2.0	.1	12	*24	59	22	15	47	37	8	.2
30	.1	.3	.8	14	114	17	12	39	25	35	8	.2
31			.7	11	108			*11	40	7		
Total	21.1	27.8	18.8	168.5	2,571	2,870	1,465.2	395.4	623.4	1,345	551.9	56.2
Mean	0.68	0.93	0.61	5.44	88.7	92.6	46.8	12.8	20.8	43.4	17.8	1.87
Ac-ft	42	58	37	334	5,100	5,690	2,910	784	1,240	2,670	1,030	111
(+)	0	0	0	0	0	0	0	1,640	5,940	7,570	6,090	1,860
(*)	0	0	0	0	0	0	0	256	1,070	1,340	1,150	490
(+*)	0	0	0	0	0	0	0	2,350	2,830	4,620	4,300	1,430
Calendar year 1959: Max	48			Min 0	Mean 6.51	Ac-ft 4,700	† -	‡ 4,660	†† 15,510			
Water year 1959-60: Max	530			Min 0	Mean 27.6	Ac-ft 20,060	† -	‡ 4,310	†† 15,530			

\* Discharge measurement or observation of no flow made on this day.

† Green Springs powerplant diversion, in acre-feet, from Klamath River basin.

‡ Diversion, in acre-feet, by Ashland lateral.

\*\* Field estimate made on this day.

†† Diversion, in acre-feet, by East lateral.

Note.--No gage-height record Oct. 27, Nov. 23, 24, May 14-17, Aug. 8, 10-22, Aug. 24 to Sept. 5; discharge interpolated or estimated on basis of unpublished records for Bear Creek at Oak Street Bridge, near Ashland, adjusted for flow in Talent lateral near Ashland.

3575. Bear Creek at Medford, Oreg.

Location.--Lat 42°19'40", long 122°52'10", in NW¼ sec.30, T.37 S., R.1 W., on left bank 40 ft upstream from Main Street Bridge in Medford.

Drainage area.--289 sq mi.

Records available.--March 1915 to June 1920 (no low-flow records), October 1920 to September 1960. Monthly discharge only for some periods, published in WSP 1318.

Gage.--Water-stage recorder. Concrete control since Dec. 30, 1947. Datum of gage is 1,343.98 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Mar. 1, 1915, to June 30, 1918, staff gage and Sept. 20, 1918, to Feb. 9, 1919, water-stage recorder, at site 40 ft upstream at datum 0.58 ft lower. Feb. 10, 1919, to Jan. 6, 1943, water-stage recorder and Jan. 7 to Sept. 9, 1943, staff gage, at site 40 ft upstream at datum 0.42 ft higher. Sept. 10, 1943, to Dec. 30, 1947, water-stage recorder at site 40 ft upstream at same datum.

Average discharge.--40 years (1920-60), 102 cfs (73,840 acre-ft per year).

Extremes.--Maximum discharge during year, 1,460 cfs Feb. 8 (gage height, 2.85 ft); minimum, 4.4 cfs Oct. 5.  
1915-60: Maximum discharge, 9,400 cfs Dec. 22, 1955 (gage height, 7.50 ft, from floodmarks); maximum gage height, about 11.0 ft Feb. 20, 1927, from floodmarks, present datum, site then in use; practically no flow at times.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow partly regulated since 1924 by Emigrant Reservoir (see p. 288). Numerous diversions for irrigation above station.

Revisions (water years).--WSP 1044: 1944. WSP 1448: 1916, 1917(M), 1918-20, 1922, 1924, 1927(M), 1928, 1930. WSP 1568: 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 Nov. 9-18)

0.1	3.0	1.0	167
.2	10	1.5	370
.3	19	2.0	680
.5	46	2.5	1,100
.7	85	3.0	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	18	32	16	b20	57	b50	415	67	67	25	37	12
2	18	32	16	20	126	54	318	77	40	19	25	18
3	18	30	16	b20	118	65	264	71	*34	20	18	16
4	14	30	16	b20	*167	81	225	*116	37	26	15	16
5	11	27	16	19	129	108	210	105	34	23	14	18
6	12	26	16	21	88	244	192	81	34	19	14	14
7	15	25	16	42	351	655	181	158	38	18	14	18
8	21	26	a15	*85	*976	492	187	188	38	16	16	20
9	23	25	a15	52	1,150	307	158	134	29	16	8.6	23
10	24	23	a15	40	*533	225	140	110	24	34	9.3	24
11	20	21	a15	37	*268	181	143	88	24	27	10	21
12	19	24	a20	38	206	206	140	81	24	18	13	19
13	20	24	a30	34	184	395	126	83	20	16	14	20
14	21	25	a25	32	161	312	132	69	16	*15	17	17
15	20	26	a20	31	155	236	126	59	19	24	16	17
16	21	27	a18	32	161	*221	115	65	16	15	14	20
17	24	26	17	38	132	198	110	59	21	15	13	25
18	25	*19	*17	44	115	198	108	50	46	17	*10	20
19	24	18	17	44	102	210	108	50	37	14	10	*20
20	27	17	16	40	92	210	105	67	24	12	8.6	19
21	38	17	16	38	85	210	100	108	20	*14	10	21
22	36	16	18	308	81	206	108	134	16	14	14	20
23	*31	20	18	34	75	198	105	137	12	17	14	21
24	30	18	25	42	71	192	100	137	13	16	15	15
25	29	15	29	46	69	188	92	143	13	18	18	15
26	29	14	25	46	b65	174	*79	170	9.3	18	14	16
27	29	17	21	54	b60	170	77	188	11	20	16	16
28	29	17	21	48	b55	167	77	149	11	32	14	17
29	30	16	21	52	52	152	75	129	14	25	14	19
30	30	15	b21	59	-----	2444	65	102	23	25	14	20
31	30	-----	b20	56	-----	312	-----	85	-----	31	12	-----
Total	756	668	585	1,204	5,844	6,861	4,359	3,260	764.3	617	453.5	557
Mean	23.7	22.3	18.9	38.8	202	221	145	105	25.5	19.9	14.6	18.6
Ac-ft	1,460	1,320	1,160	2,390	11,590	13,610	8,650	6,470	1,520	1,220	900	1,100

Calendar year 1959: Max 342 Min 9.3 Mean 47.1 Ac-ft 34,060  
Water year 1959-60: Max 1,130 Min 8.6 Mean 70.8 Ac-ft 51,390

\* Discharge measurement made on this day.  
a No gage-height record; discharge estimated on basis of recorded range in stage and records for South Fork Little Butte Creek, near Lakecreek.  
b Stage-discharge relation affected by ice.

3590. Rogue River at Raygold, near Central Point, Oreg.

Location.--Lat 42°26'15", long 122°59'10", in SW $\frac{1}{4}$  sec.18, T.36 S., R.2 W., on right bank at Raygold, 0.2 mile downstream from Gold Ray Dam, 1.3 miles downstream from Bear Creek, 5.6 miles northwest of Central Point, and at mile 121.9 (river-profile survey).

Drainage area.--2,020 sq mi, approximately.

Records available.--August 1905 to September 1960. Prior to October 1921, published as "near Tolo."

Gage.--Water-stage recorder. Datum of gage is 1,121.78 ft above mean sea level, datum of 1929. Prior to Sept. 19, 1914, staff gage and Sept. 19, 1914, to Sept. 30, 1956, water-stage recorder, at site 300 ft upstream at same datum.

Average discharge.--55 years, 2,909 cfs (2,106,000 acre-ft per year).

Extremes.--Maximum discharge during year, 26,300 cfs Feb. 9 (gage height, 10.02 ft); minimum recorded, 524 cfs Dec. 6; minimum daily, 1,020 cfs Sept. 24-26, 30.

1905-60: Maximum discharge, 110,000 cfs Feb. 21, 1927 (gage height, 24.8 ft, from floodmark, site then in use); from rating curve extended above 36,000 cfs by logarithmic plotting, and Dec. 22, 1955 (gage height, 21.55 ft, from floodmark, present site), from rating curve extended above 25,000 cfs on basis of slope-area measurement of peak flow; minimum not determined; minimum daily, 616 cfs Sept. 6, 1931.

Greatest flood known occurred during winter of 1861-62 and reached a stage of about 32 ft; flood in February 1890 reached a stage of about 27.5 ft, from information by Corps of Engineers.

Remarks.--Records good. Diurnal fluctuation caused by powerplant just above station. Many diversions for irrigation above station.

Revisions (water years).--WSP 1248: 1906, 1914(M), 1915. WSP 1398: 1910(M), 1927(M).

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

0.6	960	6.0	11,600
1.2	1,470	8.0	18,100
2.0	2,400	9.0	22,000
4.0	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	g1,200	1,280	1,240	1,290	2,140	1,710	10,300	2,580	4,100	1,560	1,210	1,070
2	g1,200	1,250	1,230	1,180	3,960	1,670	8,280	2,780	4,020	1,540	1,180	*1,120
3	g1,180	1,240	1,190	1,220	3,070	1,790	7,170	*2,780	3,940	1,470	1,140	1,140
4	g1,180	1,430	1,230	1,220	3,120	2,250	6,670	3,180	3,810	1,490	1,130	1,150
5	g1,160	1,340	1,210	1,180	3,510	3,320	6,500	3,010	3,650	1,440	1,120	1,160
6	1,170	1,280	1,180	1,300	3,250	6,420	6,250	2,880	3,510	1,420	1,120	1,140
7	1,190	1,250	1,210	1,710	7,260	12,700	5,940	4,340	3,340	1,400	1,120	1,120
8	1,510	1,250	1,200	2,900	16,000	9,180	5,470	4,440	3,090	1,350	1,100	1,090
9	1,800	1,240	1,200	2,170	29,700	7,300	3,080	3,910	2,900	1,340	1,100	1,080
10	1,750	1,240	1,180	1,720	*6,880	5,450	4,590	3,790	2,750	g1,340	1,100	1,100
11	1,470	1,230	*1,220	1,760	5,660	4,460	4,480	4,000	2,700	g1,340	1,120	1,070
12	1,500	1,230	1,340	1,850	4,360	4,590	4,080	4,520	2,600	g1,330	1,120	1,070
13	1,440	1,230	1,380	1,800	4,200	6,060	3,690	4,380	2,570	g1,240	1,110	1,070
14	1,370	1,230	1,320	1,420	3,720	5,020	3,910	3,760	2,500	g1,240	1,140	1,060
15	1,300	1,220	1,270	1,480	3,670	4,360	3,700	3,500	2,400	g1,240	1,170	1,040
16	1,280	1,230	1,280	1,420	3,620	4,500	3,450	3,410	2,320	g1,240	1,140	1,050
17	1,240	1,230	1,260	1,500	3,200	4,000	3,290	3,210	*2,260	g1,240	1,160	1,070
18	1,220	1,180	1,260	1,790	3,020	3,780	3,260	3,090	2,160	g1,190	1,150	1,070
19	1,250	1,220	1,270	1,750	2,670	3,920	3,480	2,860	2,110	g1,220	1,120	1,040
20	1,240	1,260	1,250	1,670	2,570	4,100	3,380	3,100	2,020	g1,190	1,140	1,050
21	1,300	1,280	1,240	1,610	2,370	*4,180	3,510	4,280	2,010	g1,190	1,130	1,050
22	1,530	1,390	1,240	1,670	2,230	4,260	3,360	3,960	1,940	g1,170	1,140	1,050
23	*1,740	1,480	1,240	1,670	2,120	4,320	3,180	3,920	1,880	g1,170	1,250	1,030
24	1,530	1,530	1,420	1,780	2,020	4,380	3,010	3,870	1,650	g1,170	1,250	1,020
25	1,430	1,410	1,810	1,860	1,960	4,380	2,880	3,980	1,790	*1,180	1,240	1,020
26	1,370	1,330	1,510	2,010	1,910	4,260	2,810	5,020	1,720	1,180	1,170	1,020
27	1,330	1,320	1,400	2,070	1,850	4,200	2,740	5,660	1,670	1,180	1,130	1,040
28	1,310	1,260	1,370	2,200	1,740	4,240	2,700	4,860	1,620	1,170	1,100	1,040
29	1,320	1,250	1,310	*2,160	1,670	3,780	2,580	4,550	1,580	1,170	1,120	1,040
30	1,270	1,250	1,350	2,430	-----	7,760	2,570	4,420	1,560	1,160	1,100	1,020
31	1,280	-----	1,340	2,290	-----	9,120	-----	4,260	-----	1,230	1,090	-----
Total	42,160	38,540	40,170	53,980	125,650	151,470	132,290	118,300	76,370	39,810	35,410	32,090
Mean	1,360	1,285	1,296	1,741	4,333	4,886	4,410	3,816	2,546	1,284	1,142	1,070
Ac-ft	83,620	76,440	79,680	107,100	249,200	300,400	262,400	234,600	151,500	78,960	70,230	63,650

Calendar year 1959: Max 9,830 Min 1,060 Mean 2,206 Ac-ft 1,597,000

Water year 1959-60: Max 19,700 Min 1,020 Mean 2,421 Ac-ft 1,758,000

Peak discharge (base, 11,000 cfs).--Feb. 9 (2:30 a.m.) 26,300 cfs (10.02 ft); Mar. 7 (12 m.) 16,000 cfs (7.48 ft); Mar. 31 (7 p.m.) 13,000 cfs (6.55 ft).

\* Discharge measurement made on this day.

g Computed from graph based on twice-daily staff-gage readings.

3615. Rogue River at Grants Pass, Oreg.

Location.--Lat 42°25'50", long 123°19'00", in NW 1/4 sec.20, T.36 S., R.5 W., on right bank at city of Grants Pass filter plant, 0.6 mile upstream from bridge on U. S. Highway 99 at Grants Pass and at mile 98.0 (river-profile survey).

Drainage area.--2,420 sq mi, approximately.

Records available.--October 1938 to September 1960. Prior to January 1939 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 885.28 ft above mean sea level, datum of 1929. Prior to Aug. 8, 1957, at datum 3.00 ft higher.

Average discharge.--22 years, 3,473 cfs (2,514,000 acre-ft per year).

Extremes.--Maximum discharge during year, 35,600 cfs Feb. 9 (gage height, 14.84 ft); minimum, 504 cfs Oct. 1.

1938-60: Maximum discharge, 135,000 cfs Dec. 22, 1955 (gage height, 32.6 ft, present datum), from rating curve extended above 33,000 cfs on basis of slope-area measurement of peak flow; minimum, 444 cfs Dec. 13, 1954.

Flood in winter of 1861-62 reached a stage of about 42 ft, present datum (information furnished by Corps of Engineers). Flood in February 1890 reached a stage of about 35 ft, present datum, and that of Feb. 21, 1927, about 31 ft, present datum, according to local resident.

Remarks.--Records good. Many diversions from Rogue River and tributaries above station, the largest of which are at Savage Rapids Dam of Grants Pass Irrigation District, 5 miles above station. Flow regulated by dams at Savage Rapids and Raygold and slightly by Fish Lake and Emigrant Reservoir.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 9 to Nov. 30, Jan. 7 to Feb. 2, Feb. 7-10, Mar. 7, Apr. 30 to May 7)

1.6	730	6.0	7,740
2.5	1,810	10.0	18,000
4.0	3,980	14.0	31,100

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	1,380	1,230	1,510	1,470	2,450	2,000	14,100	2,590	4,220	1,480	1,120	995
2	1,370	1,210	1,500	1,300	4,610	1,880	11,000	2,770	4,030	1,460	1,070	995
3	1,410	1,580	1,450	1,430	3,900	2,090	8,870	2,780	4,040	1,410	1,010	995
4	1,340	1,580	1,470	1,380	3,930	2,600	7,680	3,060	3,950	1,370	995	1,010
5	1,360	1,550	1,430	1,250	4,410	3,480	7,260	3,010	3,770	1,360	973	984
6	1,330	1,460	1,410	1,380	4,410	7,180	7,140	*2,850	3,630	1,340	918	973
7	1,370	1,430	1,420	1,740	9,170	15,000	6,480	3,690	3,470	1,280	907	940
8	1,550	1,410	1,420	3,290	*20,200	12,000	6,000	4,830	3,170	1,280	907	896
9	2,020	1,410	1,390	2,820	29,500	9,930	5,080	4,110	2,990	1,230	896	929
10	2,030	1,450	*1,410	1,980	12,500	7,160	5,260	3,900	2,870	1,210	896	951
11	1,600	1,450	1,390	1,860	7,070	5,710	4,900	4,030	2,740	1,210	885	907
12	1,580	1,410	1,510	2,030	5,390	5,600	4,760	4,330	2,710	1,100	874	885
13	1,520	1,420	1,690	1,740	5,050	7,200	4,280	4,700	2,870	1,110	885	863
14	1,420	1,380	1,540	1,470	4,430	6,100	4,400	4,000	2,590	1,110	896	863
15	1,520	1,380	1,430	1,520	4,280	5,150	4,290	3,640	2,520	1,110	907	820
16	1,320	1,360	1,430	1,480	4,360	5,390	4,040	3,500	*2,490	1,100	940	830
17	1,280	1,380	1,420	1,520	3,870	4,810	3,790	3,400	2,340	1,090	929	830
18	1,230	1,320	1,410	1,900	3,580	4,510	3,740	3,230	2,240	1,060	962	852
19	1,290	1,330	1,410	1,900	3,460	4,560	3,950	2,990	2,110	995	951	830
20	*1,240	1,420	1,390	1,860	3,080	4,670	3,720	2,980	2,060	1,020	951	852
21	1,360	1,450	1,360	1,760	2,850	4,810	3,950	4,380	2,020	995	962	863
22	1,630	1,520	1,340	1,820	2,710	*4,810	3,950	4,210	1,970	984	985	874
23	2,020	1,720	1,360	1,820	2,570	4,810	3,720	4,170	1,860	1,010	1,150	907
24	1,650	1,900	1,520	1,930	2,460	4,850	3,420	4,010	1,850	1,020	1,210	962
25	1,500	1,770	2,130	*2,060	2,380	4,850	3,300	4,110	1,740	1,030	1,170	951
26	1,370	1,580	1,880	2,220	2,350	4,700	3,170	4,970	1,670	*1,020	1,130	951
27	1,330	1,550	1,630	2,390	2,270	4,580	2,980	6,160	1,620	1,020	1,050	973
28	1,250	1,550	1,540	2,530	2,080	4,760	2,920	5,330	1,600	1,020	1,030	995
29	1,270	1,540	1,500	2,480	2,020	4,290	2,740	4,790	1,520	1,030	1,020	1,020
30	1,230	1,480	1,560	2,660	-----	7,940	2,630	4,670	1,490	1,020	*984	1,030
31	1,210	-----	1,550	2,660	-----	8,110	-----	4,360	-----	1,030	995	-----
Total	44,780	44,260	46,400	59,450	160,340	176,620	153,500	121,550	78,000	35,504	30,578	27,726
Mean	1,445	1,475	1,497	1,918	5,529	5,697	5,117	3,921	2,600	1,145	986	924
Ac-ft	88,820	87,790	92,030	117,900	318,000	350,300	304,500	241,100	154,700	70,420	60,650	54,990
Calendar year 1959: Max			12,400	Min	951	Mean	2,480	Ac-ft	1,795,000			
Water year 1959-60: Max			28,500	Min	820	Mean	2,674	Ac-ft	1,941,000			

Peak discharge (base, 13,000 cfs).--Feb. 9 (5 a.m.) 35,600 cfs (14.84 ft); Mar. 7 (2:30 p.m.) 19,900 cfs (10.53 ft); Apr. 1 (5 a.m.) 16,100 cfs (9.33 ft).

\* Discharge measurement made on this day.

## 3620. Applegate River near Copper, Oreg.

Location.--Lat 42°03'30", long 123°06'50", in SE $\frac{1}{4}$  sec.25, T.40 S., R.4 W., on right bank 0.2 mile downstream from French Gulch, 1.6 miles downstream from Squaw Creek, and 2.6 miles northeast of Copper.

Drainage area.--220 sq mi.

Records available.--October 1938 to September 1960. Prior to January 1939 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 1,759.66 ft above mean sea level, datum of 1929.

Average discharge.--22 years, 434 cfs (314,200 acre-ft per year).

Extremes.--Maximum discharge during year, 4,920 cfs Feb. 8 (gage height, 8.69 ft); minimum, 25 cfs Sept. 21-27.

1938-60: Maximum discharge, 20,300 cfs Dec. 21, 1955 (gage height, 23.47 ft, from floodmarks), from rating curve extended above 5,300 cfs on basis of slope-area measurement of peak flow; minimum, 20 cfs Sept. 23-25, 1939.

Remarks.--Records good except those for periods of no gage-height record, which are fair. About 11 cfs diverted for irrigation of 482 acres above station in Applegate River basin; Grand Applegate ditch diverts about 3.3 cfs around station on left bank. An average of about 8 cfs for irrigation is diverted into Thompson Creek basin. Several hundred acre-feet normally stored each winter in Squaw Lake for irrigation the following summer.

Revisions.--WSP 1064: Drainage area.

Rating tables, water-year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Dec. 8 to Jan. 7)

Oct. 1 to Feb. 1

Feb. 2 to Sept. 30

1.0	30	2.0	205
1.2	53	2.5	360
1.5	98	3.0	560

0.9	24	3.0	503
1.2	55	4.0	1,010
1.5	95	5.0	1,710
2.0	201	7.0	3,400
2.5	337		

Discharge, in cubic 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	48	43	a45	421	186	968	379	854	153	64	50
2	45	49	43	a35	462	184	1,040	*424	860	147	58	47
3	43	48	43	46	337	253	1,090	442	835	145	56	45
4	43	49	42	54	389	317	1,210	438	775	136	56	41
5	45	49	41	41	575	499	1,340	424	705	132	54	40
6	47	48	41	49	603	980	1,260	477	638	122	48	41
7	46	47	42	193	1,860	2,550	1,150	780	562	117	47	42
8	53	46	41	322	*3,310	1,500	1,040	675	511	115	45	40
9	60	45	41	a150	1,900	1,050	962	617	470	111	44	36
10	56	45	41	a100	1,090	797	819	720	438	109	41	36
11	56	45	*43	a90	711	670	742	797	424	104	41	34
12	54	45	86	a90	562	675	652	797	405	104	42	33
13	54	45	69	a78	481	685	608	625	389	100	45	32
14	53	42	52	a74	424	608	656	562	*370	100	47	*32
15	51	42	52	a70	386	558	575	546	346	100	47	33
16	51	43	51	a68	355	511	530	542	328	97	47	33
17	49	45	48	a68	334	492	511	488	305	93	46	31
18	49	45	49	a70	317	538	503	438	283	87	46	30
19	47	43	47	a66	288	617	486	418	264	84	43	28
20	48	46	46	*63	269	700	477	550	250	79	42	26
21	51	52	45	63	256	764	481	534	240	75	42	26
22	*57	56	43	65	245	814	445	466	227	74	46	25
23	54	51	45	80	232	872	421	438	219	74	51	25
24	52	49	138	96	224	908	401	448	211	74	48	25
25	51	48	98	118	222	*890	398	846	198	74	47	25
26	49	47	62	156	217	854	379	1,920	188	72	46	25
27	49	47	53	147	206	998	370	1,430	176	69	45	28
28	48	46	52	176	198	842	349	1,060	174	67	44	35
29	48	45	49	325	194	764	346	944	176	*66	43	31
30	48	43	a48	404	-----	1,340	358	896	162	65	43	29
31	48	-----	a46	254	-----	1,010	-----	872	-----	62	44	-----
Total	1,549	1,399	1,840	3,636	17,068	24,426	20,565	20,993	11,984	3,007	1,458	1,004
Mean	50.0	46.6	52.9	117	589	788	586	677	399	97.0	47.0	33.5
Ac-ft	3,070	2,770	3,250	7,210	33,850	48,450	40,790	41,640	23,770	5,960	2,890	1,990
Calendar year 1959: Max			5,760	Min	36	Mean	336	Ac-ft	243,400			
Water year 1959-60: Max			3,310	Min	25	Mean	297	Ac-ft	215,600			

Peak discharge (base, 1,700 cfs).--Feb. 8 (6 a.m.) 4,920 cfs (8.69 ft); Mar. 7 (6:30 a.m.) 3,330 cfs (6.92 ft); May 26 (4 p.m.) 2,220 cfs (5.64 ft).

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records, recorded range in stage, and records for station near Applegate.

3660. Applegate River near Applegate, Oreg.

Location.--Lat 42°14'30", long 123°08'20", in NE<sup>1</sup> sec.26, T.38 S., R.4 W., on left bank 0.9 mile downstream from Keeler Creek and 1.8 miles southeast of Applegate.

Drainage area.--480 sq mi.

Records available.--October 1938 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,285.33 ft above mean sea level, datum of 1929. Prior to Dec. 23, 1938, staff gage at same site and datum.

Average discharge.--22 years, 537 cfs (388,800 acre-ft per year).

Extremes.--Maximum discharge during year, 5,750 cfs Feb. 8 (gage height, 7.3 ft, from floodmarks); minimum, 7.0 cfs Sept. 15.

1938-60: Maximum discharge, 47,600 cfs Dec. 21, 1955 (gage height, 18.00 ft), from rating curve extended above 9,600 cfs on basis of slope-area measurement of peak flow; minimum, 7.0 cfs Sept. 18, 1945, Aug. 28, 1951, Sept. 15, 1960.

Maximum stage known, 18.7 ft Feb. 20, 1927, from floodmarks.

Remarks.--Records good except those for period of no gage-height record, which are fair. No appreciable regulation. Many diversions for irrigation of about 4,000 acres above station. McDonald Creek Canal diverts from McDonald Creek above station for irrigation in Bear Creek basin. Thompson Creek Irrigation Association ditch diverts as much as 8 cfs for irrigation and has diverted 21 cfs for mining into Thompson Creek basin. Fowler-Keeler and Berryman ditches divert up to 4.3 and 13.6 cfs, respectively, above station for irrigation of about 800 acres below.

Revisions (water years).--WSP 1064: Drainage area. WSP 1448: 1953(M).

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

0.2	6.0	2.0	295
.3	8.0	3.0	760
.5	15	4.0	1,500
1.0	57	5.0	2,500
1.5	145	7.0	5,300

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	47	52	43	67	307	236	1,150	407	936	119	29	16
2	43	51	44	52	680	232	1,210	*469	950	111	27	16
3	43	50	45	68	a400	278	1,260	492	929	105	27	16
4	42	49	44	56	a450	379	1,350	505	880	100	24	15
5	40	50	45	50	a700	514	1,470	478	808	100	23	16
6	42	49	42	73	a800	1,020	1,420	510	730	96	22	21
7	39	49	41	100	a2,500	*2,990	1,310	826	660	91	21	24
8	41	49	41	446	4,250	1,800	1,190	778	590	81	20	24
9	41	47	42	195	3,160	1,270	1,110	712	536	74	19	18
10	41	47	41	129	1,570	957	957	802	505	65	20	18
11	40	46	*43	117	999	820	874	908	482	63	20	16
12	41	47	67	117	778	808	778	908	446	64	17	13
13	40	47	101	98	665	862	712	712	424	63	13	12
14	42	46	70	94	585	778	796	630	*399	56	10	*11
15	40	45	64	91	514	706	690	615	367	57	13	7.4
16	37	44	63	87	469	645	630	595	347	57	13	8.3
17	35	45	60	85	433	610	600	555	327	52	12	8.9
18	33	44	60	91	411	630	595	500	288	51	11	8.3
19	32	43	58	87	379	700	580	456	260	49	11	9.2
20	32	44	55	*85	339	796	555	550	242	46	12	7.8
21	36	44	51	89	323	856	580	610	228	44	12	8.6
22	*49	53	51	91	299	901	532	523	201	39	13	8.3
23	53	52	55	96	284	964	500	482	185	40	15	8.6
24	53	50	103	109	274	999	474	487	180	37	18	10
25	51	49	162	123	270	*992	460	658	170	34	19	9.5
26	49	47	98	168	267	936	442	1,990	152	38	18	9.8
27	50	47	79	165	254	1,060	424	1,680	145	33	13	9.2
28	50	46	76	168	250	964	399	1,190	139	36	16	9.8
29	51	44	71	267	239	838	387	1,020	137	*32	16	12
30	50	41	71	415	-----	1,470	399	971	123	29	14	13
31	51	-----	71	284	-----	1,190	-----	957	-----	32	13	-----
Total	1,334	1,417	1,955	4,163	22,849	28,201	23,834	22,946	12,766	1,894	551	384.7
Mean	43.0	47.2	63.1	134	788	910	794	740	426	61.1	17.1	12.8
Ac-ft	2,650	2,810	3,880	8,260	45,320	55,940	47,270	45,510	25,320	3,760	1,050	763

Calendar year 1959: Max 6,590 Min 16 Mean 386 Ac-ft 279,600

Water year 1959-60: Max 4,250 Min 7.4 Mean 354 Ac-ft 242,500

Peak discharge (base, 2,200 cfs).--Feb. 8 (about 8 a.m.) 5,750 cfs (7.3 ft); Mar. 7 (11 a.m.) 4,010 cfs (6.14 ft); May 26 (7 p.m.) 2,350 cfs (4.90 ft).

\* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for station near Copper.

## 3715. Grave Creek at Pease Bridge, near Placer, Oreg.

Location.--Lat 42°38'30", long 123°12'40", in SE $\frac{1}{4}$  sec.6, T.34 S., R.4 W., on right bank 0.5 mile downstream from Pease Bridge, 0.6 mile upstream from Boulder Creek, and 5.4 miles east of Placer. All records computed are for site 0.5 mile upstream at Pease Bridge where discharge measurements are made.

Drainage area.--22 sq mi, approximately, at measuring section 0.5 mile upstream.

Records available.--October 1940 to September 1960. Prior to October 1945 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 2,354.2 ft above mean sea level, datum of 1929 (Bureau of Reclamation bench mark). Prior to Aug. 4, 1955, at sites 0.5 mile upstream at datum 29.9 ft higher.

Average discharge.--15 years (1945-60), 62.1 cfs (44,960 acre-ft per year).

Extremes.--Maximum discharge during year, 1,140 cfs Feb. 8 (gage height, 5.63 ft), from rating curve extended above 650 cfs as explained below; minimum, 0.9 cfs Aug. 20. 1940-60: Maximum discharge, 4,610 cfs Dec. 21, 1955 (gage height, 9.66 ft), from rating curve extended above 650 cfs on basis of slope-area measurement of peak flow; minimum, 0.3 cfs Sept. 13, 1944, Aug. 16-27, 1946, Aug. 18, 21, 1950.

Remarks.--Records good except those for periods of ice effect, which are fair. No regulation. One small diversion above station. Prior to 1945, Columbia upper ditch diverted water about 2 miles above station, bypassing 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 Feb. 1, 2, 5, 8, 10, Mar. 7, 9)

1.1	0.8	2.0	40
1.2	1.7	2.5	95
1.4	5.2	3.0	178
1.6	12	4.0	465
1.8	23	5.0	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	3.0	2.8	2.9	b5.0	110	33	232	30	42	5.2	1.7	1.2	
2	2.8	2.8	2.9	b5.5	152	33	217	31	35	5.0	1.5	1.3	
3	2.4	2.8	2.8	5.0	132	44	174	31	31	4.8	1.1	1.4	
4	2.3	3.0	2.8	2.8	182	118	130	33	29	4.4	1.4	2.4	
5	2.2	2.9	2.8	b4.0	222	246	105	30	25	4.4	1.4	2.2	
6	2.2	2.8	2.8	4.6	235	282	86	*29	22	4.2	1.3	1.7	
7	2.4	2.6	2.8	6.6	460	*663	74	33	20	3.8	1.2	1.6	
8	7.7	2.6	2.6	25	844	314	64	29	18	3.6	1.2	1.4	
9	7.2	2.6	2.8	18	336	230	57	27	16	3.6	1.2	1.3	
10	5.5	2.6	*2.6	12	*228	160	50	25	16	3.6	1.2	1.3	
11	4.4	2.6	3.6	11	152	127	48	22	14	3.4	1.2	1.2	
12	3.8	2.4	7.4	9.4	124	144	44	22	14	3.2	1.2	1.2	
13	3.2	2.4	7.4	b8.5	109	178	45	21	12	3.0	1.2	1.2	
14	3.0	2.4	5.8	8.0	99	145	58	18	11	3.2	1.1	1.1	
15	2.8	2.3	5.5	7.2	130	124	57	18	11	3.0	1.1	1.1	
16	2.8	2.3	5.5	7.2	124	122	56	18	*10	2.8	1.1	1.0	
17	2.6	2.3	5.8	12	99	120	55	16	10	2.6	1.2	1.0	
18	2.4	2.3	6.6	28	85	126	52	17	9.4	2.4	1.1	1.1	
19	2.4	2.4	6.6	21	70	127	51	16	9.0	2.3	1.1	1.1	
20	*2.6	2.6	6.0	18	58	122	48	32	8.4	2.3	1.0	1.1	
21	5.8	4.2	5.2	20	55	114	51	44	8.0	2.2	1.1	1.1	
22	8.0	4.6	4.8	29	53	*103	51	47	7.7	2.2	1.2	1.1	
23	5.8	5.0	4.8	37	49	95	50	49	7.2	2.0	1.7	1.1	
24	4.4	4.6	35	55	45	85	47	54	6.6	1.8	2.2	1.1	
25	3.8	4.0	25	*68	46	76	44	73	6.6	1.8	1.8	1.1	
26	3.4	3.6	12	78	45	70	42	197	6.3	*2.2	1.6	1.0	
27	3.2	3.4	8.4	61	41	71	39	153	6.0	1.8	1.5	1.1	
28	3.0	3.2	6.9	63	36	66	36	105	5.8	1.7	1.4	1.1	
29	2.9	3.0	6.0	112	35	75	33	76	5.5	1.6	1.3	1.1	
30	2.8	2.9	6.0	120	---	158	30	60	5.5	1.7	*1.2	1.2	
31	2.8	---	5.8	82	---	154	---	49	---	1.7	1.2	---	
Total	113.6	90.0	207.9	945.0	4,416	4,525	2,126	1,405	428.0	91.5	40.7	37.9	
Mean	3.66	3.00	6.71	30.5	152	146	70.9	45.3	14.3	2.95	1.31	1.26	
Cfsm	0.166	0.136	0.305	1.39	6.91	6.64	3.22	2.06	0.650	0.134	0.060	0.057	
In.	0.19	0.15	0.35	1.60	7.47	7.55	3.59	2.38	0.72	0.15	0.07	0.06	
Ac-ft	225	179	412	1,870	8,760	8,980	4,220	2,790	849	181	81	75	
Calendar year 1959: Max	1,040			Min	1.0	Mean	41.7	Cfsm	1.90	In.	25.71	Ac-ft	30,170
Water year 1959-60: Max	844			Min	1.0	Mean	39.4	Cfsm	1.79	In.	24.38	Ac-ft	28,620

Peak discharge (base, 850 cfs).--Feb. 8 (5 a.m.) 1,140 cfs (5.63 ft); Mar. 7 (5 a.m.) 1,090 cfs (5.52 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

3725. East Fork Illinois River near Takilma, Oreg.

Location.--Lat 42°00'40", long 123°37'30", in SE $\frac{1}{4}$  sec.10, T.41 S., R.8 W., on right bank 500 ft upstream from highway bridge, 0.3 mile upstream from Long Gulch, and 3 miles south of Takilma.

Drainage area.--42.6 sq mi.

Records available.--April to September 1926, April 1927 to April 1932, October 1940 to September 1960. Monthly discharge only for some periods, published in WSP 1318. Prior to October 1941, records not equivalent owing to large diversions.

Gage.--Water-stage recorder. Datum of gage is 1,746.6 ft above mean sea level, datum of 1929 (Bureau of Reclamation bench mark). Prior to Oct. 31, 1946, staff gage at nearby sites at different datums. Oct. 31, 1946, to May 13, 1949, staff gage at same site and datum.

Average discharge.--19 years (1941-60), 187 cfs (135,400 acre-ft per year).

Extremes.--Maximum discharge during year, 4,380 cfs Feb. 8 (gage height, 8.22 ft); minimum, 7.3 cfs Sept. 30.  
1926-32, 1940-60: Maximum discharge, 8,230 cfs Dec. 22, 1955 (gage height, 10.05 ft); minimum observed, 5.2 cfs Sept. 24-29, 1944.

Remarks.--Records good. No regulation. Occasional small diversion above station during summer months. Easterly Upper Canal and Osgood Canal diverted water around station prior to 1942.

Revisions (water years).--WSP 1184: 1948. WSP 1288: 1951(P). WSP 1398: 1946, 1947(M), 1949.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 21 to May 20)

1.0	6.7	4.0	450
1.2	13	5.0	850
1.5	28	6.0	1,530
2.0	67	7.0	2,650
2.5	126	8.0	4,030
3.0	206		

Discharge, in cubic 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	13	11	24	372	70	714	129	234	35	14	10
2	12	12	11	23	474	67	588	132	222	35	14	12
3	10	12	11	22	372	145	528	143	204	33	14	11
4	9.9	13	11	20	495	232	489	*152	185	32	15	11
5	11	13	11	20	669	487	447	143	166	29	13	11
6	11	12	10	20	605	790	392	157	146	27	13	10
7	12	12	10	254	1,750	1,570	336	240	129	26	13	9.9
8	23	12	*10	414	2,940	765	288	213	114	26	12	9.6
9	32	11	10	154	*1,760	669	252	197	108	26	12	9.3
10	25	11	10	95	701	400	211	217	104	26	12	9.3
11	19	11	15	96	406	296	193	222	99	24	12	9.0
12	18	11	59	76	291	328	174	230	90	23	12	8.7
13	16	10	28	62	230	398	199	195	88	23	12	8.4
14	15	10	18	53	199	323	286	171	84	23	12	8.7
15	13	10	20	45	197	264	288	163	*74	24	12	8.4
16	13	10	18	41	186	228	254	160	73	22	12	8.4
17	12	10	17	39	166	228	248	148	70	20	12	8.2
18	12	10	18	40	152	260	271	140	62	19	12	7.9
19	*13	10	16	39	133	291	268	129	58	18	11	7.6
20	14	11	15	40	118	303	258	241	54	18	11	7.9
21	15	24	15	44	110	300	262	298	53	18	11	7.9
22	21	16	15	53	104	296	232	248	52	18	13	7.9
23	19	16	16	67	100	*281	210	224	49	18	13	7.6
24	16	13	135	86	94	282	185	238	47	17	13	7.6
25	14	13	72	151	93	258	169	599	43	17	13	7.6
26	15	13	43	*192	89	246	158	1,200	41	16	12	7.6
27	14	12	36	188	84	279	146	700	43	*15	12	7.6
28	14	12	32	290	78	238	136	450	40	15	12	7.9
29	13	12	29	465	74	314	129	347	38	15	11	7.6
30	13	11	30	367	-----	900	127	288	38	15	11	7.6
31	13	-----	27	224	-----	696	-----	258	-----	15	*9.9	-----
Total	468.9	363	779	3,704	13,042	12,217	8,439	8,368	2,808	688	380.9	263.2
Mean	15.1	12.1	25.1	119	450	394	281	270	93.6	22.2	12.3	8.77
Ac-ft	930	720	1,550	7,350	25,870	24,230	16,740	16,600	5,570	1,360	756	522

Calendar year 1959: Max 2,980 Min 7.9 Mean 127 Ac-ft 91,840  
Water year 1959-60: Max 2,940 Min 7.6 Mean 141 Ac-ft 102,200

Peak discharge (base, 2,500 cfs).--Feb. 8 (5:30 a.m.) 4,380 cfs (8.22 ft).

\* Discharge measurement made on this day.

3750. Sucker Creek near Holland, Oreg.

Location.--Lat 42°09'00", long 123°27'50", in NE $\frac{1}{4}$  sec.25, T.39 S., R.7 W., on right bank 1.3 miles downstream from Grayback Creek and 4 miles northeast of Holland.

Drainage area.--76 sq mi, approximately.

Records available.--April to August 1940, September 1941 to September 1960. Prior to October 1945 monthly discharge only, published in WSP 1318.

Gage.--Water-stage recorder. Datum of gage is 1,777.22 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Sept. 16, 1947, staff gage at several sites within half a mile of present site at various datums. Sept. 16, 1947, to Sept. 19, 1952, staff gage at site 280 ft upstream at datum 0.62 ft higher.

Average discharge.--19 years (1941-60), 210 cfs (152,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,620 cfs Feb. 8 (gage height, 4.66 ft); minimum, 21 cfs Dec. 3-9.

1940-60: Maximum discharge, 7,300 cfs Jan. 12, 1959 (gage height, 8.00 ft); minimum observed, 17 cfs Sept. 29 to Oct. 3, 1941.

Remarks.--Records good except those for period of no gage-height record, which are fair. No regulation. Grayback Canal diverts water from Grayback Creek above station for domestic use and irrigation; most of return flow from this canal enters creek above station.

Revisions (water years).--WSP 1318: 1946(M).

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

Oct. 1 to Feb. 7

Feb. 8 to Sept. 30

1.2	20	2.5	280	1.2	20	2.5	270
1.4	34	3.0	455	1.4	36	3.0	485
1.7	71	4.0	1,060	1.7	75	4.0	1,110
2.0	128			2.0	132	5.0	1,970

Discharge, in cubic 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	23	27	216	92	673	183	417	82	39	32
2	29	27	23	26	267	89	619	183	412	78	39	32
3	29	27	23	25	200	115	601	196	386	77	38	31
4	28	28	21	24	236	119	595	*194	354	75	38	31
5	28	27	21	24	378	229	595	183	313	72	38	31
6	28	28	21	24	357	386	551	210	280	69	37	30
7	31	28	21	150	852	*985	496	513	254	68	35	29
8	43	28	*21	230	1,370	579	450	267	228	64	34	28
9	36	25	22	120	1,220	607	408	260	213	62	34	27
10	34	25	23	90	649	435	354	288	204	62	33	27
11	32	25	27	90	396	354	337	305	194	62	33	26
12	32	25	60	80	298	358	298	317	183	60	32	26
13	31	23	39	70	244	399	302	270	170	59	32	26
14	30	23	30	60	216	358	333	247	162	59	32	26
15	29	23	32	50	207	313	313	240	*155	56	32	26
16	29	23	28	45	188	277	288	234	150	55	32	25
17	28	23	28	40	175	263	288	219	141	54	32	24
18	28	23	28	42	170	280	288	202	134	52	32	24
19	*28	24	27	40	155	302	284	199	126	51	31	24
20	31	25	25	40	139	317	277	288	122	48	31	24
21	33	32	25	45	130	333	277	277	117	48	32	24
22	36	29	24	50	126	341	280	244	111	48	37	24
23	32	28	27	60	119	*358	244	237	107	47	37	24
24	30	25	79	70	115	363	228	244	102	46	37	24
25	30	25	48	90	111	350	219	482	100	46	34	24
26	29	24	33	*106	107	337	210	942	96	46	33	24
27	29	23	32	86	103	372	202	780	92	*44	32	24
28	28	23	31	120	98	333	191	601	89	42	31	30
29	28	23	30	187	96	335	183	524	85	40	31	26
30	28	23	29	167	-----	590	180	480	82	40	30	25
31	28	-----	28	116	-----	607	-----	440	-----	40	*29	-----
Total	944	756	927	2,394	8,938	11,256	10,544	10,049	5,579	1,752	1,047	798
Mean	30.5	25.2	29.9	77.2	308	363	351	324	186	56.5	33.8	26.6
Cfsm	0.401	0.332	0.395	1.02	4.05	4.78	4.62	4.26	2.45	0.743	0.445	0.350
In.	0.46	0.37	0.45	1.17	4.37	5.51	5.16	4.92	2.73	0.86	0.51	0.39
Ac-ft	1,870	1,500	1,840	4,750	17,750	22,330	20,910	19,930	11,070	3,480	2,080	1,580
Calendar year 1959: Max		3,490		Min 21		Mean 168		Cfsm 2.21		In. 29.98		Ac-ft 121,600
Water year 1959-60: Max		1,370		Min 21		Mean 150		Cfsm 1.97		In. 26.90		Ac-ft 109,100

Peak discharge (base, 1,400 cfs).--Feb. 8 (5 a.m.), 1,620 cfs (4.66 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Jan. 1-25; discharge estimated on basis of weather records, recorded range in stage, and records for East Fork Illinois River near Takilma.

3755. West Fork Illinois River below Rock Creek, near O'Brien, Oreg.

Location.--Lat 42°02'20", long 123°44'50", in SW<sup>1</sup>/<sub>4</sub>SE<sup>1</sup>/<sub>4</sub> sec.34, T.40 S., R.9 W., on left bank 900 ft downstream from Rock Creek and 3 miles southwest of O'Brien.

Drainage area.--42.4 sq mi.

Records available.--September 1954 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,516.14 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--6 years, 224 cfs (162,200 acre-ft per year).

Extremes.--Maximum discharge during year, 5,820 cfs Feb. 8 (gage height, 11.88 ft); minimum, 4.2 cfs Sept. 30.

1954-60: Maximum discharge, 12,100 cfs Dec. 22, 1955 (gage height, 14.79 ft); minimum, 3.2 cfs Sept. 23, 1957, Aug. 12, 1959.

During flood of Oct. 28, 1950, flow of 14,200 cfs occurred at former station downstream where the drainage area is 15 percent larger. Flood of Dec. 22, 1955, was slightly lower.

Remarks.--Records good. Slight regulation by logpond upstream.

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

1.2	3.4	4.0	272
1.4	6.8	5.0	490
1.6	12	6.0	780
2.0	28	8.0	1,750
2.5	64	11.0	4,600
3.0	118		

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.6	15	17	46	553	94	1,080	99	169	28	10	*5.8
2	7.9	15	16	43	1,190	92	623	95	148	27	9.6	6.4
3	8.1	17	16	39	767	318	432	95	130	26	9.3	6.2
4	7.9	18	15	36	956	402	322	*96	116	25	9.0	6.4
5	7.9	17	14	33	844	1,040	256	90	104	24	9.0	7.7
6	7.9	16	14	33	880	1,270	217	91	96	23	9.0	7.5
7	9.0	15	14	640	1,870	1,930	187	143	91	22	8.6	6.4
8	66	15	*13	1,020	4,390	1,130	164	133	85	20	8.1	6.0
9	97	14	13	405	*3,750	1,280	147	114	78	20	7.7	6.2
10	52	14	13	241	1,340	668	134	103	73	19	7.5	6.2
11	35	13	19	270	671	458	151	96	65	18	7.2	6.0
12	28	12	262	233	480	542	138	128	63	19	7.2	6.0
13	24	12	169	170	384	560	186	186	60	18	7.2	5.5
14	21	12	91	135	356	420	450	162	56	18	7.5	5.5
15	19	12	65	108	346	334	468	139	*54	18	7.2	5.3
16	18	12	53	95	314	280	356	125	52	17	6.4	5.7
17	17	11	48	91	263	241	282	119	50	16	6.8	4.8
18	17	11	40	97	256	214	265	117	48	16	6.0	4.8
19	*15	11	36	94	238	189	338	106	45	16	5.8	4.4
20	16	14	33	88	206	168	289	224	43	14	5.7	4.4
21	23	58	39	88	186	149	268	350	41	16	6.4	4.3
22	55	40	33	106	168	135	236	330	39	12	9.6	4.6
23	44	29	31	138	153	*124	205	354	39	11	8.8	4.4
24	33	26	480	143	139	113	175	430	36	11	8.6	4.3
25	28	24	308	189	128	103	157	1,390	55	12	8.6	4.4
26	25	22	168	*299	119	104	142	1,720	33	12	8.3	4.6
27	22	20	113	388	111	149	129	810	33	*12	7.5	4.8
28	20	19	88	568	104	259	123	465	32	11	7.0	4.4
29	19	18	73	485	99	616	113	328	30	10	6.0	4.4
30	18	18	62	388	-----	2,120	105	250	29	10	6.0	4.4
31	16	-----	53	285	-----	1,240	-----	203	-----	10	6.4	-----
Total	785.3	550	2,417	7,014	21,241	16,742	8,138	9,091	1,971	531	238.0	161.8
Mean	25.3	18.3	78.0	226	732	540	271	293	657	17.1	7.68	5.39
Ac-ft	1,560	1,090	4,790	13,910	42,130	33,210	16,140	18,030	3,910	1,050	472	321

Calendar year 1959: Max 3,120 Min 3.4 Mean 154 Ac-ft 111,400  
 Water year 1959-60: Max 4,390 Min 4.3 Mean 188 Ac-ft 136,600

Peak discharge (base, 4,000 cfs).--Feb. 8 (3:30 a.m.) 5,820 cfs (11.88 ft).

\* Discharge measurement made on this day.

## 3770. Illinois River at Kerby, Oreg.

Location.--Lat 42°11'50", long 123°39'30", in NW¼ sec.9, T.39 S., R.8 W., on upstream side of Finch Bridge, 0.5 mile west of Kerby.

Drainage area.--364 sq mi.

Records available.--March 1926 to September 1960. Monthly discharge only for March 1926, published in WSP 1318.

Gage.--Wire-weight gage read once or twice daily. Datum of gage is 1,232.00 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to May 9, 1928, staff gage at site half a mile upstream at different datums. May 9, 1928, to Nov. 2, 1934, staff gage at present site at different datums. Nov. 3, 1934, to Sept. 30, 1950, water-stage recorder at site 1 mile downstream at datum 16.76 ft lower. Oct. 1, 1950, to Dec. 28, 1958, staff gage at same site at datum 2.00 ft higher.

Average discharge.--34 years, 1,201 cfs (869,500 acre-ft per year).

Extremes.--Maximum discharge during year, 31,600 cfs Feb. 8 (gage height, 11.9 ft, from floodmark); minimum observed, 18 cfs Sept. 25.

1926-60: Maximum discharge, 56,800 cfs Dec. 22, 1955 (gage height, 16.4 ft, present datum, from floodmark), from rating curve extended above 9,600 cfs on basis of slope-area measurement at gage height 15.7 ft, present datum; minimum observed, 9.6 cfs Aug. 16, 1959.

Remarks.--Records fair. No regulation. Diversions for irrigation of 5,500 acres above station. Some diversions for mining during winter months.

Revisions (water years).--WSP 864: 1936-37. WSP 1184: 1927(M), 1942(M), 1943, 1946(M), 1948. WSP 1218: Drainage area. WSP 1398: 1927-29, 1930(M), 1931-32, 1933-34(M).

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 28 to June 18)

2.4	12	4.0	970
2.6	37	5.0	2,300
2.8	92	6.0	4,150
3.1	253	8.0	10,600
3.5	550	11.0	26,200

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	51	59	64	198	2,150	648	5,620	590	1,180	110	44	*35
2	49	59	64	175	4,850	873	3,580	622	1,060	118	39	37
3	49	59	70	175	3,470	861	2,860	690	970	110	37	34
4	54	64	73	164	4,710	1,800	2,530	*717	890	105	35	35
5	49	80	76	164	4,680	3,650	2,240	664	816	105	34	31
6	51	67	83	164	4,350	6,040	1,970	735	735	96	34	34
7	54	67	87	970	8,340	*10,500	1,670	816	605	89	34	34
8	70	67	87	4,610	25,800	5,920	1,470	910	550	86	34	49
9	534	64	*73	2,150	*20,500	5,680	1,310	852	500	86	32	47
10	166	64	70	1,140	6,870	3,550	1,210	807	501	86	32	32
11	132	67	64	1,180	3,630	2,580	1,120	789	444	89	32	39
12	76	67	458	970	2,610	2,850	1,090	807	415	86	31	47
13	76	61	545	771	2,350	3,090	1,070	843	387	83	31	37
14	73	64	373	648	1,920	2,530	1,400	825	373	83	31	31
15	80	64	273	552	1,910	1,720	2,100	789	*280	76	31	42
16	80	64	210	480	1,720	1,670	1,800	735	333	73	31	35
17	76	64	153	444	1,500	1,630	1,630	690	319	64	31	34
18	73	64	118	465	1,460	1,560	1,560	648	293	70	27	29
19	*76	61	132	472	1,300	1,480	1,550	622	273	67	29	26
20	75	59	142	422	1,140	1,500	1,610	771	247	59	26	23
21	73	64	132	437	1,020	1,460	1,530	1,110	216	59	27	21
22	110	158	118	494	981	1,390	1,390	1,300	168	54	29	21
23	123	123	110	596	900	1,330	1,260	1,390	175	49	34	20
24	127	101	1,350	699	861	*1,330	1,160	1,850	153	54	34	20
25	114	96	1,020	753	807	1,250	1,070	5,930	132	51	39	18
26	92	96	614	*1,420	753	1,160	981	8,790	114	54	44	19
27	89	89	472	1,590	717	1,200	920	4,260	118	54	47	20
28	80	86	387	3,060	682	1,400	880	2,530	118	*54	44	19
29	73	76	308	3,570	548	1,720	807	1,980	136	49	42	19
30	61	73	268	2,220	-----	9,440	708	1,550	136	44	42	21
31	59	-----	235	1,690	-----	6,570	-----	1,310	-----	44	37	-----
Total	2,825	2,247	8,185	32,845	112,429	88,182	50,206	46,902	12,755	2,307	1,074	909
Mean	91.1	74.9	264	1,060	3,677	2,845	1,674	1,513	425	74.4	54.6	30.3
Ac-ft	5,600	4,460	16,230	65,150	223,000	174,900	99,580	93,030	25,300	4,580	2,130	1,800

Calendar year 1959: Max 25,000 Min 9.6 Mean 947 Ac-ft 685,400  
water year 1959-60: Max 25,800 Min 18 Mean 986 Ac-ft 715,800

\* Discharge measurement made on this day.

3780. Illinois River near Selma, Oreg.

Location.--Lat 42°22'45", long 123°48'40", in SW<sup>1</sup>/<sub>4</sub> sec. 6, T.37 S., R.9 W., on right bank 200 ft upstream from Panther Creek, 0.3 mile downstream from Briggs Creek, and 12 miles northwest of Selma. Records include flow of Panther Creek.

Drainage area.--665 sq mi, includes that of Panther Creek.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 829.18 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Extremes.--Maximum discharge during year, 40,600 cfs Feb. 8 (gage height, 17.84 ft); minimum, 68 cfs Sept. 28-30.

1956-60: Maximum discharge, 70,100 cfs Jan. 29, 1958 (gage height, 22.3 ft, from floodmarks); minimum, 61 cfs Aug. 28, Sept. 2, 1959.

Maximum discharge known, 97,000 cfs Dec. 22, 1955 (gage height, 25.64 ft, from floodmarks), from slope-area measurement of peak flow.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No regulation. Many diversions above station for irrigation, mining, and logpond operation.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Nov. 22 to Dec. 16, May 4-20, June 6, 7, July 16 to Aug. 24)

2.1	66	4.0	480	9.0	6,220
2.5	114	5.0	940	11.0	11,300
3.0	198	6.0	1,720	14.0	22,200
3.5	320	7.0	2,850	17.0	36,000

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	152	169	160	448	4,180	1,050	10,000	1,320	2,350	356	125	*96
2	144	162	155	400	9,460	1,020	7,000	1,280	2,100	344	122	104
3	141	160	152	375	5,560	1,760	5,500	1,230	1,870	326	121	101
4	136	158	149	350	8,570	3,230	4,500	1,260	1,710	317	121	101
5	134	149	144	350	8,510	6,500	4,000	*1,180	1,540	295	118	96
6	130	147	141	350	6,980	9,560	3,500	1,140	*1,390	293	118	98
7	134	152	139	900	16,600	18,100	3,000	1,390	1,250	272	118	93
8	171	139	134	7,000	33,700	11,490	2,700	1,500	1,140	258	114	93
9	240	147	*133	4,500	31,900	12,350	2,470	1,350	1,070	240	111	94
10	451	155	133	2,300	*13,700	7,330	2,200	1,310	1,010	233	107	94
11	311	139	154	2,500	7,360	5,250	2,090	1,300	946	231	103	93
12	255	139	329	2,000	5,230	5,830	1,940	1,340	886	227	99	87
13	251	138	875	1,600	4,500	6,510	1,930	1,510	840	218	95	83
14	212	139	552	1,400	3,730	5,110	2,040	1,470	795	212	93	82
15	196	138	424	1,100	3,540	4,200	3,700	1,320	758	212	93	81
16	184	138	371	1,000	3,290	3,580	3,260	1,220	722	206	92	77
17	174	138	341	950	2,880	3,160	2,850	1,140	681	190	90	75
18	171	136	320	1,000	2,690	2,980	2,750	1,120	645	184	88	74
19	167	136	296	1,000	2,420	2,880	3,160	1,050	622	176	87	74
20	165	139	278	900	2,130	2,750	2,920	1,290	588	169	88	73
21	*169	178	265	900	1,950	2,590	2,810	2,350	556	162	89	70
22	168	225	255	1,000	1,780	2,430	2,550	2,200	540	157	93	71
23	240	236	258	1,200	1,640	2,300	2,310	2,260	504	154	103	72
24	252	210	1,370	1,400	1,520	*2,200	2,040	2,750	476	150	111	71
25	229	194	1,850	1,600	1,420	2,040	1,890	7,260	448	147	114	71
26	212	186	1,020	2,300	1,340	1,940	1,770	15,500	431	146	110	71
27	198	176	760	*2,640	1,260	2,160	1,640	8,800	420	141	103	72
28	194	173	645	5,430	1,160	2,300	1,540	5,320	401	*136	100	69
29	186	169	568	5,160	1,110	3,000	1,470	3,970	386	128	96	68
30	174	165	524	4,740	-----	17,000	1,400	3,170	380	127	95	69
31	173	-----	488	5,290	-----	13,000	-----	2,680	-----	127	93	-----
Total	6,094	4,830	13,589	60,083	190,090	165,600	90,930	81,980	27,455	6,532	3,210	2,475
Mean	197	161	432	1,938	6,555	5,342	3,031	2,645	915	211	104	82.4
Ac-ft	12,090	9,580	26,560	119,200	377,000	328,500	180,400	162,600	54,460	12,960	6,370	4,910
Calendar year 1959: Max			35,000	Min 61		Mean 1,620	Ac-ft 1,173,000					
Water year 1959-60: Max			33,700	Min 68		Mean 1,783	Ac-ft 1,295,000					

Peak discharge (base, 20,000 cfs).--Feb. 8 (10 a.m.) 40,600 cfs (17.84 ft); Mar. 7 (10 a.m.) 23,000 cfs (14.18 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Jan. 2-26, Mar. 28 to Apr. 8; discharge estimated on basis of weather records, recorded range in stage, and records for station at Kerby.

## Reservoirs in Rogue River basin, Oreg.

3420. Fish Lake.--Lat 42°23', long 122°21', in SE¼SE¼ sec.4, T.37 S., R.4 E., at outlet of reservoir on North Fork Little Butte Creek, 14 miles east of town of Lakecreek. Drainage area, 17 sq mi, approximately. Records available, October 1915 to September 1960. Staff gage read daily during summer and once or twice a month during winter. Datum of gage is 185.4 ft below mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 1, 1921, at datum 4,799.0 ft higher. Maximum contents observed during year, 6,190 acre-ft June 10-15 (gage height, 4,822.6 ft); minimum observed, 400 acre-ft Sept. 30 (gage height, 4,803.5 ft). Maximum contents observed during period 1915-60, 8,190 acre-ft May 31 to June 9, 1958 (gage height, 4,827.6 ft); no usable contents at times.

Reservoir is formed by rock-faced, earth-fill dam, completed in 1915. Capacity, 8,020 acre-ft between gage heights 4,799.0 (outlet tunnel) and 4,827.2 ft (spillway crest, rebuilt in 1956). Since August 1923, water diverted during summer from Four-mile Lake in Klamath River basin through Cascade Canal into Fish Lake. Water from reservoir used for irrigation near Eagle Point and Medford.

3490. Emigrant Reservoir (formerly published as Emigrant Gap Reservoir).--Lat 42°09'40", long 122°36'20", in SE¼ sec.20, T.39 S., R.2 E., on Emigrant Creek 2 miles downstream from Sampson Creek and 6 miles southeast of Ashland. Drainage area, 64 sq mi, approximately. Records available, October 1924 to September 1960. Datum of gage is at mean sea level (levels by Talent Irrigation District). Prior to October 1959, published as Emigrant Gap Reservoir. No storage during 1959-60 water year due to rebuilding of dam. Maximum contents observed during period 1924-60, 8,490 acre-ft Feb. 20, 1927 (elevation, 2,175.2 ft), from revised original capacity table, sedimentation being assumed negligible at that time; maximum elevation, 2,176.0 ft Jan. 27, 1954; no contents at times.

Capacity table used is based on survey made by Bureau of Reclamation in 1951, which indicated that a net amount of 366 acre-ft of silt had accumulated in reservoir from 1924-51.

Earth-fill dam being built during 1960 will cover old concrete-arch dam. Water is used for irrigation near Talent. Ashland lateral diverts water from an upstream tributary, Sampson Creek, for irrigation in vicinity of Ashland. Flow in Sampson Creek is supplied principally from Klamath River basin by Keene Creek Canal transmountain diversion.

Revisions (water years).--WSP 834: 1936. WSP 1064: 1945. WSP 1348: 1927(M), 1951-53.

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

Date	Gage height (feet)	Contents (acre- feet)	Change in contents (acre-feet)	Elevation (feet)	Contents (acre- feet)	Change in contents (acre-feet)
		Fish Lake			Emigrant Reservoir	
Sept. 30.....	4,806.5	1,050	-	-	0	0
Oct. 31.....	-	a2,200	+1,150	-	0	0
Nov. 30.....	-	a2,900	+700	-	0	0
Dec. 31.....	-	a3,420	+520	-	0	0
Calendar year 1959...	-	-	-3,780	-	-	-360
Jan. 31.....	-	a3,800	+380	-	0	0
Feb. 29.....	-	a4,200	+400	-	0	0
Mar. 31.....	-	a4,500	+300	-	0	0
Apr. 30.....	4,819.9	5,190	+690	-	0	0
May 31.....	4,822.0	5,960	+770	-	0	0
June 30.....	4,818.5	4,690	-1,270	-	0	0
July 31.....	4,812.5	2,720	-1,970	-	0	0
Aug. 31.....	4,809.4	1,810	-910	-	0	0
Sept. 30.....	4,803.5	400	-1,410	-	0	0
Water year 1959-60...	-	-	-650	-	-	0

a Interpolated.

Note.--Time of gage readings not known.

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 hydrological 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 reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are generally presented in two tables. However, no records at low-flow partial-record stations are available for the 1960 water year. A table of annual maximum discharge at crest-stage stations is given first, followed by a table of measurements made at miscellaneous sites for both low flow and high flow.

## 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 continuous-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)
Walla Walla River basin							
159	Spring Creek tributary near Walla Walla, Wash.	N½ sec.9, T.7 N., R.37 E., at Spring Creek road about 200 ft above mouth and 7 miles northeast of Walla Walla.	1.94	1956-60	1960	(ab)	<10
166	Hatley Creek near Dayton, Wash.	On line between secs.2 and 11, T.9 N., R.39 E., at North Fork Touchet River road, 5 miles southeast of Dayton.	4.12	1955-60	2- 8-60	a13.03	c60
166.5	Davis Hollow Creek near Dayton, Wash.	SE¼ sec.32, T.10 N., R.39 E., at county road 200 ft above mouth and 2 miles southeast of Dayton city center.	3.01	1956-60	2- 8-60	a14.84	3.9
172	Badger Hollow Creek near Clyde, Wash.	SE¼ sec.20, T.11 N., R.36 E., at county road 5.8 miles east of Clyde and 8 miles north of Prescott.	4.16	1955-60	2- 8-60	a4.08	23
191	Walla Walla River tributary near Wallula, Wash.	SW¼ sec.25, T.7 N., R.31 E., at U. S. Highway 410, 1.5 miles southeast of Wallula.	.80	1955-60	1960	(a)	(d)
Umatilla River basin							
208	Spring Creek at St. Andrews Mission, Oreg.	SE¼ sec.24, T.2 N., R.33 E., at culvert 0.1 mile east of St. Andrews School and 8 miles east of Pendleton.	2.74	1958-60	1960	(b)	<78
216	Umatilla River tributary near Pendleton, Oreg.	E½ sec.4, T.2 N., R.32 E., at culvert on U. S. Highway 395, 0.7 mile above mouth and 1.5 miles northwest of Pendleton.	4.30	1958-60	1960	(b)	<31
223	Little McKay Creek near Pilot Rock, Oreg.	On line between secs.1 and 12, T.1 S., R.32 E., at culvert 0.4 mile above mouth and 4 miles northeast of Pilot Rock.	e5.0	1958-60	1960	(b)	<21
Dead Canyon Creek basin							
343.2	Dead Canyon tributary near Alderdale, Wash.	N½ of line between secs.14 and 15, T.5 N., R.23 E., 6 miles north of Alderdale.	1.08	1955-60	1960	-	(d)
Willow Creek basin							
343.7	Willow Creek tributary near Heppner, Oreg.	SW¼ sec.22, T.4 S., R.28 E., at culvert on Willow Creek Road, 300 ft above mouth and 15 miles southeast of Heppner.	e1.4	1958-60	3-23-60	12.45	10
343.8	North Fork Willow Creek near Heppner, Oreg.	E½ sec.29, T.3 S., R.28 E., at culvert on Willow Creek Road, 200 ft above mouth and 12 miles southeast of Heppner.	10.0	1958-60	3-23-60	15.50	20

a See note on page 295 for datum change.

b Peak stage did not reach bottom of gage.

c Estimated.

d No evidence of flow during year.

e Approximately.

## 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)
John Day River basin							
410	Desolation Creek near Dale, Oreg.	SW $\frac{1}{4}$ sec.6, T.7 S., R.32 E., $\frac{3}{4}$ mile above mouth and 1.5 miles east of Dale.	108	1950-58 <sup>†</sup> , 1959-60	3-23-60	3.78	448
469	John Day River tributary near Clarno, Oreg.	NE $\frac{1}{4}$ sec.3, T.8 S., R.18 E., at culvert on State Highway 218, 5 miles west of Clarno.	e2.0	1959-60	1960	(b)	(f)
480.2	Grass Valley Canyon near Grass Valley, Oreg.	NW $\frac{1}{4}$ sec.35, T.2 S., R.16 E., at culvert on county road, 1 mile northeast of Grass Valley.	e8.3	1958-60	1960	(b)	(f)
480.4	Gordon Hollow at DeMoss Springs, Oreg.	NW $\frac{1}{4}$ sec.3, T.1 S., R.17 E., at culvert on U. S. Highway 97 at DeMoss Springs, 0.1 mile above Barnum Canyon.	8.86	1959-60	1960	(b)	(f)
480.6	Hay Canyon near DeMoss Springs, Oreg.	N $\frac{1}{2}$ sec.18, T.1 S., R.18 E., at bridge at Monkland Ranch, 3 miles above mouth and 4 miles southeast of DeMoss Springs.	23.8	1959-60	1960	(b)	(f)
480.8	Buck Canyon near Klondike, Oreg.	SW $\frac{1}{4}$ sec.32, T.1 N., R.18 E., at culvert on State Highway 206, 0.3 mile above mouth and 4 miles south of Klondike.	3.42	1953, 1959-60	1960	(b)	(f)
Spanish Hollow basin							
483	Spanish Hollow at Wasco, Oreg.	NE $\frac{1}{4}$ sec.9, T.1 N., R.17 E., at culvert on street in southeast Wasco.	8.05	1959-60	2- 8-60	4.37	96
Fulton Canyon basin							
483.5	Fulton Canyon tributary near Wasco, Oreg.	Center sec.12, T.1 N., R.16 E., at culvert on county road, 2.7 miles above mouth and 3.5 miles west of Wasco.	6.75	1959-60	2- 8-60	9.08	(†)
Deschutes River basin							
818	Ahalt Creek near Mitchell, Oreg.	NE $\frac{1}{4}$ sec.20, T.13 S., R.20 E., at culvert on Walton Lake Road, 200 ft above mouth and 13 miles southwest of Mitchell.	2.28	1956, 1958-60	3-21-60	7.94	45
937	Trout Creek tributary at Ashwood, Oreg.	SW $\frac{1}{4}$ sec.36, T.9 S., R.16 E., at culvert on county road, 0.1 mile above mouth and 0.3 mile north of Ashwood.	e1.9	1959-60	3- 9-60	4.68	<2
938	Trout Creek tributary near Ashwood, Oreg.	NW $\frac{1}{4}$ sec.33, T.9 S., R.17 E., at culvert on county road, 2 miles east of Ashwood and 3 miles above mouth.	e4.7	1959-60	1960	(b)	(f)
942	Antelope Creek at Antelope, Oreg.	NW $\frac{1}{4}$ sec.4, T.8 S., R.17 E., at culvert on State Highway 218 in Antelope.	e26	1959-60	1960	(b)	(f)
943	Cow Canyon Creek near Antelope, Oreg.	Sec.28, T.8 S., R.15 E., at culvert on U. S. Highway 97, 1.4 miles north of Jefferson County line and 11 miles southwest of Antelope.	e2.9	1959-60	1960	(b)	(f)
952	Mud Spring Creek tributary near Madras, Oreg.	E $\frac{1}{2}$ sec.27, T.9 S., R.14 E., at culvert on U. S. Highway 97, 1 mile above mouth and 11 miles north of Madras.	e7.4	1958-60	1960	-	0
Klickitat River basin							
1122	Little Klickitat River tributary near Goldendale, Wash.	NW $\frac{1}{4}$ sec.15, T.4 N., R.16 E., at county road $\frac{1}{2}$ miles northeast of Goldendale.	0.71	1960	2- 7-60	7.08	5.7
Little White Salmon River basin							
1252	Rock Creek near Willard, Wash.	NW $\frac{1}{4}$ sec.14, T.3 N., R.9 E., at county road 4.4 miles north of U. S. Highway 830 and 1 mile south of Willard.	4.04	1949-60	2- 7-60	a9.20	140
Unnamed Tributary to Columbia River							
1263	Columbia River tributary at Home Valley, Wash.	SE $\frac{1}{4}$ sec.27, T.3 N., R.8 E., at U. S. Highway 830, 0.3 mile east of Home Valley Post Office, Home Valley.	g0.54	1950-60	2- 7-60	a20.02	33
Dry Creek basin							
1287.4	Dry Creek at Cascade Locks, Oreg.	NW $\frac{1}{4}$ sec.7, T.2 N., R.8 E., at culvert on U. S. Highway 30, 0.4 mile above mouth and 0.8 mile east of Cascade Locks.	3.18	1952-60	10-22-59	7.87	80

† Discharge not determined.

\* Operated as a continuous-record gaging station.

a See note on page 295 for datum change.

b Peak stage did not reach bottom of gage.

e Approximately.

f Little or no flow during year.

g 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)
Sandy River basin							
1312	Lady Creek near Rhododendron, Oreg.	NW $\frac{1}{4}$ sec.16, T.3 S., R.8 E., at diversion dam 300 ft above mouth and 4 miles east of Rhododendron.	3.82	1953-60	10-22-59	11.56	h153
Washougal River basin							
1432	Canyon Creek near Washougal, Wash.	SE $\frac{1}{4}$ sec.4, T.1 N., R.5 E., at State Highway 8B, 2.4 miles from U. S. Highway 830 and 8 miles east of Washougal.	2.74	1949-60	2- 6-60	a5.94	78
1440	Little Washougal River near Washougal, Wash.	SE $\frac{1}{4}$ sec.31, T.2 N., R.4 E., 20 ft below private bridge, 1 mile above mouth, and 2 $\frac{1}{2}$ miles north of Washougal.	23.8	1952-55 <sup>†</sup> , 1956-60	10-22-59	5.79	626
g1445.5	Shanghai Creek near Hockinson, Wash.	SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.33, T.3 N., R.3 E., at county road, 3.3 miles southeast of Hockinson.	2.14	1950-60	11-22-59	a17.52	43
Groenveld Creek basin							
1446	Groenveld Creek near Camas, Wash.	NE $\frac{1}{4}$ sec.8, T.1 N., R.3 E., at private road 15 ft east of county road, 0.4 mile above mouth, and $\frac{1}{2}$ mile northwest of Camas city limits.	0.51	1958-60	2- 6-60	a3.94	25
Willamette River basin							
1448.7	Middle Fork Willamette River tributary near Oakridge, Oreg.	SW $\frac{1}{4}$ sec.10, T.22 S., R.3 E., at culvert on Rigdon Road, 400 ft above Hills Creek Reservoir and 5.0 miles south of Oakridge.	0.50	1960	2- 9-60	14.90	<11
1487	Fern Creek near Lowell, Oreg.	W $\frac{1}{2}$ NW $\frac{1}{4}$ sec.3, T.20 S., R.1 E., at culvert on State Highway 58 at mouth, 6 miles southeast of Lowell.	.44	1953-60	3- 7-60	4.95	9.2
1539	Prather Creek near Disston, Oreg.	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.30, T.21 S., R.1 E., at diversion dam 0.2 mile above mouth at Layng Creek ranger station and 1.8 miles northeast of Disston.	5.69	1953-60	2- 8-60	5.12	h156
1582.5	Hackleman Creek near Upper Soda, Oreg.	NW $\frac{1}{4}$ sec.32, T.13 S., R.6 E., at culvert on U. S. Highway 20, 1.3 miles above Indian Creek and 7 miles east of Upper Soda.	.21	1953-60	11-15-59	3.17	32
1612	Lookout Creek tributary No. 3 near Blue River, Oreg.	NE $\frac{1}{4}$ sec.31, T.15 S., R.5 E., at weir 0.1 mile above mouth in H. J. Andrews Experimental Forest and 6 miles northeast of town of Blue River.	.34	1953-60	2- 8-60	2.01	15
1616	Lookout Creek tributary near Blue River, Oreg.	NW $\frac{1}{4}$ sec.6, T.16 S., R.5 E., at weir 0.2 mile above mouth in H. J. Andrews Experimental Forest and 5.4 miles northeast of town of Blue River.	.41	1954-60	3-29-60	2.14	16
1630	Gate Creek at Vida, Oreg.	NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.28, T.16 S., R.2 E., 300 ft below U. S. Highway 126 bridge at Vida and 0.2 mile above mouth.	47.6	1952-57 <sup>†</sup> , 1958-60	2- 8-60	6.55	1,710
1697	Bear Creek near Cheshire, Oreg.	SE $\frac{1}{4}$ sec.24, T.16 S., R.6 W., at culvert on State Highway 36, 0.5 mile above Goldson millpond and 4.2 miles southwest of Cheshire.	5.19	1957-60	2- 9-60	18.72	171
1705	Rock Creek near Philomath, Oreg.	NE $\frac{1}{4}$ sec.29, T.12 S., R.6 W., at dam 250 ft above bridge on State Highway 34, 0.2 mile above mouth, and 4.5 miles southwest of Philomath.	14.6	1946-52 <sup>†</sup> , 1953-60	2- 9-60	4.99	1,200
1723	Butte Creek near Plainview, Oreg.	NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.5, T.13 S., R.2 W., at culvert on county road, 2.9 miles east of Plainview.	5.06	1955-60	2- 9-60	13.58	100
1741	Cox Creek at Albany, Oreg.	SW $\frac{1}{4}$ sec.4, T.11 S., R.3 W., at dam at Waverly Lake outlet in north Albany.	15.2	1953-60	2- 9-60	11.47	416
1788	Wind Creek near Detroit, Oreg.	NE $\frac{1}{4}$ sec.31, T.9 S., R.6 E., at culvert on Breitenbush River road, 0.1 mile above mouth and 2 miles northeast of Detroit.	1.03	1954-60	2- 9-60	9.82	57
1817	North Santiam River tributary near Gates, Oreg.	SW $\frac{1}{4}$ sec.25, T.9 S., R.3 E., at culvert on State Highway 22, 0.1 mile above mouth and 1.3 miles east of Gates.	1.97	1952-60	10- 9-59	16.01	38

† Operated as a continuous-record gaging station.

a See note on page 295 for datum change.

g Revised.

h Diversion flow negligible.

## 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)
Willamette River basin--Continued							
1849	Sheek Creek near Cascadia, Oreg.	SW $\frac{1}{4}$ sec. 36, T. 13 S., R. 2 E., at culvert on U. S. Highway 20 at Cascadia ranger station, 0.1 mile above mouth and 1.5 miles west of Cascadia.	0.94	1953-60	2- 9-60	12.67	33
1902	Waymire Creek near Falls City, Oreg.	NW $\frac{1}{4}$ sec. 22, T. 8 S., R. 6 W., at culvert on county road, 0.8 mile above mouth and 1 mile east of Falls City.	3.46	1954-60	2- 9-60	12.51	170
1906	Soap Creek tributary near Suver, Oreg.	SW $\frac{1}{4}$ sec. 18, T. 10 S., R. 4 W., at culvert on U. S. Highway 99 W., 1.2 miles south of Folk County line and 3 miles south of Suver.	.57	1933-60	3-29-60	3.00	25
1921	Glenn Creek near Salem, Oreg.	SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 20, T. 7 S., R. 3 W., at culvert on Glenn Creek road near intersection with Ferry road, 1.5 miles northwest of Salem.	2.72	1952-60	2- 9-60	16.45	48
1922	Gibson Creek near Salem, Oreg.	SE $\frac{1}{4}$ sec. 8, T. 7 S., R. 3 W., at culvert on Gibson Road, 0.8 mile above mouth and 2.5 miles northwest of Salem.	4.83	1952-60	2- 9-60	13.34	86
1928	South Yamhill River tributary near Willamina, Oreg.	SW $\frac{1}{4}$ sec. 18, T. 6 S., R. 6 W., at culvert on State Highway 22, 2 miles above mouth and 3 miles southeast of Willamina.	1.81	1954-60	3-29-60	10.30	138
1973	Panther Creek near Carlton, Oreg.	SW $\frac{1}{4}$ sec. 18, T. 3 S., R. 5 W., at diversion dam 1.6 miles above Fall Creek and 9 miles west of Carlton.	3.19	1953-60	2- 9-60	13.24	140
1997	Bull Creek near Colton, Oreg.	NE $\frac{1}{4}$ sec. 6, T. 5 S., R. 3 E., at culvert on State Highway 211, 300 ft above mouth and 2.2 miles west of Colton.	4.16	1957-60	2- 9-60	12.81	62
2038	Beaver Creek near Glenwood, Oreg.	SW $\frac{1}{4}$ sec. 10, T. 2 N., R. 5 W., at culvert on county road, 1.7 miles northwest of Glenwood and 2.5 miles above mouth.	4.70	1952-60	2- 9-60	16.21	224
2041	Bateman Creek near Glenwood, Oreg.	SE $\frac{1}{4}$ sec. 26, T. 2 N., R. 5 W., at culvert on State Highway 6 at mouth, 1.5 miles south of Glenwood.	1.34	1952-60	2- 9-60	11.27	43
2091	Kink Creek near Government Camp, Oreg.	SW $\frac{1}{4}$ sec. 4, T. 6 S., R. 7 E., at culvert 0.1 mile below Kelly Creek, 0.2 mile above mouth at Lake Harriet, and 19 miles southwest of Government Camp.	3.75	1957-60	2- 9-60	16.18	51
2099	DuBois Creek at Estacada, Oreg.	NW $\frac{1}{4}$ sec. 29, T. 3 S., R. 4 E., at culvert 0.4 mile above mouth and 0.5 mile southwest of Estacada.	2.52	1957-60	2- 8-60	16.42	42
2108	Rock Creek near Boring, Oreg.	SW $\frac{1}{4}$ sec. 32, T. 1 S., R. 3 E., at culvert on Foster Road, 1.5 miles northwest of Damascus and 4.5 miles west of Boring.	2.25	1957-60	2- 9-60	52.48	75
2118	Saltzman Creek at Portland, Oreg.	SE $\frac{1}{4}$ sec. 13, T. 1 N., R. 1 W., at culvert at intersection of N. W. Balboa and Culebra Streets in Portland, 0.3 mile above mouth.	1.46	1952-60	1-28-60	11.64	44
Lake River basin							
2119	Burntbridge Creek at Vancouver, Wash.	SW $\frac{1}{4}$ sec. 14, T. 2 N., R. 1 E., at F Street 0.3 mile east of new U. S. Highway 99 at north city limits of Vancouver.	22.2	1949-60	2-15-60	a6.80	50
Lewis River basin							
2183	Dog Creek at Cougar, Wash.	SE $\frac{1}{4}$ sec. 33, T. 7 N., R. 4 E., at State Highway 0.6 mile west of Cougar.	2.31	1956, 1958-60	1-28-60	a11.90	203
2227	East Fork Lewis River tributary near Woodland, Wash.	SE $\frac{1}{4}$ sec. 5, T. 4 N., R. 1 E., at U. S. Highway 99, 3.7 miles southeast of Woodland.	.53	1950-60	3-29-60	a8.20	44
Unnamed Tributary to Columbia River							
2238	Columbia River tributary at Carrols, Wash.	SW $\frac{1}{4}$ sec. 19, T. 7 N., R. 1 W., at old U. S. Highway 99 at Carrols.	1.06	1950-60	11-21-60	a17.08	44
Cowlitz River basin							
2268	Skate Creek tributary near Packwood, Wash.	NW $\frac{1}{4}$ sec. 16, T. 14 N., R. 8 E., on Skate Creek road $\frac{9}{2}$ miles northwest of Packwood.	1.32	1959-60	11-22-59	a16.48	130
2269	Skate Creek tributary No. 2 near Packwood, Wash.	NE $\frac{1}{4}$ sec. 26, T. 14 N., R. 8 E., on Skate Creek road 6 miles northwest of Packwood.	2.03	1959-60	11-22-59	a12.58	158

a See note on page 295 for datum change.

h Diversion flow negligible.

## Annual maximum discharge at crest-stage partial-record stations--Continued

Annual maximum discharge at crest-stage partial record stations contained							Annual maximum	
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Date	Gage height (feet)	Discharge (cfs)	
Cowlitz River basin--Continued								
2311	Mill Creek at Randle, Wash.	SE $\frac{1}{4}$ sec.8, T.12 N., R.7 E., at Main Street (formerly State Highway 5) at Randle.	2.95	1950-60	11-20-59	a15.39	133	
2320	Miggerhead Creek near Randle, Wash.	SE $\frac{1}{4}$ sec.20, T.11 N., R.8 E., 1 mile above mouth and $\frac{1}{2}$ miles southeast of Randle.	66.3	1951-53, 1954-60	11-23-59	4.16	1,790	
2353	Tilton River near Mineral, Wash.	N $\frac{1}{2}$ sec.32, T.14 N., R.5 E., at State Highway 5, 4.1 miles south of Mineral.	.79	1950-60	12-15-59	a20.70	89	
2391	North Fork Lacamas Creek near Ethel, Wash.	SE $\frac{1}{4}$ sec.6, T.12 N., R.1 E., at county road 1.5 miles northeast of Ethel.	.36	1950-60	11-22-59	a21.28	28	
2397	Olequa Creek tributary near Winlock, Wash.	SE $\frac{1}{4}$ sec.5, T.11 N., R.2 W., at county road 2.4 miles south of Winlock.	.38	1950-60	11-22-59	a16.55	12	
2426	Toutle River tributary near Castle Rock, Wash.	NW $\frac{1}{4}$ sec.30, T.10 N., R.1 W., at Tower road 4 miles northeast of Castle Rock.	.64	1950-60	11-22-59	a18.39	25	
Brooks Slough basin								
2479	Risk Creek near Skamokawa, Wash.	NW $\frac{1}{4}$ sec.23, T.9 N., R.6 W., at private driveway off old highway 830, 1,000 ft west of old Risk Channel and 3.0 miles southeast of Skamokawa.	1.13	1949-60	11-22-59	a9.51	151	
Necanicum River basin								
2990	South Fork Necanicum River near Seaside, Oreg.	NW $\frac{1}{4}$ sec.29, T.5 N., R.9 W., at diversion dam on Hollenback road, 1.4 miles (revised) above mouth and 8 miles southeast of Seaside.	7.99	1953-60	3-15-60	7.47 h1	610	
Asbury Creek basin								
2995	Asbury Creek near Cannon Beach, Oreg.	SW $\frac{1}{4}$ sec.19, T.4 N., R.10 W., at culvert on U. S. Highway 101 at Arch Cape, 0.1 mile above mouth and 6 miles south of Cannon Beach.	1.97	1952-60	2- 9-60	8.57	231	
Nehalem River basin								
3002	Oak Ranch Creek near Vernonia, Oreg.	NW $\frac{1}{4}$ sec.1, T.5 N., R.4 W., at culvert on county road, 1.9 miles above mouth and 7 miles north of Vernonia.	11.6	1959-60	11-23-59	14.18	200	
Patterson Creek basin								
3014	Patterson Creek at Bay City, Oreg.	SE $\frac{1}{4}$ sec.34, T.1 N., R.10 W., at culvert on U. S. Highway 101 in Bay City, 0.3 mile above mouth.	1.87	1952-60	2- 9-60	11.05	74	
Salmon River basin								
3037	Alder Brook near Rose Lodge, Oreg.	SE $\frac{1}{4}$ sec.25, T.6 S., R.10 W., at culvert on State Highway 18, 0.1 mile above mouth and 1.5 miles northeast of Rose Lodge.	1.09	1954-60	2- 9-60	10.87	51	
Alsea River basin								
3068.5	South Fork Weiss Creek near Waldport, Oreg.	SW $\frac{1}{4}$ sec.33, T.13 S., R.11 W., at diversion dam 0.1 mile above mouth and 3.5 miles southeast of Waldport.	0.33	1953-60	2- 9-60	6.08	h8.6	
Siusslaw River basin								
3075.5	Deadwood Creek tributary at Alpha, Oreg.	SE $\frac{1}{4}$ sec.18, T.16 S., R.8 W., at culvert on county road, 500 ft above mouth and 0.5 mile north of Alpha.	0.75	1957-60	2- 9-60	17.35	46	
3076.1	Siusslaw River tributary near Rain-Rock, Oreg.	NW $\frac{1}{4}$ sec.27, T.17 S., R.10 W., at culvert on State Highway 36 at mouth, 1.3 miles west of Rain-rock.	.42	1957-60	2- 9-60	6.57	13	
Umpqua River basin								
3089	Canyon Creek at Canyonville, Oreg.	SE $\frac{1}{4}$ sec.34, T.30 S., R.5 W., at dam near U. S. Highway 99, 0.5 mile south of Canyonville and 2.5 miles above mouth.	36.9	1951, 1953-60	2- 9-60	24.55	1,620	
3109	West Fork Frozen Creek near Myrtle Creek, Oreg.	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.32, T.28 S., R.4 W., at culvert on Frozen Creek Road, 6.2 miles northeast of Myrtle Creek.	3.16	1955-60	2- 9-60	17.91	144	

\* Operated as a continuous-record gaging station.

a See note on page 295 for datum change.

h Diversion flow negligible.

## 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)
Umpqua River basin--Continued							
3121	Parrott Creek at Roseburg, Ore.	NE $\frac{1}{4}$ sec.25, T.27 S., R.6 W., at culvert on Starmer Street in Roseburg, 0.5 mile above mouth.	2.42	1952-60	2- 8-60	12.05	128
3123	Marks Creek near Roseburg, Ore.	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.3, T.27 S., R.6 W., at culvert on Garden Valley Road, 1 mile above mouth and 3.8 miles northwest of Roseburg.	1.26	1952-60	2- 9-60	12.47	95
3171	Susan Creek near Idleyld, Ore.	NW $\frac{1}{4}$ sec.23, T.26 S., R.2 W., at culvert on North Umpqua River Highway, at mouth in Susan Creek State Park, 6 miles east of Idleyld.	4.86	1957-60	2- 8-60	12.78	100
3178	Cavitt Creek near Peel, Ore.	NE $\frac{1}{4}$ sec.14, T.27 S., R.3 W., 1.5 miles above mouth and 1.5 miles south of Peel.	56.9	1956-60	3- 7-60	15.1	1,450
3186	North Umpqua River tributary near Glide, Ore.	SE $\frac{1}{4}$ sec.9, T.26 S., R.4 W., at culvert on county road, 0.1 mile above mouth and 3.7 miles northwest of Glide.	.75	1956-60	2- 8-60	10.83	31
3206	Cabin Creek tributary near Oakland, Ore.	SE $\frac{1}{4}$ sec.32, T.24 S., R.5 W., at culvert on U. S. Highway 99, 0.2 mile above mouth and 1 mile northwest of Oakland.	1.28	1957-60	5-26-60	10.83	(†)
3219	Yoncalla Creek near Yoncalla, Ore.	SW $\frac{1}{4}$ sec.27, T.22 S., R.5 W., 1.5 miles above mouth and 1.8 miles north of Yoncalla.	26.0	1956-60	2- 9-60	12.54	1,120
3224	Pass Creek near Drain, Ore.	NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.34, T.21 S., R.5 W., 0.2 mile below Sand Creek and 3 miles northeast of Drain.	k61.9	1956-60	2- 9-60	8.21	1,900
3227	Bear Creek near Drain, Ore.	NW $\frac{1}{4}$ sec.25, T.22 S., R.6 W., at diversion dam 0.8 mile below Lost Cabin Creek and 3.5 miles southwest of Drain.	5.13	1952-60	2- 9-60	14.10	h180
Tenmile Creek basin							
3233	Eel Creek at Lakeside, Ore.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.13, T.23 S., R.13 W., at Lakeside Junction 0.8 mile west of Lakeside.	e11	1958-60	2-10-60	2.41	98
Coquille River basin							
3266	Gettys Creek near Myrtle Point, Ore.	SW $\frac{1}{4}$ sec.35, T.29 S., R.13 W., at culvert on county road, 0.2 mile above mouth and 5.5 miles southwest of Myrtle Point.	1.45	1953-60	2- 8-60	10.48	78
Geiger Creek basin							
3271	Geiger Creek near Bandon, Ore.	SE $\frac{1}{4}$ sec.32, T.28 S., R.14 W., at culvert on county road, 1.1 miles (revised) above mouth and 1.8 miles southeast of Bandon.	1.36	1954-60	2- 8-60	19.04	52
Brush Creek basin							
3274	Dry Run Creek near Port Orford, Ore.	NW $\frac{1}{4}$ sec.25, T.33 S., R.15 W., at culvert in Humbug State Park at mouth, 5 miles southeast of Port Orford.	0.86	1954-60	3- 5-60	13.66	45
Rogue River basin							
3350.7	Rogue River tributary near McLeod, Ore.	SE $\frac{1}{4}$ sec.27, T.33 S., R.1 E., at culvert on State Highway 62 in McLeod State Park at mouth, 1 mile north of McLeod.	0.50	1957-60	2- 8-60	14.60	(†)
3392	Rogue River tributary near Sams Valley, Ore.	SW $\frac{1}{4}$ sec.24, T.35 S., R.2 W., at culvert on State Highway 234, 4.5 miles east of Sams Valley.	6.42	1959-60	2- 8-60	15.64	357
3530	West Fork Ashland Creek near Ashland, Ore.	W $\frac{1}{2}$ NW $\frac{1}{4}$ sec.28, T.39 S., R.1 E., at dam above Reader Reservoir, 2.4 miles south of Ashland.	10.5	1925-32 <sup>a</sup> , 1954-60	2- 8-60	13.32	m36
3535	East Fork Ashland Creek near Ashland, Ore.	E $\frac{1}{2}$ NW $\frac{1}{4}$ sec.28, T.39 S., R.1 E., at dam above Reader Reservoir, 2.2 miles south of Ashland.	8.14	1925-32 <sup>a</sup> , 1954-60	2- 8-60	3.75	m40
3613	Jones Creek near Grants Pass, Ore.	SE $\frac{1}{4}$ sec.16, T.36 S., R.5 W., at dam 200 ft below "A" Street bridge, 0.8 mile above mouth, and 2 miles east of Grants Pass.	7.41	1952-60	3- 7-60	12.11	182
3698	Butcherknife Creek near Wonder, Ore.	NE $\frac{1}{4}$ sec.19, R.37 S., R.7 W., at culvert near U. S. Highway 199, 0.5 mile above mouth and 2 miles southwest of Wonder.	3.07	1953-60	2- 8-60	14.99	206
3700	Slate Creek at Wonder, Ore.	SW $\frac{1}{4}$ sec.10, T.37 S., R.7 W., 0.4 mile east of Wonder and 0.5 mile above Elliott Creek.	31.4	1944-57 <sup>a</sup> , 1958-60	2- 8-60	6.54	1,800

† Discharge not determined.

\* Operated as a continuous-record gaging station.

e Approximately.

h Diversion flow negligible.

j From graph based on twice-daily staff-gage readings.

k At measuring bridge 3 miles below gage.

m Includes estimated diversion flow.

## Annual maximum discharge at crest-stage partial-record stations--Continued

Annual maximum discharge at first-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)
Rogue River basin--Continued							
3702	Round Prairie Creek near Wilderville, Oreg.	SW $\frac{1}{4}$ sec.2, T.37 S., R.7 W., at culvert on U. S. Highway 199, 0.1 mile above mouth and 1.5 miles west of Wilderville.	3.16	1953-60	2- 8-60	4.14	70
3778	Snailback Creek near Selma, Oreg.	NW $\frac{1}{4}$ sec.7, T.38 S., R.8 W., at culvert on county road, 0.5 mile above mouth and 4.2 miles west of Selma.	1.62	1956-60	2- 8-60	91.02	65
Harris Creek basin							
3788	Harris Creek near Brookings, Oreg.	NE $\frac{1}{4}$ sec.36, T.40 S., R.14 W., at culvert on U. S. Highway 101, 0.4 mile above mouth and 1.9 miles northwest of Brookings.	1.05	1954-60	5-26-60	15.92	136
Ransom Creek basin							
3789	Ransom Creek near Brookings, Oreg.	NE $\frac{1}{4}$ sec.1, T.41 S., R.14 W., at culvert on U. S. Highway 101, 0.1 mile (revised) above mouth and 1.2 miles northwest of Brookings.	0.74	1953-60	3- 5-60	24.67	83

Note.--To correct gage heights published in WSP 1568 and 1638 to the datum used in this report, add figures shown in this table to previously published gage height. The figures listed in this table are equal to 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)
159	1956-59	6.18	2183	1956,	7.78
166	1955-59	9.88		1956-59	
166.5	1957-59	14.14	2227	1950-59	5.58
172	1955-59	2.45	2238	1950-59	14.58
191	1956, 1958	14.55	2268	1959	9.55
1252	1949-59	5.68	2269	1959	7.34
1263	1950-55,	16.51	2311	1950-59	12.44
	1956-59	17.54	2353	1950-59	17.56
1432	1949-59	3.51	2391	1950-59	16.70
1445.5	1950-59	14.73	2397	1950-59	14.92
1446	1958-59	2.14	2426	1950-59	16.25
2119	1949-59	3.36	2479	1949-56,	Different site
				1957, 1959	
					3.44

## 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 1950

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)
Umatilla River basin						
Meacham Creek	Umatilla River	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.31, T.3 N., R.36 E., 0.5 mile northeast of Gibbon, Oreg.	177	1907, 1910, 1912-13, 1952-57	7-14-60	*17.6
John Day River basin						
Canyon Creek.	John Day River	NW $\frac{1}{4}$ sec.25, T.14 S., R.31 E., 4 miles south of Canyon City, Oreg.	100	1905-6, 1908-9, 1914-15, 1936, 1951-53, 1955-59	8- 9-60	*4.21
South Fork John Day River.	.....do.....	NE $\frac{1}{4}$ sec.24, T.13 S., R.26 E., 3 miles south of Dayville, Oreg.	a590	1948, 1951, 1952-56*, 1957-59	8-11-60	*21.6
Rock Creek...	.....do.....	NE $\frac{1}{4}$ sec.21, T.12 S., R.25 E., 7 miles northwest of Dayville, Oreg.	292	1934, 1948-59	8-12-60	*2.19
Desolation Creek.	North Fork John Day River.	SW $\frac{1}{4}$ sec.6, T.7 S., R.32 E., 1.5 miles east of Dale, Oreg.	108	1915-17*, 1949-58†, 1959	8-11-60	*7.93
North Fork John Day River.	John Day River	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.35, T.6 S., R.31 E., $\frac{1}{2}$ mile northeast of Dale, Oreg.	525	1930-58†, 1959	8-11-60	*60.2
Cable Creek..	Camas Creek...	Near line between secs.9 and 10, T.5 S., R.32 E., 1,000 ft above mouth and 5 miles northeast of Ukiah, Oreg.	a39	1914-17*, 1920-24†, 1932-37*, 1939*, 1942-49, 1951-53, 1955-59	8-11-60	*.74
Fox Creek....	North Fork John Day River.	SW $\frac{1}{4}$ sec.8, T.11 S., R.29 E., 6 miles southwest of Fox, Oreg.	90.2	1931-58†, 1959	8-11-60	0
Deschutes River basin						
Deschutes River.	Columbia River	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.28, T.21 S., R.8 E., below Sheep Springs near Lapine, Oreg.	256	1938-49†, 1950-57	3-30-60 6-21-60 7-21-60 9-20-60	b382 b721 b728 b801
Davis Creek tributary (formerly unnamed tributary)	Davis Creek...	SE $\frac{1}{4}$ sec.5, T.22 S., R.8 E., 50 ft above junction on north side of Davis Creek and 15 miles west of Lapine, Oreg.	-	1944, 1946, 1949, 1951, 1955	9- 1-60	*15.7
Davis Creek..	Deschutes River.	SE $\frac{1}{4}$ sec.5, T.22 S., R.8 E., below Big Spring 15 miles west of Lapine, Oreg.	141	1946-51, 1954-56	9- 1-60 9-20-60	*209 *218
Deschutes River.	Columbia River	NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.14, T.15 S., R.12 E., at Cline Falls 4 miles west of Redmond, Oreg.	2,080	1910-13*, 1914-15, 1926-27, 1928-46†	8- 2-60	88.2
Willamette River basin						
McKenzie River.	Willamette River.	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.10, T.17 S., R.1 E., at Baxter mintfield, 0.5 mile east of Leaburg, Oreg.	1,009	1954, 1956, 1958	6-29-60 7-18-60 8- 1-60	664 609 534
Do.....	.....do.....	NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.26, T.17 S., R.1 W., at Emmrich bridge 1.5 miles east of Walterville, Oreg.	1,052	1952, 1954, 1956, 1958	6-29-60 7-18-60 7-18-60	948 478 562
Cowlitz River basin						
Klickitat Creek.	Cowlitz River.	SE $\frac{1}{4}$ sec.10, T.12 N., R.2 E., at highway crossing 3 miles west of Mossyrock, Wash.	-	1950	1-18-60	19.9
Salmon River basin						
Slick Rock Creek.	Salmon River..	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.6, T.7 S., R.9 W., 2 miles southeast of Rose Lodge, Oreg.	a7.3		9-22-60	*5.2
Trout Creek..	Slick Rock Creek.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.1, T.7 S., R.10 W., at mouth 1 mile southeast of Rose Lodge, Oreg.	a5.5		9-22-60	*3.4

\* Base flow.

† Operated as a continuous-record gaging station.

a Approximately.

b Subtracting flow at Deschutes River below Crane Prairie Reservoir (see p. 52) leaves base flow from intervening springs.

## Discharge measurements made at miscellaneous sites during water year 1960--Continued

Discharge measurements made at miscellaneous sites during water year 1950-Continued						
Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Dee River basin						
Rock Creek...	Devils Lake...	SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.12, T.7 S., R.11 W., at city pump 1 mile east of Oceanlake, Oreg.	a3.0		9-22-60	*2.4
Umpqua River basin						
Cavitt Creek.	Little River..	NE $\frac{1}{4}$ sec.14, T.27 S., R.3 W., 1.5 miles above mouth, 1.5 miles south of Peel, and 8.8 miles southeast of Glide, Oreg.	56.9	1955-59	11- 6-59 12-14-59 2- 4-60 3-10-60 5- 6-60 5-16-60 6- 1-60 6- 6-60 6-13-60 6-20-60 6-27-60 7- 8-60 7-12-60 8-23-60	*15.9 *55.6 271 479 142 100 *112 *63.9 *39.4 *30.8 *25.4 *16.0 *15.4 16.4
Yoncalla Creek.	Elk Creek.....	SW $\frac{1}{4}$ sec.27, T.22 S., R.5 W., 1.5 miles above mouth, 1.8 miles north of Yoncalla, and 3.3 miles southeast of Drain, Oreg.	26.0	1955-59	10- 1-59 11-10-59 12-22-59 2-11-60 3-24-60 4-26-60 6- 6-60 8-31-60	0 *.02 *1.48 181 *27.3 *55.9 *16.5 0
Pass Creek...	.....do.....	NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.34, T.21 S., R.5 W., 0.2 mile below Sand Creek and 3 miles northeast of Drain, Oreg.	61.9	1955-59	10- 1-59 10- 7-59 11-10-59 11-19-59 12-18-59 1- 8-60 2- 2-60 2- 3-60 2- 8-60 3-24-60 4-26-60 6- 6-60 7-20-60 8-31-60	*1.74 *1.60 *4.04 *3.04 *9.26 103 227 183 1,150 *84.5 *122 *64.4 *3.45 *.66
Smith River..	Umpqua River..	SE $\frac{1}{4}$ sec.31, T.21 S., R.9 W., at Smith River Falls 16 miles northeast of Reedsport, Oreg.	-		7-25-60	38.8
Termile Creek basin						
Eel Creek....	Termile Creek.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.13, T.23 S., R.13 W., at Lakeside Junction $\frac{1}{4}$ mile west of Lakeside, Oreg.	all	1957-59	10-12-59 11-16-59 12-28-59 2-11-60 3-30-60 5- 2-60 6-14-60 7-26-60 9- 6-60	8.02 *5.84 *17.5 88.8 45.8 *28.1 *20.7 *6.10 *3.78
North Slough basin						
North Slough (known locally as Bear Creek)	Pacific Ocean.	SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.7, T.24 S., R.12 W., 3 miles northeast of Hauser, Oreg.	2.42	1958-59	5- 5-60 9-14-60	*5.62 *.45
Left Branch of North Fork North Slough (known locally as North Slough)	North Slough..	NW $\frac{1}{4}$ sec.1, T.24 S., R.13 W., 0.2 mile above confluence with Right Branch and 2 miles northeast of Hauser, Oreg.	1.71	1958-59	5- 2-60 9-14-60	*4.12 .37
Coquille River basin						
North Fork Coquille River.	Coquille River	NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.29, T.26 S., R.11 W., below Neely Creek 11 miles southeast of Coos Bay, Oreg.	28.5	1958-59	9-14-60	*5.27
Do.....	.....do.....	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.22, T.28 S., R.12 W., at Fox bridge 5 miles southeast of Coquille, Oreg.	134	1958-59	9-14-60	*10.4
Do.....	.....do.....	NW $\frac{1}{4}$ sec.36, T.28 S., R.12 W., 4.5 miles northeast of Myrtle Point, Oreg.	276	1929-46*, 1949-52, 1958-59	9-13-60	*31.7

\* Base flow.

† Operated as a continuous-record gaging station.

a Approximately.

## Discharge measurements made at miscellaneous sites during water year 1960--Continued

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)
Rogue River basin						
Silver Creek.	Illinois River	SW $\frac{1}{4}$ sec. 16, T.36 S., R.11 W., at mouth 8 miles southeast of Agness, Oreg.	80.6	1956, 1958-59	9- 8-60	34.1
Indigo Creek.	.....do.....	NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 4, T.36 S., R.11 W., 0.6 mile above mouth and 5 miles southeast of Agness, Oreg.	63.0	1958-59	9- 8-60	*21.8
Rogue River..	Pacific Ocean.	NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 6, T.35 S., R.11 W., 1.5 miles north of Agness, Oreg., and 2.5 miles upstream from Illinois River.	a3,800		10-16-59 2-24-60 7- 7-60	*1,530 *3,980 *1,640
Illinois River.	Rogue River...	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 29, T.35 S., R.11 W., 1.4 miles upstream from Fox Creek and 2.7 miles southeast of Agness, Oreg.	993		5-11-60	*3,570

\* Base flow.

a Approximately.

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