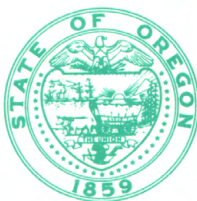
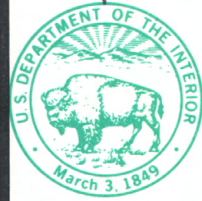


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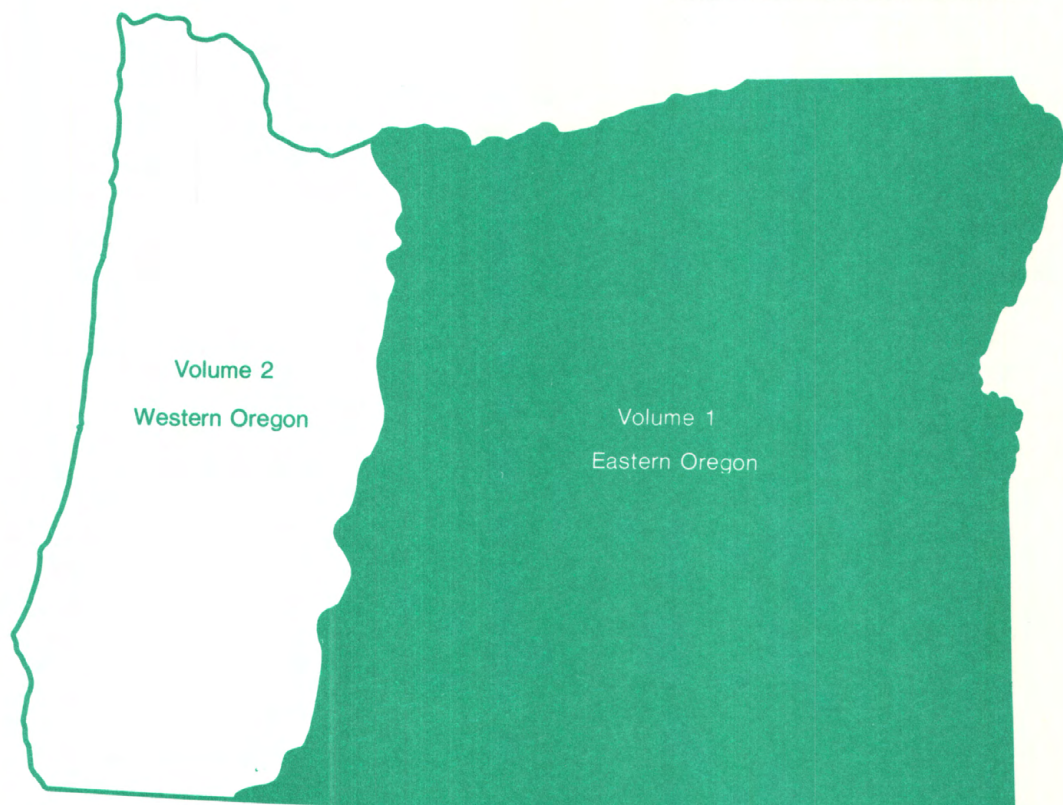
Water Resources Data Oregon Water Year 1990

Volume 1. Eastern Oregon

U.S. GEOLOGICAL SURVEY
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Prepared in cooperation with the Oregon Water Resources
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CALENDAR FOR WATER YEAR 1990

1989

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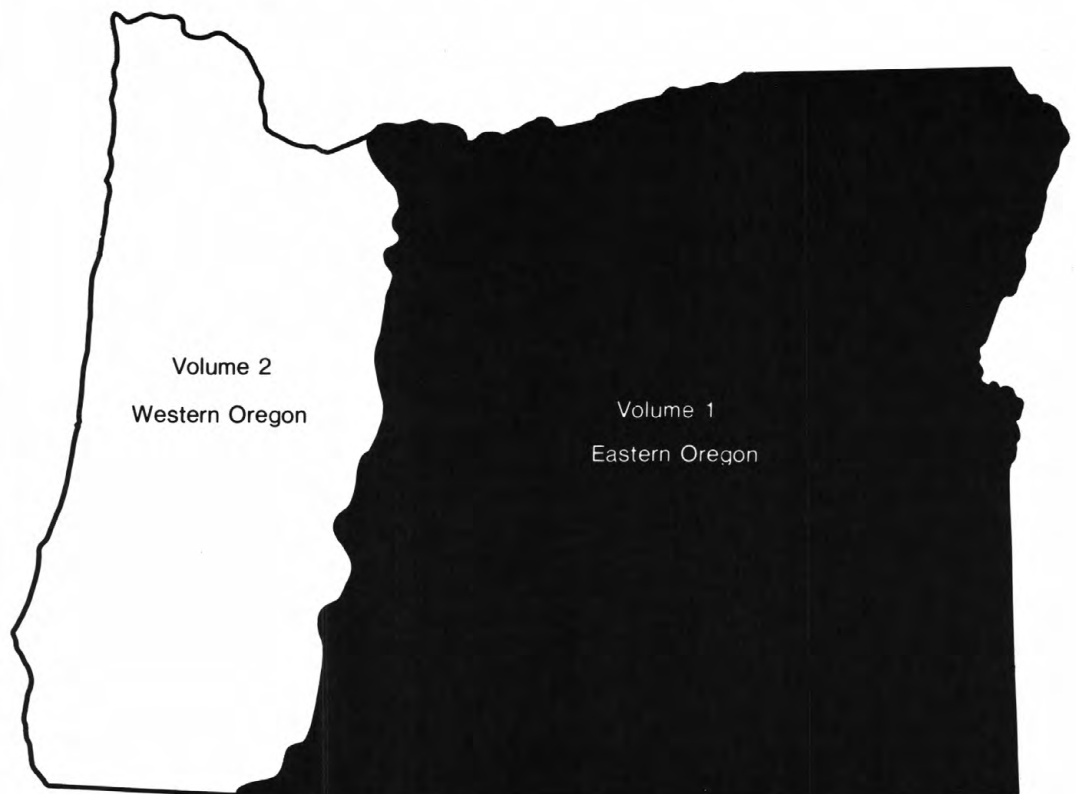
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Water Resources Data Oregon Water Year 1990

Volume 1. Eastern Oregon

by L.E. Hubbard, C.G. Kroll, T.A. Herrett, R.L. Kraus, and G.P. Ruppert



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OR-90-1
Prepared in cooperation with the Oregon Water Resources
Department and with other agencies

U.S. DEPARTMENT OF THE INTERIOR

MANUEL LUJAN, JR., Secretary

U.S. GEOLOGICAL SURVEY

Dallas L. Peck, Director

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U.S. Geological Survey
10615 S. E. Cherry Blossom Drive
Portland, Oregon 97216

1991

PREFACE

This volume of the annual Oregon hydrologic data report is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface- and ground-water data-collection networks in each State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by State, local and Federal agencies, and the private sector for developing and managing our Nation's land and water resources. Hydrologic data for Oregon are contained in two volumes as follows:

Volume 1: Eastern Oregon
Volume 2: Western Oregon

The report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who edited and assembled the reports. In addition to the authors, who had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines, the following individuals contributed significantly to the collection, processing, and tabulation of the data:

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This report was prepared in cooperation with the State of Oregon and with other agencies under the general supervision of Marvin O. Fretwell, District Chief, Oregon, Garald G. Parker, Jr., Assistant Regional Hydrologist, Pacific Northwest Area, and T. John Conomos, Regional Hydrologist, Western Region.

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16. Abstract (Limit: 200 words) Water Resources Data for the 1990 water year for Oregon consist of records of stage, discharge, and water quality of streams; and stage, contents, and water quality of lakes and reservoirs. This report, in two volumes, contains discharge records for 246 gaging stations; stage only records for 10 gaging stations; stage and contents for 37 lakes and reservoirs; water quality for 47 stations, and water quality for 3 precipitation stations. Also included are 5 crest-stage, partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in Oregon.			
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Letter after station name designates type of data: (d) discharge; (e) elevation; (g) gage height; (v) contents; (c) chemical, including periodic biological, microbiological, sediment, pesticide, and radio-chemical where applicable; (s) daily suspended sediment; (t) water temperature; and (k) specific conductance.

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WATER RESOURCES DATA FOR OREGON 1990

INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with state agencies, obtains a large amount of data pertaining to the water resources of Oregon each water year. These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the Geological Survey, the data are published annually in this report series entitled "Water Resources Data - Oregon."

This report includes records on surface water in the State. Specifically, it contains: (1) Discharge records for 246 stream-gaging stations, stage only records for 10 gaging stations, 57 partial-record or miscellaneous streamflow stations, and 5 crest-stage, partial-record streamflow stations; (2) stage and content records for 37 lakes and reservoirs; and (3) water-quality records for 43 streamflow-gaging stations and 4 ungaged streamsites.

This series of annual reports for Oregon began with the 1961 water year with a report that contained only data relating to the quantities of surface water. For the 1964 water year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to present, in one or two volumes, data on quantities of surface water, quality of surface and ground water, and ground-water levels. In 1981, the annual report was divided into two volumes: Volume 1 described the activities for Eastern Oregon, while Volume 2 described the activities for Western Oregon. Beginning with the 1985 water year, presentation of ground-water levels in this report was discontinued.

Prior to introduction of this series and for several water years concurrent with it, water-resources data for Oregon were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States, Parts 10, 11, 13, and 14." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." These Water-Supply Papers may be consulted in the libraries of the principal cities of the United States, or if not out of print, may be purchased from the U.S. Geological Survey, Books and Open-File Reports, Federal Center, Building 41, Box 25425, Denver, CO 80225. For further ordering information, telephone (303) 236-7476.

Publications similar to this report are published annually by the Geological Survey for all states. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report OR-90-1" and "U.S. Geological Survey Water-Data Report OR-90-2." For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. For further ordering information, the Customer Inquiries telephone number is (703) 487-4650.

Additional information, including current prices, for ordering specific reports may be obtained from the District Chief at the address given on back of title page or by telephone (503) 231-2009.

COOPERATION

The U.S. Geological Survey and organizations of the State of Oregon have had cooperative agreements for the systematic collection of surface-water records since 1905. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreements with the Survey are:

State of Oregon Water Resources Department, W. F. Young, Director.
State of Oregon Department of Fish and Wildlife, Randy Fisher, Director.
Coos Bay-North Bend Water Board, P. A. Matson, General Manager.
Eugene Water and Electric Board, R. L. Berggren, General Manager.
Douglas County, M. J. Youngquist, Coordinator.
City of Ashland, Department of Public Works, S. M. Hall, Director.
City of McMinnville, J. L. Harshman, General Manager.
City of Portland, Bureau of Environmental Services, M. T. Nolan, Director.
City of Portland, Bureau of Water Works, Edward Tenny, Administrator.
The Confederated Tribes of the Umatilla Indian Reservation,
E. H. Patawa, Chairman, Board of Trustees.
The Confederated Tribes of the Warm Springs Indian Reservation,
Zane Jackson, Chairman of Tribal Council.

Assistance in the form of funds or services was provided by the Forest Service, U.S. Department of Agriculture; Corps of Engineers, U.S. Army; Bonneville Power Administration, U.S. Department of Energy; Bureau of Land Management, Bureau of Reclamation, Fish and Wildlife Service, National Park Service, U.S. Department of the Interior in collection of records for stage and discharge stations and water-quality stations published in this report.

The following organizations aided in collecting records for stations under Federal Energy Regulatory Commission licenses: Eugene Water & Electric Board; Idaho Power Co., Idaho; Middle Fork Irrigation District; Pacific Power Co.; Portland General Electric Co.

SUMMARY OF HYDROLOGIC CONDITIONS

Surface Water

The hydrology of Oregon is influenced by five mountain ranges with the Cascade Range providing a natural division between western and eastern Oregon. These ranges divide the state into drainage basins and greatly affect the distribution of precipitation. Hydrologic patterns are generally uniform from drainage basin to drainage basin throughout western Oregon; whereas in eastern Oregon, hydrologic patterns vary widely between drainage basins.

Western Oregon, which composes about one-third of the total area of the state, has a climate characterized by moderate temperatures, wet winters, and dry summers. About 80 percent of the precipitation occurs between October and March. Annual precipitation ranges from about 20 inches per year in the lower elevations in the southern part of the area to about 200 inches per year in the Coast and Cascade Ranges. In general, streamflow characteristics are similar, with most of the runoff and flooding on both large and small streams being caused by winter rains. Major floods have occurred when winter rains combine with melting snow.

Eastern Oregon has more complex hydrologic patterns than western Oregon. Precipitation is less than 10 inches per year in the semiarid regions, such as parts of the north-central area, the closed basin in south-central Oregon, and southeastern Oregon. The northeastern part of the state receives as much as 80 inches of precipitation per year, much of it occurring as snowfall. On large streams, flooding can result from winter rains and (or) seasonal snowmelt; in smaller drainage basins, flooding can result from winter rains, seasonal snowmelt, and convection storms.

Surface-water Conditions

Average to below average precipitation and snowpack resulted in below normal streamflow for the 1990 water year, a contrast to the previous year of normal conditions.

Precipitation averaged near normal in the northern third of the state and below normal for the southern third of the state. The lowest accumulation occurred in the Harney Basin (south-central Oregon) recording 63 percent of the 25-year average (1961-85).

Even though the Columbia Basin snowpack was near normal for the 1990 water year, there was a distinct north-south division. Oregon's January 1 snowpack was well below normal. By April 1st, only the Mt. Hood and western side of the Cascade Mountain range were reporting near normal snowpack. The eastern Oregon basins were reporting only 46 percent of average.

In southeastern Oregon, monthly streamflow averages at the Donner Und Blitzen River near Frenchglen (10396000) continued to be above average, as in the previous water year, until January. At that time, flows declined to the below normal range through the end of the water year. Flow during the snowmelt months of March through June were 54 percent of the 30-year median (1951-80 water years). The mean annual flow for this stream was 57 percent of the 30-year median. The Williamson River, in south-central Oregon, followed a similar pattern; flows were below average for each month of the water year. The mean annual flow for the Williamson River (11502500), near the town of Chiloquin, was 58 percent of the 30-year median. Monthly and annual mean discharges for these two gages are compared with the 30-year medians in figure 1a.

West of the Cascades, southern Oregon streams followed the same general pattern of below normal flows. The Umpqua River near Elkton (14321000) recorded an annual flow that was 59 percent of the 30-year median. June streamflow was the only month during the year above the 30-year median for this site.

The Wilson River, representative of the northern Oregon coastal basins, reported monthly flows which were average to below average with the exception of January, February, and June which were above average. The annual mean for the Wilson River at Tillamook (14301500) was 98 percent of the 30-year median. Figure 1b compares the 1990 water year monthly and annual mean discharges with the 30-year medians.

Peak discharges for the 1990 water year at selected Oregon sites are shown in Table 1. An intense January rainstorm swept across the extreme northern tip of Oregon's coast and continued into southern Washington. Heavy rains (6-9 inches in 48 hours) produced record flood events on the Nehalem River in Oregon and the Chehalis River in Washington. The maximum discharge of 53,400 ft³/s, recorded on January 9th at the Nehalem River at Foss (14301000), is the highest peak flow in the 51 years of record for this gage. The previous high was 46,900 ft³/s which occurred January 20, 1972.

Table 1.--Comparison of peak discharge for the 1990 water year with peak discharge for the period of record at long-term stations

Station number	Station name	Drainage area (mi ²)	Peak discharge 1990 water year Date	ft ³ /s	Exceedance probability	Peak discharge period of record Date	ft ³ /s
10396000	Donner und Blitzen near Frenchglen	a200	Apr. 28	460	<.90	Apr. 26, 1978	4,270
11502500	Williamson River below Sprague River, near Chiloquin	a3,000	Jan. 11	1,610	.86	Dec. 26, 1964	16,100
13181000	Owyhee River near Rome	a8,000	Mar. 4	7,340	---	Feb. 19, 1986	41,400
13214000	Malheur River near Drewsey	a910	Mar. 10	341	<.90	Dec. 23, 1964	12,000
13331500	Minam River at Minam	a240	June 10	1,960	<.90	June 16, 1974	6,260
14048000	John Day River at McDonald Ferry	a7,580	Apr. 29	6,860	<.90	Dec. 24, 1964	42,800
14137000	Sandy River near Marmot	262	Apr. 27	19,400	.25	Dec. 22, 1964	61,400
14178000	North Santiam River below Boulder Creek, near Detroit	216	Jan. 8	7,930	.45	Dec. 22, 1964	26,700
14301000	Nehalem River near Foss	667	Jan. 9	53,400	.01	Jan. 9, 1990	53,400
14321000	Umpqua River near Elkton	3,683	Jan. 8	82,600	.65	Dec. 23, 1964	265,000
14325000	South Fork Coquille River at Powers	169	Jan. 7	19,400	.30	Dec. 22, 1964	48,900

a Approximately.

< Less than indicated value.

NOTE.--Exceedance probability refers to the probability that an event will exceed a specific magnitude in a given time period. A flow of 200 ft³/s with an exceedance probability of 0.5 means that there is a 50 percent chance that the flow will exceed 200 ft³/s in any one year.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Bench-Mark Network is a network of more than 50 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in national or regional water-quality planning and management. The several hundred sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objective of NASQAN is to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting. The design of the network is intended to provide data for (1) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (2) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (3) a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150 station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Tritium network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

EXPLANATION OF THE RECORDS

The surface-water records published in this report are for the 1990 water year that began October 1, 1989, and ended September 30, 1990. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, and water-quality data for surface water. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

Station Identification Numbers

Each data station in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The two systems used by the U.S. Geological Survey to assign identification numbers for surface-water stations are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for surface-water stations where only miscellaneous measurements are made. Basin designation is based on the Hydrologic Unit Map for Oregon prepared in cooperation with the U.S. Water Resources Council (1974).

Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a mainstream station are listed before that station. A station on a tributary that enters between two mainstream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary with respect to the stream to which it is immediately tributary is indicated by an indentation in the "List of Stations" in the front of this report. Each indentation represents one rank. This downstream order and system of indentation show which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, 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 series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 14105700, which appears just to the left of the station name, includes the two-digit Part number "14" plus the six-digit downstream-order number "105700." The Part number designates the major river basin; for example, part "14" refers to the Pacific slope basins in Oregon and lower Columbia River basin.

Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharges may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records, but they are presented separately in this report.

Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relations between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relation between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

Continuous records of stage are obtained with analog recorders that trace continuous graphs of stage or with digital recorders that punch stage values on paper tapes at selected time intervals. Measurements of discharge are made with current meters using methods adapted by the Geological Survey that are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations (TWRI), Book 3, Chapter A6.

In computing discharge records, results of individual measurements are plotted against the corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating tables indicating the approximate discharge for any stage within the range of the measurements are prepared. If it is necessary to define extremes of discharge outside the range of the current-meter measurements, the curves are extended using: (1) logarithmic plotting; (2) velocity-area studies; (3) results of indirect measurements of peak discharge, such as slope-area or contracted-opening measurements, and computations of flow-over-dams or weirs; or (4) step-backwater techniques.

Daily mean discharges are computed by applying the daily mean stages (gage heights) to the stage-discharge curves or tables. 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 the individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curves or tables. This shifting-control method also is used if the stage-discharge relation is changed temporarily because of aquatic growth or debris on the control. For some stations, formation of ice in the winter may so obscure the stage-discharge relations that daily mean discharges must be estimated from other information such as temperature and precipitation records, notes of observations, and records for other stations in the same or nearby basins for comparable periods.

At some stream-gaging stations the stage-discharge relation is affected by the 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 computing discharge. The slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations an acoustic velocity meter (AVM) is used instead of the slope method. The AVM measures both water-surface elevation and velocity from which discharge can be computed directly.

In computing records of lake or reservoir contents, it is necessary to have information available from surveys, curves, or tables that define the relation of stage to content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relation changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relation. Discharges over lake or reservoir spillways are computed from stage-discharge relations much as other stream discharges are computed.

For some gaging stations there are periods when no gage-height record is obtained, or the validity of the recorded gage height is so questionable that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated from the recorded range in stage, previous or following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous or following record, inflow-outflow studies, and other information. Information explaining how estimated daily-discharge values are identified in station records is included in the next two sections, "Data Presentation" (REMARKS paragraph) and "Identifying Estimated Daily Discharge."

Data Presentation

The records published for each gaging station consist of two parts, the manuscript or station description and the data table for the current water year. The manuscript provides, under various headings, descriptive information, such as station location; period of record; average discharge; historical extremes; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments to follow clarify information presented under the various headings of the station description.

LOCATION.--Information on locations is obtained from the most accurate maps available. The location of the gage with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages are based on information developed by the Hydraulics and Hydrology Committee of the Pacific Northwest River Basins Commission.

DRAINAGE AREA.--Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

PERIOD OF RECORD.--This indicates the period for which there are published records for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not, and whose location was such that records from it can reasonably be considered equivalent with records from the present station.

REVISED RECORDS.--Published records, because of new information, occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted after the year dates as follows: "(M)" means the instantaneous maximum discharge was revised; "(m)" the instantaneous minimum was revised; and "(P)" the peak discharges were revised. If the drainage area has been revised, the report in which the most recently revised figure was first published is given.

GAGE.--The type of gage in current use, the datum of the current gage referred to National Geodetic Vertical Datum of 1929 (see "DEFINITION OF TERMS"), and a condensed history of the types, locations, and datums of previous gages are given under this heading.

REMARKS.--All periods of estimated daily-discharge record will either be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily-discharge table. (See next section, "Identifying Estimated Daily Discharge.") If a remarks statement is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, special methods of computation, conditions that affect natural flow at the station and, possibly, other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

AVERAGE DISCHARGE.--The discharge value given is the arithmetic mean of the water-year mean discharges. It is computed only for stations having at least 5 water years of complete record, and only water years of complete record are included in the computation. It is not computed for stations where diversions, storage, or other water-use practices cause the value to be meaningless. If water developments significantly altering flow at a station are put into use after the station has been in operation for a period of years, a new average is computed as soon as 5 water years of record have accumulated following the development.

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is information concerning major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the U.S. Geological Survey.

EXTREMES FOR CURRENT YEAR.--Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented under this heading. The peaks greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not published for canals, ditches, drains, or streams for which the peaks are subject to substantial control by man. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, and 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the Oregon office to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the "Remarks" and in the inclusion of a skeleton stage-capacity table when daily contents are given.

The daily table for stream-gaging stations gives mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also is usually 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 there is extensive regulation or diversion or if the drainage area includes large noncontributing areas. In the yearly summary below the monthly summary, the figures shown are the appropriate discharges for the calendar and water years. At some stations monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversions or reservoir contents are given. These figures are identified by a symbol and corresponding footnote.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of annual maximum stage and discharge at crest-stage stations, and the second is a table of discharge measurements at low-flow partial-record stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. 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.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual state data reports are identified either by flagging individual daily values with the letter symbol "e" and printing a table footnote, "e Estimated," or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

Accuracy of the Records

The accuracy of streamflow records 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 measurements of stage, measurements of discharge, and interpretation of records.

The accuracy attributed to the records is indicated under the "REMARKS" paragraph. "Excellent" means that about 95 percent of the daily discharges are within 5 percent of the true; "good," within 10 percent; and "fair," within 15 percent. Records that do not meet the criteria mentioned, are rated "poor." Different accuracies may be attributed to different parts of a given record. Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 ft³/s; the nearest tenth between 1.0 and 10 ft³/s; whole numbers between 10 and 1,000 ft³/s; and 3 significant figures for more than 1,000 ft³/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff because of the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation, or 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, changes in contents of reservoirs, or 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 if adjustments or losses are large in comparison with the observed discharge.

Other Records Available

Monthly records for several ungaged sites are given in a separate section following the gaged sites. The accuracy of records for ungaged sites is generally lower than that for gaged sites, depending on the precision of the computation method and the accuracy of data used in the computations. For most gaging stations, unpublished, detailed information, on file in the Oregon office, includes discharge measurements, gage-height records, and rating tables. Many gaging-station records in Oregon through 1982 have been analyzed to determine several statistical summaries: (1) The number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year.

Other Federal and State agencies have collected discharge data at other sites in Oregon during the current water year. Although these records have not been published by the U.S. Geological Survey, the National Water Data Exchange, NAWDEX, Water Resources Division, U.S. Geological Survey, National Center, Reston, VA 22092, maintains an index of these sites and will furnish information about them.

Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may involve a variety of types of data and measurement frequencies.

Classification of Records

Water-quality data for surface-water sites are grouped into one of three classifications. A continuing-record station is a site where data are collected on a regularly scheduled basis. Frequency may be one or more times daily, weekly, monthly, or quarterly. A partial-record station is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A miscellaneous sampling site is a location other than a continuing or partial-record station, where random samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between "continuing records" as used in this report and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently.

Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

On-site Measurements and Sample Collection

In obtaining water-quality data, it is important that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, treating the samples to prevent changes in quality pending analysis, and shipping the samples to the laboratory. Procedures for onsite measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," (TWRI), Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4. All of these references are listed under "PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS" in this report. Also, detailed information on collecting, treating, and shipping samples may be obtained from the Geological Survey Oregon office.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream Quality Accounting Network (see "DEFINITION OF TERMS") are obtained from at least several verticals. Whether samples are obtained from the centroid of flow or from several verticals, depends on flow conditions and other factors which must be evaluated by the collector.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the U.S. Geological Survey office whose address is given on the back of the title page of this report.

Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the Oregon office.

Sediment

Suspended-sediment concentrations are determined from samples collected by one of the standard sampling techniques discussed in TWRI, Book 3, Chapter C2, "Field methods for measurement of fluvial sediment." Samples are obtained using standard depth- or point-integrating samplers, or by means of an approved pumping sampler. Mean concentrations for the sampled cross section are in turn determined from these samples.

During periods of rapidly changing flow or rapidly changing suspended-sediment concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided-day method (time discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily discharges of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples were collected periodically. Although data collected periodically may represent conditions only at the time of observations, such data are useful in establishing seasonal relations between quality and streamflow and in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of suspended-sediment discharge, periodic measurements of particle-size distributions for the suspended-sediment, bed-load, and bed-material samples are included for stations where samples were obtained to measure this parameter.

Laboratory Measurements

Sediment samples, samples for biochemical-oxygen demand (BOD), samples for identification of biological populations, samples for indicator bacteria, and daily samples for specific conductance are analyzed locally. All other samples are analyzed in the Geological Survey laboratory in Arvada, Colorado. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the Geological Survey laboratory are given in TWRI, Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4.

In March 1989, the National Water-Quality Laboratory discovered a bias in the turbidimetric method for sulfate analysis, indicating that values below 75 mg/L have a median positive bias of 2 mg/L above the true value for the period between 1982 and 1989. Sulfate values in this report have not been corrected for this bias.

Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of "daily values" of specific conductance, pH, water temperature, dissolved oxygen, and suspended sediment then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information, as appropriate, is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.--Information on instrumentation is given only if a water-quality monitor, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.--Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

EXTREMES.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums or minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, WATSTORE, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

Remark Codes

The following remark codes may appear with the water-quality data in this report:

<u>PRINTED OUTPUT</u>	<u>REMARK</u>
E	Estimated value
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)

ACCESS TO WATSTORE DATA

The National WATER Data STorage and RETrieval System (WATSTORE) was established for handling water data collected through the activities of the U.S. Geological Survey and to provide for more effective and efficient means of releasing the data to the public. The system is operated and maintained on the central computer facilities of the Survey at its National Center in Reston, Virginia.

WATSTORE can provide a variety of useful products ranging from simple data tables to complex statistical analyses. A minimal fee, plus the actual computer cost incurred in producing a desired product, is charged to the requester. Information about the availability of specific types of data, the acquisition of data or products, and user charges can be obtained locally from each of the Water Resources Division's District offices (see address given on the back of the title page).

General inquiries about WATSTORE may be directed to:

Chief Hydrologist
U.S. Geological Survey
437 National Center
Reston, Virginia 22092

DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also table for converting English units to International System (SI) Units on the inside of the back cover.

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equal to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Adenosine triphosphate (ATP) is an organic, phosphate-rich, compound important in the transfer of energy in organisms. Its central role in living cells makes it an excellent indicator of the presence of living material in water. A measure of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter of the original water sample.

Algae are mostly aquatic single-celled, colonial, or multicelled plants, containing chlorophyll and lacking roots, stems, and leaves.

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample.

Aquifer is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian means confined and is used to describe a well in which the water level stands above the top of the aquifer tapped by the well. A flowing artesian well is one in which the water level is above the land surface.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, while others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35°C. In the laboratory these bacteria are defined as all the organisms that produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35°C plus or minus 1.0°C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 milliliters (mL) of sample.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warmblooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5°C plus or minus 0.2°C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found also in the intestine of warmblooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C plus or minus 1.0°C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Base flow. See Base runoff.

Base runoff refers to sustained or fair weather runoff. In most streams, base runoff is composed largely of ground-water effluent. The term base flow is often used in the same sense as base runoff. However, the distinction is the same as that between streamflow and runoff. When the concept in the terms base flow and base runoff is that of the natural flow in a stream, base runoff is the logical term.

Bed material is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by micro-organisms, such as bacteria.

Biomass is the amount of living matter present at any given time, expressed as the mass per unit area or volume of habitat.

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500°C for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in grams per cubic meter (g/m^3), and periphyton and benthic organisms in grams per square meter (g/m^2).

Dry mass refers to the mass of residue present after drying in an oven at 105°C for zooplankton and periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry-mass values are expressed in the same units as ash mass.

Organic mass or volatile mass of the living substance is the difference between the dry mass and the ash mass and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash and dry mass.

Wet mass is the mass of living matter plus contained water.

Bottom material: See Bed material.

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually milliliters (mL) or liters (L).

Chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water, and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with natural water color or with carbonaceous organic pollution from sewage or industrial wastes.

Chlorophyll refers to the green pigments of plants. Chlorophyll a and b are the two most common green pigments in plants.

Color unit is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

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

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, an artificial structure, or a uniform cross section over a long reach of the channel.

Control structure as used in this report is a structure on a stream or canal that is used to regulate the flow or stage of the stream or to prevent the intrusion of salt water.

Cubic foot per second (ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Cubic foot per second-day [$(\text{ft}^3/\text{s})/\text{d}$] 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, approximately 1.9835 acre-feet, about 646,000 gallons, or 2,445 cubic meters.

Cubic feet per second per square mile [$(\text{ft}^3/\text{s})/\text{mi}^2$] 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.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment) that passes a given point within a given period of time.

Mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period.

Instantaneous discharge is the discharge at a particular instant of time.

Dissolved refers to that material in a representative water sample which passes through a 0.45-um membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

Dissolved-solids concentration of water is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

Drainage area of a stream at a specified location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations and is expressed as the equivalent concentration of calcium carbonate (CaCO_3).

Hydrologic Bench-Mark Network is a network of more than 50 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an eight-digit number.

Land-surface datum (lsd) is a datum plane that is approximately at land surface at each ground-water observation well.

Measuring point (MP) is an arbitrary permanent reference point from which the distance to the water surface in a well is measured to obtain the water level.

Metamorphic stage refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult form. This developmental process exists for most insects, and the degree of difference from the immature stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-adult or egg-nymph-adult.

Methylene blue active substances (MBAS) are apparent detergents. The determination depends on the formation of a blue color when methylene blue dye reacts with synthetic anionic detergent compounds.

Micrograms per gram (ug/g) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

Micrograms per liter (UG/L, ug/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represents the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in mg/L and is based on the mass of dry sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in national or regional water-quality planning and management. The several hundred sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objective of NASQAN is to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting. The design of the network is intended to provide data for (1) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (2) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (3) a nationally consistent data base useful for water-quality assessment and hydrologic research.

National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

Organism is any living entity.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per unit area habitat, usually square meter (m^2), acre, or hectare. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume usually milliliter (mL) or liter (L). Numbers of planktonic organisms can be expressed in these terms.

Total organism count is the total number of organisms collected and enumerated in any particular sample.

Parameter Code is a 5-digit number used in the U.S. Geological Survey computerized data system, WATSTORE, to uniquely identify a specific constituent. The codes used in WATSTORE are the same as those used in the U.S. Environmental Protection Agency data system, STORET. The Environmental Protection Agency assigns and approves all requests for new codes.

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

Particle size is the diameter, in millimeters (mm), of a particle determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

Particle-size classification used in this report agrees with the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

<u>Classification</u>	<u>Size (mm)</u>	<u>Method of analysis</u>
Clay.....	0.00024 - 0.004	Sedimentation
Silt.....	.004 - .062	Sedimentation
Sand.....	.062 - 2.0	Sedimentation or sieve
Gravel.....	2.0 - 64.0	Sieve

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic matter is removed and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native-water analysis.

Percent composition is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population in terms of types, numbers, mass, or volume.

Periphyton is the assemblage of microorganisms attached to and living upon submerged solid surfaces. While primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms.

Pesticides are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

Picocurie (PC, pCi) is one trillionth (1×10^{-12}) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7×10^{10} radioactive disintegrations per second. A picocurie yields 2.22 disintegrations per minute (dpm).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers.

Phytoplankton is the plant part of the plankton. They are usually microscopic and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment, and are commonly known as algae.

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algae mats or floating "moss" in lakes. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers.

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly, green plants). The rate of primary production is estimated by measuring the amount of oxygen released (oxygen method) or the amount of carbon assimilated by the plants (carbon method).

Milligrams of carbon per area or volume per unit time [mg C/(m².time)] for periphyton and macrophytes and [mg C/(m³.time)] for phytoplankton are units for expressing primary productivity. They define the amount of carbon dioxide consumed as measured by radioactive carbon (carbon 14). The carbon 14 method is of greater sensitivity than the oxygen light and dark bottle method, and is preferred for use in unenriched waters. Unit time may be either the hour or day, depending on the incubation period.

Milligrams of oxygen per area or volume per unit time [mg O₂/(m².time)] for periphyton and macrophytes and [mg O₂/(m³.time)] for phytoplankton are units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved-oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Recoverable from bottom material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Return period is the average time interval between occurrences of a hydrological event of a given or greater magnitude, usually expressed in years. May also be called recurrence interval.

Runoff in inches (IN, 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.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Bed load is the sediment that is transported in a stream by rolling, sliding, or skipping along the bed very close to the bed surface. In this report, bed load is considered to consist of particles in transit within 0.25 ft of the streambed.

Bed load discharge (tons per day) is the quantity of bed load measured by dry weight that moves past a section as bed load in a given time.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Suspended-sediment discharge (tons/day) is the rate at which dry mass of sediment passes a section of a stream or is the quantity of sediment, as measured by dry mass or volume, that passes a section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) x discharge (ft^3/s) x 0.0027.

Suspended-sediment load is a general term that refers to material in suspension. It is not synonymous with either discharge or concentration.

Total-sediment discharge (tons/day) is the sum of the suspended-sediment discharge and the bed-load discharge. It is the total quantity of sediment, as measured by dry mass or volume, that passes a section during a given time.

Total-sediment load or total load is a term which refers to the total sediment (bed load plus suspended-sediment load) that is in transport. It is not synonymous with total-sediment discharge.

Seven-day 10-year low flow (7 Q10) is the discharge at the 10-year recurrence interval taken from a frequency curve of annual values of the lowest mean discharge for 7 consecutive days (the 7-day low flow).

Sodium-adsorption-ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Solute is any substance that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stage-discharge relation is the relation between gage height (stage) and the volume of water, per unit of time, flowing in a channel.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Substrate is the physical surface upon which an organism lives.

Natural substrate refers to any naturally occurring emerged or submersed solid surface, such as a rock or tree, upon which an organism lives.

Artificial substrate is a device which is purposely placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multiplate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton.

Surface area of a lake is that area outlined on the latest U.S.G.S. topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimetered. All areas shown are those for the stage when the planimetered map was made.

Surficial bed material is the part (0.1 to 0.2 ft) of the bed material that is sampled using U.S. Series Bed-Material Samplers.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of undissolved material in a water-sediment mixture. It is associated with the material retained on a 0.45-um filter.

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45-um membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45-um membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchical scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, Hexagenia limbata, is the following:

Kingdom.....	Animal
Phylum.....	Arthropoda
Class.....	Insecta
Order.....	Ephemeroptera
Family.....	Ephemeridae
<u>Genus</u>	<u>Hexagenia</u>
<u>Species</u>	<u>Hexagenia limbata</u>

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term "temperature recorder" is used in the table headings and refers to any instrument that records temperature whether on a chart, a tape, or any other medium.

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration of the constituent, in milligrams per liter, by 0.00136.

Tons per day (T/DAY) is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour period.

Total is the total amount of a given constituent in a representative water-suspended sediment sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determined all of the constituent in the sample.)

Total discharge is the total quantity of any individual constituent, as measured by dry mass or volume, that passes through a stream cross section per unit of time. This term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses, because different digestion procedures are likely to produce different analytical results.

Tritium Network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

Water year in Geological Survey reports dealing with surface-water supply is the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1980, is called the "1980 water year."

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports (WRD was used as an abbreviation for "Water-Resources Data" in reports published prior to 1976).

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

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

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

The reports listed below are for sale by the U.S. Geological Survey, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

- 1-D1. WATER TEMPERATURE--INFLUENTIAL FACTORS, FIELD MEASUREMENT, AND DATA PRESENTATION, by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.
- 1-D2. GUIDELINES FOR COLLECTION AND FIELD ANALYSIS OF GROUND-WATER SAMPLES FOR SELECTED UNSTABLE CONSTITUENTS, by W. W. Wood: USGS--TWRI book 1, Chapter D2. 1976. 24 pages.
- 2-D1. APPLICATION OF SURFACE GEOPHYSICS TO GROUND-WATER INVESTIGATIONS, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.
- 2-D2. APPLICATION OF SEISMIC-REFRACTION TECHNIQUES TO HYDROLOGIC STUDIES, by F. P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 pages.
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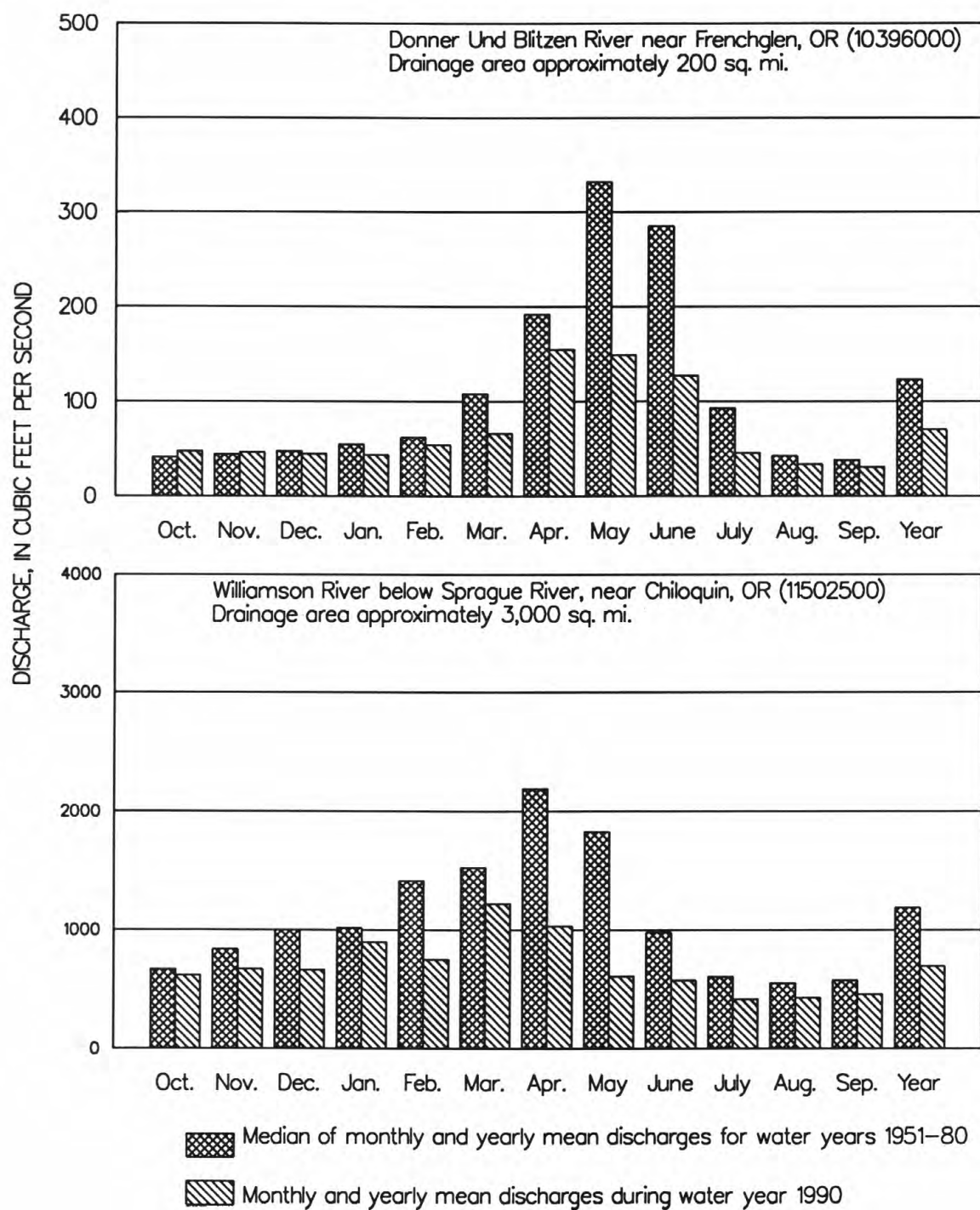


Figure 1a.--Discharge during 1990 water year compared with median discharge for period 1951-80 for two representative gaging stations in Eastern Oregon.

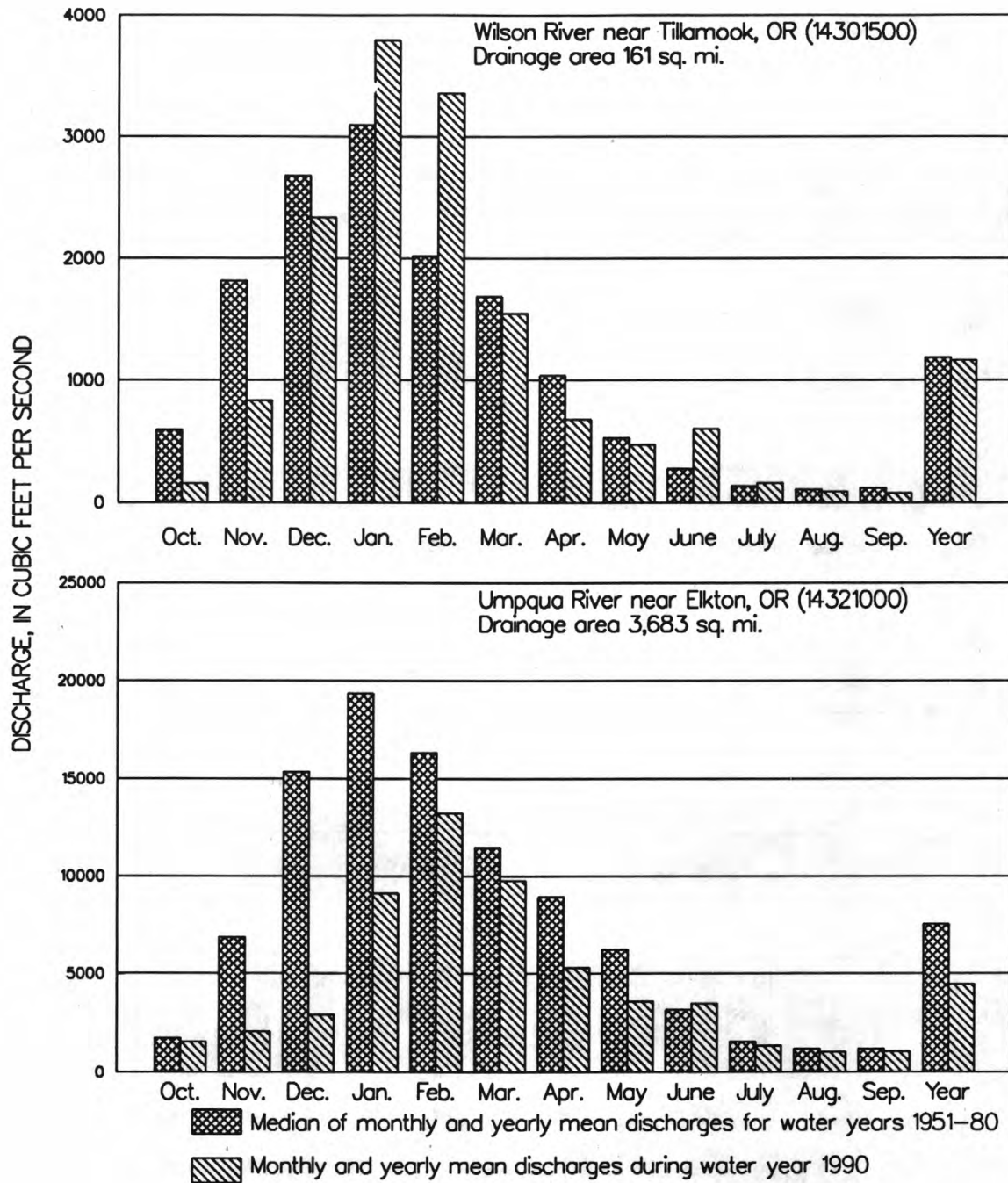


Figure 1b.--Discharge during 1990 water year compared with median discharge for period 1951-80 for two representative gaging stations in Western Oregon.

SURFACE-WATER RECORDS

31

REMARK CODES.--The following remark codes may appear with the water-quality data in this section:

PRINTED OUTPUT	REMARK
E	Estimated value
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)

NOTE: In March 1989 the National Water-Quality Laboratory discovered a bias in the turbidimetric method for sulfate analysis, indicating that values below 75 mg/L have a median positive bias of 2 mg/L above the true value for the period between 1982 and 1989.

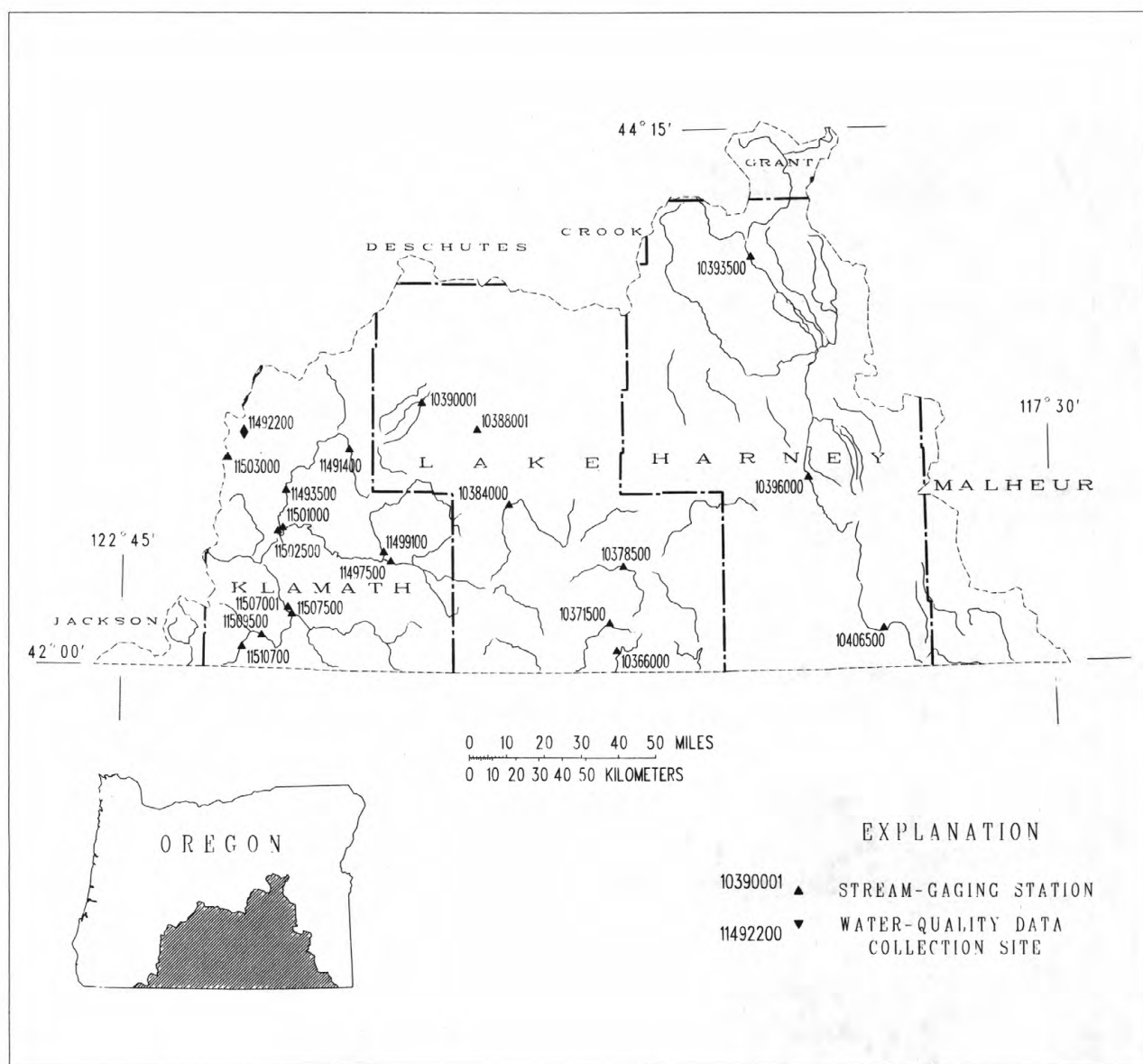


Figure 2.--Location of surface-water and water-quality stations in The Great Basin and the Klamath River basin.

GAGING STATION RECORDS

33

THE GREAT BASIN

WARNER LAKES BASIN

10366000 TWENTYMILE CREEK NEAR ADEL, OR

LOCATION.--Lat 42°04'20", long 119°57'42", in SW 1/4 NW 1/4 sec.25, T.40 S., R.23 E., Lake County, Hydrologic Unit 17120007, on left bank 1.5 mi downstream from Twelvemile Creek and 8 mi southwest of Adel.

DRAINAGE AREA.--194 mi², including 46 mi² in Cowhead Lake area.

PERIOD OF RECORD.-- March 1910 to July 1916, December 1917 to September 1919, and March 1921 to June 1922 (published as "near Warner Lake"), September 1940 to November 1944, March 1945 to current year.

REVISED RECORDS.--WSP 1090: 1945. WSP 1514: 1951-53, 1954(M), WDR OR-86-1: 1963(P), 1965(P), 1969-72(P). 1974(P), 1980(P), 1982(P), 1983(P).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 4,560.83 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 21, 1940, nonrecording gage or water-stage recorder at sites within 1 mi downstream at various datums. Sept. 21, 1940, to Nov. 30, 1944, water-stage recorder at site 1.8 mi upstream at different datums. Mar. 12, 1945, to June 28, 1952, water-stage recorder at site 70 ft upstream at datum 0.88 ft higher.

REMARKS.--Records good except those for Dec. 12 to Apr. 11, and June 25 to Sept. 30, which are poor. Some regulation by pumpage from Cowhead Lake. Diversions in Oregon for irrigation upstream from station; considerable diversions for irrigation in Cowhead Lake area in California.

AVERAGE DISCHARGE.--55 years (water years 1911-15, 1919, 1941-44, 1946-90), 52.8 ft³/s, 38,250 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,400 ft³/s Feb. 18, 1986, gage height, 16.94 ft, on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 510 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 25	2100	(a)	*4.03	Mar. 18	2300	*222	3.65

Minimum discharge, 0.91 ft³/s Mar. 13, but may have been lower during period of undefined stage-discharge relationship, Dec. 12 to Mar. 1.

(a) Backwater from ice.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	7.5	8.2	e5.4	e5.8	e65	7.5	41	34	3.5	2.7	2.2
2	6.6	7.3	8.5	e5.4	e6.0	63	9.5	39	35	3.9	2.8	2.2
3	6.5	7.6	8.7	e5.2	e6.0	90	12	36	39	3.8	2.5	2.1
4	6.7	7.9	9.3	e5.8	e6.0	50	15	37	33	3.7	2.7	2.1
5	6.8	8.1	13	e6.4	e6.0	34	15	36	31	3.2	2.3	2.0
6	7.0	7.9	14	e6.4	e6.0	13	11	39	30	3.1	1.7	2.0
7	6.9	7.8	11	e6.8	e6.0	9.2	15	39	30	3.2	1.6	2.0
8	4.9	7.6	10	e11	e6.0	19	15	36	27	3.3	1.6	2.0
9	3.2	7.5	9.7	e18	e6.0	7.5	16	32	24	2.9	1.6	2.0
10	6.3	7.7	8.4	e11	e6.2	7.1	19	28	22	2.4	1.9	2.0
11	6.1	7.5	6.7	e10	e6.4	3.8	24	29	20	2.7	2.0	1.9
12	6.4	7.5	e4.4	e8.5	e6.2	1.6	26	28	18	2.7	1.9	2.1
13	6.7	7.8	e4.9	e9.2	e5.6	1.2	25	26	17	2.8	1.9	2.0
14	5.6	8.0	e4.9	e9.8	e5.6	1.3	28	24	16	2.7	1.8	2.0
15	3.8	7.5	e4.9	e9.4	e5.8	1.2	33	23	15	3.0	1.6	1.9
16	3.8	7.8	e4.9	e8.4	e5.2	3.7	33	19	13	2.7	2.0	2.1
17	3.8	8.0	e4.9	e7.0	e4.5	19	35	18	12	2.4	3.4	2.0
18	4.2	7.9	e4.9	e6.0	e4.0	104	42	16	11	2.6	3.6	2.2
19	4.2	7.9	e5.0	e5.5	e3.7	90	41	12	9.1	3.1	2.4	2.2
20	5.2	7.6	e5.0	e6.4	e5.0	69	40	15	7.9	4.3	1.6	2.1
21	5.4	7.6	e5.0	e6.8	e7.0	51	51	18	6.7	4.0	1.6	1.9
22	6.7	7.5	e5.0	e6.8	e8.8	37	50	14	5.1	3.1	1.4	2.0
23	6.6	7.4	e5.0	e6.4	e9.5	31	75	13	4.5	2.8	1.4	1.9
24	9.1	9.1	e5.0	e5.8	e12	22	97	15	4.5	2.3	1.9	2.4
25	9.0	e8.5	e5.0	e6.2	e50	16	61	13	4.0	2.4	2.0	2.8
26	7.8	e8.0	e5.1	e6.2	e110	15	58	12	3.7	2.6	1.9	3.0
27	8.3	e7.5	e5.1	e5.4	e80	10	50	26	3.5	2.9	1.8	3.2
28	8.3	7.4	e5.1	e5.4	e72	6.0	64	29	3.8	4.8	1.8	3.3
29	7.6	7.8	e5.1	e5.5	---	5.1	51	22	4.8	3.7	2.0	3.0
30	7.0	8.3	e5.1	e5.6	---	4.4	44	22	4.0	3.1	2.2	2.7
31	7.3	---	e5.4	e5.8	---	5.5	---	34	---	2.9	2.2	---
TOTAL	194.3	233.5	207.2	227.5	461.3	855.6	1063.0	791	488.6	96.6	63.8	67.3
MEAN	6.27	7.78	6.68	7.34	16.5	27.6	35.4	25.5	16.3	3.12	2.06	2.24
MAX	9.1	9.1	14	18	110	104	97	41	39	4.8	3.6	3.3
MIN	3.2	7.3	4.4	5.2	3.7	1.2	7.5	12	3.5	2.3	1.4	1.9
AC-FT	385	463	411	451	915	1700	2110	1570	969	192	127	133

CAL YR 1989 TOTAL 23560.7 MEAN 64.5 MAX 3000 MIN 1.7 AC-FT 46730
WTR YR 1990 TOTAL 4749.7 MEAN 13.0 MAX 110 MIN 1.2 AC-FT 9420

e Estimated

WARNER LAKES BASIN

10371500 DEEP CREEK ABOVE ADEL, OR

LOCATION.-- Lat 42°11'21", long 120°00'02", in SW 1/4 NW 1/4 sec.15, T.39 S., R.23 E., Lake County, Hydrologic Unit 17120007, on left bank 700 ft downstream from Drake Creek and 5 mi west of Adel.

DRAINAGE AREA.--249 mi².

PERIOD OF RECORD.--September 1922 to September 1923, October 1929 to current year. Monthly discharge only October 1929 to September 1932, published in WSP 1314.

REVISED RECORDS.--WDR OR-83-1: 1979(M), 1980(M,P), 1982(M,P).

GAGE.--Water-stage recorder. Datum of gage is 4,980.34 ft above National Geodetic Vertical Datum of 1929 (State Highway Department bench mark). Sept. 8 to Dec. 20, 1922, nonrecording gage, and Dec. 21, 1922, to Sept. 30, 1923, and Oct. 11, 1929, to Dec. 23, 1964, water-stage recorder at site 700 ft downstream at different datums. Jan. 20 to Sept. 30, 1965, nonrecording gage at site 2,000 ft downstream at different datum.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--62 years, 132 ft³/s, 95,630 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,420 ft³/s Dec. 23, 1964, gage height, 10.64 ft, from floodmark, from rating curve extended above 1,100 ft³/s on basis of slope-area measurements of peak flow; minimum discharge, 1.7 ft³/s July 20, 27-29, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 23	2110	*686	*3.17	No other peak greater than base discharge.			
Minimum discharge, 3.2 ft ³ /s Aug. 9.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	24	e30	e19	e18	e82	140	141	257	12	5.4	7.1
2	24	23	e30	e17	e19	81	152	124	224	11	5.3	6.7
3	22	26	e29	e16	e19	96	152	123	195	11	5.2	6.6
4	21	27	e29	e19	e19	104	161	115	157	11	5.2	6.4
5	22	28	e45	e20	e19	81	153	109	120	11	5.1	6.5
6	21	24	e56	e20	e18	73	162	107	115	11	5.0	6.4
7	21	26	e42	e22	e18	74	167	106	116	11	4.9	6.6
8	21	22	e35	e30	e18	75	173	98	103	10	4.8	6.5
9	20	25	e25	e60	e18	64	161	90	92	8.9	5.0	10
10	20	26	e20	e43	e19	68	154	85	78	8.6	5.2	9.5
11	20	25	e16	e34	e20	50	154	78	74	8.6	5.3	9.3
12	20	26	e16	e25	e19	48	148	73	70	8.3	5.3	9.0
13	20	26	e17	e29	e17	e43	117	70	66	7.6	5.5	9.1
14	20	24	e17	e30	e17	44	90	68	68	7.5	5.1	9.4
15	20	21	e17	e30	e17	49	97	63	67	6.9	5.0	9.2
16	20	24	e17	e25	e17	59	102	56	64	6.6	4.8	9.5
17	20	25	e17	e22	e16	87	117	52	59	6.3	5.2	10
18	20	24	e17	e18	e15	142	145	49	55	7.2	6.6	10
19	20	24	e17	e16	e14	173	135	48	50	8.6	8.0	10
20	21	23	e17	e20	e13	196	136	71	44	8.6	7.7	10
21	22	22	e17	e21	e16	188	151	81	43	8.2	8.3	10
22	28	21	e17	e22	e20	190	197	69	36	7.1	8.0	10
23	30	25	e17	e18	e38	214	520	64	28	6.6	7.6	10
24	39	29	e17	e19	e50	180	442	83	24	6.1	7.7	10
25	31	e24	e17	e19	e120	169	250	75	21	6.7	9.0	10
26	28	e23	e17	e19	e110	206	203	70	19	7.1	8.1	11
27	32	e21	e17	e16	e100	161	175	89	17	6.8	7.8	11
28	27	e20	e18	e17	e85	143	224	112	15	6.0	7.6	11
29	24	e19	e19	e18	---	129	189	117	16	5.7	7.5	10
30	23	e25	e19	e17	---	122	162	122	14	5.6	7.6	10
31	25	---	e19	e18	---	129	---	288	---	5.5	7.4	---
TOTAL	726	722	703	719	889	3520	5329	2896	2307	253.1	196.2	270.8
MEAN	23.4	24.1	22.7	23.2	31.7	114	178	93.4	76.9	8.16	6.33	9.03
MAX	39	29	56	60	120	214	520	288	257	12	9.0	11
MIN	20	19	16	16	13	43	90	48	14	5.5	4.8	6.4
AC-FT	1440	1430	1390	1430	1760	6980	10570	5740	4580	502	389	537

CAL YR 1989 TOTAL 62039 MEAN 170 MAX 2460 MIN 10 AC-FT 123100
WTR YR 1990 TOTAL 18531.1 MEAN 50.8 MAX 520 MIN 4.8 AC-FT 36760

e Estimated

WARNER LAKES BASIN

35

10378500 HONEY CREEK NEAR PLUSH, OR

LOCATION.--Lat 42°25'33", long 119°55'23", in SW 1/4 SW 1/4 sec.20, T.36 S., R.24 E., Lake County, Hydrologic Unit 17120007, on right bank 700 ft upstream from mouth of canyon, 1.4 mi northwest of Plush, and 4 mi downstream from Twelvemile Creek.

DRAINAGE AREA.--170 mi², approximately.

PERIOD OF RECORD.--May 1909 to September 1914 (prior to January 1910, gage heights only), March to May 1915, March to September 1921, March to June 1922, May 1930 to current year. Monthly discharge only May 1930 to September 1949, published in WSP 1314.

REVISED RECORDS.--WSP 1564: 1911-12. WSP 1714: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,552.80 ft above National Geodetic Vertical Datum of 1929. Dec. 24, 1964, to Sept. 30, 1965, nonrecording gage at site 100 ft downstream at different datums. See WSP 1927 for history of changes prior to Dec. 24, 1964.

REMARKS.--Records good except those for period Dec. 1 to Feb. 28, which are fair, and those for period Aug. 14 to Sept. 30, which are poor. Slight regulation by five small reservoirs, combined capacity, 870 acre-ft. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--64 years (water years 1911-14, 1931-90), 30.2 ft³/s, 21,880 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,000 ft³/s Dec. 23, 1964, gage height, 13.4 ft, from floodmark, from rating curve extended above 250 ft³/s on basis of slope-area measurements at gage height 10.46 ft and of peak flow; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
July 17	1545	*264	*4.10	No other peak greater than base discharge.			
Minimum discharge, no flow Jan. 3, result of freezeup.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.92	3.8	4.4	e3.5	4.8	7.1	30	19	18	.79	.26	.58
2	.99	3.6	4.6	e2.8	5.0	5.7	34	18	20	.84	.25	.63
3	1.1	3.9	4.8	e2.7	5.1	6.5	34	18	17	.87	.26	.67
4	1.2	4.2	5.2	e3.6	e4.8	10	36	16	12	.74	.24	.67
5	1.1	4.3	6.4	e3.7	e5.0	10	32	15	10	.76	.23	.59
6	1.4	4.2	10	e5.0	5.1	8.4	33	14	9.2	.69	.22	.55
7	1.5	3.9	7.9	e7.0	5.2	8.0	42	14	11	.64	.25	.57
8	1.4	3.9	6.9	e10	5.2	6.8	40	13	11	.58	.27	.68
9	1.5	3.8	6.1	e15	5.0	5.5	33	13	9.6	.61	.32	.61
10	1.5	3.8	5.6	e11	5.4	7.1	30	12	8.8	.51	.34	.51
11	1.5	3.9	e2.9	8.6	6.4	e6.2	28	11	8.2	.52	.33	.46
12	1.4	3.9	e2.7	7.7	6.1	6.5	28	11	8.4	.50	.35	.48
13	1.4	3.9	e2.8	8.1	5.7	6.4	27	10	8.2	.49	.32	.50
14	1.5	3.9	e2.8	6.2	e5.2	7.0	27	9.5	7.9	.48	.25	.46
15	1.6	3.7	e2.8	6.4	5.4	8.5	25	9.1	6.7	.45	.25	.42
16	1.6	3.7	e2.8	5.6	5.4	7.8	27	8.6	6.0	.38	.29	.49
17	1.9	4.2	e2.7	5.4	4.8	8.3	27	8.4	5.8	19	.31	.53
18	1.9	4.2	e2.6	4.6	4.7	14	26	8.4	6.3	1.6	.52	.55
19	1.9	4.3	e2.5	4.8	e4.7	16	24	9.2	6.0	.70	.56	.47
20	1.9	4.4	e3.0	e5.4	e4.5	15	23	9.5	4.4	.63	.49	.46
21	2.2	4.0	e2.6	e6.4	5.2	15	22	12	3.9	.45	.55	.47
22	2.5	3.8	e3.3	e6.0	6.4	19	21	10	3.8	.41	.43	.46
23	2.9	3.9	e3.1	e5.4	e7.4	27	31	8.9	3.2	.34	.41	.42
24	4.6	4.1	e2.6	4.7	e9.0	32	40	11	2.4	.29	.44	.45
25	4.6	4.4	e2.1	5.5	e12	19	31	12	1.1	.39	.46	.51
26	3.9	4.1	e1.7	5.1	e10	30	26	11	.93	.41	.65	.51
27	3.6	5.1	e1.7	e4.8	e9.4	28	23	10	1.2	.34	.76	.53
28	4.8	3.8	e2.2	4.6	e8.0	23	24	12	1.8	.32	.67	.59
29	4.5	3.1	e2.0	4.3	---	26	25	12	1.2	.28	.68	.56
30	3.6	4.0	e1.8	5.0	---	18	21	13	.80	.26	.62	.56
31	3.8	---	e2.5	4.6	---	26	---	15	---	.26	.59	---
TOTAL	70.21	119.8	115.1	183.5	170.9	433.8	870	373.6	214.83	35.53	12.57	15.94
MEAN	2.26	3.99	3.71	5.92	6.10	14.0	29.0	12.1	7.16	1.15	.41	.53
MAX	4.8	5.1	10	15	12	32	42	19	20	.19	.76	.68
MIN	.92	3.1	1.7	2.7	4.5	5.5	21	8.4	.80	.26	.22	.42
AC-FT	139	238	228	364	339	860	1730	741	426	70	25	32

CAL YR 1989 TOTAL 10172.80 MEAN 27.9 MAX 286 MIN .18 AC-FT 20180
WTR YR 1990 TOTAL 2615.78 MEAN 7.17 MAX 42 MIN .22 AC-FT 5190

e Estimated

ABERT LAKE BASIN

10384000 CHEWAUCAN RIVER NEAR PAISLEY, OR

LOCATION.--Lat 42°41'05", long 120°34'08", in SW 1/4 NW 1/4 sec.26, T.33 S., R.18 E., Lake County, Hydrologic Unit 17120006, on left bank 1.2 mi downstream from Mill Creek and 1.4 mi southwest of Paisley.

DRAINAGE AREA.--275 mi².

PERIOD OF RECORD.--April 1912 to September 1921, May 1924 to current year. Published as "above Conn ditch, near Paisley" April to September 1912 and May 1924 to September 1955, as "above Mill Creek, near Paisley" October 1912 to December 1913, and as "at Chewaucan Land & Cattle Co.'s gage, near Paisley" January to September 1914.

REVISED RECORDS.--WSP 860: Drainage area. WSP 1927: 1957-59.

GAGE.--Water-stage recorder. Datum of gage is 4,430 ft above National Geodetic Vertical Datum of 1929 (river-profile survey). See WSP 1734 for history of changes prior to Oct. 6, 1956.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--75 years, 146 ft³/s, 105,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,490 ft³/s Dec. 22, 1964, gage height, 8.35 ft, from rating curve extended above 900 ft³/s on basis of slope-area measurement of peak flow; no flow for part of each day Dec. 7, 1927, Dec. 12, 1932, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 23	1130	*495	*2.77				

Minimum discharge, 16 ft³/s Aug. 5-7, but may have been less during period of ice effect, Nov. 23 to Dec. 3, Dec. 11 to Jan. 8, Jan. 19-22, Feb. 4 to Mar. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	43	e38	e32	48	e78	194	192	174	37	18	26
2	38	42	e40	e32	48	e75	212	181	165	36	18	25
3	41	44	e45	e40	47	88	219	173	146	41	18	25
4	38	46	57	e45	e40	115	230	164	130	37	17	24
5	38	45	64	e50	e43	85	225	159	122	34	17	24
6	38	39	75	e60	e45	75	237	157	119	34	16	24
7	37	45	57	e80	e45	75	254	153	124	34	18	25
8	37	40	53	e170	e45	73	262	145	109	33	20	24
9	37	42	49	159	e50	61	242	134	102	32	20	24
10	36	42	34	96	52	70	239	128	98	30	20	23
11	36	41	e34	60	51	55	246	122	94	32	21	23
12	36	41	e34	59	e43	59	241	118	88	33	21	22
13	36	43	e34	67	e39	44	234	110	85	30	21	23
14	36	42	e34	59	e35	63	238	105	84	28	21	24
15	36	38	e31	57	e39	56	238	103	81	27	20	24
16	36	44	e31	50	e39	64	238	98	79	26	20	25
17	36	44	e31	48	e39	72	278	89	82	24	22	26
18	36	42	e31	47	e39	114	287	86	102	25	30	26
19	36	40	e35	e46	e40	129	250	84	79	27	41	26
20	36	39	e36	e46	e50	144	228	99	70	27	32	25
21	42	39	e36	e46	e60	140	217	109	66	25	37	25
22	67	37	e36	e50	e62	148	219	99	62	23	31	25
23	60	e37	e36	54	e69	165	441	135	57	21	29	25
24	70	e36	e33	57	e73	160	355	131	54	20	29	26
25	56	e35	e31	54	e80	164	281	108	51	21	28	29
26	50	e35	e33	47	e90	213	255	103	49	22	27	35
27	52	e40	e40	52	e95	183	235	126	47	21	27	33
28	47	e49	e37	55	e85	172	264	180	45	20	26	29
29	38	e35	e33	47	---	167	226	161	43	19	26	27
30	44	e37	e35	43	---	165	208	153	41	19	28	26
31	44	---	e40	48	---	174	---	175	---	18	28	---
TOTAL	1308	1222	1233	1856	1491	3446	7493	4080	2648	856	747	768
MEAN	42.2	40.7	39.8	59.9	53.2	111	250	132	88.3	27.6	24.1	25.6
MAX	70	49	75	170	95	213	441	192	174	41	41	35
MIN	36	35	31	32	35	44	194	84	41	18	16	22
AC-FT	2590	2420	2450	3680	2960	6840	14860	8090	5250	1700	1480	1520

CAL YR 1989 TOTAL 66208 MEAN 181 MAX 1150 MIN 22 AC-FT 131300
WTR YR 1990 TOTAL 27148 MEAN 74.4 MAX 441 MIN 16 AC-FT 53850

e Estimated

37

LOCATION.--Lat 42°59'42", long 120°44'54", in SE 1/4 sec.6, T.30 S., R.17 E., Lake County, Hydrologic Unit 17120005, on left bank 300 ft downstream from diversion dam and 2.0 mi northeast of town of Summer Lake.

PERIOD OF RECORD.--October 1929 to September 1939 (river only); June to September 1928, April 1931 to July 1938, and April 1940 to September 1942 (irrigation season records for Summer Lake Canal only); June 1951 to current year. Prior to June 1951 monthly discharge only, published in WSP 1314.

REMARKS.--No estimated daily discharges. Records good. All records presented herein include flow in Summer Lake Canal which diverts 300 ft upstream from station for irrigation of lands along west side of Summer Lake. Flow regulated by gates at diversion dam.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 188 ft³/s Dec. 22, 1964, gage height, 2.81 ft, no flow in canal; minimum discharge, 1.0 ft³/s Jan. 21, 22, 1970; minimum daily, 3.0 ft³/s Oct. 31, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 97 ft³/s Nov. 13; minimum daily, 66 ft³/s May 1, Sept. 6.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85	87	89	92	89	88	89	66	84	77	80	79
2	85	87	90	91	89	88	89	78	83	75	80	79
3	84	87	90	90	89	88	89	74	84	77	80	79
4	84	87	90	90	89	88	89	67	84	77	80	79
5	84	86	90	91	89	88	89	83	83	77	82	74
6	83	86	90	90	88	88	90	83	83	77	83	66
7	83	86	90	90	88	88	90	94	83	77	83	70
8	83	86	90	90	88	88	90	86	83	77	83	78
9	82	86	90	90	88	88	90	77	83	77	84	78
10	82	86	90	89	88	88	88	76	83	77	84	78
11	82	86	90	89	88	89	89	81	83	77	84	78
12	82	90	89	89	88	89	89	82	83	77	84	77
13	82	96	89	89	88	88	89	83	83	77	84	77
14	82	96	89	89	88	89	89	86	83	77	84	78
15	81	96	89	89	88	88	89	85	83	77	85	79
16	81	95	89	89	88	88	87	85	83	77	85	78
17	81	94	90	89	88	89	86	85	83	77	85	78
18	81	94	90	89	88	89	86	84	83	77	85	78
19	81	93	90	89	88	89	87	83	84	77	85	78
20	81	93	90	89	87	89	87	84	84	77	83	78
21	82	93	90	89	87	89	87	85	83	77	81	79
22	82	92	90	89	87	89	84	84	83	77	79	79
23	82	92	90	89	88	88	79	84	82	79	79	79
24	91	91	92	89	88	88	79	84	80	79	78	79
25	94	90	91	89	88	88	80	84	80	82	79	79
26	90	90	92	89	88	89	76	85	81	83	79	79
27	89	89	92	89	88	89	73	85	79	81	78	79
28	89	89	92	89	88	89	73	85	79	80	77	79
29	88	89	92	89	---	89	74	85	79	80	78	77
30	88	89	92	89	---	89	72	86	79	80	78	72
31	88	---	92	89	---	89	---	86	---	80	79	---
TOTAL	2612	2701	2799	2772	2466	2743	2548	2555	2470	2416	2528	2320
MEAN	84.3	90.0	90.3	89.4	88.1	88.5	84.9	82.4	82.3	77.9	81.5	77.3
MAX	94	96	92	92	89	89	90	94	84	83	85	79
MIN	81	86	89	89	87	88	72	66	79	75	77	66
AC-FT	5180	5360	5550	5500	4890	5440	5050	5070	4900	4790	5010	4600
CAL YR 1989	TOTAL 30466		MEAN 83.5	MAX 96	MIN 61	AC-FT 60430						
WTR YR 1990	TOTAL 30930		MEAN 84.7	MAX 96	MIN 66	AC-FT 61350						

SILVER LAKE BASIN

10390001 SILVER CREEK NEAR SILVER LAKE, OR

LOCATION.--Lat 43°06'50", long 121°03'59" in NE 1/4 SW 1/4 sec.28, T.28 S., R.14 E., Lake County, Hydrologic Unit 17120005, on right bank 1.5 mi downstream from diversion dam of Silver Lake Irrigation District, 1.5 mi southwest of town of Silver Lake, and 3 mi upstream from Bridge Creek.

DRAINAGE AREA.--180 mi², approximately.

PERIOD OF RECORD.--January 1905 to March 1907, January 1909 to September 1927, February to December 1928, February 1929 to current year.

REVISED RECORDS.--WSP 1564: 1906, 1910, 1921(M). WSP 1734: Drainage area.

GAGE.--Water-stage recorder. Concrete control since Sept. 15, 1932. Datum of gage is 4,361.22 ft above National Geodetic Vertical Datum of 1929. Prior to May 24, 1932, nonrecording gage or water-stage recorder at practically same location at datum 1.00 ft higher, or nonrecording gage at diversion dam outlet 1.5 mi upstream at different datum.

REMARKS.--Records good except for estimated daily discharges, which are poor. Flow regulated by reservoir, capacity, 800 acre-ft, 1.5 mi upstream from station and by Thompson Valley Reservoir, capacity, 19,660 acre-ft, 11 mi upstream from station. Records given herein include flow in Silver Lake Irrigation District Canal which diverts 1.5 mi upstream from station. No record of diversion October 1943 to September 1965.

AVERAGE DISCHARGE.--78 years (water years 1906, 1910-27, 1930-41, 1944-90), 31.3 ft³/s, 22,680 acre-ft/yr, including diversion by Silver Lake Irrigation District Canal.

EXTREMES FOR PERIOD OF RECORD.--Creek only, maximum discharge, 1,800 ft³/s Mar. 20, 1907, gage height, 10.08 ft, present datum, from rating curve extended above 700 ft³/s; maximum gage height, 10.3 ft Dec. 22, 1964; no flow at times in 1931-32, 1934, 1937.

Combined flow, maximum discharge, 1,800 ft³/s Mar. 20, 1907, gage height, 10.08 ft, present datum, from rating curve extended above 700 ft³/s; maximum gage height, 10.3 ft Dec. 22, 1964; no flow at times in 1931-32, 1934, 1937.

EXTREMES FOR CURRENT YEAR.--Creek only, maximum discharge, 28 ft³/s Oct. 9, gage height, 2.06 ft; maximum gage height, 2.20 ft Jan. 20 (ice affected); minimum discharge, 0.90 ft³/s Feb. 17.

Combined flow, maximum daily discharge, 60 ft³/s May 23; minimum daily, 3.2 ft³/s Feb. 14-20, but may have been less during period of no record, December to March.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	8.6	e6.1	5.1	e3.7	e4.1	e4.5	7.1	56	56	35	18
2	12	8.5	e6.1	e5.0	e3.5	e3.9	e4.5	7.2	56	56	34	18
3	12	8.3	6.3	e4.8	e3.5	e3.9	e4.7	8.9	55	57	34	18
4	12	8.3	6.3	e4.1	e3.5	e4.0	e4.7	15	55	56	34	18
5	12	8.3	6.4	e4.0	e3.3	e3.9	e4.9	20	54	55	34	17
6	12	8.2	6.3	e4.0	e3.3	e3.9	e5.0	21	55	43	33	13
7	11	8.2	6.4	e4.0	e3.3	e4.0	e5.0	21	54	37	34	11
8	13	8.1	6.4	e4.1	e3.6	e4.0	e5.0	21	53	38	34	10
9	13	8.1	6.4	e4.3	e4.0	e4.0	e5.0	26	54	38	33	10
10	12	8.1	e6.3	e4.2	e4.0	e4.1	e5.1	40	56	37	33	10
11	12	7.9	e6.1	e4.2	e4.0	e4.1	5.3	45	56	35	33	9.9
12	11	7.9	e6.1	e4.2	e3.5	e4.2	5.6	44	55	33	33	10
13	9.3	7.9	e6.2	e4.2	e3.3	e4.2	5.7	44	55	33	32	9.6
14	9.3	7.8	e6.0	e4.2	e3.2	e3.9	6.0	47	55	29	32	9.5
15	9.3	7.8	5.9	e4.1	e3.2	e3.8	6.2	49	55	28	32	9.5
16	9.1	7.7	e5.9	e4.0	e3.2	e3.8	6.4	49	55	28	31	9.5
17	9.1	7.7	e5.8	e4.0	e3.2	e3.7	7.2	49	53	28	30	9.6
18	9.1	7.7	e5.8	e3.9	e3.2	e3.7	7.5	48	53	27	31	9.7
19	8.9	7.6	e5.7	e3.9	e3.2	e3.8	10	46	53	27	31	9.0
20	8.8	7.6	e5.7	e3.9	e3.2	e3.9	12	48	53	27	24	14
21	9.0	7.5	e5.5	e3.8	e3.5	e3.8	12	48	54	33	20	14
22	9.0	7.5	e5.5	e3.7	e3.6	e4.0	11	49	55	36	19	15
23	8.8	7.3	5.4	e3.7	e3.6	e4.0	11	60	57	36	18	15
24	8.8	7.3	e5.5	e3.7	e3.7	e3.9	11	57	57	35	18	14
25	8.9	7.2	e5.5	e3.7	e3.7	e4.0	9.8	56	55	34	18	15
26	8.9	7.0	e5.4	e3.7	e3.7	e4.0	9.0	54	55	34	18	14
27	8.8	e6.7	e5.3	e3.7	e3.7	e4.1	8.8	54	54	34	18	14
28	8.5	e6.5	5.2	e3.7	e3.8	e4.1	8.2	55	55	32	18	7.9
29	8.5	e6.3	e5.2	e3.7	---	e4.2	8.0	55	56	32	18	6.4
30	8.5	6.3	e5.2	e3.7	---	e4.3	7.8	57	57	32	18	6.3
31	8.6	---	5.1	e3.7	---	e4.4	---	57	---	34	18	---
TOTAL	312.2	229.9	181.0	125.0	98.2	123.7	216.9	1258.2	1646	1140	848	364.9
MEAN	10.1	7.66	5.84	4.03	3.51	3.99	7.23	40.6	54.9	36.8	27.4	12.2
MAX	13	8.6	6.4	5.1	4.0	4.4	12	60	57	57	35	18
MIN	8.5	6.3	5.1	3.7	3.2	3.7	4.5	7.1	53	27	18	6.3
AC-FT	619	456	359	248	195	245	430	2500	3260	2260	1680	724

CAL YR 1989 TOTAL 12103.6 MEAN 33.2 MAX 151 MIN 2.5 AC-FT 24010
WTR YR 1990 TOTAL 6544.0 MEAN 17.9 MAX 60 MIN 3.2 AC-FT 12980

e Estimated

MALHEUR AND HARNEY LAKES BASIN

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10393500 SILVIES RIVER NEAR BURNS, OR

LOCATION.-- Lat 43°42'55", long 119°10'35", in NW 1/4 NW 1/4 sec.31, T.21 S., R.30 E., Harney County. Hydrologic Unit 17120002, on left bank 5 mi downstream from Emigrant Creek and 11 mi northwest of Burns.

DRAINAGE AREA.--934 mi².

PERIOD OF RECORD.--May 1903 to July 1906, December 1908 to December 1912, March 1913 to September 1917 (irrigation seasons only), March 1918 to October 1920, March 1921 to July 1922 (irrigation seasons only), October 1922 to current year.

GAGE.--Water-stage recorder. Datum of gage is 4,195 ft above National Geodetic Vertical Datum of 1929 (river-profile survey). See WSP 1734 for history of changes prior to Oct. 4, 1951.

REMARKS.--Records good except those for January, which are fair, and estimated daily discharges and records for July 24 to Sept. 30, which are poor. No regulation. Diversions for irrigation upstream from station during periods of high flow only.

AVERAGE DISCHARGE.--77 years (water years 1904-5, 1910-12, 1918-21, 1923-90), 178 ft³/s, 129,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,960 ft³/s Apr. 6, 1952, gage height, 15.2 ft; no flow July 19 to Sept. 22, 1934.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 294 ft³/s Mar. 22, gage height, 3.21 ft; minimum discharge, 2.4 ft³/s Aug. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	40	e32	e29	e38	110	132	164	65	15	3.7	8.7
2	30	38	e33	e29	e38	113	134	162	67	14	3.9	8.5
3	30	41	e36	e27	e36	100	133	139	65	14	4.0	8.4
4	30	41	e40	e26	e37	108	133	119	62	14	3.4	8.1
5	30	41	45	e30	e36	109	128	104	58	13	3.7	8.3
6	30	40	47	e35	e36	122	129	92	54	13	3.9	8.6
7	30	39	48	e45	e35	144	127	84	54	12	3.9	8.4
8	30	40	46	57	e35	138	137	77	52	12	4.0	8.4
9	30	40	e44	73	e38	145	132	73	50	11	3.8	8.6
10	30	44	e38	71	e40	130	120	70	47	10	4.0	8.6
11	30	43	e35	69	e42	162	120	67	45	9.5	4.0	8.6
12	30	42	e32	104	e42	140	115	64	43	8.8	4.0	8.7
13	30	42	e31	102	e37	138	110	61	41	8.3	3.9	8.9
14	30	43	e31	104	e30	100	99	58	41	7.8	4.1	9.1
15	30	42	e32	93	e26	89	96	55	36	7.1	4.5	9.1
16	30	40	e33	79	e28	87	91	46	35	6.5	4.5	9.5
17	30	43	e33	73	e29	88	93	46	35	5.8	4.5	9.9
18	30	44	e33	64	e28	105	91	46	35	5.5	5.4	11
19	30	44	e30	52	e30	151	87	45	33	4.9	6.5	11
20	30	42	e27	e40	e37	241	85	44	31	5.1	6.9	11
21	31	41	e27	e33	e45	276	83	46	29	5.1	7.8	11
22	34	48	e28	e30	e60	287	80	47	27	4.8	9.2	11
23	37	56	e28	e35	77	275	86	47	26	4.4	8.9	11
24	37	66	e27	e40	108	255	91	48	24	3.9	12	11
25	37	e60	e26	e35	125	233	88	49	22	3.7	8.7	11
26	37	e52	e25	e36	142	226	84	48	20	3.8	8.7	11
27	39	e48	e25	e36	148	217	80	37	19	4.1	9.3	11
28	41	e43	e25	e36	124	195	86	47	18	3.7	8.6	13
29	40	e35	e26	e37	---	172	116	54	17	3.5	8.4	10
30	37	e32	e27	e38	---	151	145	55	16	3.4	8.0	8.8
31	38	---	e29	e38	---	135	---	58	---	3.6	8.4	---
TOTAL	1008	1310	1019	1596	1527	4942	3231	2152	1167	241.3	184.6	290.2
MEAN	32.5	43.7	32.9	51.5	54.5	159	108	69.4	38.9	7.78	5.95	9.67
MAX	41	66	48	104	148	287	145	164	67	15	12	13
MIN	30	32	25	26	26	87	80	37	16	3.4	3.4	8.1
AC-FT	2000	2600	2020	3170	3030	9800	6410	4270	2310	479	366	576
CAL YR 1989	TOTAL	86015	MEAN	236	MAX	1420	MIN	12	AC-FT	170600		
WTR YR 1990	TOTAL	18668.1	MEAN	51.1	MAX	287	MIN	3.4	AC-FT	37030		

e Estimated

MALHEUR AND HARNEY LAKES BASIN

10396000 DONNER UND BLITZEN RIVER NEAR FRENCHGLEN, OR

LOCATION.--Lat 42°47'28", long 118°52'00", in NW 1/4 NW 1/4 sec.20, T.32 S., R.32-1/2 E., Harney County, Hydrologic Unit 17120003, Bureau of Land Management land, on left bank 1.5 mi upstream from upper diversions for Malheur National Wildlife Refuge, 2.0 mi downstream from Fish Creek, and 3.5 mi southeast of Frenchglen.

DRAINAGE AREA.--200 mi², approximately.

PERIOD OF RECORD.--March 1911 to September 1913, March 1914 to September 1916, April 1917 to September 1921, August to November 1929, April to September 1930, December 1937 to current year. Monthly discharge only for some periods, published in WSP 1314. Published as "near Diamond" 1911-21. Records of discharge for January 1909 to September 1910 (published in WSP 270, 290, and 370, for a nonequivalent site as "near Diamond") have been found to be unreliable and should not be used.

REVISED RECORDS.--WSP 330: Drainage area (former site). WSP 860: Drainage area (present site). WSP 1564: 1938-39(M), 1942-43(M), 1948(M), 1951(P), 1952-53. WSP 1714: Drainage area. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 4,254 ft above National Geodetic Vertical Datum of 1929 (levels by Fish and Wildlife Service). Prior to December 1937, nonrecording gage at several sites within 2 mi downstream at different datums. Dec. 6, 1937, to Feb. 14, 1938, nonrecording gage at present site and datum.

REMARKS.--No estimated daily discharges. Records excellent except those for Nov. 20 to Feb. 20, which are good. No regulation or diversion upstream from station. Water-quality records for period March 1975 to September 1986 have been collected at this location. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--60 years (water years 1912-13, 1915-16, 1918-21, 1939-90), 127 ft³/s, 92,010 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,270 ft³/s Apr. 26, 1978, gage height, 7.15 ft, from floodmarks, from rating curve extended above 1,900 ft³/s on basis of slope-area measurement of peak flow; minimum discharge, 4.2 ft³/s Dec. 9, 1972, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 650 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	0930	*460	*3.38				
Minimum discharge, 18 ft ³ /s Feb. 7.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	46	51	47	41	54	92	186	166	66	33	32
2	51	45	49	44	41	52	97	178	170	65	32	32
3	50	49	48	40	41	57	101	173	159	62	32	31
4	49	49	48	42	40	57	102	185	181	58	32	31
5	48	48	52	52	35	53	99	215	181	56	31	31
6	48	47	59	45	44	47	97	249	175	54	31	31
7	47	48	48	46	32	51	95	225	194	53	31	31
8	47	46	50	56	47	57	101	180	185	52	31	31
9	47	47	47	49	42	47	94	161	190	51	31	30
10	46	47	38	46	41	53	89	159	180	50	32	30
11	46	47	31	44	40	47	94	155	149	49	31	30
12	46	46	36	44	40	47	96	147	130	48	31	30
13	46	47	46	49	31	44	97	133	117	47	30	30
14	46	46	49	47	31	50	105	129	111	45	30	30
15	46	43	48	44	40	50	124	120	105	43	30	30
16	46	47	43	43	54	50	154	114	99	41	30	30
17	46	48	38	43	49	54	197	115	99	39	31	31
18	46	49	39	33	49	80	229	115	103	40	35	31
19	46	46	41	32	37	80	195	109	100	40	40	31
20	46	46	45	35	43	74	192	110	113	52	42	31
21	46	45	48	45	49	75	199	108	116	43	45	31
22	48	44	46	50	47	79	214	101	123	39	38	31
23	47	46	44	45	139	94	238	102	107	38	36	31
24	48	49	43	39	148	85	229	106	96	37	40	31
25	49	43	37	45	98	84	193	99	90	38	40	31
26	48	49	35	43	82	97	187	101	82	43	36	31
27	52	45	43	38	73	89	187	115	77	38	34	32
28	49	41	52	43	58	88	309	152	74	36	33	31
29	44	40	44	41	---	84	232	210	72	35	33	31
30	47	51	42	42	---	84	202	177	72	34	32	30
31	49	---	49	42	---	86	---	175	---	34	33	---
TOTAL	1474	1390	1389	1354	1512	2049	4640	4604	3816	1426	1046	924
MEAN	47.5	46.3	44.8	43.7	54.0	66.1	155	149	127	46.0	33.7	30.8
MAX	54	51	59	56	148	97	309	249	194	66	45	32
MIN	44	40	31	32	31	44	89	99	72	34	30	30
AC-FT	2920	2760	2760	2690	3000	4060	9200	9130	7570	2830	2070	1830
CAL YR 1989	TOTAL 60110	MEAN 165	MAX 2000	MIN 20	AC-FT 119200							
WTR YR 1990	TOTAL 25624	MEAN 70.2	MAX 309	MIN 30	AC-FT 50830							

ALVORD LAKE BASIN

41

10406500 TROUT CREEK NEAR DENIO, NV

LOCATION.--Lat 42°09'20", long 118°27'14", in NW 1/4 SE 1/4 sec.26, T.39 S., R.36 E., Harney County, Hydrologic Unit 17120009, on right bank 0.4 mi upstream from bridge at mouth of canyon, 5 mi east of Trout Creek Ranch, and 14 mi northeast of Denio.

DRAINAGE AREA.--88 mi², approximately.

PERIOD OF RECORD.--March 1911 to March 1912, April 1922 to November 1923, March 1925 to September 1931 (irrigation seasons only), April 1932 to current year. Prior to Oct. 1, 1961, published as "near Denio, Oreg."

REVISED RECORDS.--WSP 1564: 1932, 1933-34(M), 1938(M). WSP 1714: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,351.52 ft above National Geodetic Vertical Datum of 1929. Mar. 25, 1911, to Mar. 31, 1912, nonrecording gage at bridge 0.4 mi downstream at different datum. Apr. 28, 1922, to June 14, 1932, water-stage recorder at site 10 ft upstream at datum 0.50 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--59 years (water years 1923, 1933-90), 16.4 ft³/s, 11,880 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 470 ft³/s Aug. 1, 1933, gage height, 5.26 ft, from rating curve extended above 230 ft³/s; minimum discharge observed, 0.10 ft³/s Aug. 4, 1930, Aug. 1, Sept. 12, 28, 1934. Probably no flow at times Sept. 1-19, 1931.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage, 6.0 ft, caused by cloudburst, probably occurred in 1924 or 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 24	0530	53	2.56	Apr. 26	0430	*74	*2.76

Minimum discharge, 1.6 ft³/s July 27 to Aug. 3, Aug. 11-18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	3.7	e6.0	e5.0	e2.7	6.8	11	32	16	4.5	1.6	2.4
2	7.0	3.7	e6.4	e4.2	e3.0	6.8	9.6	29	15	4.2	1.6	2.4
3	7.3	4.2	e7.0	e4.0	e2.5	8.1	8.5	24	15	4.4	2.2	2.2
4	6.9	4.1	e7.5	e4.0	e2.2	7.6	7.4	21	13	4.3	2.2	2.2
5	6.4	5.7	8.1	e5.8	e2.0	7.1	6.9	21	12	4.1	2.1	2.2
6	6.2	5.8	8.8	e8.4	e2.0	5.6	7.5	19	13	4.1	2.0	2.2
7	6.1	6.0	6.9	e9.8	e2.1	6.5	8.2	17	14	4.0	1.9	2.2
8	6.0	4.7	6.6	e9.0	e2.3	6.4	8.9	15	14	4.0	1.7	2.2
9	5.8	5.1	6.4	e7.0	e2.4	5.8	9.0	16	11	4.0	1.7	2.2
10	6.2	5.3	6.0	e5.0	e2.2	e5.4	9.2	15	9.3	3.7	1.7	2.1
11	5.9	5.6	5.5	e3.6	e1.8	e5.0	11	12	9.5	3.6	1.7	2.1
12	6.0	5.7	5.3	e3.9	e1.7	e5.0	13	10	10	3.4	1.6	2.1
13	6.1	5.8	e5.3	e4.0	e1.7	e5.0	9.2	10	10	3.5	1.6	2.6
14	6.2	5.8	e5.3	e4.0	e1.7	e4.8	9.0	9.2	8.6	3.0	1.6	2.6
15	6.4	5.3	e5.3	e4.0	e1.8	e4.8	9.8	8.9	7.7	2.7	1.6	2.9
16	6.4	5.7	e5.6	e3.7	e2.1	6.0	11	9.6	7.7	2.5	1.6	3.0
17	6.4	5.6	e5.6	e3.3	e2.1	6.4	12	8.5	8.1	2.2	1.6	3.0
18	6.4	5.7	e6.0	e3.0	e1.8	6.9	26	7.8	7.9	2.1	1.7	3.1
19	7.0	5.8	e6.2	e2.9	e1.7	8.2	13	7.6	7.3	2.4	1.7	2.7
20	7.2	5.8	e6.2	e2.9	e2.0	8.5	e15	8.1	6.2	2.8	2.1	2.8
21	7.2	5.8	e6.2	e2.9	e2.5	8.0	23	8.6	5.8	2.6	2.7	2.9
22	7.6	5.7	e6.2	e3.2	e3.5	8.3	15	8.5	5.5	2.4	2.7	2.8
23	7.9	5.7	e6.2	e3.5	e4.5	10	37	8.1	4.9	2.1	3.0	2.9
24	9.1	7.7	e5.9	e3.7	e6.0	9.5	42	10	4.8	1.9	3.5	3.0
25	10	6.6	e5.8	e3.8	7.6	9.2	47	9.2	5.4	2.2	3.0	3.0
26	10	e5.4	e5.7	e3.7	7.7	9.1	62	7.4	6.3	2.1	2.9	3.1
27	8.5	e5.3	e5.4	e3.6	7.1	8.6	45	6.2	6.3	1.7	2.9	3.6
28	7.7	e5.3	e5.0	e3.4	6.7	8.8	43	9.3	6.0	1.6	2.7	3.3
29	6.6	e5.3	e5.0	e3.2	---	8.7	41	11	5.7	1.6	2.4	3.0
30	6.0	e5.6	e5.2	e2.9	---	8.9	36	10	5.2	1.6	2.2	3.1
31	4.8	---	e5.4	e2.5	---	9.3	---	16	---	1.6	2.3	---
TOTAL	213.5	163.5	188.0	133.9	87.4	225.1	606.2	405.0	271.2	90.9	65.8	79.9
MEAN	6.89	5.45	6.06	4.32	3.12	7.26	20.2	13.1	9.04	2.93	2.12	2.66
MAX	10	7.7	8.8	9.8	7.7	10	62	32	16	4.5	3.5	3.6
MIN	4.8	3.7	5.0	2.5	1.7	4.8	6.9	6.2	4.8	1.6	1.6	2.1
AC-FT	423	324	373	266	173	446	1200	803	538	180	131	158

CAL YR 1989 TOTAL 6329.6 MEAN 17.3 MAX 149 MIN 2.2 AC-FT 12550
WTR YR 1990 TOTAL 2530.4 MEAN 6.93 MAX 62 MIN 1.6 AC-FT 5020

e Estimated

PACIFIC SLOPE BASINS IN CALIFORNIA

KLAMATH RIVER BASIN

11491400 WILLIAMSON RIVER BELOW SHEEP CREEK, NEAR LENZ, OR

LOCATION.--Lat 42°54'42", long 121°28'32", in NE 1/4 SW 1/4 sec.1, T.31 S., R.10 E., Klamath County, Hydrologic Unit 18010201, on left bank at Forest Service bridge, 0.1 mi downstream from Sheep Creek and 17 mi east of Lenz.

DRAINAGE AREA.--205 mi².

PERIOD OF RECORD.--October 1973 to current year. Prior to October 1979, in reports of Oregon Water Resources Department.

GAGE.--Water-stage recorder. Elevation of gage is 4,550 ft, from topographic map.

REMARKS.--Records good. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--17 years, 70.4 ft³/s, 51,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 246 ft³/s May 9, 10, 1974, gage height, 3.51 ft; minimum discharge, 16 ft³/s Dec. 13, 1980, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 79 ft³/s Jan. 8, gage height, 1.41 ft; maximum gage height, 1.98 ft Feb. 15, backwater from ice; minimum discharge, 37 ft³/s July 9, 10, 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	53	50	e53	57	61	61	55	50	48	43	43
2	54	53	50	e50	57	61	62	55	49	47	42	43
3	53	52	50	e45	57	63	61	54	51	46	42	43
4	53	53	51	e52	e57	63	61	54	52	44	42	43
5	55	52	54	56	e57	63	61	54	51	46	42	43
6	56	52	55	54	57	63	61	53	52	45	42	43
7	55	52	53	58	59	62	61	51	54	44	42	43
8	55	53	53	74	57	62	61	50	53	43	42	42
9	54	57	54	64	57	62	60	49	51	41	42	42
10	54	58	52	62	57	62	60	47	51	39	42	43
11	53	57	e50	61	57	61	60	47	49	40	42	44
12	53	56	e48	61	57	61	59	45	48	40	42	43
13	53	55	e54	62	57	61	59	46	49	40	42	42
14	53	53	55	62	e52	62	59	45	49	40	41	44
15	52	52	56	62	e50	62	59	42	49	39	38	43
16	52	52	57	62	e52	61	60	42	51	39	39	43
17	52	52	e60	62	e56	61	62	42	53	39	40	43
18	52	52	e60	60	58	62	58	43	51	39	42	43
19	51	52	e60	e56	58	61	56	43	50	40	43	43
20	50	52	e60	e56	55	61	56	44	50	40	44	42
21	50	52	e60	e56	56	61	56	45	48	40	43	41
22	51	52	e60	59	57	61	56	46	46	41	43	40
23	53	52	56	59	57	61	58	52	48	41	42	42
24	54	52	55	58	58	61	59	50	48	39	41	42
25	52	52	e55	58	60	61	57	45	47	41	43	43
26	52	52	e55	58	61	63	56	45	47	42	43	45
27	53	52	e55	58	61	64	56	45	49	40	43	46
28	54	52	e54	58	61	62	57	46	49	39	43	47
29	53	e50	e55	58	---	62	56	46	48	41	43	46
30	53	51	e54	58	---	62	56	47	48	41	44	46
31	53	---	e53	57	---	62	---	50	---	40	44	---
TOTAL	1643	1585	1694	1809	1595	1915	1764	1478	1491	1284	1306	1296
MEAN	53.0	52.8	54.6	58.4	57.0	61.8	58.8	47.7	49.7	41.4	42.1	43.2
MAX	56	58	60	74	61	64	62	55	54	48	44	47
MIN	50	50	48	45	50	61	56	42	46	39	38	40
AC-FT	3260	3140	3360	3590	3160	3800	3500	2930	2960	2550	2590	2570

CAL YR 1989 TOTAL 24175 MEAN 66.2 MAX 141 MIN 40 AC-FT 47950
WTR YR 1990 TOTAL 18860 MEAN 51.7 MAX 74 MIN 38 AC-FT 37410

e Estimated

43

LOCATION.--Lat 42°58'45", long 122°04'45", (unsurveyed) Crater Lake National Park and Vicinity Quadrangle, Klamath County, Hydrologic Unit 18010201, at boat harbor at end of trail in Cleetwood Cove and 6 mi northeast of Crater Lake post office.

WATER-ELEVATION RECORDS

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to September 1961, nonrecording gage and various reference points used near old boat landing at abandoned trail (Eagle Cove) directly across lake.

REMARKS.--Crater Lake occupies the caldera of prehistoric Mount Mazama. It has no visible inlet or outlet. Over a period of years precipitation and runoff from snowmelt on the walls of the crater are offset by seepage and evaporation. Records of accumulated annual precipitation, collected at the north rim of Crater Lake as part of the operation of this station, are published annually in reports of the National Weather Service.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 6,179.34 ft Mar. 25, 1975; minimum observed, 6,163.2 ft Sept. 10, 1942.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum elevation known, 6,180.5 ft, average of several observations of line of crustose lichens made between 1916 and 1960; that stage may have occurred near the close of the 19th century. The occurrence of living pine trees slightly higher suggests that the lake has not been materially higher for several centuries.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 6,173.04 ft June 6; minimum, 6,171.45 ft Sept. 30.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6172.91	6172.74	6172.54	6172.31	6172.71	6172.76	6172.63	6172.75	6172.99	6172.83	6172.38	6171.94
2	6172.88	6172.72	6172.53	6172.28	6172.68	6172.79	6172.62	6172.74	6172.99	6172.83	6172.36	6171.92
3	6172.85	6172.71	6172.54	6172.26	6172.72	6172.81	6172.61	6172.73	6173.03	6172.81	6172.35	6171.90
4	6172.83	6172.69	6172.61	6172.26	6172.70	6172.83	6172.60	6172.72	6173.01	6172.80	6172.33	6171.87
5	6172.82	6172.67	6172.63	6172.27	6172.77	6172.80	6172.59	6172.73	6173.00	6172.80	6172.32	6171.86
6	6172.80	6172.70	6172.63	6172.31	6172.78	6172.78	6172.60	6172.71	6173.04	6172.77	6172.31	6171.83
7	6172.79	6172.65	6172.63	6172.60	6172.83	6172.79	6172.60	6172.69	6173.03	6172.76	6172.29	6171.82
8	6172.77	6172.65	6172.65	6172.64	6172.87	6172.77	6172.57	6172.67	6173.02	6172.75	6172.27	6171.81
9	6172.76	6172.63	6172.61	6172.62	6172.91	6172.79	6172.56	6172.67	6173.02	6172.74	6172.26	6171.80
10	6172.76	6172.62	6172.60	6172.58	6172.89	6172.82	6172.56	6172.66	6173.02	6172.73	6172.25	6171.78
11	6172.73	6172.62	6172.58	6172.56	6172.87	6172.81	6172.54	6172.64	6173.01	6172.73	6172.23	6171.76
12	6172.70	6172.66	6172.57	6172.57	6172.87	6172.80	6172.53	6172.63	6172.99	6172.72	6172.22	6171.73
13	6172.67	6172.63	6172.55	6172.57	6172.86	6172.79	6172.53	6172.61	6172.98	6172.71	6172.20	6171.72
14	6172.65	6172.61	6172.54	6172.56	6172.84	6172.80	6172.52	6172.59	6172.97	6172.70	6172.18	6171.69
15	6172.63	6172.59	6172.53	6172.55	6172.92	6172.78	6172.52	6172.58	6173.01	6172.68	6172.14	6171.66
16	6172.61	6172.57	6172.51	6172.55	6172.92	6172.77	6172.52	6172.56	6173.00	6172.67	6172.12	6171.64
17	6172.60	6172.57	6172.49	6172.52	6172.90	6172.77	6172.52	6172.55	6172.99	6172.66	6172.14	6171.63
18	6172.57	6172.56	6172.48	6172.50	6172.88	6172.75	6172.51	6172.54	6172.98	6172.64	6172.11	6171.61
19	6172.56	6172.54	6172.45	6172.49	6172.86	6172.74	6172.51	6172.54	6172.97	6172.63	6172.10	6171.59
20	6172.64	6172.53	6172.44	6172.47	6172.86	6172.73	6172.51	6172.58	6172.96	6172.61	6172.12	6171.56
21	6172.67	6172.51	6172.43	6172.46	6172.85	6172.73	6172.50	6172.62	6172.95	6172.60	6172.09	6171.53
22	6172.73	6172.49	6172.41	6172.45	6172.85	6172.73	6172.55	6172.75	6172.96	6172.58	6172.07	6171.52
23	6172.81	6172.56	6172.40	6172.44	6172.83	6172.71	6172.59	6172.76	6172.95	6172.56	6172.05	6171.50
24	6172.81	6172.58	6172.38	6172.42	6172.82	6172.70	6172.57	6172.76	6172.94	6172.53	6172.03	6171.50
25	6172.79	6172.63	6172.37	6172.44	6172.81	6172.70	6172.60	6172.75	6172.93	6172.51	6172.03	6171.51
26	6172.85	6172.64	6172.36	6172.46	6172.80	6172.71	6172.60	6172.78	6172.91	6172.49	6171.99	6

KLAMATH RIVER BASIN

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1963 to current year.

INSTRUMENTATION.--Temperature recorder from October 1963 to current year. Elevation of probe is 6,157 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Samples were collected at boat harbor at end of trail in Cleetwood Cove and 6 mi northeast of Crater Lake post office. Records represent water temperature at sensor within 0.5°C.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 18.5°C Aug. 9, 10, 1978; minimum recorded, 0.5°C on several days in 1969, but may have been as low or lower during period of missing record Oct. 29, 1985 to July 1, 1986.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 18.0°C Aug. 14, 15; minimum, 2.0°C Feb. 18.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	HARDNESS (MG/L AS CaCO3)	CALCIUM, DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM PERCENT
OCT 1989										
20...	1200	113	7.9	9.5	0.1	28	6.8	2.6	10	42
JUN 1990										
27...	1300	115	7.5	10.5	0.4	29	7.2	2.6	10	41
SEP 18...	1110	114	7.7	13.5	0.3	29	7.1	2.6	11	44
DATE	SODIUM AD-SORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY DIS IT FIELD (MG/L AS CaCO3)	BICARBONATE DIS IT FIELD (MG/L AS HCO3)	CARBONATE DIS IT FIELD (MG/L AS CO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)
OCT 1989										
20...	0.8	1.6	29	36	0	10	9.0	0.1	18	75
JUN 1990										
27...	0.8	1.6	28	34	0	9.9	11	0.2	18	64
SEP 18...	0.9	1.6	28	34	0	11	11	<0.1	18	73
DATE	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHORUS DIS-SOLVED (MG/L AS P)	PHOSPHORUS ORTHO, DIS-SOLVED (MG/L AS P)	ALUMINUM, DIS-SOLVED (UG/L AS AL)
OCT 1989										
20...	76	0.10	<0.01	<0.1	<0.01	<0.2	0.03	0.02	0.04	--
JUN 1990										
27...	77	0.09	<0.01	<0.1	<0.01	<0.2	0.02	0.01	0.01	60
SEP 18...	79	0.10	<0.01	<0.1	<0.01	<0.2	0.01	0.02	<0.01	<10

KLAMATH RIVER BASIN

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11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	ARSENIC, DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM, DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM, DIS- SOLVED (UG/L AS LI)
OCT 1989 20...	3	5	<0.5	<1	1	<3	<1	14	<1	43
JUN 1990 27...	3	6	<0.5	<1	<1	<3	--	6	--	45
SEP 18...	3	5	<0.5	<1	<1	<3	1	4	<1	46
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY, DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	
OCT 1989 20...	1	<0.1	10	<1	<1	<1	57	<6	23	
JUN 1990 27...	1	<0.1	<10	<1	<1	<1	57	<6	--	
SEP 18...	2	<0.1	<10	<1	<1	<1	58	<6	7	

KLAMATH RIVER BASIN

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	11.0	11.0	11.0	7.5	7.5	7.5	5.5	5.0	5.5	4.5	4.0	4.5
2	11.0	10.5	10.5	7.5	7.5	7.5	5.5	5.0	5.5	4.0	4.0	4.0
3	10.5	10.0	10.5	7.5	7.0	7.5	5.0	5.0	5.0	4.0	4.0	4.0
4	10.5	10.0	10.5	7.5	7.0	7.0	5.0	5.0	5.0	4.0	4.0	4.0
5	10.5	10.0	10.0	7.0	7.0	7.0	5.0	5.0	5.0	4.0	4.0	4.0
6	10.5	10.0	10.5	7.0	7.0	7.0	5.0	5.0	5.0	4.0	4.0	4.0
7	10.5	10.5	10.5	7.0	7.0	7.0	5.0	5.0	5.0	4.0	4.0	4.0
8	10.5	10.5	10.5	7.0	7.0	7.0	5.0	5.0	5.0	4.0	4.0	4.0
9	10.5	10.5	10.5	7.0	7.0	7.0	5.0	4.5	5.0	4.0	3.5	4.0
10	10.5	10.5	10.5	7.0	7.0	7.0	5.0	4.5	4.5	4.0	3.5	4.0
11	10.5	10.5	10.5	7.0	7.0	7.0	5.0	4.5	4.5	4.0	3.5	4.0
12	10.5	10.5	10.5	7.0	6.5	7.0	5.0	4.5	5.0	3.5	3.5	3.5
13	10.5	10.0	10.0	6.5	6.5	6.5	5.0	4.5	5.0	3.5	3.5	3.5
14	10.0	10.0	10.0	6.5	6.5	6.5	5.0	4.5	5.0	3.5	3.5	3.5
15	10.0	10.0	10.0	6.5	6.5	6.5	5.0	4.5	5.0	3.5	3.5	3.5
16	10.0	10.0	10.0	6.5	6.5	6.5	5.0	4.5	4.5	3.5	3.5	3.5
17	10.0	9.5	10.0	6.5	6.0	6.5	4.5	4.5	4.5	3.5	3.5	3.5
18	10.0	10.0	10.0	6.5	6.0	6.5	4.5	4.5	4.5	3.5	3.5	3.5
19	10.0	10.0	10.0	6.5	6.0	6.0	4.5	4.5	4.5	3.5	3.5	3.5
20	10.0	9.5	9.5	6.5	6.0	6.0	4.5	4.5	4.5	3.5	3.5	3.5
21	9.5	9.5	9.5	6.5	6.0	6.5	4.5	4.5	4.5	3.5	3.5	3.5
22	9.5	9.0	9.0	6.5	6.0	6.5	4.5	4.5	4.5	3.5	3.5	3.5
23	9.0	8.5	9.0	6.0	6.0	6.0	4.5	4.5	4.5	3.5	3.5	3.5
24	8.5	8.5	8.5	6.0	6.0	6.0	4.5	4.5	4.5	3.5	3.5	3.5
25	8.5	8.0	8.5	6.0	6.0	6.0	4.5	4.5	4.5	3.5	3.5	3.5
26	8.0	8.0	8.0	6.0	5.5	5.5	4.5	4.5	4.5	3.5	3.5	3.5
27	8.0	8.0	8.0	5.5	5.5	5.5	4.5	4.5	4.5	3.5	3.5	3.5
28	7.5	7.5	7.5	5.5	5.5	5.5	4.5	4.0	4.5	3.5	3.5	3.5
29	7.5	7.5	7.5	5.5	5.5	5.5	4.5	4.0	4.5	3.5	3.5	3.5
30	7.5	7.5	7.5	5.5	5.5	5.5	4.5	4.5	4.5	3.5	3.5	3.5
31	7.5	7.5	7.5	---	---	---	4.5	4.5	4.5	3.5	3.5	3.5
MONTH	11.0	7.5	9.5	7.5	5.5	6.5	5.5	4.0	4.5	4.5	3.5	3.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	3.5	3.0	3.5	3.0	2.5	2.5	4.0	3.5	4.0	5.5	5.0	5.0
2	3.5	3.5	3.5	2.5	2.5	2.5	4.0	3.5	3.5	5.0	4.5	5.0
3	3.5	3.0	3.5	3.0	2.5	2.5	4.0	3.5	4.0	5.5	5.0	5.0
4	3.5	3.0	3.0	3.0	2.5	2.5	4.0	3.5	3.5	6.0	5.5	6.0
5	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.5	4.0	5.5	5.5	5.5
6	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.5	4.0	6.0	5.5	6.0
7	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.5	4.0	6.0	5.5	5.5
8	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.5	4.0	5.5	5.5	5.5
9	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5	5.5	5.0	5.5
10	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.5	3.5	5.5	5.0	5.5
11	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.5	4.0	5.0	5.0	5.0
12	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5	5.5	5.0	5.5
13	3.0	3.0	3.0	3.0	2.5	3.0	4.0	3.5	4.0	5.5	5.5	5.5
14	2.5	2.5	2.5	3.0	3.0	3.0	3.5	3.5	3.5	5.5	5.0	5.5
15	3.0	2.5	2.5	3.0	3.0	3.0	4.0	3.5	4.0	5.5	5.0	5.5
16	3.0	3.0	3.0	3.5	3.0	3.0	4.0	3.5	4.0	5.0	5.0	5.0
17	3.0	2.5	2.5	3.5	3.0	3.0	4.0	3.5	4.0	5.0	5.0	5.0
18	2.5	2.0	2.5	3.5	3.0	3.5	4.5	4.0	4.0	5.0	5.0	5.0
19	2.5	2.5	2.5	3.5	3.0	3.5	4.5	4.0	4.5	5.0	5.0	5.0
20	2.5	2.5	2.5	3.5	3.0	3.5	4.5	4.0	4.5	5.5	5.0	5.0
21	2.5	2.5	2.5	3.5	3.0	3.5	4.5	4.5	4.5	5.0	5.0	5.0
22	2.5	2.5	2.5	3.5	3.0	3.5	4.5	4.0	4.0	5.5	5.0	5.5
23	3.0	2.5	2.5	3.5	3.5	3.5	4.5	4.0	4.5	5.5	5.5	5.5
24	3.0	2.5	2.5	3.5	3.5	3.5	4.5	4.0	4.5	5.5	5.0	5.5
25	3.0	3.0	3.0	3.5	3.5	3.5	4.5	4.0	4.5	6.0	5.5	6.0
26	3.0	2.5	3.0	3.5	3.5	3.5	4.5	4.5	4.5	6.0	5.5	6.0
27	3.0	2.5	3.0	3.5	3.5	3.5	4.5	4.5	4.5	6.5	6.0	6.0
28	3.0	3.0	3.0	3.5	3.5	3.5	4.5	4.5	4.5	6.0	5.5	6.0
29	---	---	---	4.0	3.5	3.5	5.0	4.5	5.0	6.5	6.0	6.5
30	---	---	---	4.0	3.5	3.5	5.5	5.0	5.5	6.0	6.0	6.0
31	---	---	---	4.0	3.5	3.5	---	---	---	6.5	6.0	6.5
MONTH	3.5	2.0	3.0	4.0	2.5	3.0	5.5	3.5	4.0	6.5	4.5	5.5

KLAMATH RIVER BASIN

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11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	6.5	6.0	6.5	10.5	10.0	10.5	15.5	14.5	15.0	14.0	13.5	13.5
2	6.5	6.0	6.5	10.5	10.0	10.5	15.5	14.5	15.0	13.5	13.5	13.5
3	6.5	6.0	6.5	10.5	10.0	10.0	15.5	14.5	15.0	13.5	13.5	13.5
4	6.5	6.0	6.5	10.5	10.5	10.5	16.0	15.5	15.5	13.5	13.5	13.5
5	6.5	6.5	6.5	10.5	10.5	10.5	16.0	15.5	16.0	14.0	13.5	13.5
6	7.0	6.5	6.5	10.5	10.5	10.5	16.5	15.5	16.0	14.0	13.5	14.0
7	7.0	7.0	7.0	10.5	10.5	10.5	17.0	16.5	16.5	14.0	13.5	13.5
8	8.0	7.0	7.5	10.5	10.5	10.5	17.5	17.0	17.0	13.5	13.5	13.5
9	8.5	8.0	8.0	11.0	10.5	10.5	17.5	17.0	17.5	13.5	13.5	13.5
10	9.5	8.5	9.0	11.5	11.0	11.0	17.0	16.5	17.0	14.0	13.5	13.5
11	10.0	9.5	9.5	12.0	11.0	11.5	17.0	17.0	17.0	14.5	14.0	14.0
12	10.5	10.0	10.0	12.0	10.5	11.5	17.0	16.0	16.5	14.5	14.0	14.5
13	10.0	9.5	10.0	12.0	10.5	11.5	17.5	17.0	17.0	14.5	14.0	14.0
14	---	---	---	12.5	11.0	12.0	18.0	17.5	18.0	14.5	14.0	14.0
15	---	---	---	13.0	11.5	12.5	18.0	17.5	18.0	14.0	13.5	13.5
16	---	---	---	13.5	13.0	13.5	17.5	17.0	17.5	13.5	13.5	13.5
17	---	---	---	14.5	13.0	14.0	17.0	16.5	16.5	13.5	13.5	13.5
18	---	---	---	15.0	13.5	14.5	16.0	15.5	16.0	13.5	13.5	13.5
19	---	---	---	15.5	13.5	14.5	15.5	15.5	15.5	13.5	13.0	13.5
20	---	---	---	14.5	13.5	14.5	15.0	15.0	15.0	13.5	13.0	13.5
21	---	---	---	14.0	13.0	13.5	15.0	14.5	14.5	13.5	13.0	13.0
22	---	---	---	15.0	13.5	14.0	14.5	14.5	14.5	13.0	13.0	13.0
23	---	---	---	15.5	14.5	15.0	15.0	14.5	14.5	13.0	13.0	13.0
24	---	---	---	16.0	13.5	14.5	15.0	14.5	14.5	13.0	13.0	13.0
25	---	---	---	13.5	12.5	13.0	14.5	14.0	14.5	13.0	13.0	13.0
26	---	---	---	14.5	13.5	14.5	14.5	14.0	14.5	13.0	13.0	13.0
27	---	---	---	14.5	14.5	14.5	14.0	14.0	14.0	13.0	12.5	13.0
28	10.5	10.0	10.5	15.0	14.5	14.5	14.0	14.0	14.0	13.0	13.0	13.0
29	10.5	10.0	10.0	15.0	14.5	15.0	14.0	13.5	14.0	13.0	12.5	13.0
30	11.0	10.0	10.5	15.5	14.5	15.0	13.5	13.5	13.5	12.5	12.5	12.5
31	---	---	---	16.0	15.0	15.5	13.5	13.5	13.5	---	---	---
MONTH	---	---	---	16.0	10.0	12.5	18.0	13.5	15.5	14.5	12.5	13.5

KLAMATH RIVER BASIN

11493500 WILLIAMSON RIVER NEAR KLAMATH AGENCY, OR

LOCATION.--Lat 42°44'25", long 121°50'00", in NW 1/4 SW 1/4 sec.1, T.33 S., R.7 E., Klamath County, Hydrologic Unit 18010201, on right bank 250 ft downstream from highway bridge, 0.6 mi southwest of railroad station at Kirk, 10 mi upstream from Spring Creek, and 10 mi northeast of Klamath Agency.

DRAINAGE AREA.--1,290 mi², approximately.

PERIOD OF RECORD.--March 1908 to January 1909, April 1909 to June 1910, October 1954 to current year. Monthly discharge only June 1910, published in WSP 1315-B.

REVISED RECORDS.--WSP 1565: 1908-9.

GAGE.--Water-stage recorder. Datum of gage is 4,483.16 ft above National Geodetic Vertical Datum of 1929. Mar. 25, 1908, to June 30, 1910, nonrecording gage or water-stage recorder at two sites about 0.5 mi upstream at different datums. Oct. 1, 1954, to Sept. 30, 1955, water-stage recorder at present site at datum 2.05 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow affected by natural storage in Klamath Marsh. Small diversions upstream from station for irrigation in vicinity of marsh.

AVERAGE DISCHARGE.--36 years (water years 1955-90), 205 ft³/s, 148,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 1,590 ft³/s Mar. 13, 1910, gage height, 3.7 ft, site and datum then in use, from rating curve extended above 800 ft³/s; maximum gage height, 5.57 ft Mar. 3, 1958; no flow at times during 1960-74, 1977-81, 1988-90.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 359 ft³/s Mar. 26-28, gage height, 4.49 ft; no flow Oct. 1 to Nov. 11, June 29 to Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	75	57	e130	108	316	81	17	.00	.00	.00
2	.00	.00	76	54	e125	115	308	76	16	.00	.00	.00
3	.00	.00	77	51	e120	124	300	71	13	.00	.00	.00
4	.00	.00	80	48	e120	130	292	66	14	.00	.00	.00
5	.00	.00	86	45	e120	137	282	61	12	.00	.00	.00
6	.00	.00	91	43	e120	144	272	61	11	.00	.00	.00
7	.00	.00	92	52	e120	153	256	58	11	.00	.00	.00
8	.00	.00	97	86	e120	167	240	56	9.8	.00	.00	.00
9	.00	.00	101	103	123	178	237	53	8.2	.00	.00	.00
10	.00	.00	102	121	123	194	230	50	6.0	.00	.00	.00
11	.00	.00	105	133	123	207	223	47	6.9	.00	.00	.00
12	.00	.05	106	142	122	219	219	41	4.7	.00	.00	.00
13	.00	.52	106	152	e120	227	214	35	7.1	.00	.00	.00
14	.00	5.4	107	164	e115	234	209	33	5.7	.00	.00	.00
15	.00	11	107	171	e110	244	201	27	4.7	.00	.00	.00
16	.00	17	108	183	e105	255	194	19	4.1	.00	.00	.00
17	.00	23	e110	190	e105	269	190	13	4.4	.00	.00	.00
18	.00	27	e105	185	e100	289	184	11	3.9	.00	.00	.00
19	.00	32	e105	e180	e100	301	175	9.1	3.4	.00	.00	.00
20	.00	35	e100	e175	e95	312	171	8.0	2.7	.00	.00	.00
21	.00	42	e95	e170	95	321	163	9.5	2.0	.00	.00	.00
22	.00	46	e95	e170	95	324	155	11	1.3	.00	.00	.00
23	.00	47	e90	e165	95	335	154	13	1.1	.00	.00	.00
24	.00	57	e85	e165	96	343	150	11	.78	.00	.00	.00
25	.00	63	e80	e160	97	345	140	12	.64	.00	.00	.00
26	.00	66	e80	e155	98	353	134	10	.31	.00	.00	.00
27	.00	68	e75	e150	101	353	112	12	.10	.00	.00	.00
28	.00	71	70	e150	104	352	106	14	.01	.00	.00	.00
29	.00	74	66	143	---	345	97	14	.00	.00	.00	.00
30	.00	75	63	138	---	337	89	15	.00	.00	.00	.00
31	.00	---	59	e135	---	326	---	16	---	.00	.00	---
TOTAL	0.00	759.97	2794	4036	3097	7741	6013	1013.6	171.84	0.00	0.00	0.00
MEAN	.000	25.3	90.1	130	111	250	200	32.7	5.73	.000	.000	.000
MAX	.00	75	110	190	130	353	316	81	17	.00	.00	.00
MIN	.00	.00	59	43	95	108	89	8.0	.00	.00	.00	.00
AC-FT	.00	1510	5540	8010	6140	15350	11930	2010	341	.00	.00	.00

CAL YR 1989 TOTAL 52601.47 MEAN 144 MAX 844 MIN .00 AC-FT 104300
WTR YR 1990 TOTAL 25626.41 MEAN 70.2 MAX 353 MIN .00 AC-FT 50830

e Estimated

KLAMATH RIVER BASIN

49

11497500 SPRAGUE RIVER NEAR BEATTY, OR

LOCATION.--Lat 42°26'50", long 121°14'15", in NW 1/4 SE 1/4 sec.13, T.36 S., R.12 E., Klamath County. Hydrologic Unit 18010202, on right bank 1.6 mi east of Beatty, and 4.6 mi upstream from Sycan River.

DRAINAGE AREA.--513 mi².

PERIOD OF RECORD.--April to September 1912 and November 1912 to September 1913 (fragmentary), October 1913 to September 1915, February to November 1916, March 1917 to June 1918, May 1919 to October 1920, February 1921 to September 1926 (irrigation seasons only), October 1953 to current year. Monthly discharge only October 1913, published in WSP 1315-B. Prior to October 1917, published as "near Yainax."

REVISED RECORDS.--WSP 1315-B: 1917(M).

GAGE.--Water-stage recorder. Datum of gage is 4,305.35 ft above National Geodetic Vertical Datum of 1929.

Apr. 19, 1912, to Feb. 19, 1914, nonrecording gage, Feb. 20, 1914, to Sept. 11, 1917, water-stage recorder, and Sept. 12, 1917, to Sept. 30, 1926, nonrecording gage, at site 2 mi upstream at different datum.

REMARKS.--Records good except those for Mar. 29 to June 11, Aug. 1 to Sept. 18, which are poor. No regulation. Diversions for irrigation upstream from station in the vicinity of Bly.

AVERAGE DISCHARGE.--40 years (water years 1914-15, 1920, 1954-90), 308 ft³/s, 223,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,980 ft³/s Dec. 23, 1964, gage height, 12.19 ft; minimum discharge, 50 ft³/s Aug. 25, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,060 ft³/s Jan. 9, gage height, 5.89 ft; minimum discharge, 31 ft³/s Aug. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	159	165	149	e120	145	267	290	234	366	149	90	70
2	163	163	147	122	146	251	310	203	355	152	86	67
3	171	162	148	102	145	370	321	184	302	154	71	68
4	176	165	152	122	137	400	333	170	261	159	71	59
5	170	164	171	138	126	375	332	160	226	159	70	60
6	163	161	197	137	155	289	343	144	226	163	68	60
7	159	161	178	147	139	237	353	133	207	159	61	60
8	158	159	169	582	146	224	361	127	175	159	58	57
9	147	159	172	862	144	202	347	115	167	155	52	55
10	147	158	148	495	146	198	330	100	159	153	50	61
11	153	157	126	268	155	196	339	92	161	149	46	60
12	154	156	137	209	160	184	318	87	163	154	50	59
13	152	157	143	206	138	166	308	84	160	155	49	60
14	150	155	141	216	122	174	309	81	159	148	39	65
15	149	153	140	199	131	187	307	75	157	140	35	64
16	149	154	138	188	141	195	310	66	161	135	32	65
17	149	153	130	174	e130	207	331	59	167	126	31	76
18	148	154	129	157	e130	234	307	66	187	126	38	81
19	149	151	128	146	126	276	278	65	190	138	58	80
20	152	151	124	141	135	298	261	69	201	154	67	73
21	157	149	133	153	147	284	250	83	199	153	65	65
22	165	148	133	158	156	273	249	87	215	137	76	64
23	179	150	131	154	180	283	393	129	191	125	62	61
24	201	164	130	148	223	294	483	204	187	118	63	74
25	198	160	125	150	296	283	395	160	201	112	60	86
26	188	158	121	154	313	295	347	140	183	109	51	106
27	189	150	e120	141	313	302	317	147	174	111	55	118
28	182	145	e120	146	290	286	318	194	155	106	56	130
29	169	130	e120	150	---	276	304	222	149	99	56	121
30	165	146	e118	147	---	271	259	245	147	95	68	114
31	166	---	e118	148	---	276	---	333	---	94	72	---
TOTAL	5077	4658	4336	6380	4715	8053	9703	4258	5951	4246	1806	2239
MEAN	164	155	140	206	168	260	323	137	198	137	58.3	74.6
MAX	201	165	197	862	313	400	483	333	366	163	90	130
MIN	147	130	118	102	122	166	249	59	147	94	31	55
AC-FT	10070	9240	8600	12650	9350	15970	19250	8450	11800	8420	3580	4440

CAL YR 1989 TOTAL 126638 MEAN 347 MAX 2450 MIN 91 AC-FT 251200
WTR YR 1990 TOTAL 61422 MEAN 168 MAX 862 MIN 31 AC-FT 121800

e Estimated

KLAMATH RIVER BASIN

11499100 SYCAN RIVER BELOW SNAKE CREEK, NEAR BEATTY, OR

LOCATION.--Lat 42°29'10", long 121°16'40", in SW 1/4 SE 1/4 sec.34, T.35 S., R.12 E., Klamath County, Hydrologic Unit 18010202, on left bank 200 ft downstream from Snake Creek and 3.1 mi north of Beatty.

DRAINAGE AREA.--568 mi².

PERIOD OF RECORD.--October 1973 to current year. Prior to October 1979, in reports of Oregon Water Resources Department.

GAGE.--Water-stage recorder. Elevation of gage is 4,310 ft, from topographic map.

REMARKS.--Records good. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--17 years, 164 ft³/s, 118,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,550 ft³/s Feb. 21 or 22, 1982, gage height, 12.22 ft, from floodmarks; minimum discharge, 3.0 ft³/s Nov. 21, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 332 ft³/s Mar. 6; minimum discharge, 11 ft³/s Aug. 11-15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	37	e32	29	34	213	97	85	107	19	16	14
2	28	35	32	29	33	235	94	80	101	19	15	14
3	28	35	33	29	34	217	92	75	87	19	17	14
4	29	35	38	30	31	281	90	69	77	19	14	15
5	30	35	46	30	30	286	89	63	69	19	13	15
6	32	35	41	31	31	278	93	58	64	19	13	15
7	32	36	e39	43	30	280	99	54	61	19	14	15
8	29	36	e39	176	30	237	114	49	55	18	13	15
9	29	36	e35	103	31	185	125	47	47	18	12	16
10	29	38	e31	215	32	197	125	44	44	18	12	16
11	30	38	e28	155	34	169	117	41	43	18	11	16
12	30	36	e28	110	33	140	110	38	41	17	11	16
13	30	36	e30	127	31	121	114	37	41	17	11	16
14	32	36	e30	121	29	109	113	37	39	17	11	16
15	32	35	e30	79	29	106	109	36	38	16	12	16
16	31	36	e30	72	31	126	112	35	33	16	12	17
17	31	37	30	67	31	164	120	33	33	16	12	17
18	32	36	30	50	30	176	114	32	33	16	12	17
19	32	35	29	44	30	169	124	32	32	17	13	17
20	32	36	29	40	28	155	127	33	32	17	13	17
21	33	36	30	50	31	143	119	35	32	16	12	18
22	34	35	30	48	35	139	114	35	29	15	12	18
23	43	38	29	47	35	136	122	49	24	15	13	18
24	46	41	29	45	40	131	113	50	21	17	13	18
25	44	34	29	42	45	125	119	50	21	16	13	18
26	42	37	29	43	53	128	126	48	22	16	12	20
27	46	35	e29	42	86	143	109	49	21	18	13	19
28	43	34	e29	37	168	133	99	53	21	17	14	19
29	41	32	e29	40	---	122	87	56	20	15	14	19
30	39	e32	e29	37	---	110	88	61	20	16	14	19
31	38	---	e29	34	---	102	---	89	---	18	14	---
TOTAL	1057	1073	981	2045	1115	5256	3274	1553	1308	533	401	500
MEAN	34.1	35.8	31.6	66.0	39.8	170	109	50.1	43.6	17.2	12.9	16.7
MAX	46	41	46	215	168	286	127	89	107	19	17	20
MIN	28	32	28	29	28	102	87	32	20	15	11	14
AC-FT	2100	2130	1950	4060	2210	10430	6490	3080	2590	1060	795	992

CAL YR 1989 TOTAL 69029 MEAN 189 MAX 3300 MIN 22 AC-FT 136900
WTR YR 1990 TOTAL 19096 MEAN 52.3 MAX 286 MIN 11 AC-FT 37880

e Estimated

KLAMATH RIVER BASIN

51

11501000 SPRAGUE RIVER NEAR CHILOQUIN, OR

LOCATION.--Lat 42°35'05", long 121°50'55", in NE 1/4 NW 1/4 sec.35, T.34 S., R.7 E., Klamath County, Hydrologic Unit 18010202, on right bank 1.0 mi northeast of Chiloquin, 4.6 mi upstream from Modoc Point Canal intake, and at mile 5.4.

DRAINAGE AREA.--1,580 mi², approximately.

PERIOD OF RECORD.--July to October 1920, March 1921 to current year. Monthly discharge only July 1920, published in WSP 1315-B. Prior to October 1931, published as "at McCreedy Ranch, near Chiloquin."

REVISED RECORDS.--WSP 591: 1922(M). WSP 1011: 1943(M). WSP 1565: 1921-22.

GAGE.--Water-stage recorder. Datum of gage is 4,202.43 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1931, nonrecording gage at site 12 mi upstream at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Minor regulation from irrigation diversions upstream from station.

AVERAGE DISCHARGE.--69 years (water years 1922-90), 582 ft³/s, 421,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,900 ft³/s Dec. 26, 1964, gage height, 10.37 ft; minimum daily discharge, 50 ft³/s May 26, 1926.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,100 ft³/s Jan. 11, gage height, 3.04 ft; minimum discharge, 100 ft³/s Aug. 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	292	326	e290	e250	e320	579	501	441	419	163	118	160
2	293	326	e300	e250	e310	620	492	402	455	148	108	160
3	294	326	e310	e250	e310	655	493	378	488	152	106	168
4	290	325	e320	e270	e310	710	505	355	482	160	115	166
5	275	322	332	e290	e310	787	513	336	444	155	118	153
6	278	319	342	e320	e310	841	516	327	402	151	115	147
7	280	326	361	343	e310	813	500	309	359	154	111	150
8	275	325	377	574	e320	737	506	282	338	153	119	154
9	277	326	365	712	e320	679	513	262	322	155	137	159
10	279	325	e340	996	e320	644	524	248	290	154	125	161
11	276	326	e320	1070	e320	586	524	237	259	147	130	152
12	278	326	e300	883	e320	584	516	228	242	149	133	139
13	295	326	e290	628	e320	543	508	228	235	154	129	131
14	301	326	e290	508	e280	504	487	224	220	148	123	123
15	310	326	e280	503	e270	476	469	230	201	153	127	129
16	306	324	e280	488	e270	475	467	230	192	148	129	151
17	302	323	e280	434	e280	477	478	243	215	140	147	169
18	301	324	e270	404	e280	503	502	235	223	138	151	164
19	304	326	e270	e370	e270	542	518	228	220	132	153	157
20	305	322	e270	e340	e260	567	495	227	233	132	165	160
21	305	322	e270	e330	e290	592	476	240	239	144	201	161
22	313	323	e270	e330	e310	598	468	254	224	160	219	151
23	326	325	e260	e330	e330	579	456	288	220	151	219	141
24	341	326	e260	e320	356	567	459	318	209	149	214	137
25	362	332	e260	e320	391	562	530	351	211	139	216	142
26	375	345	e260	e320	456	570	585	389	198	122	210	176
27	367	334	e260	e320	524	560	546	371	179	131	198	189
28	352	e310	e260	e320	557	563	510	338	181	138	187	196
29	344	e300	e260	e320	---	565	474	332	177	138	164	220
30	341	e290	e260	e320	---	541	462	359	169	136	167	234
31	331	---	e260	e320	---	518	---	392	---	128	170	---
TOTAL	9568	9702	9067	13433	9224	18537	14993	9282	8246	4522	4724	4800
MEAN	309	323	292	433	329	598	500	299	275	146	152	160
MAX	375	345	377	1070	557	841	585	441	488	163	219	234
MIN	275	290	260	250	260	475	456	224	169	122	106	123
AC-FT	18980	19240	17980	26640	18300	36770	29740	18410	16360	8970	9370	9520

CAL YR 1989 TOTAL 232689 MEAN 638 MAX 4450 MIN 113 AC-FT 461500
WTR YR 1990 TOTAL 116098 MEAN 318 MAX 1070 MIN 106 AC-FT 230300

e Estimated

KLAMATH RIVER BASIN

11502500 WILLIAMSON RIVER BELOW SPRAGUE RIVER, NEAR CHILOQUIN, OR

LOCATION.--Lat 42°34'15", long 121°52'35", in NE 1/4 NE 1/4 sec.4, T.35 S., R.7 E., Klamath County, Hydrologic Unit 18010202, on right bank 0.2 mi downstream from Sprague River and 0.8 mi southwest of Chiloquin.

DRAINAGE AREA.--3,000 mi², approximately.

PERIOD OF RECORD.--June 1917 to current year.

REVISED RECORDS.--WSP 981: 1938(M). WSP 1565: 1920(M), 1927(M), 1938.

GAGE.--Water-stage recorder. Datum of gage is 4,155.55 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 1, 1923, at different datum.

REMARKS.--Records excellent except for estimated daily discharges, which are fair. Some regulation by diversion dams and logpond operations on Sprague River. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--73 years, 1,053 ft³/s, 762,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,100 ft³/s Dec. 26, 1964, gage height, 10.56 ft; minimum discharge, 320 ft³/s Oct. 14, 1920.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,610 ft³/s Jan. 11, gage height, 3.58 ft; minimum discharge, 371 ft³/s Aug. 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	585	646	e680	e570	e760	1040	1190	827	787	429	388	451
2	589	644	e690	e570	e760	1090	1170	771	813	420	379	448
3	592	646	e710	e560	e760	1150	1160	725	846	418	377	461
4	591	646	722	e590	e760	1200	1160	701	831	426	378	461
5	575	645	741	e620	e760	1290	1170	679	789	425	386	447
6	574	639	748	e660	e760	1350	1170	662	736	419	381	444
7	578	646	769	773	e760	1340	1150	635	679	423	376	443
8	578	646	e780	1050	e760	1280	1120	605	652	426	385	442
9	574	646	e790	1180	e750	1240	1080	576	622	430	406	449
10	578	646	e770	1480	e750	1230	1080	551	592	429	395	453
11	576	646	e740	1590	e750	1180	1070	534	565	418	393	446
12	574	649	e720	1430	e750	1190	1050	518	552	428	398	437
13	590	652	e700	1180	e750	1170	1050	512	544	441	397	430
14	595	646	e680	1040	e670	1140	1010	510	523	428	389	422
15	606	646	e660	e1000	e650	1120	976	507	501	426	396	425
16	601	656	e650	e990	e660	1130	976	503	483	421	399	441
17	600	662	e630	988	e670	1140	990	505	494	409	410	470
18	593	666	e620	949	e660	1180	996	493	502	405	427	470
19	596	673	e610	919	e650	1230	1010	487	496	402	428	461
20	601	678	e600	866	e650	1260	981	485	505	404	438	459
21	609	678	e600	e840	e670	1290	954	490	520	406	475	456
22	614	681	e590	e830	e700	1310	940	520	502	430	491	449
23	643	696	e590	e820	e760	1300	924	578	492	419	499	439
24	656	701	e590	e810	769	1290	906	602	481	414	504	438
25	671	714	e590	e800	813	1280	973	642	475	406	506	444
26	699	733	e590	e790	885	1300	1030	699	463	386	502	476
27	701	723	e590	e780	965	1280	988	711	441	389	495	495
28	678	712	e590	e770	1000	1270	927	673	441	400	485	506
29	663	701	e590	e770	---	1270	881	667	440	402	469	523
30	662	e690	e580	e770	---	1250	858	700	433	404	470	541
31	656	---	e580	e760	---	1220	---	758	---	393	467	---
TOTAL	18998	20053	20490	27745	21002	38010	30940	18826	17200	12876	13289	13727
MEAN	613	668	661	895	750	1226	1031	607	573	415	429	458
MAX	701	733	790	1590	1000	1350	1190	827	846	441	506	541
MIN	574	639	580	560	650	1040	858	485	433	386	376	422
AC-FT	37680	39780	40640	55030	41660	75390	61370	37340	34120	25540	26360	27230

CAL YR 1989 TOTAL 404048 MEAN 1107 MAX 5230 MIN 431 AC-FT 801400
WTR YR 1990 TOTAL 253156 MEAN 694 MAX 1590 MIN 376 AC-FT 502100

e Estimated

KLAMATH RIVER BASIN

53

11503000 ANNIE SPRING NEAR CRATER LAKE, OR

LOCATION.--Lat 42°52'20", long 122°10'00", unsurveyed, Klamath County, Hydrologic Unit 18010203, in Crater Lake National Park, at highway bridge 0.1 mi downstream from source.

DRAINAGE AREA.--Indeterminate, normal flow is entirely from Annie Spring.

PERIOD OF RECORD.--June 1977 to current year. Discharge measurement and fragmentary gage-height record August to October 1913. Discharge measurements only Oct. 11, 1967, June 26, Sept. 13, 1968.

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 5,982.65 ft above National Geodetic Vertical Datum of 1929 (National Park Service bench mark).

REMARKS.--No estimated daily discharges. Records fair. Fluctuations caused by pumps 0.1 mi upstream. Diversion for domestic use by National Park Service 0.1 mi upstream.

COOPERATION.--Records of diversion by pumping furnished by National Park Service.

AVERAGE DISCHARGE.--13 years, 3.01 ft³/s, 2,180 acre-ft/yr, adjusted for diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18 ft³/s July 6, 1984, gage height, 1.56 ft; minimum discharge, 0.33 ft³/s Nov. 20, 22, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5.2 ft³/s June 13-18, gage height, 1.22 ft; minimum discharge, 0.54 ft³/s Mar. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	2.5	2.2	1.9	1.4	.95	.78	3.9	4.6	3.8	2.4	1.6
2	2.4	2.5	2.2	1.8	1.4	.90	.80	4.1	4.6	3.6	2.4	1.6
3	2.4	2.4	2.2	1.6	1.4	.88	.83	4.1	4.6	3.6	2.3	1.6
4	2.4	2.4	2.1	1.7	1.4	.85	.87	4.1	4.7	3.5	2.3	1.6
5	2.4	2.4	2.1	1.7	1.4	.82	.90	4.2	4.8	3.4	2.3	1.6
6	2.4	2.4	2.1	1.6	1.4	.83	.93	4.3	4.9	3.3	2.2	1.6
7	2.4	2.4	2.1	1.7	1.3	.83	.98	4.4	4.9	3.4	2.2	1.5
8	2.5	2.4	2.2	1.8	1.3	.81	1.0	4.5	4.9	3.3	2.2	1.5
9	2.5	2.4	2.2	1.8	1.3	.79	1.1	4.5	4.9	3.3	2.1	1.5
10	2.4	2.4	2.1	1.7	1.3	.75	1.1	4.5	4.9	3.2	2.1	1.5
11	2.4	2.4	2.1	1.7	1.2	.72	1.2	4.6	4.9	3.2	2.0	1.5
12	2.3	2.4	2.2	1.7	1.1	.72	1.2	4.6	5.0	3.1	2.0	1.5
13	2.3	2.3	2.1	1.7	1.1	.72	1.3	4.7	5.1	3.1	2.0	1.5
14	2.4	2.3	2.1	1.6	1.1	.73	1.3	4.7	5.2	3.1	2.0	1.5
15	2.3	2.3	2.2	1.6	1.0	.72	1.4	4.7	5.1	3.0	1.9	1.4
16	2.3	2.3	2.1	1.6	1.0	.64	1.5	4.6	5.2	3.0	1.9	1.4
17	2.3	2.3	2.1	1.6	1.0	.67	1.7	4.6	5.1	2.8	1.9	1.4
18	2.3	2.3	2.1	1.6	1.0	.67	2.0	4.4	5.2	2.9	1.9	1.4
19	2.3	2.3	2.1	1.6	1.0	.67	2.1	4.4	5.1	2.8	1.9	1.4
20	2.3	2.3	2.1	1.6	1.0	.65	2.2	4.4	4.9	2.8	1.8	1.4
21	2.4	2.3	2.0	1.6	.98	.66	2.3	4.5	5.0	2.7	1.8	1.4
22	2.4	2.3	2.0	1.5	.97	.66	2.3	4.4	4.8	2.7	1.8	1.4
23	2.4	2.2	2.0	1.5	.97	.67	2.4	4.2	4.8	2.6	1.7	1.4
24	2.5	2.2	2.0	1.5	1.0	.69	2.4	4.2	4.8	2.6	1.7	1.4
25	2.5	2.2	1.9	1.5	1.1	.69	2.4	4.2	4.6	2.5	1.7	1.4
26	2.5	2.2	1.9	1.5	1.1	.69	2.4	4.2	4.6	2.6	1.8	1.3
27	2.5	2.3	1.9	1.5	1.0	.67	2.4	4.2	4.5	2.6	1.7	1.3
28	2.5	2.3	1.9	1.5	.97	.66	2.5	4.2	4.4	2.5	1.7	1.3
29	2.5	2.2	1.9	1.5	---	.73	3.4	4.3	4.2	2.4	1.6	1.3
30	2.5	2.2	1.9	1.5	---	.75	3.7	4.4	4.1	2.5	1.7	1.3
31	2.5	---	1.9	1.4	---	.79	---	4.5	---	2.4	1.7	---
TOTAL	74.7	69.8	64.0	50.1	32.19	22.98	51.39	135.6	144.4	92.3	60.7	43.5
MEAN	2.41	2.33	2.06	1.62	1.15	.74	1.71	4.37	4.81	2.98	1.96	1.45
MAX	2.5	2.5	2.2	1.9	1.4	.95	3.7	4.7	5.2	3.8	2.4	1.6
MIN	2.3	2.2	1.9	1.4	.97	.64	.78	3.9	4.1	2.4	1.6	1.3
AC-FT	148	138	127	99	64	46	102	269	286	183	120	86
MEAN†	2.44	2.34	2.08	1.63	1.17	0.76	1.73	4.41	4.87	3.06	2.04	1.50
AC-FT†	150	139	128	100	65.2	46.6	103	271	290	188	125	89.5

CAL YR 1989 TOTAL 1127.96 MEAN 3.09 MAX 9.3 MIN .41 AC-FT 2240 MEAN† 3.14 AC-FT† 2270
WTR YR 1990 TOTAL 841.66 MEAN 2.31 MAX 5.2 MIN .64 AC-FT 1670 MEAN† 2.35 AC-FT† 1700

† Adjusted for diversion by pumping.

KLAMATH RIVER BASIN

11507001 UPPER KLAMATH LAKE NEAR KLAMATH FALLS, OR

LOCATION.--Lat 42°15'00", long 121°48'55", in NW 1/4 SW 1/4 sec.19, T.38 S., R.9 E., Klamath County, Hydrologic Unit 18010203, at southeast end of lake, 1.4 mi upstream from outlet and 2.5 mi northwest of Main Street Bridge at Klamath Falls.

DRAINAGE AREA.--3,810 mi², approximately, including 26.2 mi² in closed basin of Crater Lake.

PERIOD OF RECORD.--May 1904 to September 1923 (gage heights only), October 1923 to current year. Monthend contents only October 1923 to September 1927, published in WSP 1315-B.

GAGE.--Water-stage recorder. Datum of gage is 4,098.22 ft above National Geodetic Vertical Datum of 1929, or 4,100.00 ft above Bureau of Reclamation datum. Gage readings have been reduced to elevations above Bureau of Reclamation datum. See WSP 1735 for history of changes prior to Nov. 10, 1923. Since Oct. 1, 1974, supplementary water-stage recorders at sites 7 mi north and 21 mi northwest at same datum (water-surface transfer by Pacific Power and Light Co.).

REMARKS.--Reservoir is formed by concrete dam at outlet of natural lake, completed in 1921, replacing a temporary dam built in 1919; controlled storage began Apr. 15, 1919. Capacity, 523,700 acre-ft between elevations 4,136.0 ft and 4,143.3 ft. Dead storage below elevation 4,136.0 ft is 211,300 acre-ft. Stored water may be diverted through "A" Canal for irrigation on land under Klamath project of Bureau of Reclamation, or released to Link River through dam or powerplants at Klamath Falls. Contents given herein represent those above elevation 4,136.0 ft. Prior to Oct. 1, 1973, contents given represented those above elevation 4,135.0 ft. Prior to Sept. 30, 1974, contents at end of month obtained by averaging elevations for last 3 days of month and first 3 days of following month to compensate for wind effect. Since Oct. 1, 1974, daily elevations are weighted mean of elevations at base and supplementary gages; contents at end of month are obtained from weighted midnight elevations of base and supplementary gages.

COOPERATION.--Capacity table furnished by Bureau of Reclamation, Klamath Project.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 4,144.98 ft about Apr. 20, 1904, from high-water marks; minimum recorded, 4,135.55 ft Oct. 30, 1944.

EXTREMES FOR CURRENT YEAR.--Maximum daily elevation, 4,142.86 ft Apr. 28; minimum daily, 4,138.95 ft Sept. 30.

Capacity table (elevation, in feet, and contents, in acre-feet)

4,136	0	4,139	193,700	4,142	414,400
4,137	61,300	4,140	262,600	4,143	498,300
4,138	127,000	4,141	335,400	4,143.3	523,700

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4139.63	4139.87	4140.28	4140.56	4141.39	4141.76	4142.73	4142.83	4142.71	4142.04	4140.70	4139.64
2	4139.67	4139.87	4140.29	4140.58	4141.40	4141.80	4142.74	4142.83	4142.71	4142.01	4140.64	4139.61
3	4139.63	4139.90	4140.29	4140.58	4141.36	4141.86	4142.73	4142.81	4142.74	4141.94	4140.59	4139.59
4	4139.62	4139.88	4140.28	4140.58	4141.42	4141.91	4142.73	4142.82	4142.78	4141.86	4140.55	4139.56
5	4139.62	4139.90	4140.31	4140.60	4141.42	4141.97	4142.71	4142.80	4142.78	4141.81	4140.50	4139.51
6	4139.63	4139.90	4140.34	4140.60	4141.45	4141.99	4142.71	4142.82	4142.79	4141.79	4140.45	4139.51
7	4139.63	4139.91	4140.37	4140.62	4141.46	4142.01	4142.72	4142.78	4142.81	4141.76	4140.40	4139.47
8	4139.62	4139.94	4140.37	4140.81	4141.47	4142.08	4142.73	4142.74	4142.81	4141.72	4140.35	4139.45
9	4139.61	4139.95	4140.42	4140.90	4141.47	4142.07	4142.73	4142.73	4142.81	4141.66	4140.34	4139.44
10	4139.60	4139.97	4140.44	4140.98	4141.49	4142.12	4142.75	4142.71	4142.83	4141.61	4140.29	4139.42
11	4139.59	4139.98	4140.44	4141.04	4141.50	4142.16	4142.77	4142.67	4142.81	4141.57	4140.24	4139.40
12	4139.58	4139.97	4140.43	4141.06	4141.51	4142.20	4142.75	4142.65	4142.80	4141.53	4140.20	4139.37
13	4139.60	4140.00	4140.43	4141.12	4141.52	4142.16	4142.75	4142.62	4142.76	4141.49	4140.16	4139.35
14	4139.62	4140.02	4140.44	4141.16	4141.51	4142.19	4142.76	4142.59	4142.74	4141.43	4140.10	4139.27
15	4139.64	4140.03	4140.44	4141.16	4141.51	4142.24	4142.75	4142.56	4142.70	4141.38	4140.04	4139.28
16	4139.62	4140.04	4140.45	4141.23	4141.54	4142.27	4142.78	4142.52	4142.67	4141.31	4139.98	4139.27
17	4139.64	4140.05	4140.46	4141.24	4141.55	4142.31	4142.79	4142.50	4142.63	4141.23	4139.92	4139.26
18	4139.65	4140.06	4140.46	4141.24	4141.56	4142.35	4142.77	4142.46	4142.62	4141.17	4139.90	4139.22
19	4139.64	4140.07	4140.47	4141.24	4141.56	4142.40	4142.78	4142.38	4142.59	4141.16	4139.90	4139.21
20	4139.57	4140.09	4140.47	4141.25	4141.56	4142.44	4142.79	4142.38	4142.57	4141.10	4139.86	4139.17
21	4139.60	4140.10	4140.47	4141.25	4141.57	4142.49	4142.80	4142.33	4142.53	4141.07	4139.82	4139.14
22	4139.56	4140.12	4140.49	4141.26	4141.59	4142.54	4142.77	4142.39	4142.49	4141.04	4139.81	4139.09
23	4139.58	4140.11	4140.50	4141.27	4141.62	4142.57	4142.82	4142.50	4142.44	4141.02	4139.81	4139.04
24	4139.71	4140.15	4140.51	4141.28	4141.63	4142.63	4142.80	4142.49	4142.40	4140.98	4139.79	4139.03
25	4139.76	4140.16	4140.52	4141.27	4141.66	4142.67	4142.79	4142.50	4142.36	4140.94	4139.71	4139.00
26	4139.73	4140.21	4140.53	4141.31	4141.68	4142.71	4142.80	4142.46	4142.32	4140.87	4139.67	4139.01
27	4139.81	4140.22	4140.54	4141.27	4141.70	4142.73	4142.77	4142.49	4142.26	4140.85	4139.68	4139.00
28	4139.82	4140.25	4140.56	4141.27	4141.72	4142.72	4142.86	4142.61	4142.21	4140.82	4139.68	4139.00
29	4139.83	4140.27	4140.56	4141.28	---	4142.71	4142.85	4142.60	4142.15	4140.79	4139.67	4138.96
30	4139.84	4140.27	4140.57	4141.32	---	4142.72	4142.85	4142.62	4142.10	4140.76	4139.67	4138.95
31	4139.86	---	4140.57	4141.33	---	4142.72	---	4142.68	---	4140.71	4139.66	---
MEAN	4139.66	4140.04	4140.44	4141.05	4141.53	4142.31	4142.77	4142.61	4142.60	4141.33	4140.07	4139.27
MAX	4139.86	4140.27	4140.57	4141.33	4141.72	4142.73	4142.86	4142.83	4142.83	4142.04	4140.70	4139.64
MIN	4139.56	4139.87	4140.28	4140.56	4141.36	4141.76	4142.71	4142.33	4142.10	4140.71	4139.66	4138.95
(+)	254200	283200	302800	365400	394800	476200	488900	472800	421000	313800	238200	190400
(+)	+19500	+29000	+19600	+62600	+29400	+81400	+12700	-16100	-51800	-107200	-75600	-47800

CAL YR 1989 MEAN 4141.19 MAX 4143.14 MIN 4139.43 AC-FT# 0
WTR YR 1990 MEAN 4141.14 MAX 4142.86 MIN 4138.95 AC-FT# -44300

+ Contents, in acre-feet, at 2400, on last day of month.

+ Change in contents, in acre-feet.

KLAMATH RIVER BASIN

55

11507500 LINK RIVER AT KLAMATH FALLS, OR

LOCATION.--Lat 42°13'25", long 121°47'35", in SW 1/4 NW 1/4 sec.32, T.38 S., R.9 E., Klamath County, Hydrologic Unit 18010204, on right bank 600 ft upstream from outlet of Keno Canal and 0.4 mi upstream from Main Street Bridge at Klamath Falls.

DRAINAGE AREA.--3,810 mi², approximately, including 26.2 mi² in closed basin of Crater Lake.

PERIOD OF RECORD.--May 1904 to current year. Records since October 1983 equivalent to earlier records if flow in Keno Canal is added to flow past station.

GAGE.--Water-stage recorder. Datum of gage is 4,083.71 ft above National Geodetic Vertical Datum of 1929, or 4,085.50 ft above mean sea level, datum of Bureau of Reclamation. Prior to Sept. 14, 1912, water-stage recorder or nonrecording gages at several sites within 0.5 mi of present site at various datums. Sept. 14, 1912, to Nov. 23, 1923, at site 600 ft downstream at datum 5.42 ft lower. Nov. 24, 1923, to Nov. 15, 1961, at site on left bank at present datum.

REMARKS.--No estimated daily discharges. Records excellent. Flow regulated since 1919 by Upper Klamath Lake (station 11507001). Large diurnal fluctuation caused by powerplant upstream from station. Water diverted upstream from station by main or "A" Canal of Klamath project. Many other diversions upstream from lake. All records presented herein do not include flow in Keno Canal which, since September 1908, has diverted from Upper Klamath Lake at Link River Dam for power generation, and returns flow to Link River downstream from station.

AVERAGE DISCHARGE.--79 years (water years 1905-83), 1,593 ft³/s, 1,154,000 acre-ft/yr, not adjusted for "A" Canal.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,400 ft³/s May 12, 1904, gage height at Main Street Bridge, 7.30 ft, datum then in use, from floodmarks; minimum daily discharge, 17 ft³/s Dec. 13, 1937.

EXTREMES FOR CURRENT YEAR.-- Maximum discharge, 2,200 ft³/s Apr. 23; minimum, 57 ft³/s Mar. 16, result of regulation from Upper Klamath Lake, minimum daily, 135 ft³/s Jan. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	414	780	664	850	1110	609	1300	675	264	1070	532	630
2	406	731	952	801	1110	902	1600	580	247	1210	653	628
3	412	550	1120	792	1110	814	1630	618	262	1020	824	629
4	413	512	974	798	1010	493	1570	659	265	1040	716	678
5	504	513	902	861	1120	573	1510	715	261	1220	805	871
6	750	512	654	857	1120	423	1180	1030	261	1040	912	777
7	758	513	730	745	1120	915	815	851	265	1020	833	693
8	756	514	771	253	1120	1130	719	688	263	849	919	590
9	756	584	914	135	1120	1080	719	684	267	1020	841	461
10	757	614	975	225	1120	708	748	698	272	1020	875	438
11	817	614	1060	770	1120	623	940	779	367	738	935	643
12	589	573	1030	875	1120	759	986	1060	942	986	858	432
13	468	566	1010	1120	1120	750	869	810	803	1010	902	697
14	469	619	959	1120	1370	603	1040	768	802	961	899	768
15	377	620	954	1120	1650	583	901	921	676	957	790	774
16	413	621	957	1120	1400	510	703	1010	823	936	990	613
17	640	621	959	1120	1130	263	679	903	939	960	866	663
18	792	622	981	1090	1130	185	545	575	716	641	578	1040
19	790	624	956	1120	1130	189	478	623	712	539	617	1040
20	786	621	724	1120	1130	200	385	543	715	516	457	1040
21	731	621	724	1120	606	201	449	499	764	498	317	1030
22	653	623	724	1110	436	363	1070	374	966	405	306	1030
23	653	705	725	1120	434	458	1990	235	931	350	450	1040
24	595	609	725	1120	530	462	419	232	959	500	640	966
25	485	607	726	1110	535	464	463	228	738	643	326	903
26	420	611	730	1120	423	809	465	223	839	448	295	919
27	542	617	768	1110	421	1310	627	220	1060	350	403	924
28	609	715	876	1110	421	1620	790	218	958	349	405	929
29	608	716	874	1110	---	1440	1140	219	1010	347	403	921
30	650	767	875	1110	---	1250	1060	354	1080	347	541	872
31	760	---	875	1110	---	1250	---	319	---	369	630	---
TOTAL	18773	18515	26868	29142	27166	21939	27790	18311	19427	23359	20518	23639
MEAN	606	617	867	940	970	708	926	591	648	754	662	788
MAX	817	780	1120	1120	1650	1620	1990	1060	1080	1220	990	1040
MIN	377	512	654	135	421	185	385	218	247	347	295	432
AC-FT	37240	36720	53290	57800	53880	43520	55120	36320	38530	46330	40700	46890

CAL YR 1989 TOTAL 446587 MEAN 1224 MAX 4900 MIN 115 AC-FT 885800
WTR YR 1990 TOTAL 275447 MEAN 755 MAX 1990 MIN 135 AC-FT 546300

KLAMATH RIVER BASIN

11509500 KLAMATH RIVER AT KENO, OR

LOCATION.--Lat 42°08'00", long 121°57'40", in NW 1/4 SE 1/4 sec.35, T.39 S., R.7 E., Klamath County, Hydrologic Unit 18010206, on left bank 1.7 mi northwest of Keno and 4.5 mi upstream from Spencer Creek.

DRAINAGE AREA.--3,920 mi², approximately (not including Lost River or Lower Klamath Lake basins).

PERIOD OR RECORD.--June 1904 to December 1913, October 1929 to current year. Monthly discharge only October to December 1929, published in WSP 1315-B.

GAGE.--Water-stage recorder. Datum of gage is 3,961 ft above National Geodetic Vertical Datum of 1929 (from river-profile survey). See WSP 1735 for history of changes prior to Nov. 6, 1954.

REMARKS.--No estimated daily discharges. Records excellent. Flow regulated since 1919 by Upper Klamath Lake (station 11507001). Fluctuation by Keno powerplant 0.9 mi upstream. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--70 years, 1,681 ft³/s, 1,218,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,300 ft³/s Feb. 28, 1986, gage height, 12.82 ft, caused by regulation from Keno powerplant 0.9 mi upstream; minimum discharge, 26 ft³/s Sept. 23, 1956; minimum daily, 60 ft³/s May 19, 1934.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage, 15.3 ft, from floodmark (original datum), about May 10, 1904, discharge, 9,250 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,770 ft³/s Apr. 20, gage height, 7.78 ft, caused by regulation from Keno powerplant 0.9 mi upstream; minimum discharge, 229 ft³/s June 11; minimum daily, 326 ft³/s June 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	770	1090	1360	1020	1670	1450	1790	607	767	435	494	689
2	788	1070	1350	1020	1570	1430	1790	604	785	437	521	682
3	980	994	1360	1030	1460	1370	1790	619	785	437	625	694
4	983	981	1270	1100	1390	1420	1720	616	779	433	671	740
5	978	980	1150	1190	1350	1600	1370	615	776	432	670	791
6	1250	984	1180	1190	1350	1290	902	619	644	434	681	730
7	1260	984	1180	1190	1360	1770	660	622	530	433	551	672
8	1270	983	1210	1710	1340	1850	659	621	440	430	412	643
9	1290	980	1290	1760	1340	1580	660	619	338	430	459	644
10	1280	981	1290	1050	1340	1590	658	619	332	396	905	644
11	1280	983	1280	988	1410	1580	667	620	326	344	683	817
12	945	985	1290	1370	1450	1580	669	621	340	343	821	665
13	934	984	1290	1630	1450	1580	721	626	340	342	784	658
14	927	983	1290	1630	1650	1580	840	623	338	343	650	658
15	927	983	1290	1630	1870	1560	841	612	338	341	649	662
16	923	985	1290	1550	1630	1470	840	612	342	340	646	665
17	1030	987	1290	1400	1300	1200	839	612	346	340	670	661
18	1050	985	1290	1430	1300	1100	839	613	347	340	700	1030
19	1040	983	1180	1490	1310	1100	836	611	346	340	700	1020
20	1030	981	968	1620	1450	1100	2010	604	343	339	870	1010
21	1040	981	967	1590	936	1100	1480	604	404	335	969	1010
22	1030	976	967	1520	1100	1110	633	608	427	334	967	1010
23	1030	977	966	1520	986	1120	500	627	425	334	917	1010
24	984	979	965	1520	988	1120	850	912	416	335	858	1020
25	934	978	964	1560	1000	1120	848	920	438	335	913	1000
26	1010	975	986	1620	1050	1400	845	777	437	337	1000	1000
27	1090	975	1020	1560	1170	1750	841	776	437	384	869	999
28	1090	1040	1020	1510	1350	2010	843	774	437	432	714	1010
29	1090	1040	1020	1560	---	1950	847	753	435	433	671	1030
30	1090	1170	1020	1780	---	1800	846	776	435	431	628	1050
31	1090	---	1020	1720	---	1800	---	732	---	431	697	---
TOTAL	32413	29957	36013	44458	37570	45480	29634	20574	13873	11830	22365	24914
MEAN	1046	999	1162	1434	1342	1467	988	664	462	382	721	830
MAX	1290	1170	1360	1780	1870	2010	2010	920	785	437	1000	1050
MIN	770	975	964	988	936	1100	500	604	326	334	412	643
AC-FT	64290	59420	71430	88180	74520	90210	58780	40810	27520	23460	44360	49420

CAL YR 1989 TOTAL 589416 MEAN 1615 MAX 7430 MIN 319 AC-FT 1169000
WTR YR 1990 TOTAL 349081 MEAN 956 MAX 2010 MIN 326 AC-FT 692400

KLAMATH RIVER BASIN

57

11510700 KLAMATH RIVER BELOW JOHN C. BOYLE POWERPLANT, NEAR KENO, OR

LOCATION.--Lat 42°05'05", long 122°04'20", in SE 1/4 SE 1/4 sec.14, T.40 S., R.6 E., Klamath County, Hydrologic Unit 18010206, on right bank 0.7 mi downstream from John C. Boyle powerplant, 8 mi downstream from Spencer Creek, and 8.5 mi southwest of Keno.

DRAINAGE AREA.--4,080 mi², approximately (not including Lost River or Lower Klamath Lake basins).

PERIOD OF RECORD.--January 1959 to current year. Prior to Oct. 1, 1961, published as "below Big Bend powerplant."

REVISED RECORDS.--WDR OR-87-1: 1967.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 3,274.82 ft above National Geodetic Vertical Datum of 1929 (levels by Pacific Power & Light Co.).

REMARKS.--No estimated daily discharges. Records excellent. Flow regulated by Upper Klamath Lake (station 11507001). Large diurnal fluctuation caused by Keno and John C. Boyle powerplants. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--31 years, 1,876 ft³/s, 1,359,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,000 ft³/s Mar. 5, 1972, gage height, 9.33 ft; minimum discharge, 283 ft³/s Feb. 17, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,980 ft³/s Mar. 31, gage height, 5.81 ft; minimum discharge, 305 ft³/s Sept. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	971	1240	1470	1180	1830	1660	2140	857	980	573	666	969
2	1050	1290	1530	1290	1720	1680	2140	850	943	670	758	969
3	1190	1300	1530	1290	1710	1600	2140	855	981	663	972	960
4	1200	1240	1490	1600	1700	1750	2120	852	1020	661	777	912
5	1190	1240	1210	1270	1650	1930	1810	846	1030	873	739	891
6	1230	1250	1530	1500	1510	1280	1240	815	913	861	927	896
7	1480	1250	1530	1230	1710	2500	890	855	693	602	801	864
8	1450	1240	1530	2000	1500	2250	976	843	881	612	782	857
9	1220	1250	1520	2180	1750	1900	879	858	523	642	597	859
10	1490	1240	1090	1400	1610	1830	905	851	546	319	603	870
11	1490	1240	1530	1280	1590	1880	895	873	533	369	988	1070
12	1450	1240	1530	1260	1690	1690	905	848	493	542	1120	869
13	1200	796	1530	1780	1740	1910	901	851	507	505	905	852
14	1200	1190	1520	1930	1800	1920	1100	857	504	502	918	866
15	1200	1250	1530	1940	2180	1620	1130	853	523	504	907	858
16	1200	1240	1530	1720	2070	1820	1180	810	511	531	913	859
17	1200	1240	1530	1630	1740	1380	1080	781	580	524	915	860
18	1200	1240	1530	2030	1520	1440	1110	806	523	495	907	1610
19	1210	1240	1490	1400	1460	1380	1110	809	517	518	910	1310
20	1200	1230	1210	2010	1710	1360	2230	822	507	518	909	1310
21	1200	866	1160	1750	1020	1370	2050	810	578	518	1290	1330
22	1200	1510	1190	1720	1620	1370	459	831	663	518	1270	1260
23	1210	1240	1190	1690	977	1460	810	833	688	513	1300	1260
24	1240	1240	1190	1680	1180	1350	1110	1250	681	473	1030	1290
25	1250	1240	1190	1620	1240	1380	1120	1280	608	506	1100	1180
26	1290	1240	1190	2070	1490	1960	1160	1060	600	524	1100	1320
27	1530	1240	846	1750	1280	1970	1190	1060	639	835	1020	1320
28	1250	1210	1250	1910	1860	2300	1160	1050	631	772	1150	1190
29	1250	1200	1240	1710	---	2310	1160	1060	627	768	947	1260
30	1250	1360	1230	2130	---	1990	1170	1050	619	569	978	1260
31	1250	---	1180	2150	---	2190	---	950	---	571	993	---
TOTAL	38941	36792	42216	52100	44857	54430	38270	28026	20042	18051	29192	32181
MEAN	1256	1226	1362	1681	1602	1756	1276	904	668	582	942	1073
MAX	1530	1510	1530	2180	2180	2500	2230	1280	1030	873	1300	1610
MIN	971	796	846	1180	977	1280	459	781	493	319	597	852
AC-FT	77240	72980	83740	103300	88970	108000	75910	55590	39750	35800	57900	63830

CAL YR 1989 TOTAL 674920 MEAN 1849 MAX 7780 MIN 347 AC-FT 1339000
WTR YR 1990 TOTAL 435098 MEAN 1192 MAX 2500 MIN 319 AC-FT 863000

KLAMATH RIVER BASIN

11516530 KLAMATH RIVER BELOW IRON GATE DAM, CA

LOCATION.--Lat 41°55'41", long 122°26'35", in SE 1/4 NE 1/4 sec.17, T.47 N., R.5 W., Siskiyou County, Hydrologic Unit 18010206, on left bank 0.1 mi downstream from Bogus Creek, 0.6 mi downstream from Iron Gate Dam, and 5.9 mi northeast of Hornbrook.

DRAINAGE AREA.--4,630 mi², approximately (not including Lost River, Butte Creek, or Lower Klamath Lake basins).

PERIOD OF RECORD.--October 1960 to current year. Chemical data available October 1961 to September 1981. Water temperature data available October 1962 to September 1980.

GAGE.--Water-stage recorder. Datum of gage is 2,162.44 ft above National Geodetic Vertical Datum of 1929 (levels by Pacific Corp., formerly Pacific Power and Light Co.).

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Upper Klamath Lake (station 11507001), capacity, 523,700 acre-ft, Iron Gate Reservoir, other smaller reservoirs, and diversions upstream from station.

AVERAGE DISCHARGE.--30 years, 2,209 ft³/s, 1,600,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,400 ft³/s Dec. 22, 1964, gage height, 13.63 ft, from rating curve extended above 15,000 ft³/s, on basis of slope-area measurement of peak flow; minimum daily discharge, 539 ft³/s July 7, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,360 ft³/s Jan. 9, gage height, 5.55 ft; minimum daily discharge, 717 ft³/s July 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1340	1400	1630	1410	2300	1790	2270	1040	953	738	722	1030
2	1340	1400	1640	1410	2300	1810	2260	1020	1090	748	741	1030
3	1340	1400	1630	1400	2310	1820	2260	1020	1090	749	755	1030
4	1350	1400	1630	1410	2350	1820	2260	1020	1340	736	759	1030
5	1350	1400	1640	1410	2140	2280	2110	1020	1390	733	768	1030
6	1350	1400	1630	1410	1790	2630	1780	1020	1390	732	770	1030
7	1350	1400	1630	1460	1790	2650	1770	1020	1190	730	769	1030
8	1360	1400	1630	2120	1790	2660	1770	1020	847	725	768	1030
9	1360	1400	1630	3310	1790	2540	1600	1020	733	739	771	1030
10	1360	1400	1630	3000	1790	2200	1340	1020	733	740	785	1030
11	1370	1400	1620	1800	1790	2170	1350	1020	729	734	1040	1030
12	1370	1400	1620	1790	1790	2130	1340	1020	724	733	1050	1030
13	1370	1390	1620	1800	1790	2110	1340	1020	722	737	1050	1030
14	1380	1390	1620	1800	1780	2110	1340	1020	721	732	1050	1030
15	1380	1390	1620	1790	1790	2130	1340	1020	726	728	1050	1030
16	1380	1390	1620	1790	1790	2010	1340	1020	734	731	1040	1030
17	1390	1390	1620	1790	1790	1800	1350	1020	736	727	1030	1040
18	1400	1390	1610	1790	1790	1800	1330	1030	822	727	1030	1350
19	1410	1390	1610	1790	1790	1800	1340	1030	737	733	1030	1350
20	1410	1390	1430	1780	1790	1790	1340	1030	744	728	1040	1360
21	1410	1400	1410	1780	1790	1790	1340	1030	745	724	1040	1360
22	1410	1400	1400	1780	1590	1780	1350	1070	737	722	1040	1360
23	1420	1400	1400	1780	1410	1770	1360	1090	744	721	1030	1340
24	1410	1400	1400	1780	1410	1770	1350	1040	737	721	1030	1330
25	1410	1400	1400	1790	1410	1770	1350	1030	741	718	1030	1340
26	1410	1400	1400	1790	1410	1760	1350	1030	755	718	1030	1340
27	1410	1400	1400	1790	1530	1760	1350	1040	739	717	1160	1340
28	1400	1400	1410	1790	1790	1800	1350	1050	730	722	1340	1340
29	1400	1410	1410	1790	---	2370	1350	1030	743	723	1340	1350
30	1400	1480	1410	1790	---	2290	1360	1070	743	723	1270	1350
31	1400	---	1410	2060	---	2280	---	1080	---	722	1030	---
TOTAL	42840	42010	47760	56180	50580	63190	46340	32010	25565	22611	30358	35030
MEAN	1382	1400	1541	1812	1806	2038	1545	1033	852	729	979	1168
MAX	1420	1480	1640	3310	2350	2660	2270	1090	1390	749	1340	1360
MIN	1340	1390	1400	1400	1410	1760	1330	1020	721	717	722	1030
AC-FT	84970	83330	94730	111400	100300	125300	91920	63490	50710	44850	60220	69480

CAL YR 1989 TOTAL 757774 MEAN 2076 MAX 9780 MIN 731 AC-FT 1503000
WTR YR 1990 TOTAL 494474 MEAN 1355 MAX 3310 MIN 717 AC-FT 980800

LOCATION.--Lat 46°37'44", long 119°51'49", in SE 1/4 NW 1/4 sec.7, T.13 N., R.24 E., Grant County, Hydrologic Unit 17020016, on left bank 2.6 mi downstream from Priest Rapids Dam, 14.7 mi south of Beverly, and at mile 394.5.

WATER-DISCHARGE RECORDS

REVISED RECORDS.--WSP 1933: Drainage area. WDR WA-82-2: 1965(m), 1971(m).

REMARKS.--No estimated daily discharges. Water-discharge records excellent. Diversions for irrigation of about 500,000 acres upstream from station. Flow regulated by 10 major reservoirs and numerous smaller reservoirs and powerplants. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 692,600 ft³/s June 12, 1948, gage height, 59.35 ft, site and datum then in use; minimum discharge, 4,120 ft³/s Feb. 10, 1932, gage height, 11.40 ft, site and datum then in use.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 7, 1894, reached a discharge of about 740,000 ft³/s, based on information obtained at other points.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 322,000 ft³/s June 12, elevation, 418.28 ft; minimum discharge, 36,700 ft³/s Sept. 4, elevation, 396.45 ft.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	63200	96600	110000	92600	148000	157000	133000	147000	218000	211000	132000	68600
2	82400	94800	118000	111000	134000	137000	164000	156000	195000	202000	134000	58500
3	105000	94300	80000	132000	130000	133000	182000	181000	156000	184000	135000	57100
4	92100	99100	81700	147000	117000	113000	144000	180000	162000	191000	138000	67000
5	64700	94200	84600	137000	106000	118000	134000	163000	223000	191000	120000	83300
6	77500	77900	101000	115000	120000	130000	136000	152000	249000	196000	110000	76300
7	72000	122000	125000	108000	150000	131000	157000	162000	244000	181000	125000	73200
8	57500	112000	129000	103000	165000	133000	142000	185000	275000	181000	125000	67200
9	75900	111000	121000	125000	136000	169000	140000	144000	256000	194000	125000	54500
10	91200	103000	105000	131000	121000	137000	158000	128000	207000	201000	133000	77700
11	103000	98100	128000	117000	104000	129000	152000	110000	189000	188000	131000	96500
12	107000	88200	123000	108000	129000	132000	152000	109000	262000	179000	95900	77500
13	111000	88900	128000	119000	130000	129000	142000	115000	263000	176000	97600	70100
14	68200	110000	129000	84900	139000	133000	123000	142000	245000	157000	121000	82000
15	57700	129000	132000	115000	170000	131000	88900	146000	252000	134000	117000	70900
16	69400	116000	118000	128000	183000	135000	92800	158000	234000	142000	103000	62400
17	87700	123000	102000	127000	145000	136000	129000	162000	224000	147000	101000	77500
18	84800	114000	117000	130000	136000	136000	140000	170000	234000	131000	99700	81500
19	82900	97400	131000	121000	160000	130000	142000	148000	221000	128000	91200	80700
20	83700	119000	131000	127000	168000	133000	160000	126000	212000	149000	98500	74500
21	72200	99100	126000	121000	161000	151000	138000	133000	216000	128000	113000	65700
22	66900	91000	120000	116000	137000	141000	115000	155000	204000	104000	108000	85400
23	75600	84800	107000	130000	135000	164000	146000	163000	182000	104000	110000	53400
24	80100	78000	87200	134000	132000	156000	154000	156000	186000	133000	116000	63100
25	86100	91400	83500	134000	133000	154000	175000	144000	178000	118000	116000	90800
26	92400	89900	107000	133000	128000	152000	186000	105000	220000	105000	106000	101000
27	90900	107000	123000	139000	130000	165000	172000	122000	238000	102000	111000	85800
28	90400	113000	130000	130000	125000	177000	139000	122000	217000	94700	129000	94500
29	84400	130000	123000	120000	---	179000	115000	138000	21500			

COLUMBIA RIVER MAIN STEM

12472800 COLUMBIA RIVER BELOW PRIEST RAPIDS DAM, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: March 1980 to current year. Temperature records for site "at Vernita Bridge, near Priest Rapids Dam" (station 12472900) for period July 1974 to September 1980 are equivalent.

INSTRUMENTATION.--Temperature recorder since December 1979.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 21.5°C Aug. 4, 1985, Aug. 7, 1989; minimum, 1.0°C Feb. 3-11, 1985, Feb. 6-9, 1989.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 21.0°C Aug. 12, 13; minimum, 3.0°C Feb. 18-21.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	18.0	17.0	18.0	14.5	13.5	14.0	10.0	9.5	9.5	6.5	6.0	6.5
2	18.0	17.5	17.5	14.0	13.5	14.0	9.5	9.5	9.5	6.0	6.0	6.0
3	18.0	17.5	17.5	14.0	13.5	13.5	9.5	9.0	9.5	6.0	6.0	6.0
4	18.0	17.0	17.5	13.5	13.0	13.5	9.5	9.0	9.5	6.0	6.0	6.0
5	18.0	17.0	17.5	14.0	13.0	13.5	9.5	9.0	9.5	6.0	6.0	6.0
6	18.0	17.0	17.5	13.0	12.5	13.0	9.5	9.0	9.0	6.0	6.0	6.0
7	18.0	17.0	17.5	13.0	12.5	13.0	9.5	9.0	9.5	6.0	6.0	6.0
8	18.5	17.0	18.0	13.0	13.0	13.0	9.0	9.0	9.0	6.5	6.0	6.5
9	18.0	17.0	17.5	13.5	13.0	13.0	9.0	8.5	9.0	6.0	6.0	6.0
10	18.0	17.5	17.5	13.5	13.0	13.5	8.5	8.5	8.5	6.0	6.0	6.0
11	17.5	17.0	17.5	13.5	13.0	13.5	8.5	8.5	8.5	6.0	5.5	6.0
12	17.0	17.0	17.0	13.5	13.0	13.5	8.5	8.0	8.5	6.0	5.5	5.5
13	17.0	16.5	17.0	13.0	12.5	13.0	8.0	8.0	8.0	5.5	5.5	5.5
14	17.0	16.0	16.5	13.0	12.5	12.5	8.0	8.0	8.0	5.5	5.5	5.5
15	17.0	15.5	16.0	12.5	12.0	12.5	8.0	8.0	8.0	5.5	5.5	5.5
16	16.0	15.5	16.0	12.0	12.0	12.0	8.0	7.5	8.0	5.5	5.5	5.5
17	16.5	15.5	16.0	12.0	11.5	12.0	8.0	7.5	7.5	5.5	5.0	5.5
18	16.0	15.5	16.0	12.0	12.0	12.0	7.5	7.5	7.5	5.0	5.0	5.0
19	16.0	15.5	16.0	12.0	11.5	12.0	7.5	7.5	7.5	5.5	5.0	5.0
20	16.0	15.5	15.5	11.5	11.5	11.5	7.5	7.0	7.0	5.0	5.0	5.0
21	15.5	15.0	15.5	12.0	11.5	11.5	7.0	7.0	7.0	5.0	5.0	5.0
22	15.5	15.0	15.5	11.5	11.0	11.5	7.0	7.0	7.0	5.0	4.5	4.5
23	15.5	15.0	15.0	11.5	11.0	11.0	7.0	7.0	7.0	4.5	4.5	4.5
24	15.5	14.5	15.0	11.0	10.5	11.0	7.0	7.0	7.0	4.5	4.5	4.5
25	15.5	14.5	15.0	11.0	10.5	11.0	7.0	7.0	7.0	4.5	4.0	4.5
26	15.0	14.5	15.0	11.0	10.5	10.5	7.0	6.5	7.0	4.5	4.0	4.0
27	15.0	14.5	14.5	10.5	10.5	10.5	7.0	6.5	6.5	4.0	4.0	4.0
28	15.0	14.0	14.5	10.0	10.0	10.0	6.5	6.5	6.5	4.5	4.0	4.0
29	15.0	14.0	14.5	10.0	10.0	10.0	6.5	6.5	6.5	4.5	4.0	4.0
30	14.5	14.0	14.5	10.0	9.5	10.0	6.5	6.5	6.5	4.5	4.0	4.0
31	14.5	14.0	14.0	---	---	---	6.5	6.0	6.5	4.0	4.0	4.0
MONTH	18.5	14.0	16.2	14.5	9.5	12.2	10.0	6.0	7.9	6.5	4.0	5.2

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	4.0	4.0	4.0	4.0	4.0	4.0	6.5	6.0	6.5	9.5	9.0	9.5
2	4.0	4.0	4.0	4.5	4.0	4.0	7.0	6.5	6.5	10.0	9.5	10.0
3	4.0	4.0	4.0	4.5	4.0	4.0	7.0	6.5	7.0	10.0	9.5	10.0
4	4.5	4.0	4.0	4.5	4.0	4.0	7.0	6.5	7.0	10.0	9.5	10.0
5	4.5	4.0	4.0	4.5	4.0	4.5	7.5	7.0	7.0	11.5	10.0	10.5
6	4.0	4.0	4.0	4.5	4.0	4.5	7.5	7.0	7.0	11.0	10.5	10.5
7	4.0	3.5	4.0	4.5	4.5	4.5	7.5	7.0	7.5	10.5	10.0	10.5
8	4.0	3.5	4.0	4.5	4.0	4.5	8.0	7.5	7.5	10.5	10.0	10.5
9	4.0	3.5	4.0	4.5	4.0	4.5	7.5	7.5	7.5	11.0	10.5	10.5
10	4.5	4.0	4.0	4.5	4.5	4.5	8.0	7.5	8.0	11.5	10.5	11.0
11	4.5	4.5	4.5	4.5	4.0	4.5	8.0	8.0	8.0	11.5	11.0	11.0
12	4.5	4.0	4.0	4.5	4.0	4.5	8.0	8.0	8.0	11.5	11.0	11.5
13	4.0	4.0	4.0	5.0	4.0	4.5	8.0	8.0	8.0	11.5	11.0	11.5
14	4.0	3.5	4.0	5.0	4.5	4.5	8.5	8.0	8.0	11.5	11.0	11.0
15	3.5	3.5	3.5	5.0	4.5	5.0	9.0	8.0	8.5	11.5	11.0	11.5
16	3.5	3.5	3.5	5.0	5.0	5.0	9.0	8.5	8.5	11.5	11.0	11.5
17	3.5	3.5	3.5	5.0	5.0	5.0	9.0	8.5	9.0	12.0	11.5	11.5
18	3.5	3.0	3.0	5.5	5.0	5.0	9.0	8.5	8.5	12.0	12.0	12.0
19	3.0	3.0	3.0	5.5	5.0	5.5	9.0	9.0	9.0	12.5	12.0	12.0
20	3.5	3.0	3.0	5.5	5.0	5.5	9.0	8.5	9.0	12.5	12.0	12.5
21	3.5	3.0	3.5	5.5	5.5	5.5	9.5	9.0	9.0	12.5	12.0	12.5
22	3.5	3.5	3.5	6.0	5.5	5.5	10.0	9.0	9.5	12.5	12.0	12.5
23	3.5	3.5	3.5	5.5	5.5	5.5	9.5	9.0	9.5	12.0	12.0	12.0
24	3.5	3.5	3.5	5.5	5.5	5.5	10.0	9.0	9.5	12.5	12.0	12.0
25	3.5	3.5	3.5	5.5	5.5	5.5	10.0	9.5	9.5	12.5	12.0	12.0
26	4.0	3.5	3.5	5.5	5.5	5.5	9.5	9.5	9.5	12.5	12.0	12.5
27	4.0	3.5	4.0	5.5	5.5	5.5	9.5	9.0	9.5	12.5	12.0	12.5
28	4.5	4.0	4.0	5.5	5.5	5.5	9.5	9.0	9.0	12.5	12.5	12.5
29	---	---	---	5.5	5.5	5.5	9.5	9.0	9.0	13.0	12.5	12.5
30	---	---	---	6.0	5.5	6.0	9.5	9.0	9.5	12.5	12.5	12.5
31	---	---	---	6.5	6.0	6.0	---	---	---	12.5	12.5	12.5
MONTH	4.5	3.0	3.7	6.5	4.0	5.0	10.0	6.0	8.3	13.0	9.0	11.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	13.0	12.5	12.5	15.5	15.5	15.5	19.5	19.0	19.0	19.5	18.5	19.0
2	12.5	12.5	12.5	15.5	15.0	15.0	19.0	18.5	19.0	20.0	18.5	19.0
3	13.5	12.5	13.0	15.0	14.5	15.0	19.5	19.0	19.0	20.0	18.5	19.5
4	13.0	13.0	13.0	15.0	15.0	15.0	19.5	19.0	19.5	20.0	18.5	19.5
5	13.0	12.5	13.0	15.5	15.0	15.5	20.0	19.0	19.5	20.0	19.5	20.0
6	13.0	12.5	13.0	15.5	15.5	15.5	20.0	19.0	19.5	20.0	19.5	20.0
7	13.0	12.5	13.0	15.5	15.0	15.5	20.5	19.5	19.5	20.0	19.5	19.5
8	13.0	13.0	13.0	16.0	15.5	15.5	19.5	19.5	19.5	20.5	19.5	19.5
9	13.5	13.0	13.0	16.5	16.0	16.0	20.0	19.5	20.0	20.5	19.5	20.0
10	13.5	13.0	13.0	16.5	16.0	16.5	20.0	19.5	20.0	20.5	19.0	20.0
11	13.5	13.0	13.0	17.0	16.5	16.5	20.0	20.0	20.0	20.5	20.0	20.5
12	13.0	13.0	13.0	17.5	17.0	17.0	21.0	19.5	20.5	20.5	19.5	20.0
13	13.0	13.0	13.0	17.5	17.0	17.5	21.0	20.0	20.5	20.0	18.5	19.5
14	13.5	13.0	13.0	17.5	17.0	17.5	20.5	20.0	20.0	20.5	19.0	19.5
15	13.5	13.0	13.5	18.0	17.5	17.5	20.0	19.5	20.0	20.0	19.0	19.5
16	14.0	13.5	13.5	18.0	17.5	18.0	20.0	19.5	19.5	20.0	19.0	19.5
17	14.0	13.5	13.5	18.5	18.0	18.0	20.0	19.5	19.5	20.0	19.0	19.5
18	14.5	14.0	14.0	18.5	18.0	18.0	20.0	19.5	19.5	20.0	19.0	19.5
19	14.5	14.0	14.5	18.5	18.0	18.5	19.5	19.0	19.5	20.0	19.0	19.5
20	15.0	14.5	14.5	18.5	18.0	18.5	19.5	19.0	19.5	20.0	19.0	19.5
21	15.0	14.5	15.0	19.0	18.5	18.5	20.0	19.5	19.5	20.0	18.5	19.5
22	15.0	14.5	15.0	19.5	18.5	19.0	20.0	19.5	19.5	20.0	19.5	19.5
23	15.0	15.0	15.0	19.0	18.0	19.0	19.5	19.0	19.5	20.5	19.0	19.5
24	15.5	15.0	15.0	19.0	18.5	18.5	19.5	19.0	19.0	20.5	19.0	20.0
25	15.5	15.0	15.5	18.5	18.0	18.5	19.5	19.0	19.0	20.0	19.5	20.0
26	15.5	15.0	15.0	18.5	18.0	18.0	19.5	19.0	19.5	20.0	19.5	19.5
27	15.0	15.0	15.0	18.5	17.5	18.5	19.5	19.0	19.5	20.0	19.0	19.5
28	15.5	15.0	15.0	19.5	18.0	18.5	19.5	19.0	19.5	20.0	19.0	19.5
29	15.5	15.0	15.0	19.5	18.0	19.0	19.5	19.0	19.5	20.0	18.5	19.0
30	15.5	15.5	15.5	19.5	18.5	19.0	19.5	18.5	19.0	19.5	18.5	19.0
31	---	---	---	19.5	19.0	19.0	19.5	19.0	19.0	---	---	---
MONTH	15.5	12.5	13.8	19.5	14.5	17.3	21.0	18.5	19.5	20.5	18.5	19.6
YEAR	21.0	3.0	11.7									

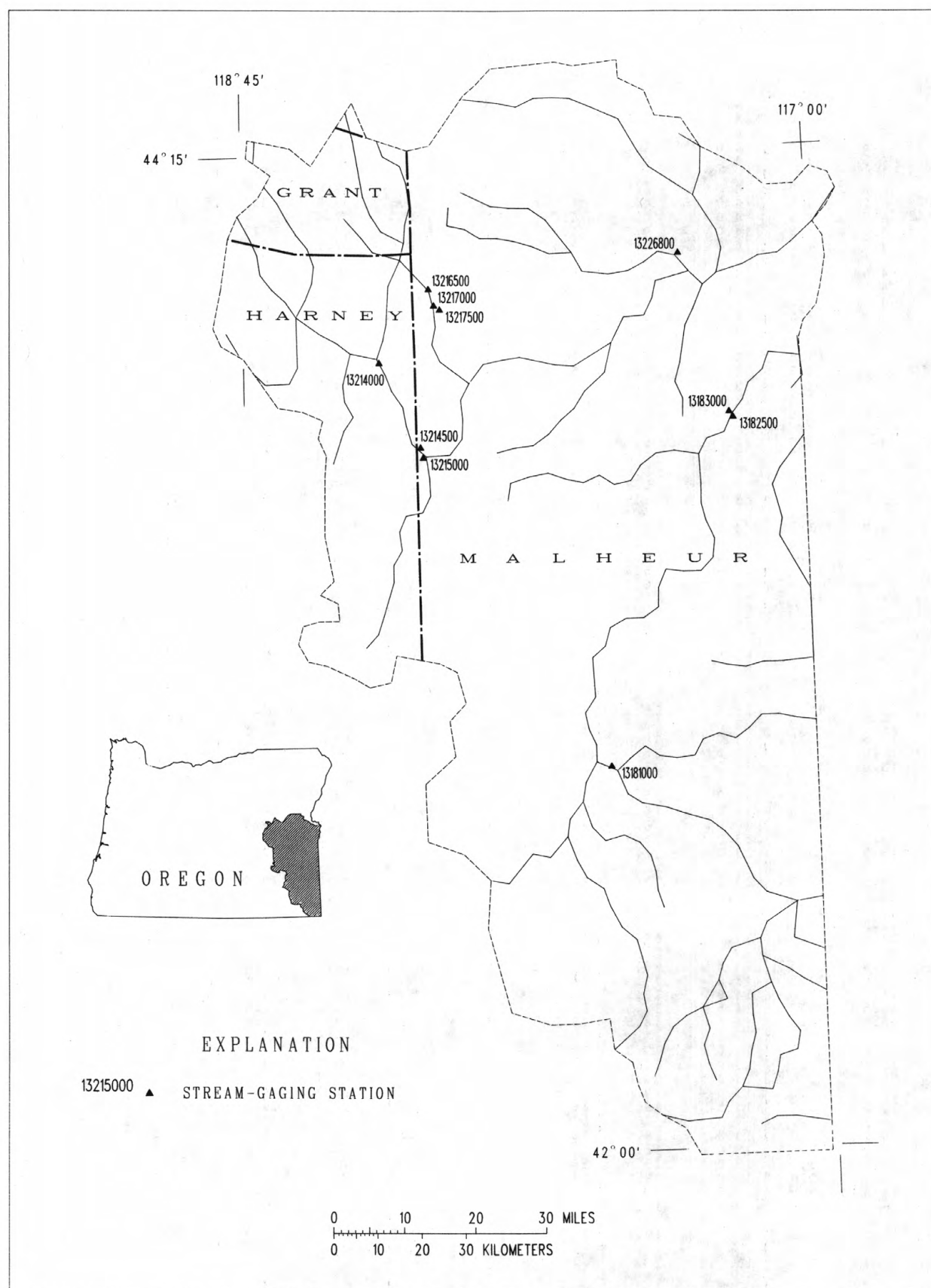


Figure 3.--Location of surface-water and water-quality stations in the Owyhee River, and Malheur River basins.

OWYHEE RIVER BASIN

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13181000 OWYHEE RIVER NEAR ROME, OR

LOCATION.--Lat 42°52'02", long 117°38'52", in SE 1/4 NE 1/4 sec.14, T.31 S., R.41 E., Malheur County, Hydrologic Unit 17050107, on right bank 0.5 mi downstream from Jordan Creek, 2.6 mi north of Rome, and at mile 122.4.

DRAINAGE AREA.--About 8,000 mi².

PERIOD OF RECORD.--October 1949 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,344.20 ft above National Geodetic Vertical Datum of 1929. Prior to Feb 10, 1960, at datum 0.24 ft lower.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by Antelope Reservoir, capacity, 70,000 acre-ft, increased in 1970, and Wild Horse Reservoir, capacity, 32,690 acre-ft, and numerous small reservoirs. Diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--41 years, 995 ft³/s, 720,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 41,400 ft³/s Feb. 19, 1986, gage height, 19.09 ft; minimum, 42 ft³/s Aug. 12, 1954, July 28, Aug. 5, 1961, July 31, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 4	1745	*7,340	*7.94	No other peak greater than base discharge.			
Minimum discharge, 91 ft ³ /s Sept. 15-17.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	148	206	179	214	210	1090	911	943	1580	176	181	133
2	149	200	e190	215	209	1140	867	836	1450	167	183	129
3	154	191	e210	208	202	1360	834	751	1450	170	189	126
4	155	186	e250	209	194	4700	810	688	1190	174	184	119
5	159	184	283	194	203	4090	797	627	995	182	170	119
6	157	182	276	188	179	2720	795	576	873	185	160	118
7	155	181	268	191	e170	1990	788	520	758	183	155	114
8	155	184	262	206	169	1750	771	480	684	200	151	109
9	154	207	278	244	193	2150	775	420	614	204	144	105
10	152	209	269	299	201	1780	781	370	550	203	148	103
11	149	211	255	680	209	1810	769	348	480	190	151	101
12	147	214	233	772	e195	1590	736	313	425	177	148	100
13	145	221	194	614	e180	1300	686	293	396	175	140	99
14	144	224	193	474	e165	1070	645	281	410	191	134	98
15	144	220	193	421	e181	930	614	272	414	179	129	96
16	145	218	212	395	e160	841	591	273	385	180	126	91
17	145	214	243	377	e160	819	571	278	370	194	122	93
18	143	214	e220	322	e160	1060	569	276	441	187	118	97
19	145	214	e205	e240	e165	1650	633	260	460	186	120	97
20	150	211	e210	204	e175	2640	622	245	448	189	120	98
21	153	211	215	179	185	2840	590	245	418	185	118	97
22	155	211	221	193	196	2970	591	242	399	180	137	94
23	155	211	215	213	201	2950	602	240	379	179	148	93
24	153	218	219	216	211	2810	767	248	339	174	152	94
25	154	220	215	239	254	2320	983	239	305	172	173	95
26	158	220	209	235	353	1730	1120	255	281	176	167	98
27	162	220	196	234	613	1500	982	281	261	181	171	104
28	177	220	196	218	917	1330	835	309	233	180	163	108
29	193	221	e200	214	---	1260	874	442	212	189	157	108
30	204	196	207	219	---	1090	938	797	195	188	149	108
31	212	---	215	213	---	975	---	1590	---	187	136	---
TOTAL	4871	6239	6931	9040	6610	58255	22847	13938	17395	5683	4644	3144
MEAN	157	208	224	292	236	1879	762	450	580	183	150	105
MAX	212	224	283	772	917	4700	1120	1590	1580	204	189	133
MIN	143	181	179	179	160	819	569	239	195	167	118	91
AC-FT	9660	12380	13750	17930	13110	115500	45320	27650	34500	11270	9210	6240

CAL YR 1989 TOTAL 469295 MEAN 1286 MAX 21000 MIN 123 AC-FT 930800
WTR YR 1990 TOTAL 159597 MEAN 437 MAX 4700 MIN 91 AC-FT 316600

e Estimated

OWYHEE RIVER BASIN

13182500 LAKE OWYHEE NEAR NYSSA, OR

LOCATION.--Lat 43°38'30", long 117°14'30", in NW 1/4 SE 1/4 sec.20, T.22 S., R.45 E., Malheur County, Hydrologic Unit 17050110, near left abutment on Owyhee Dam on Owyhee River, 21 mi southwest of Nyssa, and at mile 28.5.

DRAINAGE AREA.--11,160 mi², approximately.

PERIOD OF RECORD.--October 1932 to current year (month-end contents and change in contents only prior to October 1979). Prior to October 1958, published as Owyhee Reservoir at Owyhee Dam, near Nyssa.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Prior to Oct. 1, 1965, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by concrete arch-gravity dam, completed in September 1932; storage began Oct. 16, 1932. Capacity, 1,122,000 acre-ft between elevations 2,367.50 ft bottom of sluice gates and 2,670.00 ft top of spillway gate, 715,000 acre-ft between elevations 2,590.20 ft diversion tunnel and 2,670.00 ft. Dead storage below elevation 2,367.50 ft negligible. Figures given herein are contents above elevation 2,367.50 ft. Reservoir generally will not be drawn below elevation 2,590.2 ft, contents, 406,800 acre-ft, which project considers dead storage. Water is released through diversion tunnel to South Canal for irrigation of lands west of Snake River in vicinity of Homedale, Idaho, and to North Canal for irrigation of lands north and west of Owyhee River and through sluice gates to river for Owyhee Canal, which diverts about 18 mi downstream. Additional data available in files of Oregon Water Resources Department.

COOPERATION.--Capacity tables furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 1,140,000 acre-ft Apr. 15, 1952, elevation, 2,671.50 ft; minimum contents observed since full capacity was attained on May 7, 1936, 409,800 acre-ft Sept. 30, 1988, elevation, 2,590.72 ft, furnished by Owyhee Irrigation District.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 964,000 acre-ft Apr. 3, elevation, 2,656.89 ft; minimum contents, 602,300 acre-ft Sept. 30, elevation, 2,618.79 ft.

Capacity table (elevation, in feet, and total contents, in acre-feet)

2,590	405,700	2,640	787,300
2,600	466,300	2,650	888,300
2,610	535,400	2,660	999,700
2,620	611,900	2,670	1,122,000
2,630	695,800	2,671	1,135,000

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2639.46	2637.57	2639.54	2641.74	2644.26	2646.23	2656.81	2654.00	2649.40	2644.31	2634.67	2626.21
2	2639.32	2637.65	2639.60	2641.82	2644.32	2646.47	2656.85	2653.99	2649.52	2643.97	2634.34	2625.98
3	2639.19	2637.70	2639.65	2641.88	2644.39	2646.70	2656.85	2653.96	2649.63	2643.67	2634.02	2625.75
4	2639.06	2637.78	2639.77	2641.91	2644.46	2647.11	2656.83	2653.91	2649.73	2643.38	2633.72	2625.50
5	2638.92	2637.85	2639.86	2641.99	2644.49	2648.23	2656.75	2653.85	2649.75	2643.07	2633.40	2625.30
6	2638.83	2637.95	2639.95	2642.07	2644.55	2648.89	2656.67	2653.71	2649.78	2642.73	2633.07	2625.02
7	2638.72	2637.98	2640.02	2642.20	2644.70	2649.36	2656.59	2653.56	2649.67	2642.43	2632.73	2624.76
8	2638.60	2638.00	2640.11	2642.20	2644.67	2649.70	2656.47	2653.45	2649.60	2642.11	2632.45	2624.52
9	2638.49	2638.05	2640.20	2642.30	2644.75	2650.07	2656.34	2653.27	2649.52	2641.80	2632.16	2624.27
10	2638.39	2638.11	2640.23	2642.35	2644.80	2650.49	2656.22	2653.10	2649.37	2641.52	2631.73	2624.00
11	2638.27	2638.17	2640.32	2642.42	2644.83	2650.80	2656.06	2652.91	2649.20	2641.18	2631.50	2623.75
12	2638.16	2638.23	2640.42	2642.61	2644.89	2651.09	2655.95	2652.70	2649.01	2640.86	2631.07	2623.44
13	2638.05	2638.34	2640.48	2642.76	2644.93	2651.36	2655.79	2652.46	2648.80	2640.57	2630.75	2623.18
14	2637.96	2638.37	2640.52	2642.91	2645.00	2651.59	2655.63	2652.25	2648.61	2640.25	2630.40	2622.90
15	2637.87	2638.42	2640.62	2643.02	2645.09	2651.76	2655.48	2652.01	2648.43	2639.94	2630.06	2622.63
16	2637.75	2638.50	2640.68	2643.10	2645.16	2651.90	2655.25	2651.78	2648.15	2639.61	2629.81	2622.34
17	2637.62	2638.58	2640.72	2643.22	2645.18	2652.05	2655.14	2651.61	2648.00	2639.28	2629.47	2622.06
18	2637.51	2638.63	2640.81	2643.29	2645.25	2652.17	2654.96	2651.48	2647.84	2638.96	2629.17	2621.81
19	2637.41	2638.71	2640.87	2643.39	2645.31	2652.41	2654.79	2651.16	2647.61	2638.69	2628.84	2621.53
20	2637.39	2638.80	2640.92	2643.45	2645.37	2652.80	2654.72	2650.92	2647.36	2638.37	2628.80	2621.27
21	2637.42	2638.86	2641.02	2643.54	2645.42	2653.31	2654.58	2650.69	2647.11	2638.07	2628.53	2621.02
22	2637.42	2638.90	2641.07	2643.61	2645.47	2653.87	2654.47	2650.50	2646.88	2637.77	2628.30	2620.74
23	2637.39	2638.99	2641.14	2643.65	2645.53	2654.37	2654.33	2650.29	2646.62	2637.44	2628.04	2620.51
24	2637.40	2639.08	2641.20	2643.73	2645.63	2654.87	2654.19	2650.14	2646.37	2637.12	2627.77	2620.23
25	2637.45	2639.14	2641.29	2643.90	2645.67	2655.31	2654.15	2649.89	2646.10	2636.80	2627.65	2620.00
26	2637.48	2639.21	2641.33	2643.87	2645.77	2655.67	2654.12	2649.74	2645.80	2636.52	2627.45	2619.73
27	2637.47	2639.27	2641.40	2643.92	2645.85	2655.94	2654.09	2649.57	2645.51	2636.21	2627.26	2619.50
28	2637.46	2639.33	2641.49	2644.01	2645.98	2656.17	2654.05	2649.47	2645.22	2635.93	2627.08	2619.24
29	2637.49	2639.41	2641.54	2644.08	---	2656.38	2654.03	2649.34	2644.92	2635.61	2626.88	2619.03
30	2637.51	2639.48	2641.61	2644.16	---	2656.57	2653.99	2649.21	2644.64	2635.34	2626.65	2618.79
31	2637.54	---	2641.66	2644.20	---	2656.73	---	2649.27	---	2635.00	2626.43	---
MAX	2639.46	2639.48	2641.66	2644.20	2645.98	2656.73	2656.85	2654.00	2649.78	2644.31	2634.67	2626.21
MIN	2637.39	2637.57	2639.54	2641.74	2644.26	2646.23	2653.99	2649.21	2644.64	2635.00	2626.43	2618.79
(†)	764000	782300	803400	828500	846500	922200	931600	880600	833000	740500	665100	602300
(‡)	-19500	+18300	+21100	+25100	+18000	+115700	-30600	-51000	-47600	-92500	-75400	-62800

CAL YR 1989 MAX 2669.86 MIN 2600.06 AC-FT† +337600
WTR YR 1990 MAX 2656.85 MIN 2618.79 AC-FT† -181200

† Contents, in acre-feet, at 2400, on last day of month.

‡ Change in contents, in acre-feet.

OWYHEE RIVER BASIN

65

13183000 OWYHEE RIVER BELOW OWYHEE DAM, OR

LOCATION.--Lat 43°39'17", long 117°15'16", in SE 1/4 sec.18, T.22 S., R.45 E., Malheur County, Hydrologic Unit 17050110, on left bank 0.8 mi downstream from Owyhee Dam, 20 mi southwest of Nyssa, and at mile 27.3.

DRAINAGE AREA.--11,160 mi², approximately.

PERIOD OF RECORD.--February 1929 to current year.

REVISED RECORDS.--WSP 983: 1941-42. WSP 1397: 1930, 1933, 1946.

GAGE.--Water-stage recorder. Datum of gage is 2,343.67 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation).

REMARKS.--No estimated daily discharges. Records good. Flow regulated since October 1932 by Lake Owyhee (station 13182500), and by many smaller reservoirs. Diversion of up to 457,000 acre-ft from Lake Owyhee during the year for irrigation of lands downstream from station and outside the basin. Many smaller diversions upstream from Lake Owyhee for irrigation upstream from station. Monthly and annual adjusted flows are furnished by State of Oregon Water Resources Department.

AVERAGE DISCHARGE.--58 years (water years 1933-90), 433 ft³/s, 313,700 acre-ft/yr, not adjusted for storage or diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,900 ft³/s Apr. 15, 1952, gage height, 15.70 ft; no flow for part of Aug. 8, 9, 1932, when temporary diversion tunnel at Owyhee Dam was closed.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 273 ft³/s June 24, gage height, 2.28 ft; minimum discharge, 6.3 ft³/s Nov. 3.

CORRECTIONS.--The adjusted mean discharge and acre-feet for water year 1989 were published erroneously. The corrections are shown below. They supersede figures published in the report for 1989.

WTR YR 1989 MEAN† 1457 AC-FT† 1055000

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	232	96	16	15	16	16	190	195	193	197	187	195
2	232	17	16	15	17	17	191	195	195	194	187	197
3	231	6.8	16	15	17	17	192	195	194	195	187	197
4	230	9.6	16	15	17	17	192	195	194	195	187	197
5	230	11	15	15	16	17	192	195	195	195	183	197
6	230	14	15	15	15	18	192	195	196	195	184	197
7	230	14	15	15	15	18	192	195	197	195	185	189
8	230	14	15	15	16	81	193	195	196	195	185	200
9	230	14	15	14	17	129	192	195	195	195	180	200
10	230	14	15	14	17	128	190	195	195	193	185	200
11	230	14	15	14	17	127	190	195	195	192	188	200
12	230	14	15	14	16	127	190	195	194	192	190	200
13	230	19	15	14	15	127	190	195	192	192	190	202
14	230	26	15	14	15	127	190	195	192	192	190	202
15	230	19	15	14	15	127	190	195	192	189	190	202
16	230	14	15	14	15	127	190	195	190	190	182	202
17	230	19	15	14	15	127	193	195	188	190	182	202
18	230	19	15	14	15	127	195	195	190	187	193	202
19	230	19	15	14	15	127	195	195	190	187	195	202
20	230	19	15	14	21	127	187	193	190	187	197	202
21	230	24	15	14	16	127	192	194	190	187	195	202
22	230	19	15	14	16	127	192	195	190	187	196	202
23	230	18	15	15	16	127	195	195	192	187	197	203
24	230	23	15	15	16	127	197	195	184	187	193	205
25	212	12	15	15	16	127	198	195	200	187	195	205
26	200	13	15	15	16	136	200	195	198	186	195	174
27	200	16	15	15	16	158	200	195	197	182	195	184
28	200	16	15	15	15	160	198	195	197	188	195	177
29	200	16	15	15	---	170	197	195	197	187	195	177
30	200	16	15	14	---	183	196	195	198	187	195	177
31	200	---	15	15	---	187	---	194	---	187	195	---
TOTAL	6937	565.4	469	450	449	3357	5791	6041	5806	5899	5893	5891
MEAN	224	18.8	15.1	14.5	16.0	108	193	195	194	190	190	196
MAX	232	96	16	15	21	187	200	195	200	197	197	205
MIN	200	6.8	15	14	15	16	187	193	184	182	180	174
AC-FT	13760	1120	930	893	891	6660	11490	11980	11520	11700	11690	11680
MEAN†	291	326	358	423	340	1991	808	503	628	177	262	160
AC-FT†	17890	19420	22030	25990	18890	122400	48100	30900	37340	10900	16610	9520

CAL YR 1989 TOTAL 131988.6 MEAN 362 MAX 7420 MIN 1.8 AC-FT 261800 MEAN† 1450 AC-FT† 1050000
WTR YR 1990 TOTAL 47548.4 MEAN 130 MAX 232 MIN 6.8 AC-FT 94310 MEAN† 525 AC-FT† 380000

† Adjusted for diversions from Lake Owyhee and change in lake contents.

MALHEUR RIVER BASIN

13214000 MALHEUR RIVER NEAR DREWSEY, OR

LOCATION.--Lat 43°47'05", long 118°19'50", in NE 1/4 SE 1/4 sec.31, T.20 S., R.36 E., Harney County, Hydrologic Unit 17050116, on left bank 300 ft downstream from bridge on U.S. Highway 20, 0.5 mi downstream from Cottonwood Creek, 3.0 mi southeast of Drewsey, and at mile 129.0.

DRAINAGE AREA.--910 mi², approximately.

PERIOD OF RECORD.--June 1920 to September 1921, November, December 1921, March, April 1922, April to September 1923, June 1926 to current year. Monthly discharge only for some periods, published in WSP 1317. March to September 1914 at site 13 mi upstream; records not equivalent owing to inflow from several creeks.

REVISED RECORDS.--WSP 1093: 1927. WSP 1287: Drainage area. WSP 1397: 1921, 1927-31, 1937, drainage area (former site). WSP 1517: 1952. WDR OR-78-1: 1976(P).

GAGE.--Water-stage recorder. Datum of gage is 3,479.13 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 27, 1923, water-stage recorder or nonrecording gage at site 0.5 mi downstream at different datum. Apr. 27, 1923, to June 6, 1939, water-stage recorder at site 7 mi downstream at different datum.

REMARKS.--Records good except those for Mar. 10 to Apr. 28, which are fair. Slight regulation by small reservoirs upstream from station. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--64 years (water years 1927-90), 190 ft³/s, 137,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft³/s Dec. 23, 1964, gage height, 13.50 ft, from rating curve extended above 4,500 ft³/s on basis of contracted-opening measurement at gage height 13.20 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 10	2200	*341	*3.85	No other peak greater than base discharge.			
Minimum discharge, 1.1 ft ³ /s Aug. 2-10, 16, 17.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	52	71	e53	e57	68	97	194	112	103	6.5	1.3	2.9
2	51	66	e55	e59	64	96	194	95	97	4.8	1.2	3.6
3	52	68	e62	e55	64	95	198	90	75	3.8	1.1	3.3
4	50	71	79	e53	64	121	191	77	66	3.2	1.1	2.4
5	53	71	95	53	59	108	180	73	61	3.0	1.2	2.4
6	52	71	87	58	61	99	171	71	55	2.9	1.3	2.5
7	55	72	88	68	63	93	164	74	41	5.9	1.3	2.1
8	52	70	87	80	63	102	164	74	51	7.9	1.2	1.7
9	51	69	81	103	69	102	125	72	51	8.6	1.1	1.7
10	53	70	70	89	74	137	122	67	47	8.2	1.2	1.5
11	53	70	60	85	76	182	118	58	45	7.9	1.3	1.5
12	53	70	e56	81	75	101	105	56	41	8.2	1.4	1.4
13	60	71	55	82	66	87	97	56	27	8.3	1.3	1.7
14	61	72	55	89	e58	84	93	60	27	6.6	1.3	1.8
15	63	70	62	87	56	85	91	57	31	5.4	1.4	1.6
16	58	66	63	81	51	85	98	54	35	5.2	1.3	1.5
17	59	70	e58	74	e65	91	102	53	34	4.4	1.3	1.5
18	60	77	57	65	e57	116	76	48	32	5.5	1.5	2.1
19	60	75	62	56	e62	166	77	44	28	11	1.6	1.9
20	67	72	54	48	e60	187	81	44	29	10	2.8	1.5
21	63	72	58	50	e65	201	89	41	22	9.6	3.1	1.4
22	71	81	61	56	e75	223	76	38	19	9.2	2.9	1.3
23	77	e80	61	72	e85	239	84	42	17	9.9	1.8	1.3
24	78	e75	e59	65	e95	241	94	50	13	9.1	2.0	1.4
25	76	e70	e55	61	e110	210	80	50	13	7.3	1.9	1.5
26	73	e65	e55	64	e120	203	78	54	12	9.4	2.2	1.6
27	73	e70	55	63	e110	177	79	58	11	6.9	2.5	1.8
28	77	e60	55	64	103	186	176	70	9.5	2.4	3.1	2.2
29	73	e55	59	67	---	186	191	77	8.3	1.9	2.6	3.0
30	67	e53	e55	68	---	182	144	72	7.4	1.6	1.7	5.1
31	69	---	e56	66	---	179	---	81	---	1.4	2.2	---
TOTAL	1912	2093	1968	2119	2038	4461	3732	1968	1108.2	196.0	53.2	61.2
MEAN	61.7	69.8	63.5	68.4	72.8	144	124	63.5	36.9	6.32	1.72	2.04
MAX	78	81	95	103	120	241	198	112	103	11	3.1	5.1
MIN	50	53	53	48	51	84	76	38	7.4	1.4	1.1	1.3
AC-FT	3790	4150	3900	4200	4040	8850	7400	3900	2200	389	106	121

CAL YR 1989 TOTAL 94047.5 MEAN 258 MAX 2750 MIN 1.9 AC-FT 186500
WTR YR 1990 TOTAL 21709.6 MEAN 59.5 MAX 241 MIN 1.1 AC-FT 43060

e Estimated

UPPER MALHEUR RIVER BASIN

67

13214500 WARMSPRINGS RESERVOIR NEAR RIVERSIDE, OR

LOCATION.--Lat 43°35'07", long 118°12'30", NW 1/4 SW 1/4 sec.8, T.23 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on Bureau of Reclamation lands, near right end of dam on Malheur River, 3 mi northwest of Riverside, 4 mi upstream from South Fork, and at mile 114.0.

DRAINAGE AREA.--1,100 mi², approximately.

PERIOD OF RECORD.--January 1920 to October 1929, December 1929 to current year. Prior to Sept. 3, 1980, monthend contents and change in contents only.

GAGE.--Water-stage recorder. Datum of gage is 3,327.0 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation); gage readings have been reduced to elevations NVGD. Prior to May 29, 1964, nonrecording gage read daily or weekly.

REMARKS.--Reservoir is formed by concrete-arch dam. Storage began in 1919. Capacity, 191,000 acre-ft between elevations 3,327.00 ft, bottom of outlet tunnel, and 3,406.00 ft, top of flashboards. Dead storage, 1,400 acre-ft below elevation 3,327.00 ft not included in records. Water used to irrigate lands on both sides of river between Namorf and Ontario.

COOPERATION.--Capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 196,100 acre-ft Apr. 16, May 13, 1958, elevation, 3,407.10 ft; no contents Sept. 18 to Nov. 1, 1929, Aug. 26 to sometime in November 1935, Sept. 18 to Oct. 11, 1950, sometime in August to Oct. 3, 1977, Sept. 23-25, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 106,300 acre-ft Apr. 4, elevation, 3,384.81 ft; minimum contents 11 acre-ft Sept. 20, elevation, 3,327.28 ft.

Capacity table (elevation, in feet, and useable contents, in acre-feet)

3,327	0	3,345	10,150	3,380	90,520
3,330	295	3,350	16,930	3,390	124,600
3,335	1,960	3,360	35,400	3,400	164,400
3,340	5,090	3,370	60,140	3,406	191,000

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3377.26	3376.23	3377.68	---	3380.57	3382.03	3384.71	3381.38	3376.99	3368.72	3350.16	3327.52
2	3377.15	3376.27	3377.72	---	3380.61	3382.10	3384.74	3381.31	3376.99	3368.13	3349.48	3327.50
3	3377.03	3376.33	3377.78	---	3380.67	3382.16	3384.79	3381.24	3376.96	3367.52	3348.79	3327.50
4	3376.92	3376.36	3377.82	---	3380.70	3382.26	3384.80	3381.16	3376.93	3366.94	3348.07	3327.50
5	3376.81	3376.41	3377.89	---	3380.74	3382.33	3384.80	3381.07	3376.87	3366.37	3347.31	3327.51
6	3376.71	3376.44	3377.95	---	3380.77	3382.40	3384.77	3380.96	3376.81	3365.81	3346.53	3327.50
7	3376.60	3376.50	3378.02	3379.32	3380.80	3382.46	3384.72	3380.84	3376.72	3365.23	3345.67	3327.50
8	3376.50	3376.51	3378.08	3379.34	3380.86	3382.53	3384.67	3380.72	3376.64	3364.68	3344.77	3327.50
9	3376.39	3376.59	3378.15	3379.45	3380.90	3382.61	3384.59	3380.62	3376.54	3364.10	3343.73	3327.49
10	3376.29	3376.65	3378.19	3379.48	3380.96	3382.70	3384.49	3380.51	3376.43	3363.53	3342.72	3327.48
11	3376.17	3376.70	3378.23	3379.57	3381.02	3382.85	3384.40	3380.36	3376.33	3363.00	3341.59	3327.46
12	3376.07	3376.75	3378.28	3379.61	3381.05	3382.92	3384.29	3380.19	3376.19	3362.44	3340.39	3327.45
13	3375.97	3376.80	3378.30	3379.68	3381.09	3382.98	3384.14	3380.02	3376.02	3361.89	3338.90	3327.43
14	3375.89	3376.83	3378.33	3379.76	3381.10	3383.03	3383.96	3379.84	3375.85	3361.33	3336.99	3327.40
15	3375.80	3376.88	3378.36	3379.82	---	3383.08	3383.78	3379.67	3375.65	3360.77	3334.83	3327.36
16	3375.73	3376.92	3378.40	3379.88	3381.20	3383.14	3383.60	3379.50	3375.42	3360.16	3332.76	3327.35
17	3375.67	3376.97	3378.42	3379.93	---	3383.20	3383.43	3379.30	3375.25	3359.55	3331.04	3327.34
18	3375.62	3377.03	3378.44	3379.97	---	3383.26	3383.22	3379.11	3375.05	3358.92	3329.80	3327.34
19	3375.62	3377.08	---	3380.02	---	3383.36	3383.00	3378.89	3374.79	3358.28	3328.96	3327.32
20	3375.67	3377.13	3378.56	---	---	3383.47	3382.78	3378.67	3374.48	3357.67	3328.66	3327.31
21	3375.73	3377.17	---	---	3381.42	3383.60	3382.56	3378.45	3374.09	3357.06	3328.37	3327.31
22	3375.78	3377.23	---	---	3381.46	3383.75	3382.33	3378.25	3373.66	3356.43	3328.14	3327.32
23	3375.83	3377.28	---	---	3381.53	3383.87	3382.15	3378.04	3373.17	3355.78	3327.96	3327.32
24	3375.89	3377.34	---	---	3381.61	3384.02	3381.98	3377.85	3372.68	3355.12	3327.87	3327.31
25	3375.92	3377.44	---	---	3381.69	3384.16	3381.82	3377.67	3372.16	3354.49	3327.80	3327.30
26	3375.97	3377.49	---	---	3381.78	3384.27	3381.66	3377.50	3371.66	3353.87	3327.72	3327.31
27	3376.01	3377.54	---	---	3381.88	3384.37	3381.53	3377.36	3371.09	3353.28	3327.68	3327.33
28	3376.06	3377.58	---	3380.42	3381.96	3384.47	3381.44	3377.23	3370.52	3352.70	3327.63	3327.37
29	3376.10	3377.61	---	3380.45	---	3384.56	3381.43	3377.13	3369.94	3352.08	3327.61	3327.40
30	3376.15	3377.64	---	3380.48	---	3384.64	3381.41	3377.06	3369.34	3351.47	3327.56	3327.44
31	3376.19	---	---	3380.53	---	3384.67	---	3377.02	---	3350.81	3327.54	---
MAX	3377.26	3377.64	---	---	---	3384.67	3384.80	3381.38	3376.99	3368.72	3350.16	3327.52
MIN	3375.62	3376.23	---	---	---	3382.03	3381.41	3377.02	3369.34	3350.81	3327.54	3327.30
(†)	78530	83070	a87430	92210	96820	105800	95040	81120	58330	18180	22	18
(‡)	-3630	+4540	+4360	+4780	+4610	+8980	-10760	-13920	-22790	-40150	-18158	-4

CAL YR 1989 AC-FT# -7964
WTR YR 1990 AC-FT# -82142

† Contents, in acre-feet, at 2400, on last day of month.
‡ Change in contents, in acre-feet.
a Interpolated.

UPPER MALHEUR RIVER BASIN

13215000 MALHEUR RIVER BELOW WARMSPRINGS RESERVOIR, NEAR RIVERSIDE, OR

LOCATION.--Lat 43°34'29", long 118°12'31", on line between NW 1/4 SW 1/4 and SW 1/4 NW 1/4 sec.17, T.23 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on left bank 0.9 mi downstream from Warm Springs Dam, 3.0 mi upstream from South Fork, 4.0 mi northwest of Riverside, and at mile 113.

DRAINAGE AREA.--1,100 mi², approximately.

PERIOD OF RECORD.--January 1906 to March 1907 and December 1908 (gage heights only), January 1909 to September 1910, December 1914 to July 1917, March 1919 to current year. Monthly discharge only for some periods, published in WSP 1317. Figures of discharge for January 1906 to March 1907, published in WSP 272 and 370, have been found to be unreliable and should not be used. Published as Middle Fork of Malheur River at Riverside 1906-7, as Middle Fork of Malheur River above South Fork, at Riverside 1909-10, as Malheur River above South Fork, at Riverside in WSP 370, 1906-10, and as Malheur River at Warm Springs reservoir site, near Riverside 1914-17.

REVISED RECORDS.--WSP 833: 1936. WSP 1063: 1942-45. WSP 1397: 1909-10, 1917. WSP 1447: 1955. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,305 ft, by barometer. See WSP 1317 or 1737 for history of changes prior to Sept. 29, 1949.

REMARKS.--No estimated daily discharges. Records good except for flows below 100 ft³/s, which are poor. Flow completely regulated since November 1919 by Warm Springs Reservoir (station 13214500). Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--71 years (water years 1920-90), 191 ft³/s, 138,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 7,200 ft³/s Mar. 1, 1910, gage height, 10.7 ft, site and datum then in use, from rating curve extended above 820 ft³/s; maximum discharge since storage began November 1919, 3,150 ft³/s Mar. 22, 1984, gage height, 9.70 ft, from floodmark; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 718 ft³/s June 30, gage height, 5.48 ft; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	189	.00	.00	.00	.00	.00	122	187	124	711	432	1.6
2	189	.00	.00	.00	.00	.00	130	200	117	688	429	1.2
3	194	.00	.00	.00	.00	.00	135	207	118	672	429	1.0
4	197	.00	.00	.00	.00	.00	168	207	127	662	436	1.0
5	197	.00	.00	.00	.00	.00	187	216	143	635	436	1.1
6	203	.00	.00	.00	.00	.00	210	221	155	618	438	1.0
7	206	.00	.00	.00	.00	.00	240	221	171	616	451	.87
8	206	.00	.00	.00	.00	.00	249	221	176	614	461	.84
9	206	.00	.00	.00	.00	.00	258	222	175	614	459	.83
10	206	.00	.00	.00	.00	.00	263	232	175	614	454	.64
11	206	.00	.00	.00	.00	.00	263	260	184	590	453	.44
12	206	.00	.00	.00	.00	.00	263	288	213	587	437	.26
13	187	.00	.00	.00	.00	.00	317	296	250	597	438	.22
14	175	.00	.00	.00	.00	.00	349	285	267	590	442	.22
15	176	.00	.00	.00	.00	.00	349	278	277	577	383	.21
16	136	.00	.00	.00	.00	.00	354	290	299	563	291	.00
17	115	.00	.00	.00	.00	.00	372	311	309	568	205	.00
18	117	.00	.00	.00	.00	.00	381	311	309	562	124	.64
19	45	.00	.00	.00	.00	.00	386	338	350	551	74	1.2
20	.00	.00	.00	.00	.00	.00	404	353	407	539	42	1.1
21	.00	.00	.00	.00	.00	.00	412	334	485	527	28	.28
22	.00	.00	.00	.00	.00	.00	409	322	565	523	17	.09
23	.00	.00	.00	.00	.00	.00	350	322	607	515	12	.00
24	.00	.00	.00	.00	.00	.00	308	308	614	505	9.4	.00
25	.00	.00	.00	.00	.00	.00	301	300	623	495	7.8	.00
26	.00	.00	.00	.00	.00	.00	300	288	626	480	6.6	.00
27	.00	.00	.00	.00	.00	.00	300	281	656	457	5.5	.00
28	.00	.00	.00	.00	.00	.00	246	282	686	441	4.6	.33
29	.00	.00	.00	.00	---	.00	214	249	690	437	3.7	.83
30	.00	.00	.00	.00	---	61	197	187	704	437	2.8	1.7
31	.00	---	.00	.00	---	122	---	143	---	437	2.0	---
TOTAL	3356.00	0.00	0.00	0.00	0.00	183.00	8437	8160	10602	17422	7413.4	17.60
MEAN	108	.000	.000	.000	.000	5.90	281	263	353	562	239	.59
MAX	206	.00	.00	.00	.00	122	412	353	704	711	461	1.7
MIN	.00	.00	.00	.00	.00	.00	122	143	117	437	2.0	.00
AC-FT	6660	.00	.00	.00	.00	363	16730	16190	21030	34560	14700	35

CAL YR 1989 TOTAL 65956.42 MEAN 181 MAX 589 MIN .00 AC-FT 130800
WTR YR 1990 TOTAL 55591.00 MEAN 152 MAX 711 MIN .00 AC-FT 110300

MALHEUR RIVER BASIN

69

13216500 NORTH FORK MALHEUR RIVER ABOVE BEULAH RESERVOIR, NEAR BEULAH, OR

LOCATION.--Lat 43°56'54", long 118°10'24", in NW 1/4 NE 1/4 sec.4, T.19 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on left bank 1,000 ft upstream from Beulah Reservoir, 3.5 mi northwest of Beulah, and at mile 16.8. Prior to Sept. 24, 1985, at site 800 ft upstream.

DRAINAGE AREA.--355 mi².

PERIOD OF RECORD.--January to September 1914 (published as "at Scott's Ranch, near Beulah"), June 1936 to current year. Published as "above Agency Valley Reservoir, near Beulah", June 1936 to September 1968.

REVISED RECORDS.--WSP 1934: 1960 (M).

GAGE.--Water-stage recorder. Elevation of gage is 3,320 ft above National Geodetic Vertical Datum of 1929, from topographic map. Jan. 1 to Sept. 30, 1914, nonrecording gage and June 10, 1936, to Oct. 14, 1958, water-stage recorder at site 0.5 mi upstream at different datums. Oct. 15, 1958, to Oct. 8, 1975, water-stage recorder at site 800 ft upstream, datum of gage 3,351.0 ft. Oct. 9, 1975, to Sept. 24, 1985, at site 800 ft upstream, datum of gage 3,349.4 ft.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--54 years (water years 1937-90), 135 ft³/s, 97,810 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,970 ft³/s Dec. 23, 1964, gage height, 9.90 ft, present datum, from floodmark, from rating curve extended above 1,300 ft³/s, on basis of slope-area measurement of peak flow; maximum gage height, 11.0 ft, present datum, sometime during period Dec. 17-23, 1964 (icejam); minimum discharge, 8.5 ft³/s Dec. 13, 1967, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	0730	*234	*1.91	No other peak greater than base discharge.			

Minimum discharge recorded, 17 ft³/s Jan. 19, result of freezeup, but may have been less during periods of ice effect, Nov. 26 to Dec. 2, Dec. 12 to Jan. 5, Feb. 6, 15-27, Mar. 13, 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	46	e38	e40	50	75	132	132	98	40	35	38
2	45	47	e43	e43	48	82	143	125	86	42	31	37
3	45	56	57	e35	47	79	152	124	80	42	32	38
4	45	53	67	e40	50	88	156	118	73	42	33	38
5	46	54	65	e43	36	73	153	113	69	41	33	37
6	46	51	58	53	e36	70	148	115	70	40	33	34
7	44	51	53	58	43	72	145	115	80	42	e32	37
8	45	51	52	96	50	77	150	114	65	40	e32	37
9	46	51	52	86	53	64	141	110	64	39	e31	37
10	47	52	49	66	58	98	132	101	64	37	e31	37
11	46	51	40	62	60	78	133	88	60	36	e31	34
12	45	50	e40	58	56	57	133	91	56	37	e31	34
13	45	52	e40	57	43	e57	131	93	62	37	e31	35
14	45	51	e40	61	34	e57	130	92	62	35	e31	32
15	45	46	e43	55	e33	61	130	89	64	37	e31	35
16	46	51	e42	53	e33	63	137	88	61	37	e31	37
17	49	55	e39	50	e33	69	132	85	65	36	e32	37
18	48	55	e38	40	e35	88	132	81	70	35	e32	37
19	47	52	e40	32	e40	102	127	79	60	35	e34	39
20	48	50	e46	36	e45	111	121	89	54	34	e40	39
21	49	50	e42	52	e55	112	126	91	53	31	e48	36
22	56	47	e42	59	e52	122	126	83	52	32	45	36
23	55	50	e42	61	e60	137	126	82	50	32	40	37
24	58	53	e40	48	e65	125	115	88	48	34	37	37
25	54	47	e39	52	e85	113	105	78	46	38	46	37
26	52	e47	e38	52	e100	111	105	76	46	37	41	39
27	57	e47	e33	50	e80	107	111	79	46	33	37	40
28	54	e40	e43	49	75	113	200	91	46	35	40	40
29	47	e36	e41	51	---	114	156	98	43	35	38	40
30	51	e36	e39	52	---	115	139	90	40	36	40	40
31	56	---	e40	50	---	121	---	103	---	36	39	---
TOTAL	1506	1478	1381	1640	1455	2811	4067	3001	1833	1143	1098	1111
MEAN	48.6	49.3	44.5	52.9	52.0	90.7	136	96.8	61.1	36.9	35.4	37.0
MAX	58	56	67	96	100	137	200	132	98	42	48	40
MIN	44	36	33	32	33	57	105	76	40	31	31	32
AC-FT	2990	2930	2740	3250	2890	5580	8070	5950	3640	2270	2180	2200

CAL YR 1989 TOTAL 48748 MEAN 134 MAX 893 MIN 16 AC-FT 96690
WTR YR 1990 TOTAL 22524 MEAN 61.7 MAX 200 MIN 31 AC-FT 44680

e Estimated

MALHEUR RIVER BASIN

13217000 BEULAH RESERVOIR AT BEULAH, OR

LOCATION.--Lat 43°54'41", long 118°09'25", in SW 1/4 SE 1/4 sec.15, T.19 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on top of dam near right end of dam on North Fork Malheur River, 0.2 mi northwest of Beulah, and at mile 15.0.

DRAINAGE AREA.--440 mi², approximately.

PERIOD OF RECORD.--December 1935 to current year. Prior to October 1968, published as Agency Valley Reservoir at Beulah. Prior to March 1979, monthend contents only.

REVISED RECORDS.--WSP 1397: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 7.49 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1978, published as "National Geodetic Vertical Datum of 1929, Bureau of Reclamation construction datum." Prior to Mar. 28, 1979, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill, rock-faced dam. Storage began December 1935. Capacity, 59,920 acre-ft between gage heights 3,263.21 ft, bottom of outlet tunnel, and 3,340.0 ft, top of spillway gates; with gates open the capacity is 32,220 acre-ft. No dead storage. Water is used for irrigation of lands below Juntura, on Vale project, Bureau of Reclamation. U.S. Bureau of Reclamation satellite telemeter at station.

COOPERATION.--Prior to Mar. 28, 1979, daily gage heights furnished by Vale-Oregon Irrigation District. Capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 62,770 acre-ft May 3, 1941, gage height, 3,341.50 ft; no contents Sept. 17 to Oct. 13, 1950, Aug. 28 to Oct. 4, 1955, Aug. 13 to Oct. 1, 1961, Sept. 21 to Oct. 5, 1968, Aug. 31 to Oct. 3, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 37,500 acre-ft Apr. 8, gage height, 3,326.69 ft; minimum contents, 194 acre-ft Aug. 24-26, gage height, 3,272.98 ft.

Capacity table (gage height, in feet, and total contents, in acre-feet)

3,263	0	3,290	3,750	3,320	28,250
3,265	3	3,295	6,090	3,325	35,025
3,270	70	3,300	8,980	3,330	42,530
3,275	310	3,305	12,520	3,335	50,820
3,280	925	3,310	16,950	3,340	59,925
3,285	2,020	3,315	22,220	3,341	61,840

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3305.28	3308.82	3312.13	3315.17	3318.45	3321.43	3326.05	3322.07	3317.97	3312.00	3298.80	3273.02
2	3305.37	3308.94	3312.22	3315.25	3318.54	3321.59	3326.22	3322.01	3318.03	3311.33	3298.25	3273.02
3	3305.45	3309.11	3312.37	3315.32	3318.63	3321.73	3326.36	3321.95	3318.07	3311.18	3297.66	3273.02
4	3305.57	3309.22	3312.52	3315.41	3318.72	3321.89	3326.45	3321.86	3318.10	3310.90	3296.92	3273.02
5	3305.69	3309.32	3312.74	3315.50	3318.79	3322.01	3326.52	3321.74	3318.12	3310.56	3296.08	3273.02
6	3305.80	3309.45	3312.86	3315.61	3318.88	3322.15	3326.58	3321.56	3318.15	3310.20	3295.20	3273.02
7	3305.92	3309.57	3312.98	3315.77	3318.97	3322.28	3326.60	3321.41	3318.10	3309.92	3294.19	3273.03
8	3306.03	3309.70	3313.10	3315.97	3319.07	3322.39	3326.62	3321.28	3317.92	3309.61	3293.12	3273.03
9	3306.15	3309.84	3313.21	3316.12	3319.19	3322.51	3326.58	3321.15	3317.69	3309.26	3291.92	3273.03
10	3306.27	3309.95	3313.31	3316.28	3319.30	3322.70	3326.44	3320.97	3317.35	3308.92	3290.59	3273.03
11	3306.36	3310.06	3313.37	3316.39	3319.41	3322.82	3326.22	3320.78	3317.10	3308.50	3289.17	3273.02
12	3306.47	3310.17	3313.42	3316.51	3319.50	3322.91	3325.99	3320.58	3316.78	3308.09	3287.62	3273.02
13	3306.58	3310.28	3313.48	3316.64	3319.56	3323.02	3325.74	3320.42	3316.56	3307.69	3285.79	3273.02
14	3306.66	3310.37	3313.57	3316.76	3319.61	3323.14	3325.46	3320.21	3316.27	3307.26	3283.68	3273.02
15	3306.74	3310.48	3313.68	3316.87	3319.70	3323.25	3325.16	3320.04	3316.12	3306.83	3281.01	3273.01
16	3306.86	3310.61	3313.76	3316.98	3319.79	3323.35	3324.89	3319.85	3315.90	3306.32	3277.34	3273.01
17	3306.98	3310.75	3313.85	3317.07	3319.90	3323.47	3324.59	3319.57	3315.69	3305.81	3273.01	3273.01
18	3307.11	3310.86	3313.92	3317.14	3319.97	3323.61	3324.31	3319.30	3315.55	3305.28	3273.01	3273.01
19	3307.22	3310.97	3314.00	3317.19	3320.04	3323.77	3324.01	3319.00	3315.31	3304.78	3272.99	3273.01
20	3307.35	3311.08	3314.09	3317.25	3320.14	3323.95	3323.69	3318.75	3315.09	3304.31	3273.00	3273.02
21	3307.46	3311.20	3314.19	3317.33	3320.26	3324.12	3323.39	3318.50	3314.85	3303.84	3273.00	3273.02
22	3307.61	3311.31	3314.29	3317.45	3320.38	3324.33	3323.10	3318.28	3314.59	3303.34	3273.01	3273.03
23	3307.71	3311.43	3314.39	3317.56	3320.49	3324.52	3322.83	3318.09	3314.33	3302.81	3273.00	3273.02
24	3307.86	3311.53	3314.48	3317.65	3320.62	3324.72	3322.58	3317.96	3314.04	3302.22	3272.99	3273.03
25	3307.98	3311.66	3314.57	3317.75	3320.80	3324.91	3322.35	3317.84	3313.73	3301.74	3272.99	3273.03
26	3308.12	3311.75	3314.64	3317.84	3321.00	3325.08	3322.15	3317.71	3313.45	3301.49	3273.01	3273.02
27	3308.24	3311.84	3314.72	3317.94	3321.16	3325.24	3322.03	3317.64	3313.16	3301.09	3273.01	3273.02
28	3308.36	3311.92	3314.81	3318.05	3321.29	3325.41	3322.05	3317.70	3312.95	3300.72	3273.02	3273.02
29	3308.48	3311.94	3314.90	3318.16	---	3325.58	3322.06	3317.78	3312.69	3300.28	3273.02	3273.02
30	3308.60	3312.03	3314.98	3318.24	---	3325.74	3322.06	3317.80	3312.35	3299.84	3273.01	3273.03
31	3308.73	---	3315.07	3318.35	---	3325.89	---	3317.87	---	3299.35	3273.02	---
MAX	3308.73	3312.03	3315.07	3318.35	3321.29	3325.89	3326.62	3322.07	3318.15	3312.00	3298.80	3273.03
MIN	3305.28	3308.82	3312.13	3315.17	3318.45	3321.43	3322.03	3317.64	3312.35	3299.35	3272.99	3273.01
(†)	15710	19010	22300	26210	29930	36320	30950	25620	19340	8570	196	196
(‡)	+3050	+3300	+3290	+3910	+3720	+6390	-5370	-5330	-6280	-10770	-8374	0

CAL YR 1989 MAX 3339.92 MIN 3296.80 AC-FT† -2610
WTR YR 1990 MAX 3326.62 MIN 3272.99 AC-FT† -12464

† Contents, in acre-feet, at 2400, on last day of month.
‡ Change in contents, in acre-feet.

MALHEUR RIVER BASIN

71

13217500 NORTH FORK MALHEUR RIVER AT BEULAH, OR

LOCATION.--Lat 43°54'28", long 118°09'08", in NW 1/4 NE 1/4 sec.22, T.19 S., R.37 E., Malheur County, Hydrologic Unit 17050116, on left bank at Beulah, 0.3 mi downstream from Agency Valley Dam, 12 mi northwest of Juntura, and at mile 14.5.

DRAINAGE AREA.--440 mi², approximately.

PERIOD OF RECORD.--June 1926 to current year. Published as "near Beulah" June 1926 to September 1935.

REVISED RECORDS.--WSP 1397: 1927-32, 1934, drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,261.20 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 25, 1926, water-stage recorder at site 1 mi downstream at different datum. Apr. 25, 1936, to Sept. 30, 1949, nonrecording gage at site 20 ft downstream at datum 1.0 ft higher. Oct. 1, 1949, to June 30, 1964, at present site at datum 1.0 ft higher.

REMARKS.--No estimated daily discharges. Records good except discharges below 10 ft³/s, which are poor. Flow regulated since 1935 by Beulah Reservoir (station 13217000). Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--55 years (water years 1936-90), 146 ft³/s, 105,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,000 ft³/s May 7, 1942, gage height, 9.4 ft, present datum, from floodmark, caused by failure of gates at Agency Valley Dam, from rating curve extended above 1,100 ft³/s on basis of computation of peak flow over dam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 353 ft³/s Aug. 16, gage height, 3.28 ft; no flow Dec 18 to Mar. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.82	.06	.14	.00	.00	.00	40	127	53	227	215	39
2	1.0	.07	.12	.00	.00	.00	37	155	46	225	213	36
3	1.1	.06	.10	.00	.00	.00	56	175	46	224	223	36
4	.99	.06	.15	.00	.00	.00	109	178	46	224	266	36
5	.99	.07	.21	.00	.00	.00	125	183	66	207	285	35
6	1.1	.07	.21	.00	.00	.00	124	183	108	200	282	30
7	1.2	.07	.21	.00	.00	.00	134	196	124	199	306	34
8	1.2	.09	.21	.00	.00	.00	155	203	173	197	320	34
9	1.2	.09	.21	.00	.00	.00	199	202	198	199	324	33
10	1.3	.07	.12	.00	.00	.00	250	200	200	219	340	32
11	1.4	.07	.10	.00	.00	.00	287	200	197	230	341	30
12	1.6	.07	.10	.00	.00	.00	305	198	197	230	334	28
13	1.6	.06	.08	.00	.00	.00	322	194	197	230	340	30
14	1.6	.06	.04	.00	.00	.00	343	198	197	235	344	26
15	2.1	.06	.01	.00	.00	.00	343	200	195	238	341	29
16	1.2	.05	.01	.00	.00	.00	343	205	194	253	341	31
17	.04	.06	.01	.00	.00	.00	342	243	194	262	307	32
18	.04	.07	.00	.00	.00	.00	337	257	194	262	92	30
19	.05	.09	.00	.00	.00	.01	338	260	194	250	53	32
20	.06	.10	.00	.00	.00	.01	343	262	194	235	59	32
21	.07	.10	.00	.00	.00	.01	330	248	195	230	61	30
22	.08	.10	.00	.00	.00	.12	325	223	194	230	52	28
23	.06	.12	.00	.00	.00	.05	315	193	194	231	45	30
24	.07	.14	.00	.00	.00	.07	287	166	194	225	42	30
25	.06	.14	.00	.00	.00	.06	256	157	193	210	51	30
26	.05	.21	.00	.00	.00	.04	240	157	194	196	47	33
27	.07	.21	.00	.00	.00	.05	215	128	192	183	39	34
28	.05	.21	.00	.00	.00	.17	172	84	189	185	42	35
29	.05	.16	.00	.00	---	.32	155	66	190	189	40	34
30	.06	.14	.00	.00	---	24	144	66	216	185	41	35
31	.06	---	.00	.00	---	40	---	66	---	204	40	---
TOTAL	21.27	2.93	2.03	0.00	0.00	64.91	6971	5573	4964	6814	5826	964
MEAN	.69	.098	.065	.000	.000	2.09	232	180	165	220	188	32.1
MAX	2.1	.21	.21	.00	.00	40	343	262	216	262	344	39
MIN	.04	.05	.00	.00	.00	.00	37	66	46	183	39	26
AC-FT	42	5.8	4.0	.00	.00	129	13830	11050	9850	13520	11560	1910

CAL YR 1989 TOTAL 47277.40 MEAN 130 MAX 599 MIN .00 AC-FT 93770
WTR YR 1990 TOTAL 31203.14 MEAN 85.5 MAX 344 MIN .00 AC-FT 61890

MALHEUR RIVER BASIN

13226800 BULLY CREEK RESERVOIR NEAR VALE, OR

LOCATION.--Lat 44°00'55", long 117°23'45", in SE 1/4 SW 1/4 sec.12, T.18 S., R.43 E., Malheur County, Hydrologic Unit 17050118, U.S. Bureau of Reclamation land, on top of dam over outlet works near right end of dam on Bully Creek, 8.0 mi northwest of Vale, and at mile 12.5.

DRAINAGE AREA.--547 mi².

PERIOD OF RECORD.--February 1963 to current year. Prior to March 1979, monthend contents only.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (Bureau of Reclamation datum). Prior to Mar. 22, 1979, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill, rock-faced dam. Storage began Feb. 1, 1963. Capacity, 29,980 acre-ft between elevations 2,456.58 ft, outlet works, and 2,516.00 ft, spillway crest. Dead storage, 1,650 acre-ft below elevation 2,456.58 ft. Figures given herein do not include dead storage. Water used for irrigation lands of Vale-Oregon Irrigation District. Bully Creek Reservoir feed canal diverts from Malheur River by way of Vale Oregon canal.

COOPERATION.--Capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents not determined, occurred during period Apr. 4 to May 2, 1969, elevation above 2,516.00 ft, spillway crest; no usable contents at times in 1973, 1977, 1978, 1988, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 16,260 acre-ft Apr. 9, 10, elevation, 2,499.95 ft; minimum contents recorded, 254 acre-ft Aug. 18, elevation, 2,458.49 ft, but may have been less during period of missing record, Aug. 19 to Sept. 30.

Capacity table (elevation, in feet, and contents, in acre-feet)

2,456.5	0	2,480	5,430	2,505	20,130
2,460	465	2,485	7,430	2,510	24,370
2,465	1,310	2,490	9,930	2,515	29,000
2,470	2,401	2,495	12,900	2,520	34,040
2,475	3,770	2,500	16,290		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2489.78	2488.49	2489.48	2491.14	2493.83	2497.03	2499.61	2495.70	2491.67	2483.76	2470.02	---
2	2489.65	2488.51	2489.52	2491.17	2493.94	2497.16	2499.62	2495.73	2491.90	2483.13	2469.32	---
3	2489.54	2488.55	2489.57	2491.20	2494.09	2497.28	2499.57	2495.65	2491.97	2482.65	2468.58	---
4	2489.47	2488.57	2489.64	2491.22	2494.18	2497.39	2499.63	2495.52	2491.90	2482.20	2467.81	---
5	2489.41	2488.57	2489.73	2491.25	2494.32	2497.49	2499.72	2495.37	2491.84	2481.76	2466.96	---
6	2489.34	2488.59	2489.77	2491.28	2494.44	2497.61	2499.73	2495.15	2491.74	2481.30	2466.19	---
7	2489.27	2488.60	2489.81	2491.35	2494.53	2497.73	2499.83	2494.96	2491.62	2480.85	2465.40	---
8	2489.20	2488.62	2489.91	2491.41	2494.68	2497.81	2499.89	2494.79	2491.47	2480.41	2464.39	---
9	2489.15	2488.67	2490.04	2491.47	2494.80	2497.93	2499.91	2494.64	2491.31	2479.90	2463.22	---
10	2489.09	2488.70	2490.13	2491.49	2494.92	2498.10	2499.88	2494.48	2491.13	2479.39	2462.11	---
11	2489.00	2488.74	2490.20	2491.57	2495.05	2498.17	2499.76	2494.28	2490.96	2478.84	2460.93	---
12	2488.92	2488.79	2490.30	2491.71	2495.13	2498.29	2499.56	2494.11	2490.78	2478.31	2459.98	---
13	2488.84	2488.84	2490.39	2491.89	2495.22	2498.41	2499.37	2493.93	2490.49	2477.85	2459.34	---
14	2488.73	2488.83	2490.49	2492.06	2495.29	2498.52	2499.16	2493.73	2490.30	2477.41	2458.86	---
15	2488.63	2488.87	2490.57	2492.20	2495.39	2498.64	2498.96	2493.56	2490.10	2477.00	2458.58	---
16	2488.56	2488.93	2490.61	2492.34	2495.50	2498.76	2498.67	2493.36	2489.88	2476.57	2458.62	---
17	2488.52	2488.98	2490.66	2492.45	2495.59	2498.86	2498.40	2493.14	2489.64	2476.16	2458.64	---
18	2488.49	2489.02	2490.68	2492.55	2495.69	2498.96	2498.08	2492.94	2489.40	2475.72	2458.49	---
19	2488.45	2489.04	2490.71	2492.66	2495.76	2499.05	2497.79	2492.71	2489.12	2475.33	---	---
20	2488.44	2489.08	2490.74	2492.72	2495.87	2499.12	2497.49	2492.54	2488.81	2474.97	---	---
21	2488.46	2489.13	2490.78	2492.81	2496.01	2499.20	2497.20	2492.35	2488.45	2474.69	---	---
22	2488.46	2489.16	2490.81	2492.89	2496.16	2499.28	2496.92	2492.20	2488.06	2474.42	---	---
23	2488.44	2489.20	2490.84	2492.96	2496.32	2499.33	2496.66	2492.06	2487.65	2474.10	---	---
24	2488.46	2489.25	2490.87	2493.02	2496.44	2499.39	2496.42	2491.91	2487.26	2473.76	---	---
25	2488.46	2489.30	2490.90	2493.13	2496.56	2499.47	2496.26	2491.76	2486.82	2473.45	---	---
26	2488.48	2489.37	2490.91	2493.23	2496.67	2499.56	2496.04	2491.62	2486.38	2473.18	---	---
27	2488.48	2489.37	2490.96	2493.29	2496.79	2499.61	2495.95	2491.49	2485.89	2472.88	---	---
28	2488.47	2489.40	2491.02	2493.39	2496.91	2499.62	2495.80	2491.40	2485.36	2472.58	---	---
29	2488.47	2489.42	2491.05	2493.50	---	2499.61	2495.69	2491.30	2484.85	2472.20	---	---
30	2488.49	2489.45	2491.08	2493.59	---	2499.61	2495.65	2491.25	2484.30	2471.53	---	---
31	2488.50	---	2491.11	2493.68	---	2499.62	---	2491.40	---	2470.77	---	---
MAX	2489.78	2489.45	2491.11	2493.68	2496.91	2499.62	2499.91	2495.73	2491.97	2483.76	---	---
MIN	2488.44	2488.49	2489.48	2491.14	2493.83	2497.03	2495.65	2491.25	2484.30	2470.77	---	---
(†)	9130	9630	10560	12080	14140	16020	13320	10720	7130	2590	a155	a155
(‡)	-710	+500	+930	+1520	+2060	+1880	-2700	-2600	-3590	-4540	-2435	0

CAL YR 1989 AC-FT# +7460

WTR YR 1990 AC-FT# -9685

a Interpolated.

† Contents, in acre-feet, at 2400, on last day of month.

‡ Change in contents, in acre-feet.

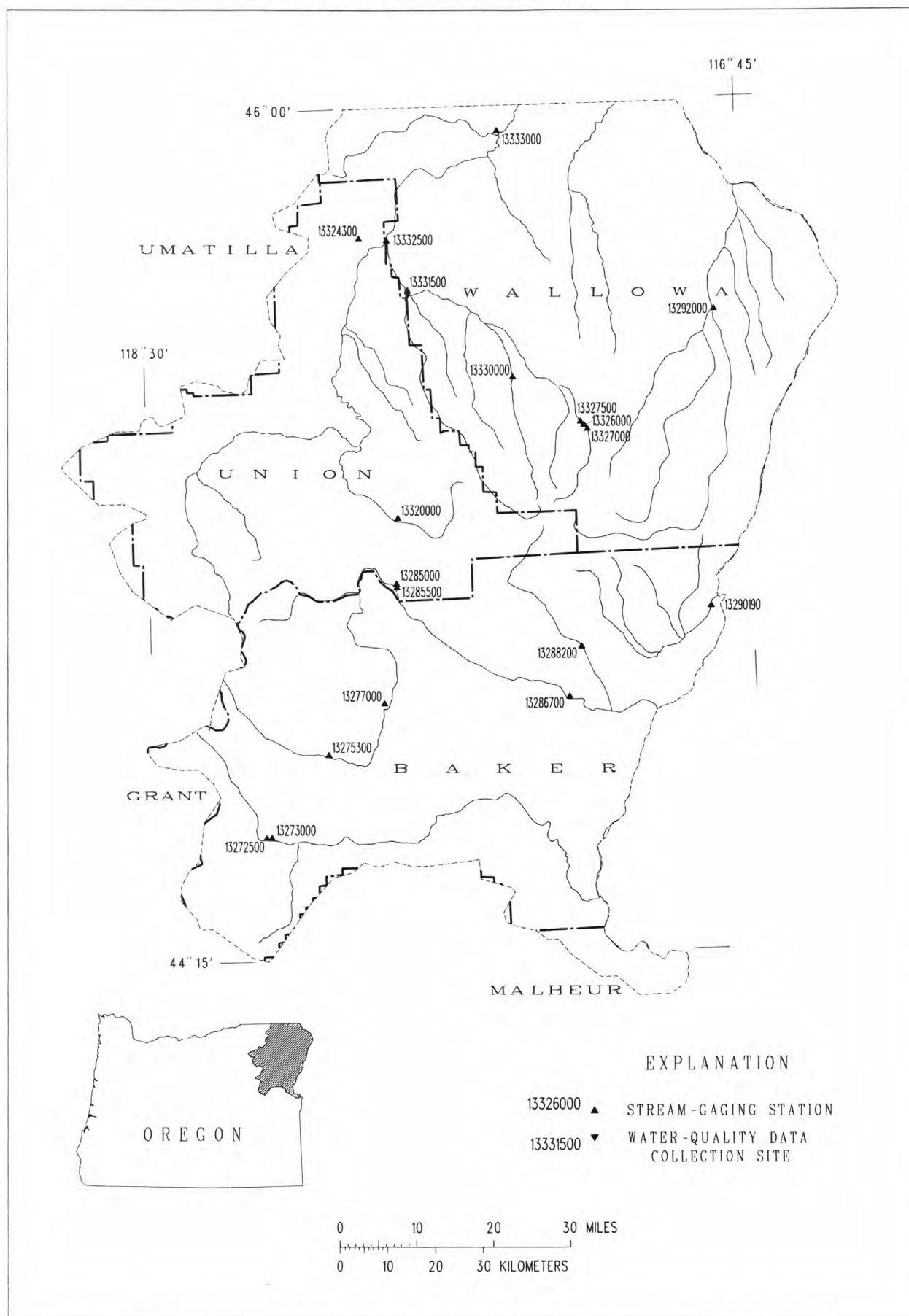


Figure 4.--Location of surface-water and water-quality stations in the Burnt River, Powder River, Pine Creek, Imnaha River, and Grande Ronde River basins.

BURNT RIVER BASIN

13272500 UNITY RESERVOIR NEAR UNITY, OR

LOCATION.--Lat 44°30'13", long 118°10'45", in SE 1/4 SW 1/4 sec.21, T.12 S., R.37 E., Baker County, Hydrologic Unit 17050202, at spillway near right end of dam on Burnt River, 4.4 mi north of Unity, and at mile 63.6.

DRAINAGE AREA.--309 mi².

PERIOD OF RECORD.--March 1938 to current year. Prior to September 1978, monthend contents only.

GAGE.-- Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). Mar. 13, 1938, to Nov. 4, 1941, reference mark or mercury pressure gage and Nov. 5, 1941, to Dec. 10, 1978, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill dam with concrete spillway and outlet works, completed by Bureau of Reclamation in 1937; storage began Feb. 19, 1938. Capacity, 25,200 acre-ft between elevations 3,776.5 ft, bottom of outlet gates, and 3,820.0 ft, top of radial gates on spillway when closed. Dead storage, 600 acre-ft below elevation 3,776.5 ft. Records given herein represent usable contents. Water used for irrigation in the Burnt River Irrigation District near Hereford and Bridgeport. U.S. Bureau of Reclamation satellite telemeter at station.

COOPERATION.--Capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 26,770 acre-ft Apr. 8, 1971, elevation, 3,821.62 ft; no contents Sept. 5 to Oct. 4, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 26,090 acre-ft Apr. 13, elevation, 3,820.94 ft; minimum contents, 4,230 acre-ft Sept. 30, elevation, 3,790.43.

Capacity table (elevation, in feet, and usable contents, in acre-feet)

3,780	590	3,805	12,960
3,785	1,960	3,810	16,680
3,790	4,020	3,815	20,770
3,795	6,610	3,820	25,220
3,800	9,600	3,821	26,150

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3799.58	3801.70	3804.26	3806.87	3809.88	3812.33	3819.15	3820.77	3816.47	3812.02	3804.53	3796.99
2	3799.64	3801.77	3804.30	3806.94	3809.95	3812.44	3819.43	3820.82	3816.41	3811.65	3804.27	3796.82
3	3799.71	3801.87	3804.35	3807.02	3810.03	3812.52	3819.71	3820.82	3816.32	3811.44	3804.04	3796.66
4	3799.78	3801.90	3804.43	3807.11	3810.06	3812.63	3819.95	3820.79	3816.21	3811.21	3803.81	3796.51
5	3799.84	3802.05	3804.48	3807.21	3810.17	3812.73	3820.21	3820.76	3816.11	3810.97	3803.56	3796.31
6	3799.88	3802.15	3804.57	3807.33	3810.22	3812.83	3820.45	3820.59	3816.00	3810.76	3803.34	3796.07
7	3799.93	3802.26	3804.67	3807.45	3810.34	3812.95	3820.63	3820.55	3815.97	3810.57	3803.09	3795.86
8	3799.98	3802.35	3804.78	3807.65	3810.42	3813.05	3820.69	3820.58	3815.89	3810.37	3802.81	3795.63
9	3800.02	3802.40	3804.85	3807.78	3810.54	3813.19	3820.78	3820.59	3815.82	3810.17	3802.46	3795.42
10	3800.07	3802.45	3804.93	3807.91	3810.63	3813.27	3820.83	3820.59	3815.64	3809.97	3802.14	3795.22
11	3800.11	3802.54	3804.98	3808.03	3810.73	3813.36	3820.83	3820.50	3815.55	3809.75	3801.80	3795.01
12	3800.16	3802.64	3805.08	3808.14	3810.79	3813.44	3820.84	3820.19	3815.43	3809.53	3801.47	3794.76
13	3800.21	3802.82	3805.20	3808.26	3810.85	3813.53	3820.87	3819.96	3815.37	3809.32	3801.13	3794.49
14	3800.23	3802.89	3805.30	3808.36	3810.92	3813.64	3820.86	3819.71	3815.27	3809.10	3800.81	3794.25
15	3800.26	3802.96	3805.39	3808.43	3811.01	3813.76	3820.84	3819.54	3815.22	3808.88	3800.47	3793.99
16	3800.32	3803.05	3805.48	3808.53	3811.06	3813.90	3820.87	3819.36	3815.13	3808.62	3800.16	3793.74
17	3800.40	3803.16	3805.57	3808.62	3811.14	3814.04	3820.83	3819.10	3815.08	3808.32	3799.92	3793.49
18	3800.46	3803.25	3805.66	3808.68	3811.21	3814.32	3820.82	3818.88	3815.01	3808.08	3799.63	3793.26
19	3800.53	3803.35	3805.74	3808.73	3811.28	3814.74	3820.81	3818.69	3814.91	3807.81	3799.38	3793.00
20	3800.61	3803.46	3805.85	3808.81	3811.36	3815.19	3820.81	3818.48	3814.82	3807.53	3799.17	3792.76
21	3800.69	3803.56	3805.93	3808.90	3811.49	3815.67	3820.85	3818.25	3814.74	3807.26	3798.96	3792.52
22	3800.77	3803.57	3806.02	3809.01	3811.57	3816.14	3820.85	3818.00	3814.60	3806.97	3798.76	3792.29
23	3800.87	3803.67	3806.10	3809.09	3811.65	3816.65	3820.88	3817.74	3814.41	3806.72	3798.54	3792.06
24	3800.96	3803.74	3806.19	3809.14	3811.78	3817.09	3820.87	3817.50	3814.11	3806.43	3798.33	3791.82
25	3801.07	3803.83	3806.26	3809.26	3811.93	3817.42	3820.87	3817.30	3813.82	3806.19	3798.12	3791.60
26	3801.10	3803.95	3806.36	3809.32	3812.08	3817.76	3820.85	3817.09	3813.50	3805.98	3797.93	3791.38
27	3801.22	3804.03	3806.45	3809.43	3812.15	3818.04	3820.77	3816.88	3813.21	3805.75	3797.78	3791.16
28	3801.37	3804.09	3806.54	3809.53	3812.23	3818.27	3820.55	3816.81	3812.90	3805.53	3797.62	3790.93
29	3801.46	3804.14	3806.63	3809.62	---	3818.46	3820.49	3816.72	3812.62	3805.24	3797.45	3790.68
30	3801.55	3804.21	3806.70	3809.69	---	3818.66	3820.62	3816.60	3812.31	3805.04	3797.30	3790.43
31	3801.63	---	3806.77	3809.78	---	3818.90	---	3816.52	---	3804.79	3797.13	---
MAX	3801.63	3804.21	3806.77	3809.78	3812.23	3818.90	3820.88	3820.82	3816.47	3812.02	3804.53	3796.99
MIN	3799.58	3801.70	3804.26	3806.87	3809.88	3812.33	3819.15	3816.52	3812.31	3804.79	3797.13	3790.43
(†)	10660	12410	14240	16510	18450	24220	25790	22100	18520	12810	7830	4230
(‡)	+1360	+1750	+1830	+2270	+1940	+5770	+1570	-3690	-3580	-5710	-4980	-3600
CAL YR 1989	MAX	--	MIN	--	AC-FT†	+8460						
WTR YR 1990	MAX	3820.88	MIN	3790.43	AC-FT†	-5070						

† Contents, in acre-feet, at 2400, on last day of month.

‡ Change in contents, in acre-feet.

BURNT RIVER BASIN

75

13273000 BURNT RIVER NEAR HEREFORD, OR

LOCATION.--Lat 44°30'14", long 118°10'35", in SE 1/4 sec.21, T.12 S., R.37 E., Baker County, Hydrologic Unit 17050202, on left bank 800 ft downstream from Unity Dam, 0.4 mi upstream from Van Cleve ditch, 7 mi west of Hereford, and at mile 63.5.

DRAINAGE AREA.--309 mi².

PERIOD OF RECORD.--March to September 1915, April to September 1916, October 1928 to current year. Monthly discharge only for some periods, published in WSP 1317.

REVISED RECORDS.--WSP 903: 1939. WSP 1397: 1916, 1930, 1930(M).

GAGE.--Water-stage recorder. Datum of gage is 3,758.19 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1943, to Oct. 31, 1966, water-stage recorder at site 450 ft downstream at datum 1.44 ft lower. See WSP 1317 or 1737 for history of changes prior to Oct. 1, 1943.

REMARKS.--No estimated daily discharges. Records good except those for discharges below 1.0 ft³/s, which are poor. Flow regulated since 1938 by Unity Reservoir (station 13272500). Diversions for irrigation upstream from station. U.S. Bureau of Reclamation satellite telemeter at station.

AVERAGE DISCHARGE.--62 years (water years 1929-90), 86.2 ft³/s, 62,450 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,220 ft³/s Apr. 17, 1943, gage height, 5.91 ft, present datum, from rating curve extended above 1,300 ft³/s; maximum gage height, 9.07 ft Apr. 8, 1971; no flow at times; minimum discharge before construction of Unity Dam, 1.6 ft³/s Aug. 31, 1935.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 530 ft³/s Apr. 27, gage height, 6.40 ft; minimum discharge, 0.80 ft³/s Oct. 2, 4, 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.95	11	21	4.9	5.5	11	49	78	73	132	93	52
2	.85	12	23	5.0	5.9	12	49	117	66	131	93	52
3	.89	11	21	5.2	6.1	12	50	136	66	122	92	52
4	.85	12	27	5.3	6.1	12	42	124	66	110	92	47
5	2.9	12	26	5.5	6.0	12	20	117	66	107	91	61
6	6.4	12	16	5.5	6.1	12	12	115	66	96	90	71
7	10	12	15	5.7	6.1	12	38	75	66	96	90	66
8	12	12	11	6.2	6.2	12	57	55	66	95	102	65
9	12	12	6.7	6.4	6.6	12	61	56	66	95	118	63
10	12	12	6.7	6.4	7.0	12	70	56	66	95	123	61
11	12	12	6.6	6.6	7.3	12	72	87	66	94	123	60
12	11	12	6.4	6.7	7.4	12	72	174	66	94	122	67
13	11	12	6.5	7.0	7.3	12	72	166	66	93	121	76
14	11	12	5.4	7.1	7.0	12	72	142	65	93	114	70
15	11	12	4.8	6.1	7.0	12	72	130	65	93	110	70
16	11	12	3.9	5.3	7.0	12	71	137	65	107	104	69
17	11	12	3.4	5.0	7.0	13	70	146	65	114	100	69
18	11	12	3.5	4.7	7.4	13	52	134	64	114	97	68
19	11	12	3.5	4.6	7.8	14	35	126	63	113	90	68
20	11	12	3.7	4.5	7.9	14	32	134	63	113	84	67
21	11	12	3.8	4.6	8.8	14	32	145	62	112	75	67
22	11	12	4.0	4.8	9.6	15	32	145	75	111	71	66
23	11	12	4.0	4.9	9.8	10	38	144	115	106	71	65
24	12	12	4.2	4.7	10	9.5	41	144	145	98	70	65
25	11	12	4.1	4.6	11	11	48	137	145	98	70	65
26	11	12	4.5	4.7	11	12	51	129	144	96	62	64
27	12	12	4.4	4.8	11	10	176	124	144	96	53	64
28	11	12	4.6	5.0	11	34	388	100	143	95	53	63
29	11	12	4.7	5.1	---	47	213	88	143	95	53	63
30	11	14	4.7	5.2	---	48	98	82	138	94	53	62
31	11	---	4.7	5.2	---	49	---	81	---	94	52	---
TOTAL	292.84	360	268.8	167.3	216.9	504.5	2185	3624	2569	3202	2732	1918
MEAN	9.45	12.0	8.67	5.40	7.75	16.3	72.8	117	85.6	103	88.1	63.9
MAX	12	14	27	7.1	11	49	388	174	145	132	123	76
MIN	.85	11	3.4	4.5	5.5	9.5	12	55	62	93	52	47
AC-FT	581	714	533	332	430	1000	4330	7190	5100	6350	5420	3800

CAL YR 1989 TOTAL 35925.83 MEAN 98.4 MAX 949 MIN .03 AC-FT 71260
WTR YR 1990 TOTAL 18040.34 MEAN 49.4 MAX 388 MIN .85 AC-FT 35780

POWDER RIVER BASIN

13275300 POWDER RIVER NEAR SUMPTER, OR

LOCATION.--Lat 44°40'20", long 117°59'40", in NE 1/4 NE 1/4 sec.25, T.10 S., R.38 E., Baker County, Hydrologic Unit 17050203, Wallowa Whitman National Forest, on left bank 1,200 ft downstream from Mason Dam, 1.4 mi upstream from California Gulch, 11.4 mi southeast of Sumpter, and at mile 123.2.

DRAINAGE AREA.--168 mi², approximately. Prior to Oct. 1, 1970, 170 mi² at cableway, 0.5 mi downstream.

PERIOD OF RECORD.--April 1965 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,898.47 ft above National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). Prior to July 29, 1965, nonrecording gage at datum 1.03 ft higher.

REMARKS.--Records good except: flows below 10 ft³/s, which are fair; flows below 5 ft³/s, which are poor. Flow completely regulated since Oct. 31, 1967, by Phillips Lake, active capacity, 90,540 acre-ft. Many small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--25 years, 110 ft³/s, 79,700 acre-ft/yr, not adjusted for storage in Phillips Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 971 ft³/s Apr. 30, 1965, gage height, 4.43 ft; no flow Nov. 12, 1967; Nov. 23-29, 1988; Sept. 29, 1989.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 1,600 ft³/s, approximately, Mar. 20, 1910, based on comparison with records for station downstream, near Baker.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 326 ft³/s Aug. 1, gage height, 3.21 ft; minimum discharge, 0.41 ft³/s Oct. 3, gage height, 1.40 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.5	5.0	4.6	4.6	3.7	6.9	5.5	211	17	278	316	63
2	2.5	5.0	4.6	4.6	3.7	7.5	5.5	227	15	278	321	43
3	8.6	5.0	4.6	4.6	3.7	8.9	8.5	248	15	258	318	38
4	21	4.5	4.6	4.6	3.3	12	10	255	21	235	318	53
5	21	4.1	4.6	4.6	3.3	4.5	10	262	24	233	313	62
6	21	4.1	4.6	4.1	3.3	3.6	10	270	27	233	270	61
7	21	4.1	4.6	3.7	3.3	3.3	18	292	42	227	262	61
8	21	4.1	4.7	3.7	3.3	3.7	34	310	42	224	271	61
9	19	4.1	5.0	3.7	3.3	3.7	55	313	42	191	261	61
10	7.1	4.1	e4.6	3.7	3.4	3.7	85	314	42	170	243	84
11	7.1	4.1	e4.6	3.7	3.7	3.7	112	314	39	193	228	125
12	7.1	4.1	e4.6	3.7	e3.3	3.7	130	314	44	219	224	121
13	7.1	4.1	e4.6	3.7	e3.1	3.7	130	314	66	211	224	110
14	7.4	4.1	e4.6	3.7	e3.1	3.9	127	299	71	188	223	103
15	7.7	4.1	e4.6	3.7	e3.1	4.1	125	268	100	201	214	98
16	7.7	4.1	e4.6	3.7	e3.1	4.2	125	247	99	214	201	90
17	7.7	4.1	e4.6	3.7	e3.1	4.2	125	214	98	224	197	88
18	7.7	4.1	4.6	3.7	e3.1	4.3	167	197	100	225	187	81
19	7.6	4.1	4.6	3.7	e3.1	4.6	210	185	106	256	174	90
20	7.1	4.1	4.6	3.7	3.3	4.6	224	186	147	272	169	102
21	7.1	4.1	4.6	3.7	3.4	5.0	223	181	176	258	158	102
22	7.0	4.1	4.6	3.7	3.7	5.0	222	144	203	258	152	102
23	5.5	4.1	4.6	3.7	3.9	5.3	221	156	203	245	152	102
24	5.5	4.1	4.6	3.7	4.6	5.0	221	149	203	236	152	102
25	5.5	4.1	4.6	3.7	4.8	5.0	234	134	173	224	152	70
26	5.2	4.1	e4.6	3.7	4.9	5.0	242	134	159	218	152	44
27	5.0	4.1	e4.6	3.7	4.6	5.0	242	129	159	205	145	39
28	5.0	4.1	e4.6	3.7	5.5	5.5	222	114	163	198	119	39
29	5.0	4.3	3.1	3.7	---	5.5	206	79	193	199	102	39
30	5.0	4.6	2.9	3.7	---	5.5	206	50	243	241	94	31
31	5.0	---	4.6	3.7	---	5.5	---	32	---	287	77	---
TOTAL	286.7	126.8	139.9	119.6	101.7	156.1	3955.5	6542	3032	7099	6389	2265
MEAN	9.25	4.23	4.51	3.86	3.63	5.04	132	211	101	229	206	75.5
MAX	21	5.0	5.0	4.6	5.5	12	242	314	243	287	321	125
MIN	2.5	4.1	2.9	3.7	3.1	3.3	5.5	32	15	170	77	31
AC-FT	569	252	277	237	202	310	7850	12980	6010	14080	12670	4490

CAL YR 1989 TOTAL 23930.1 MEAN 65.6 MAX 306 MIN 1.3 AC-FT 47470
WTR YR 1990 TOTAL 30213.3 MEAN 82.8 MAX 321 MIN 2.5 AC-FT 59930

e Estimated

POWDER RIVER BASIN

77

13277000 POWDER RIVER AT BAKER, OR

LOCATION.--Lat 44°46'06", long 117°49'50", in SE 1/4 NE 1/4 sec.20, T.9 S., R.40 E., Baker County, Hydrologic Unit 17050203, on right bank 600 ft upstream from Myrtle Street Bridge in Baker, 0.5 mi downstream from Sutton Creek, and at mile 107.6.

DRAINAGE AREA.--351 mi².

PERIOD OF RECORD.--May to September 1913, April to July 1914, November 1971 to current year. Monthly discharge only May 1913, April 1914 published in WSP 1317. November 1971 to September 1978 in reports of Oregon Water Resources Department.

REVISED RECORDS.--WSP 1317: 1913.

GAGE.--Water-stage recorder. Datum of gage is 3,441.71 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 19, 1971, nonrecording gage at site 0.7 mi downstream at different datum.

REMARKS.--Records excellent except for estimated daily discharges, which are poor. Flow regulated since Oct. 31, 1967, by Phillips Lake, active capacity, 90,540 acre-ft. Old Settlers Slough diverts from left bank 0.2 mi upstream for irrigation downstream from station. U.S. Bureau of Reclamation satellite telemeter at station.

AVERAGE DISCHARGE.--18 years, 109 ft³/s, 78,970 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,120 ft³/s Jan. 15, 1974, gage height, 5.55 ft; maximum gage height, 5.57 ft Jan. 5, 1984 (ice jam); minimum discharge, 0.7 ft³/s Oct. 28, 29, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 260 ft³/s Aug. 1-3, 5, gage height, 3.03 ft; minimum discharge, 2.9 ft³/s Oct. 3, 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.2	6.3	e11	e11	e12	22	23	130	36	184	239	35
2	4.5	6.8	e12	e10	e12	22	23	139	21	191	252	25
3	2.9	8.4	e12	e9.0	e12	21	17	154	17	180	253	10
4	13	8.4	13	e10	e12	24	11	165	15	146	251	9.7
5	24	8.7	14	e11	e12	23	6.1	168	12	140	249	22
6	24	8.6	14	e12	e12	22	4.5	177	13	134	213	23
7	24	9.1	13	e13	e11	22	3.3	187	23	130	196	24
8	24	8.8	14	e13	e14	29	4.0	218	26	125	197	24
9	24	10	14	e15	15	23	11	218	28	113	201	22
10	17	12	e12	23	54	29	21	217	32	83	186	23
11	9.4	12	e11	19	e35	32	43	225	37	91	181	56
12	9.3	12	e11	17	e25	26	75	233	29	118	166	74
13	9.6	13	e13	17	e20	25	75	232	42	126	159	66
14	9.8	13	e13	17	e16	26	71	230	39	98	145	66
15	10	12	e13	16	e15	25	67	197	45	100	131	61
16	10	13	e12	15	e17	24	68	177	53	115	120	58
17	10	14	e11	e14	e16	26	58	150	58	123	115	59
18	11	14	e11	e13	e15	36	65	132	52	121	109	58
19	11	13	e12	e12	e14	44	104	130	47	132	100	53
20	11	13	e11	e11	e16	45	125	129	72	181	100	70
21	11	13	e13	e13	e17	42	128	126	103	157	98	77
22	13	12	e13	e13	e19	39	132	98	132	158	85	80
23	13	13	e12	e12	e21	51	130	86	132	154	84	80
24	12	14	e12	e11	28	44	127	119	129	141	85	87
25	12	13	e12	e13	33	36	133	101	124	146	89	81
26	11	14	e11	e12	34	32	140	102	103	140	90	52
27	14	e12	e11	e11	26	29	153	102	92	142	85	42
28	11	e12	e11	e12	22	27	171	114	82	135	83	38
29	6.1	e13	e11	e12	---	25	138	90	98	137	65	38
30	6.2	e12	e11	e12	---	23	131	65	131	159	59	37
31	6.8	---	e11	e11	---	22	---	52	---	207	54	---
TOTAL	381.8	344.1	375	410.0	555	916	2257.9	4663	1823	4307	4440	1450.7
MEAN	12.3	11.5	12.1	13.2	19.8	29.5	75.3	150	60.8	139	143	48.4
MAX	24	14	14	23	54	51	171	233	132	207	253	87
MIN	2.9	6.3	11	9.0	11	21	3.3	52	12	83	54	9.7
AC-FT	757	683	744	813	1100	1820	4480	9250	3620	8540	8810	2880

CAL YR 1989 TOTAL 23172.0 MEAN 63.5 MAX 421 MIN 2.9 AC-FT 45960
WTR YR 1990 TOTAL 21923.5 MEAN 60.1 MAX 253 MIN 2.9 AC-FT 43490

e Estimated

POWDER RIVER BASIN

13285000 THIEF VALLEY RESERVOIR NEAR NORTH POWDER, OR

LOCATION.--Lat 45°00'45", long 117°46'50", in NE 1/4 SW 1/4 sec.26, T.6 S., R.40 E., Baker County, Hydrologic Unit 17050203, Bureau of Reclamation land, on top of right end of dam on Powder River, 7.0 mi east of North Powder, and at mile 70.0.

DRAINAGE AREA.--910 mi², approximately.

PERIOD OF RECORD.--October 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark).

REMARKS.--Reservoir is formed by concrete dam. Storage began in February 1932. Capacity, 17,400 acre-ft between elevations 3,094.00 ft, minimum pool, and 3,133.00 ft, spillway crest. No dead storage. Water used for irrigation of lands of Lower Powder River Irrigation District.

COOPERATION.--Capacity table furnished by Oregon Water Resources Department. Table uncertain below about 3,096 ft, due to siltation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 18,900 acre-ft July 2, 1982, elevation, 3,134.99 ft; no contents observed Sept. 17, 1987; probably no contents most days during September 1987, Sept. 7-18, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 17,800 acre-ft June 3, elevation, 3,133.53 ft; minimum contents, 298 acre-ft Sept. 28, elevation, 3,096.47 ft.

Capacity table (elevation, in feet, and contents, in acre-feet)

3,096	230	3,120	8,950
3,100	966	3,125	11,880
3,105	2,360	3,130	15,210
3,110	4,170	3,135	18,910
3,115	6,370		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3113.03	3115.39	3124.49	3131.44	3133.19	3133.24	3133.30	3133.25	3133.52	3131.85	3123.44	3113.68
2	3112.82	3115.65	3124.74	3131.57	3133.19	3133.24	3133.26	3133.25	3133.49	3131.55	3123.18	3113.57
3	3112.54	3115.96	3125.07	3131.70	3133.19	3133.28	3133.28	3133.21	3133.45	3131.39	3122.83	3113.42
4	3112.38	3116.25	3125.39	3131.87	3133.19	3133.27	3133.25	3133.21	3133.39	3131.28	3122.50	3113.15
5	3112.18	3116.59	3125.71	3132.06	3133.19	3133.28	3133.24	3133.26	3133.41	3131.11	3122.16	3112.80
6	3111.94	3116.90	3126.06	3132.24	3133.19	3133.27	3133.22	3133.20	3133.39	3130.87	3121.79	3112.47
7	3111.82	3117.20	3126.42	3132.45	3133.19	3133.28	3133.23	3133.20	3133.46	3130.65	3121.42	3112.11
8	3111.66	3117.49	3126.71	3132.74	3133.15	3133.31	3133.14	3133.20	3133.45	3130.41	3121.05	3111.75
9	3111.48	3117.80	3127.02	3133.18	3133.20	3133.27	3133.12	3133.14	3133.45	3130.20	3120.66	3111.36
10	3111.39	3118.14	3127.29	3133.25	3133.23	3133.27	3133.16	3133.11	3133.43	3129.97	3120.21	3110.92
11	3111.39	3118.47	3127.44	3133.25	3133.29	3133.27	3133.18	3133.08	3133.41	3129.71	3119.77	3110.40
12	3111.43	3118.78	3127.59	3133.26	3133.29	3133.26	3133.11	3132.89	3133.41	3129.43	3119.35	3109.85
13	3111.43	3119.12	3127.83	3133.24	3133.19	3133.27	3133.14	3132.72	3133.32	3129.13	3118.92	3109.27
14	3111.35	3119.41	3128.11	3133.24	3133.14	3133.32	3133.20	3132.60	3133.26	3128.83	3118.51	3108.63
15	3111.29	3119.71	3128.39	3133.24	3133.14	3133.32	3133.23	3132.56	3133.22	3128.53	3118.00	3107.98
16	3111.36	3120.02	3128.60	3133.22	3133.11	3133.30	3133.16	3132.37	3133.22	3128.21	3117.54	3107.41
17	3111.63	3120.40	3128.79	3133.19	3133.13	3133.29	3133.08	3132.26	3133.22	3127.90	3117.10	3106.83
18	3111.87	3120.79	3128.95	3133.15	3133.13	3133.34	3132.98	3132.07	3133.23	3127.58	3116.70	3106.23
19	3112.14	3121.12	3129.18	3133.11	3133.13	3133.45	3132.75	3131.88	3133.21	3127.27	3116.35	3105.55
20	3112.42	3121.47	3129.33	3133.08	3133.14	3133.39	3132.54	3131.77	3133.20	3126.96	3116.01	3104.95
21	3112.68	3121.78	3129.54	3133.14	3133.15	3133.39	3132.25	3131.65	3133.13	3126.66	3115.75	3104.22
22	3112.92	3122.09	3129.78	3133.19	3133.15	3133.36	3132.13	3131.55	3133.06	3126.36	3115.54	3103.43
23	3113.17	3122.44	3129.98	3133.21	3133.19	3133.31	3132.04	3131.45	3132.99	3126.03	3115.30	3102.56
24	3113.41	3122.72	3130.16	3133.16	3133.23	3133.32	3132.00	3131.43	3132.90	3125.68	3115.07	3101.65
25	3113.65	3123.02	3130.31	3133.16	3133.24	3133.33	3132.06	3131.51	3132.80	3125.36	3114.81	3100.64
26	3113.91	3123.33	3130.47	3133.19	3133.26	3133.33	3131.93	3131.56	3132.66	3125.04	3114.55	3099.33
27	3114.17	3123.61	3130.61	3133.19	3133.27	3133.32	3131.93	3131.65	3132.59	3124.71	3114.33	3097.51
28	3114.38	3123.87	3130.78	3133.20	3133.24	3133.28	3132.66	3132.11	3132.46	3124.41	3114.18	3096.48
29	3114.60	3124.04	3130.95	3133.18	---	3133.26	3133.13	3132.96	3132.35	3124.10	3114.05	3096.48
30	3114.84	3124.26	3131.10	3133.19	---	3133.26	3133.25	3133.43	3132.14	3123.88	3113.90	3096.49
31	3115.10	---	3131.25	3133.19	---	3133.29	---	3133.51	---	3123.67	3113.79	---
MAX	3115.10	3124.26	3131.25	3133.26	3133.29	3133.45	3133.30	3133.51	3133.52	3131.85	3123.44	3113.68
MIN	3111.29	3115.39	3124.49	3131.44	3133.11	3133.24	3131.93	3131.43	3132.14	3123.67	3113.79	3096.48
(†)	6420	11420	16110	17540	17580	17620	17590	17780	16760	11070	5800	300
(‡)	+850	+5000	+4690	+1430	+40	+40	-30	+190	-1020	-5690	-5270	-5500
CAL YR 1989	MAX	---	MIN	---	AC-FT†	+6910						
WTR YR 1990	MAX	3133.52	MIN	3096.48	AC-FT‡	-5270						

† Contents, in acre-feet, at 2400, on last day of month.

‡ Change in contents, in acre-feet.

POWDER RIVER BASIN

79

13285500 POWDER RIVER BELOW THIEF VALLEY RESERVOIR, NEAR NORTH POWDER, OR

LOCATION.--Lat 45°00'20", long 117°46'50", in NE 1/4 NW 1/4 sec.35, T.6 S., R.40 E., Baker County, Hydrologic Unit 17050203, on right bank 0.6 mi downstream from Thief Valley Reservoir, 7.0 mi east of North Powder, and at mile 69.4.

DRAINAGE AREA.--910 mi², approximately.

PERIOD OF RECORD.--March 1909 to June 1912, July to September 1932, August 1978 to current year. Prior to July 1932, published as Powder River near North Powder.

REVISED RECORDS.--WSP 1317: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,080.166 ft above National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). Prior to Aug. 18, 1978, nonrecording gage at site 0.5 mi upstream at different datum.

REMARKS.--Records good except those below 1.0 ft³/s, which are poor. Flow regulated by Phillips Lake since October 1967, usable capacity, 90,540 acre-ft, by Wolf Creek Reservoir since April 1975, usable capacity, 10,400 acre-ft, by Pilcher Creek Reservoir since April 1984, usable capacity 5,560 acre-ft, and by Thief Valley Reservoir since February 1932, usable capacity, 17,400 acre-ft. Many diversions for irrigation upstream from station. U.S. Bureau of Reclamation satellite telemeter at station.

AVERAGE DISCHARGE.--12 years (water years 1979-90), 226 ft³/s, 163,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 2,920 ft³/s Mar. 21, 1910, gage height, 10.0 ft, site and datum then in use, from rating curve extended above 1,000 ft³/s; maximum gage height, 10.05 ft July 2, 1982; no flow Aug. 9 to Sept. 10, 1910.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 355 ft³/s June 1, gage height, 6.73 ft; minimum discharge, 0.17 ft³/s Oct. 20, 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	89	10	12	14	92	124	99	101	349	105	65	54
2	89	10	12	14	100	126	98	90	320	104	67	54
3	89	10	12	14	96	128	89	70	273	103	102	54
4	88	11	12	14	82	130	79	67	246	102	102	70
5	88	11	12	13	90	136	70	72	226	101	101	77
6	87	11	12	13	77	133	59	89	213	101	101	77
7	87	10	12	13	74	137	56	70	257	100	101	76
8	87	10	12	14	80	145	53	79	242	100	108	75
9	86	10	13	26	104	138	38	85	220	100	111	74
10	73	10	13	116	118	151	38	81	250	100	122	81
11	56	10	13	139	148	153	44	88	250	100	122	92
12	56	11	13	132	173	154	34	95	217	100	123	90
13	56	11	13	127	145	143	35	94	190	100	122	92
14	56	11	13	125	e96	146	54	94	160	99	120	99
15	56	11	13	122	e80	142	60	93	128	98	119	97
16	28	10	13	117	e84	139	87	93	106	e99	119	95
17	.39	11	13	117	86	134	99	93	100	e98	117	93
18	.22	10	13	103	86	146	99	93	120	e98	116	91
19	.19	10	13	84	82	166	114	93	119	e97	115	88
20	.18	11	13	73	82	173	113	94	116	e97	104	85
21	.17	11	13	78	81	174	112	94	132	e96	87	82
22	2.1	11	13	96	85	172	112	93	114	e96	74	79
23	10	11	13	117	91	173	111	94	111	e95	73	75
24	10	11	13	87	113	162	101	65	110	102	72	71
25	10	11	13	83	132	153	95	52	106	114	72	66
26	10	11	13	96	139	143	95	52	87	113	71	60
27	11	11	13	88	138	129	86	53	73	112	70	54
28	10	11	13	95	129	115	60	53	72	112	63	33
29	10	11	13	101	---	102	45	54	72	111	55	26
30	10	12	13	99	---	102	95	173	92	79	55	22
31	10	---	13	96	---	98	---	315	---	65	55	---
TOTAL	1265.25	320	395	2426	2883	4367	2330	2832	5071	3097	2904	2182
MEAN	40.8	10.7	12.7	78.3	103	141	77.7	91.4	169	99.9	93.7	72.7
MAX	89	12	13	139	173	174	114	315	349	114	123	99
MIN	.17	10	12	13	74	98	34	52	72	65	55	22
AC-FT	2510	635	783	4810	5720	8660	4620	5620	10060	6140	5760	4330

CAL YR 1989 TOTAL 61185.54 MEAN 168 MAX 1970 MIN .01 AC-FT 121400
WTR YR 1990 TOTAL 30072.25 MEAN 82.4 MAX 349 MIN .17 AC-FT 59650

e Estimated

POWDER RIVER BASIN

13286700 POWDER RIVER NEAR RICHLAND, OR

LOCATION.--Lat 44°46'40", long 117°17'30", in SE 1/4 sec.14, T.9 S., R.44 E., Baker County, Hydrologic Unit 17050203, on left bank 0.4 mi upstream from Upper Timber Canyon, 6.0 mi west of Richland, and at mile 20.3.

DRAINAGE AREA.--1,310 mi², approximately.

PERIOD OF RECORD.--October 1957 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,277.42 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for estimated daily discharges, which are poor. Flow regulated by Phillips Lake since October 1967, usable capacity, 90,540 acre-ft, Wolf Creek Reservoir since April 1975, usable capacity, 10,400 acre-ft, Thief Valley Reservoir since February 1932, usable capacity, 17,400 acre-ft, and Pilcher Creek Reservoir since April 1984, usable capacity, 5,560 acre-ft. Diversions for irrigation upstream and downstream from station.

AVERAGE DISCHARGE.--33 years, 264 ft³/s, 191,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,090 ft³/s Feb. 21, 1982, gage height, 7.50 ft, from floodmark; maximum gage height, 9.29 ft Jan. 15, 1974 (ice jam); minimum discharge, 0.80 ft³/s Aug. 11, 12, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 581 ft³/s May 29, gage height, 2.96 ft; minimum discharge, 5.6 ft³/s Aug. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	45	e40	e40	118	182	249	105	469	44	22	41
2	75	44	e44	e36	114	179	274	115	460	38	23	35
3	76	43	e46	e30	121	211	286	104	420	45	24	40
4	77	45	e46	e36	118	211	263	117	365	26	29	40
5	73	44	50	e40	95	203	231	115	308	10	25	42
6	36	43	49	e42	e86	207	208	103	304	23	23	48
7	25	43	47	e44	e80	205	171	92	348	27	20	44
8	33	44	46	e44	99	225	160	82	359	32	11	38
9	164	47	46	e80	119	217	147	67	321	47	9.7	33
10	80	51	45	e160	141	290	124	75	294	74	7.8	34
11	76	58	e42	240	156	313	91	68	328	34	7.6	31
12	63	56	e40	209	194	261	61	54	300	26	9.0	33
13	60	56	e40	174	202	242	48	59	261	30	11	24
14	69	56	e46	170	e160	220	42	73	221	31	12	26
15	69	54	e46	164	e130	219	37	70	194	23	30	30
16	71	52	e44	158	e110	213	37	63	158	23	56	27
17	84	56	e40	151	e120	215	39	54	137	20	33	31
18	57	59	e40	e130	e120	226	39	44	127	23	50	36
19	44	57	e45	e110	e120	275	38	41	114	23	43	31
20	38	55	e42	e90	e110	331	33	47	99	22	49	28
21	36	54	e42	e80	e110	350	34	56	79	21	65	30
22	40	52	e42	e90	e110	345	36	50	86	18	68	31
23	41	52	e46	e100	e120	366	47	47	73	17	60	34
24	42	52	e40	e120	e140	364	48	41	57	17	52	37
25	47	52	e38	e90	173	331	54	32	53	18	69	37
26	48	51	e38	e100	192	302	48	26	49	22	70	35
27	52	50	e40	e110	196	288	49	25	44	25	61	33
28	54	47	e42	e100	191	270	101	77	43	24	61	33
29	49	e44	e42	e110	---	255	137	194	36	24	55	31
30	47	e44	e42	124	---	242	106	169	30	26	52	33
31	46	---	e42	122	---	244	---	244	---	26	45	---
TOTAL	1850	1506	1338	3294	3745	8002	3238	2509	6137	859	1153.1	1026
MEAN	59.7	50.2	43.2	106	134	258	108	80.9	205	27.7	37.2	34.2
MAX	164	59	50	240	202	366	286	244	469	74	70	48
MIN	25	43	38	30	80	179	33	25	30	10	7.6	24
AC-FT	3670	2990	2650	6530	7430	15870	6420	4980	12170	1700	2290	2040

CAL YR 1989 TOTAL 93186.0 MEAN 255 MAX 2810 MIN 7.6 AC-FT 184800
WTR YR 1990 TOTAL 34657.1 MEAN 95.0 MAX 469 MIN 7.6 AC-FT 68740

e Estimated

POWDER RIVER BASIN

81

13288200 EAGLE CREEK ABOVE SKULL CREEK, NEAR NEW BRIDGE, OR

LOCATION.--Lat 44°52'50", long 117°15'10", in SE 1/4 sec.7, T.8 S., R.45 E., Baker County, Hydrologic Unit 17050203, Wallowa-Whitman National Forest, on left bank 0.5 mi upstream from Skull Creek, 6.5 mi northwest of New Bridge, and at mile 10.5.

DRAINAGE AREA.--156 mi².

PERIOD OF RECORD.--October 1957 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,800 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation. Some diversions upstream from station for irrigation and one small interbasin diversion for irrigation supply. All diversions are small compared to flow at station during irrigation season.

AVERAGE DISCHARGE.--33 years, 318 ft³/s, 230,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,310 ft³/s July 12, 1975, gage height, 5.06 ft, from rating curve extended above 2,500 ft³/s on basis of slope-area measurement of peak flow; maximum gage height, 6.88 ft Jan. 25, 1962 (ice jam); minimum daily discharge, 30 ft³/s Nov. 28, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
June 10	0030	*1,080	*2.92				
Minimum daily discharge, 70 ft ³ /s Jan. 3.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	108	122	e110	e100	96	108	346	487	661	580	143	96
2	104	124	e120	e80	95	112	427	524	592	548	154	95
3	102	126	136	e70	94	115	489	562	572	467	135	94
4	102	148	142	e90	92	117	507	612	587	401	128	92
5	100	143	146	e90	e86	115	508	732	574	377	125	91
6	99	139	136	e90	e84	115	515	839	645	358	122	90
7	97	141	132	e100	e82	118	531	758	736	342	120	89
8	96	137	133	e110	e100	128	560	660	695	328	119	90
9	95	232	131	111	e100	123	540	604	778	319	123	89
10	95	225	125	107	e100	153	517	593	1030	319	132	88
11	93	205	e100	105	e96	139	538	589	850	312	130	86
12	93	204	e94	103	e88	126	563	553	699	301	127	86
13	93	197	e100	106	e85	124	546	529	622	291	125	85
14	93	186	e110	107	e80	122	599	510	575	278	121	84
15	93	173	e120	102	e78	119	711	479	544	255	119	84
16	93	173	e110	101	e90	121	796	458	550	236	117	84
17	93	186	e110	96	e86	129	890	458	565	214	129	84
18	91	175	e100	e80	e80	151	941	474	580	199	129	84
19	91	170	e110	e80	e76	192	909	455	666	189	127	83
20	92	166	e110	e76	e100	224	965	464	760	181	132	81
21	110	163	e110	e90	e100	228	962	432	801	175	130	88
22	183	157	111	e84	e100	237	987	439	822	168	142	87
23	167	158	110	e80	e100	282	959	501	849	162	122	85
24	201	156	107	e76	e120	265	796	548	821	160	120	85
25	150	153	e100	e96	e140	237	723	478	809	161	119	84
26	144	153	e94	94	e120	226	636	448	757	162	127	83
27	151	146	e94	98	108	234	623	456	688	151	113	90
28	140	e130	e100	113	107	239	604	763	622	141	107	85
29	129	e120	e100	106	---	245	540	901	604	136	103	83
30	132	e120	e110	93	---	257	500	805	609	134	101	82
31	131	---	e100	93	---	282	---	775	---	148	99	---
TOTAL	3561	4828	3511	2927	2683	5383	19728	17886	20663	8193	3840	2607
MEAN	115	161	113	94.4	95.8	174	658	577	689	264	124	86.9
MAX	201	232	146	113	140	282	987	901	1030	580	154	96
MIN	91	120	94	70	76	108	346	432	544	134	99	81
AC-FT	7060	9580	6960	5810	5320	10680	39130	35480	40990	16250	7620	5170

CAL YR 1989 TOTAL 123611 MEAN 339 MAX 2310 MIN 45 AC-FT 245200
WTR YR 1990 TOTAL 95810 MEAN 262 MAX 1030 MIN 70 AC-FT 190000

e Estimated

PINE CREEK BASIN

13290190 PINE CREEK NEAR OXBOW, OR

LOCATION.--Lat 44°57'13", long 116°52'21", in NE 1/4 SW 1/4 sec.17, T.7 S., R.48 E., Baker County, Hydrologic Unit 17050201, 1.8 mi south of Oxbow, and at mile 1.9.

DRAINAGE AREA.--230 mi², approximately.

PERIOD OF RECORD.--November 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,850.48 ft above National Geodetic Vertical Datum of 1929 (levels by Idaho Power Co.). Prior to Aug. 24, 1967, nonrecording gage at site 1.7 mi downstream at different datum.

REMARKS.--No estimated daily discharges. Records good. Diversions upstream from station for irrigation of about 19,000 acres (1966 determination).

AVERAGE DISCHARGE.--23 years, 363 ft³/s, 263,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft³/s Feb. 21, 1968, gage height, 9.82 ft; minimum discharge, 10 ft³/s Aug. 17-24, 1977, gage height, 2.12 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,280 ft³/s May 29, gage height, 5.56 ft; minimum discharge, 25 ft³/s Aug. 9, 11, gage height, 2.42 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75	111	104	71	109	274	621	587	1020	171	32	40
2	76	113	102	69	102	296	744	574	912	159	31	39
3	73	113	103	52	98	422	844	561	814	195	32	37
4	70	116	106	72	103	514	866	571	765	165	33	37
5	69	125	115	70	86	480	820	630	701	159	31	37
6	68	117	109	75	103	492	784	702	734	150	30	35
7	68	133	105	87	85	484	787	615	846	145	28	34
8	67	121	106	290	102	568	831	546	729	128	28	34
9	66	144	110	357	117	514	795	508	734	106	26	35
10	65	155	99	228	285	850	707	485	835	80	27	33
11	63	151	88	197	331	841	680	433	722	79	27	33
12	62	149	82	178	265	614	707	396	604	72	28	31
13	61	162	102	187	219	511	652	369	540	75	29	31
14	62	148	100	243	155	469	660	375	494	68	28	29
15	62	136	98	220	139	442	718	351	463	54	28	28
16	64	137	94	205	166	423	853	328	436	50	30	28
17	65	142	92	188	150	426	934	320	436	43	33	31
18	65	136	86	169	123	471	942	336	423	40	56	30
19	63	131	86	158	118	588	867	326	403	39	58	29
20	62	126	80	143	120	696	868	373	389	37	58	28
21	67	124	86	141	132	689	896	398	371	35	55	28
22	147	118	81	136	127	671	979	372	341	37	62	28
23	122	122	81	134	129	866	1020	392	333	36	56	28
24	126	128	77	118	148	738	851	622	310	37	51	28
25	126	124	75	121	186	608	728	549	297	43	73	29
26	118	131	74	117	230	549	656	504	283	48	70	27
27	164	110	73	111	258	545	674	488	245	44	63	28
28	140	104	76	113	262	545	849	684	239	39	54	27
29	122	101	75	119	---	542	660	1100	220	37	49	27
30	120	101	69	116	---	541	618	1110	190	35	48	27
31	119	---	69	109	---	556	---	1140	---	32	43	---
TOTAL	2697	3829	2803	4594	4448	17225	23611	16745	15829	2438	1297	936
MEAN	87.0	128	90.4	148	159	556	787	540	528	78.6	41.8	31.2
MAX	164	162	115	357	331	866	1020	1140	1020	195	73	40
MIN	61	101	69	52	85	274	618	320	190	32	26	27
AC-FT	5350	7590	5560	9110	8820	34170	46830	33210	31400	4840	2570	1860
CAL YR 1989	TOTAL 135829		MEAN 372	MAX 1990	MIN 31	AC-FT 269400						
WTR YR 1990	TOTAL 96452		MEAN 264	MAX 1140	MIN 26	AC-FT 191300						

LOWER SNAKE RIVER BASIN

83

13292000 IMNAHA RIVER AT IMNAHA, OR

LOCATION.--Lat 45°33'45", long 116°50'00", in SW 1/4 sec.16, T.1 N., R.48 E., Wallowa County, Hydrologic Unit 17060102, on left bank at Imnaha, 0.3 mi downstream from Big Sheep Creek, and at mile 19.3.

DRAINAGE AREA.--622 mi².

PERIOD OF RECORD.--June 1928 to current year.

REVISED RECORDS.--WSP 833: 1938. WSP 1397: 1929, 1932(M), 1949. WSP 1737: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,941.14 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 6, 1934, nonrecording gage at site 0.25 mi upstream at different datum. Aug. 6-31, 1934, nonrecording gage at present site and datum.

REMARKS.--Records good. No regulation. Diversions for irrigation upstream from station. Water is diverted from Big Sheep Creek and tributaries upstream from station for irrigation in Wallowa River basin. National Weather Service satellite telemeter at station.

AVERAGE DISCHARGE.--62 years, 512 ft³/s, 370,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,100 ft³/s Jan. 17, 1974, gage height, 7.86 ft, from rating curve extended above 3,500 ft³/s; minimum discharge observed, 16 ft³/s Nov. 22, 1931, result of freezeup; minimum daily, 25 ft³/s Nov. 22, 23, 1931.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 30	0430	*2,330	*4.94	No other peak greater than base discharge.			
Minimum discharge, 68 ft ³ /s Feb. 15.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	169	192	184	153	146	248	693	816	2120	760	220	157
2	159	195	186	150	145	250	866	904	1940	743	214	153
3	155	204	198	94	145	260	1020	1000	1720	718	206	150
4	151	206	204	118	145	272	1060	1020	1560	614	200	146
5	149	218	201	149	120	268	1040	1040	1400	569	194	144
6	146	211	194	169	134	264	1030	1110	1340	539	187	144
7	144	208	184	163	117	258	1060	1030	1420	510	182	144
8	147	202	182	185	138	289	1090	937	1300	485	178	142
9	147	209	183	180	151	289	1080	852	1260	462	174	138
10	146	247	178	178	153	318	1020	809	1430	452	178	136
11	145	245	151	171	154	307	1030	777	1330	446	188	132
12	144	241	108	165	150	270	1070	750	1160	426	179	130
13	144	247	179	165	132	267	1030	716	1050	417	169	129
14	142	236	194	170	118	265	1060	726	967	403	164	126
15	142	219	177	172	83	260	1160	716	919	379	159	125
16	142	225	163	171	132	264	1290	678	904	359	156	124
17	141	241	171	168	148	286	1370	664	900	340	175	124
18	139	230	154	146	138	327	1370	679	878	326	215	123
19	139	225	133	108	113	404	1290	670	888	310	197	121
20	137	222	141	97	142	575	1250	697	935	298	193	120
21	154	221	169	126	157	614	1290	696	975	287	182	118
22	325	215	162	e150	156	617	1310	655	1000	277	201	118
23	281	214	164	185	154	701	1370	684	1020	278	184	117
24	356	220	148	131	169	636	1210	881	1030	282	181	115
25	269	210	133	143	193	568	1060	890	1000	305	207	112
26	237	216	128	162	225	534	977	944	978	296	208	114
27	251	194	139	142	242	539	893	956	903	270	192	132
28	235	164	145	144	247	554	887	1290	843	254	176	125
29	209	171	157	150	---	560	846	1950	803	242	168	118
30	211	178	138	148	---	566	801	2220	792	231	164	115
31	213	---	148	144	---	596	---	2160	---	225	161	---
TOTAL	5669	6426	5096	4697	4247	12426	32523	29917	34765	12503	5752	3892
MEAN	183	214	164	152	152	401	1084	965	1159	403	186	130
MAX	356	247	204	185	247	701	1370	2220	2120	760	220	157
MIN	137	164	108	94	83	248	693	655	792	225	156	112
AC-FT	11240	12750	10110	9320	8420	24650	64510	59340	68960	24800	11410	7720

CAL YR 1989 TOTAL 155009 MEAN 425 MAX 2170 MIN 56 AC-FT 307500
WTR YR 1990 TOTAL 157913 MEAN 433 MAX 2220 MIN 83 AC-FT 313200

e Estimated

GRANDE RONDE RIVER BASIN

13320000 CATHERINE CREEK NEAR UNION, OR

LOCATION.--Lat 45°09'20", long 117°46'26", in NW 1/4 SE 1/4 sec.2, T.5 S., R.40 E., Union County, Hydrologic Unit 17060104, on right bank 3.0 mi downstream from Little Catherine Creek, 5.5 mi southeast of Union, and at mile 25.4.

DRAINAGE AREA.--105 mi².

PERIOD OF RECORD.--May 1906 to May 1907 (gage heights only), August 1911 to December 1912, March to September 1915, February 1918 to September 1919, October 1925 to current year. Monthly discharge only for some periods, published in WSP 1317.

REVISED RECORDS.--WSP 1397: 1912-13, 1919, 1926, 1928-33, 1937, 1939, 1940(M), 1941-43, 1950.

GAGE.--Water-stage recorder. Datum of gage is 3,081.76 ft above National Geodetic Vertical Datum of 1929 (Oregon State Highway Department bench mark). Prior to Nov. 28, 1938, nonrecording gage at several sites within 1.8 mi of present site at various datums. Nov. 28, 1938, to May 16, 1939, water-stage recorder at site 400 ft downstream at datum 4.29 ft lower.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation. Several small diversions for irrigation upstream from station. Since 1937, diversion to Big Creek in Powder River basin provides a small part of the water used for irrigation in that basin.

AVERAGE DISCHARGE.--67 years (water years 1912, 1919, 1926-90), 119 ft³/s, 86,220 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,740 ft³/s May 27, 1948, gage height, 4.57 ft; minimum discharge, 6.5 ft³/s Feb. 4, 1955, result of freezeup; minimum daily, 8 ft³/s Nov. 7, 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 5	2100	*523	*2.70	No other peak greater than base discharge.			
Minimum discharge, 19 ft ³ /s Nov. 1.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	27	e34	e36	27	60	204	318	434	162	44	30
2	30	30	e34	e34	27	60	254	379	421	161	43	30
3	29	32	41	e32	26	62	289	424	405	149	42	29
4	29	45	43	e34	26	61	295	446	375	132	41	29
5	28	42	53	e32	e24	60	293	470	346	124	39	29
6	27	38	50	e30	e26	57	292	484	360	117	38	30
7	27	39	47	33	e24	59	296	433	375	109	37	28
8	27	37	47	40	e26	68	300	378	350	103	36	27
9	27	96	47	38	e28	66	285	332	353	97	37	26
10	26	82	43	37	e30	74	268	309	394	91	37	26
11	26	70	e30	35	e32	68	275	292	342	86	36	25
12	26	73	e28	36	e34	65	288	272	319	84	34	25
13	25	71	e30	39	e30	62	279	255	297	81	33	25
14	25	64	e32	42	e26	57	291	243	274	76	33	25
15	25	57	e40	41	e28	55	324	226	259	73	32	24
16	25	56	e34	40	e30	54	353	211	248	70	32	25
17	25	75	e32	37	e28	58	380	208	251	67	37	27
18	25	69	e32	e28	e26	71	389	207	242	64	44	26
19	25	63	e36	e28	e24	112	379	202	248	62	41	26
20	25	60	e38	e26	e28	159	377	207	259	60	44	24
21	26	58	e34	e28	e30	164	389	198	261	57	41	24
22	38	53	e34	e30	e32	168	405	199	262	56	49	24
23	40	52	e34	e32	e36	183	416	221	260	54	40	23
24	45	51	e32	e26	e40	164	366	238	251	56	38	23
25	32	48	e32	e28	50	148	336	215	241	64	41	23
26	30	48	e36	e30	59	137	299	207	225	57	38	24
27	39	44	e36	e30	65	140	315	212	209	54	36	27
28	35	e36	e36	e28	62	143	348	289	193	51	34	24
29	28	e38	e30	e30	---	146	334	338	181	48	33	23
30	32	e30	e32	29	---	152	313	372	172	47	32	23
31	31	---	e38	28	---	167	---	426	---	47	31	---
TOTAL	910	1584	1145	1017	924	3100	9632	9211	8807	2559	1173	774
MEAN	29.4	52.8	36.9	32.8	33.0	100	321	297	294	82.5	37.8	25.8
MAX	45	96	53	42	65	183	416	484	434	162	49	30
MIN	25	27	28	26	24	54	204	198	172	47	31	23
AC-FT	1800	3140	2270	2020	1830	6150	19110	18270	17470	5080	2330	1540

CAL YR 1989 TOTAL 47833 MEAN 131 MAX 917 MIN 16 AC-FT 94880
WTR YR 1990 TOTAL 40836 MEAN 112 MAX 484 MIN 23 AC-FT 81000

e Estimated

GRANDE RONDE RIVER BASIN

85

13324300 LOOKINGGLASS CREEK NEAR LOOKING GLASS, OR

LOCATION.--Lat 45°43'55", long 117°51'50", in NW 1/4 NW 1/4 sec.19, T.3 N., R.40 E., Union County, Hydrologic Unit 17060104, on left bank at Oregon State Fish and Wildlife Service fish hatchery, 310 ft upstream from Jarboe Creek, 2.3 mi northwest of Looking Glass, and at mile 2.3.

DRAINAGE AREA.--78.3 mi².

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 2,530 ft, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor. Records include a diversion by the fish hatchery 0.3 mi upstream from station of up to 50 ft³/s that is returned through the fish ladder to the gage pool.

AVERAGE DISCHARGE.--8 years, 131 ft³/s 94,910 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,100 ft³/s May 30, 1984, gage height, 6.52 ft; minimum discharge, 25 ft³/s Oct. 11, 1983, result of regulation at fish hatchery upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 380 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 16	2000	541	5.67	May 6	unknown	*621	*5.80

Minimum discharge, 40 ft³/s Sept. 8, 9, 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	54	59	59	56	85	205	300	e260	80	53	48
2	55	54	59	59	53	93	244	356	e220	77	52	49
3	54	55	60	59	54	91	313	404	e190	76	51	49
4	54	69	64	60	55	89	e360	e460	e170	75	51	48
5	54	64	88	60	53	88	e390	e500	e160	73	51	47
6	55	62	80	62	55	88	e390	e510	e150	73	51	46
7	55	66	84	72	53	91	e380	e480	e160	70	51	46
8	56	60	87	117	56	100	e380	e400	e150	68	51	46
9	55	72	89	108	64	99	e390	e320	e140	66	51	46
10	55	71	78	123	85	107	e395	e270	e155	64	51	46
11	55	65	68	107	103	106	e385	e240	e140	63	50	45
12	54	73	67	94	98	105	e385	e230	e130	65	47	46
13	55	75	68	88	87	105	e390	e220	e115	64	46	45
14	55	68	69	89	82	105	e390	e205	e105	61	46	45
15	55	66	69	85	81	102	e420	e190	e100	60	46	45
16	55	64	66	82	82	99	438	e180	e98	56	47	46
17	55	73	66	75	73	99	477	e170	e92	57	48	45
18	55	70	61	69	69	107	469	e165	e96	58	49	45
19	54	68	64	64	68	131	452	e160	e100	57	50	46
20	54	65	64	68	64	169	423	e160	e105	55	51	46
21	63	65	63	64	63	193	382	e160	e110	55	52	44
22	63	65	62	63	62	202	369	e165	e115	55	55	44
23	61	67	62	69	63	e192	413	e180	e115	55	51	45
24	58	74	62	59	66	e178	368	e205	e110	55	49	44
25	56	69	61	57	72	172	352	e200	e107	55	51	44
26	56	69	59	57	81	172	321	e195	99	55	49	45
27	60	67	59	56	84	169	307	e210	94	55	49	45
28	60	62	60	57	84	169	327	e240	91	54	49	45
29	58	62	57	58	---	175	312	e270	88	53	50	45
30	56	61	59	57	---	178	310	e320	83	54	49	44
31	55	---	59	57	---	183	---	e300	---	53	49	---
TOTAL	1740	1975	2073	2254	1966	4042	11137	8365	3848	1917	1546	1370
MEAN	56.1	65.8	66.9	72.7	70.2	130	371	270	128	61.8	49.9	45.7
MAX	63	75	89	123	103	202	477	510	260	80	55	49
MIN	54	54	57	56	53	85	205	160	83	53	46	44
AC-FT	3450	3920	4110	4470	3900	8020	22090	16590	7630	3800	3070	2720

CAL YR 1989 TOTAL 55052 MEAN 151 MAX 846 MIN 50 AC-FT 109200
WTR YR 1990 TOTAL 42233 MEAN 116 MAX 510 MIN 44 AC-FT 83770

e Estimated

GRANDE RONDE RIVER BASIN

13326000 WALLOWA LAKE NEAR JOSEPH, OR

LOCATION.--Lat 45°20'10", long 117°13'15", in NW 1/4 sec.5, T.3 S., R.45 E., Wallowa County, Hydrologic Unit 17060105, at spillway near right end of Wallowa Lake dam on Wallowa River, 1.3 mi southeast of Joseph, and at mile 50.2.

DRAINAGE AREA.--50.8 mi².

PERIOD OF RECORD.--November 1903 to July 1906 (gage height only), January 1912 to March 1914, May to September 1915 (gage heights and change in contents only), October 1925 to June 1926, December 1926 to current year. Monthend contents only for some periods, published in WSP 1317. November 1903 to March 1905 published as Wallowa River at Joseph. Change in contents for January 1912 to March 1914 and May to September 1915 published with records for Wallowa River at Joseph.

REVISED RECORDS.--WSP 1737: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,355.66 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1925, nonrecording gage at several sites within 0.5 mi of present site at different datums. Oct. 1, 1925, to June 30, 1926, Dec. 1, 1926, to May 18, 1961, nonrecording gage near left end of dam at same datum.

REMARKS.--Reservoir is formed by concrete dam. Capacity, 42,750 acre-ft between gage heights 0.0 (sill of outlet gates) and 26.8 ft, spillway crest. About 5,300 acre-ft dead storage above outlet gates, because channel is about 3.4 ft above outlet gates. Dead storage below outlet gates not known. Records are based on capacities above outlet gates.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 47,830 acre-ft June 5-7, 1957, gage height, 29.85 ft; minimum contents observed, 4,790 acre-ft Oct. 10, 1929, gage height, 3.10 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 42,890 acre-ft June 2-5, gage height, 26.88 ft (mean of surge); minimum contents, 18,890 acre-ft Sept. 30, gage height, 12.12 ft.

MONTHEND GAGE-HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Gage Height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	12.76	19,910	--
Oct. 31.....	14.24	22,260	+2,350
Nov. 30.....	15.32	23,990	+1,730
Dec. 31.....	17.30	27,170	+3,180
CAL YR 1989.....	--	--	+15,770
Jan. 31.....	18.53	29,160	+1,990
Feb. 28.....	19.47	30,690	+1,530
Mar. 31.....	20.52	32,400	+1,710
Apr. 30.....	25.26	40,190	+7,790
May 31.....	26.78	42,720	+2,530
June 30.....	26.71	42,600	-120
July 31.....	--	431,880	-10,720
Aug. 31.....	13.50	21,090	-10,790
Sept. 30.....	12.12	18,890	-2,200
WTR 1990.....	--	--	-1,020

a Interpolated

GRANDE RONDE RIVER BASIN

87

13327500 WALLOWA RIVER AT JOSEPH, OR

LOCATION.--Lat 45°20'15", long 117°13'35", in NW 1/4 sec.5, T.3 S., R.45 E., Wallowa County, Hydrologic Unit 17060105, on left bank 0.2 mi downstream from Wallowa Lake dam, 1.1 mi south of Joseph, and at mile 50.0.

DRAINAGE AREA.--50.9 mi².

PERIOD OF RECORD.--November 1903 to August 1907, June 1908 to March 1914, May to September 1915, December 1926 to current year. Monthly discharge only for some periods, published in WSP 1317. Published as "near Joseph" 1911.

REVISED RECORDS.--WSP 1397: 1906. WSP 1737: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,326.86 ft above National Geodetic Vertical Datum of 1929. Nov. 12, 1903, to Sept. 25, 1915, nonrecording gage at several sites at lake outlet or near present site at different datums.

REMARKS.--Records good. Monthly discharge adjusted for storage in Wallowa Lake (station 13326000) and diversion from Wallowa Lake by Silver Lake ditch. Silver Lake ditch diverts at Wallowa Lake dam for irrigation northeast of Joseph. City of Joseph diverts less than 1.0 ft³/s from Wallowa Lake for municipal use.

AVERAGE DISCHARGE.--63 years (water years 1928-90), 133 ft³/s, 35.48 in/yr, 96,360 acre-ft/yr, adjusted for storage and diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,550 ft³/s June 10, 1969, gage height, 5.15 ft; no flow at times in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 374 ft³/s June 7, gage height, 3.37 ft; minimum discharge, 13 ft³/s Jan. 13 to Mar. 16, Mar. 21 to Apr. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	19	21	21	13	13	13	42	221	327	262	94
2	22	19	21	21	13	13	13	43	221	328	260	91
3	22	19	21	20	13	13	13	43	221	328	252	91
4	22	19	21	20	13	13	14	44	221	326	250	105
5	22	19	21	20	13	13	14	61	238	324	248	119
6	22	19	21	20	13	13	14	67	291	325	246	121
7	23	19	21	20	13	13	14	84	355	325	245	118
8	23	19	21	19	13	13	14	89	360	295	244	127
9	23	19	21	19	13	13	14	90	359	285	242	128
10	23	22	21	18	13	13	14	90	359	285	240	85
11	23	34	21	18	13	13	14	90	358	284	236	59
12	23	33	21	18	13	13	14	90	359	244	233	55
13	23	32	21	14	13	13	14	112	357	279	232	55
14	23	26	e21	13	13	13	14	128	355	278	231	55
15	22	22	e21	13	13	13	14	132	354	289	226	55
16	23	21	e21	13	13	14	14	168	353	291	226	55
17	22	22	e21	13	13	14	16	187	352	289	220	55
18	22	22	e21	13	13	14	16	187	350	288	214	55
19	22	22	e21	13	13	14	17	187	314	288	209	54
20	22	22	e21	13	13	14	17	185	280	307	187	54
21	22	22	21	13	13	13	17	184	273	309	158	54
22	22	22	21	13	13	13	17	183	278	308	142	54
23	21	22	21	13	13	13	17	191	279	317	130	54
24	21	22	21	13	13	13	31	194	292	319	119	54
25	20	22	21	13	13	13	41	194	299	316	117	54
26	21	22	21	13	13	13	42	193	300	329	113	53
27	21	21	21	14	13	13	42	191	322	330	111	54
28	20	21	21	13	13	13	42	191	328	309	110	53
29	19	21	21	13	---	13	42	192	329	287	104	53
30	19	21	21	13	---	13	42	208	328	280	99	53
31	19	---	21	13	---	13	---	221	---	268	98	---
TOTAL	675	665	651	483	364	408	620	4261	9306	9357	6004	2167
MEAN	21.8	22.2	21.0	15.6	13.0	13.2	20.7	137	310	302	194	72.2
MAX	23	34	21	21	13	14	42	221	360	330	262	128
MIN	19	19	21	13	13	13	13	42	221	244	98	53
AC-FT	1340	1320	1290	958	722	809	1230	8450	18460	18560	11910	4300
MEAN†	63.8	53.9	76.6	51.1	42.9	46.8	155	194	354	208	84.7	47.7
CFSM†	1.25	1.06	1.50	1.00	0.84	0.92	3.05	3.81	6.95	4.09	1.66	0.94
IN.†	1.44	1.18	1.74	1.16	0.88	1.06	3.40	4.38	7.76	4.71	1.92	1.05
AC-FT†	3920	3210	4710	3140	2380	2880	9230	11900	21050	12770	5210	2840

CAL YR 1989 TOTAL 27096 MEAN 74.2 MAX 325 MIN 11 AC-FT 53740 MEAN† 114 CFSM† 2.24 IN.† 30.53 AC-FT† 82850
WTR YR 1990 TOTAL 34961 MEAN 95.8 MAX 360 MIN 13 AC-FT 69350 MEAN† 115 CFSM† 2.26 IN.† 30.67 AC-FT† 83230

e Estimated

† Adjusted for change in contents in Wallowa Lake and diversion by Silver Lake ditch.

GRANDE RONDE RIVER BASIN

13330000 LOSTINE RIVER NEAR LOSTINE, OR

LOCATION.--Lat 45°26'20", long 117°25'35", in NW 1/4 sec.34, T.1 S., R.43 E., Wallowa County, Hydrologic Unit 17060105, on left bank 3.5 mi south of Lostine and at mile 10.0.

DRAINAGE AREA.--70.9 mi².

PERIOD OF RECORD.--August 1912 to March 1914, April to September 1915, July 1925 to current year. Monthly discharge only for some periods, published in WSP 1317.

REVISED RECORDS.--WSP 1397: 1913, 1942. WSP 1737: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,650 ft, by barometer. See WSP 1317 or 1737 for history of changes prior to Dec. 16, 1953. Dec. 16, 1953, to Aug. 23, 1977, at datum 1.04 ft higher.

REMARKS.--Records excellent. Minam Lake, capacity 440 acre-ft, has stored and diverted flow from Minam River since 1917 for irrigation in Lostine River basin. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--66 years (water years 1913, 1926-90), 193 ft³/s, 139,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,550 ft³/s June 16, 1974, gage height, 8.59 ft, present datum; minimum discharge, 7.5 ft³/s Mar. 2, 1966, result of freezeup; minimum daily, 10 ft³/s Nov. 28-30, 1936.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
June 23	2130	*1,210	*6.31	No other peak greater than base discharge.			
Minimum discharge, 22 ft ³ /s Mar. 13.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	47	70	46	40	36	94	235	462	800	121	46
2	45	50	68	46	41	36	130	244	396	718	110	45
3	42	54	71	e42	39	37	168	261	385	575	101	43
4	41	72	88	45	38	37	183	307	440	483	95	42
5	40	65	128	43	e37	37	187	414	439	472	89	41
6	39	61	103	45	38	35	192	529	492	460	86	41
7	59	59	96	59	37	33	198	461	626	428	83	41
8	60	61	94	78	38	35	211	387	572	408	79	40
9	58	157	90	57	40	33	212	340	703	404	76	39
10	56	179	86	56	52	37	213	325	986	416	78	39
11	53	148	75	53	49	35	225	320	767	411	74	38
12	50	146	75	52	42	33	228	308	580	399	69	38
13	48	135	81	51	39	33	226	292	473	407	65	37
14	45	122	78	51	34	34	256	276	423	367	61	37
15	43	112	71	50	e30	34	309	258	416	325	59	36
16	40	111	67	49	e32	33	357	239	433	303	58	35
17	38	119	66	46	35	34	408	236	486	271	65	35
18	36	107	58	e37	e33	36	440	249	535	240	76	34
19	33	105	66	e36	e31	41	447	253	673	220	66	33
20	32	102	60	e35	35	50	495	252	840	202	66	33
21	41	100	57	41	37	54	530	240	932	188	62	32
22	66	93	55	45	37	59	539	266	991	174	72	31
23	72	97	54	41	37	72	525	364	1070	173	62	31
24	104	94	52	38	37	67	431	417	1040	177	60	31
25	71	89	50	41	36	62	385	349	1040	190	63	32
26	63	86	49	40	36	60	338	318	979	166	63	35
27	65	81	49	37	36	61	326	327	856	149	58	39
28	61	76	46	38	36	62	329	474	769	142	53	32
29	53	73	45	39	---	63	286	647	783	134	50	31
30	56	73	46	40	---	67	254	627	834	133	49	31
31	55	---	46	40	---	74	---	562	---	129	48	---
TOTAL	1611	2874	2140	1417	1052	1420	9122	10777	20421	10064	2217	1098
MEAN	52.0	95.8	69.0	45.7	37.6	45.8	304	348	681	325	71.5	36.6
MAX	104	179	128	78	52	74	539	647	1070	800	121	46
MIN	32	47	45	35	30	33	94	235	385	129	48	31
AC-FT	3200	5700	4240	2810	2090	2820	18090	21380	40510	19960	4400	2180

CAL YR 1989 TOTAL 63879 MEAN 175 MAX 1280 MIN 19 AC-FT 126700
WTR YR 1990 TOTAL 64213 MEAN 176 MAX 1070 MIN 30 AC-FT 127400

e Estimated

GRANDE RONDE RIVER BASIN

89

13331500 MINAM RIVER AT MINAM, OR
(Hydrologic bench-mark station)

LOCATION.--Lat 45°37'12", long 117°43'32", in SW 1/4 SW 1/4 sec.29, T.2 N., R.41 E., Wallowa County, Hydrologic Unit 17060105, on left bank 2.3 mi downstream from Squaw Creek, 0.3 mi west of Minam, and at mile 0.3.

DRAINAGE AREA.--240 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1912 to March 1914, September 1965 to current year. Monthly discharge only for some periods, published in WSP 1317.

GAGE.--Water-stage recorder. Datum of gage is 2,540.48 ft above National Geodetic Vertical Datum of 1929. June 1912 to March 1914, nonrecording gage at approximately same site at different datum.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are poor. No regulation. Minam Lake, capacity 440 acre-ft, has stored and diverted flow from Minam River since 1917 for irrigation in Lostine River basin.

AVERAGE DISCHARGE.--26 years, 459 ft³/s, 25.97 in/yr, 332,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,260 ft³/s June 16, 1974, gage height, 6.89 ft; maximum gage height, 7.3 ft May 28, 1913, datum then in use; minimum discharge, 10 ft³/s Dec. 6, 1972, Jan. 10, 1973, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,450 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 23	0330	1,460	3.02	June 10	1400	*1,960	*3.50
May 6	0300	1,560	3.12	June 23	0230	1,540	3.35
May 30	0530	1,560	3.12				

Minimum daily discharge, 61 ft³/s Sept. 23-25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	109	107	159	e130	126	203	407	856	1280	1110	155	82
2	107	103	146	e110	124	200	538	898	1150	1040	149	81
3	102	117	170	e90	122	198	641	961	1100	910	144	79
4	98	128	178	e105	119	193	647	1050	1140	748	139	79
5	95	149	223	e130	102	187	629	1230	1090	680	133	77
6	94	133	208	e140	122	179	629	1460	1140	645	128	75
7	92	136	196	e160	111	177	648	1290	1440	598	124	75
8	91	129	194	239	114	202	663	1120	1360	558	120	73
9	89	181	191	215	128	198	646	979	1450	531	114	72
10	88	243	182	207	232	233	604	925	1910	519	113	71
11	87	211	162	198	312	241	623	897	1660	505	111	69
12	84	208	143	190	264	227	677	846	1350	483	106	68
13	83	224	160	186	218	214	662	792	1180	459	103	67
14	82	203	186	189	182	210	694	761	1060	428	99	66
15	82	184	182	182	158	200	817	711	1000	377	96	65
16	81	187	161	177	172	195	926	667	982	349	93	64
17	81	209	164	169	162	199	1050	646	1030	319	95	66
18	80	204	e140	147	142	213	1110	675	1060	290	121	67
19	79	198	e130	118	122	275	1120	670	1170	268	113	66
20	78	194	e145	107	146	428	1200	672	1380	248	116	65
21	81	191	163	141	163	436	1290	655	1520	230	111	64
22	130	183	162	176	150	416	1320	660	1590	219	125	64
23	140	184	159	158	152	456	1400	799	1680	211	113	62
24	216	188	140	137	177	417	1220	908	1630	204	99	61
25	150	179	110	141	207	368	1090	817	1600	230	104	61
26	133	177	97	136	223	341	986	792	1520	210	103	64
27	140	171	110	124	219	331	945	807	1350	194	100	73
28	135	151	e125	122	210	327	1060	1100	1190	180	92	70
29	118	149	e140	127	---	325	967	1480	1120	171	87	64
30	116	150	e130	130	---	328	887	1510	1150	165	85	62
31	119	---	e130	128	---	343	---	1480	---	161	83	---
TOTAL	3260	5171	4886	4709	4679	8460	26096	29114	39282	13240	3474	2072
MEAN	105	172	158	152	167	273	870	939	1309	427	112	69.1
MAX	216	243	223	239	312	456	1400	1510	1910	1110	155	82
MIN	78	103	97	90	102	177	407	646	982	161	83	61
AC-FT	6470	10260	9690	9340	9280	16780	51760	57750	77920	26260	6890	4110
CFSM	.44	.72	.66	.63	.70	1.14	3.62	3.91	5.46	1.78	.47	.29
IN.	.51	.80	.76	.73	.73	1.31	4.04	4.51	6.09	2.05	.54	.32

CAL YR 1989 TOTAL 153968 MEAN 422 MAX 2630 MIN 43 AC-FT 305400 CFSM 1.76 IN. 23.87
WTR YR 1990 TOTAL 144443 MEAN 396 MAX 1910 MIN 61 AC-FT 286500 CFSM 1.65 IN. 22.39

e Estimated

GRANDE RONDE RIVER BASIN

13331500 MINAM RIVER AT MINAM, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1966 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1965 to September 1985.

REMARKS.--Radiochemistry data collected, but not available at time of publication. Some samples were analyzed by different methods and may have data with different levels of detection.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATURATION)	COLIFORM, FECCAL, 0.7 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECCAL, KF AGAR (COLS. PER 100 ML)	HARDNESS (MG/L AS CaCO3)	HARDNESS, NONCARB (MG/L AS CaCO3)	
NOV 14...	1235	202	45	7.9	4.0	0.4	11.8	99	K2	K4	18	0	
FEB 20...	1220	137	62	7.7	0.0	4.1	13.3	99	<1	K1	24	0	
MAY 16...	1155	666	39	7.6	8.5	1.0	10.9	102	<1	K1	16	0	
AUG 08...	1215	119	48	8.1	23.0	0.5	8.2	105	K3	400	18	0	
DATE		CALCIUM, DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY, DIS IT FIELD (MG/L AS CaCO3)	BICARBONATE, DIS IT FIELD (MG/L AS HCO3)	CARBONATE, DIS IT FIELD (MG/L AS CO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS Cl)	FLUORIDE, DIS-SOLVED (MG/L AS F)
NOV 14...	5.2	1.1	2.1	20	0.2	0.8	21	26	0	<1.0	0.5	<0.1	
FEB 20...	6.6	1.9	2.6	18	0.2	1.2	33	41	0	1.0	0.5	<0.1	
MAY 16...	4.9	1.0	1.8	19	0.2	0.8	20	25	0	<1.0	0.4	<0.1	
AUG 08...	5.5	1.1	2.2	20	0.2	1.1	26	32	0	<1.0	0.9	<0.1	
DATE		SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	
NOV 14...	16	35	--	0.05	19.0	<0.01	<0.10	0.01	<0.01	0.9	0.02		
FEB 20...	24	65	58	0.09	24.0	<0.01	<0.10	0.02	0.03	0.3	0.02		
MAY 16...	17	35	--	0.05	62.9	<0.01	<0.10	<0.01	<0.01	0.5	<0.01		
AUG 08...	16	40	--	0.05	12.9	<0.01	<0.10	<0.01	<0.01	<0.2	<0.01		

K - Results based on colony count outside acceptable range (non-ideal colony count).

GRANDE RONDE RIVER BASIN

13332500 GRANDE RONDE RIVER AT RONDOWA, OR

LOCATION.--Lat 45°43'36", long 117°46'59", in SW 1/4 NW 1/4 sec.23, T.3 N., R.40 E., Wallowa County, Hydrologic Unit 17060106, on right bank at Rondowa, 500 ft downstream from Wallowa River, 13 mi northeast of Elgin, and at mile 81.4.

DRAINAGE AREA.--2,555 mi².

PERIOD OF RECORD.--October 1926 to current year.

REVISED RECORDS.--WSP 1093: 1928-29, 1932-33, 1936, 1938, 1939(M), 1943. WSP 1397: 1927. WSP 1447: 1927.

GAGE.--Water-stage recorder. Datum of gage is 2,281.87 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records excellent. Flow slightly regulated by Wallowa Lake (station 13326000) and small reservoirs. Diversions for irrigation upstream from station, chiefly in vicinity of La Grande, Enterprise, and Wallowa; one transbasin diversion from Sheep Creek in Imnaha River basin for irrigation in Wallowa Valley.

AVERAGE DISCHARGE.--64 years, 2,151 ft³/s, 1,558,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,700 ft³/s Jan. 30, 1965, gage height, 10.93 ft; minimum discharge, 179 ft³/s Aug. 24, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0600	*6,650	*5.09	June 10	1630	6,400	4.98

Minimum discharge, 327 ft³/s Sept. 25, 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	564	599	688	624	698	1530	2770	5140	5000	2990	682	496
2	572	637	670	608	686	1530	3210	5260	4800	2810	634	456
3	573	633	738	550	677	1570	3660	5430	4670	2590	593	418
4	562	663	805	580	665	1580	3780	5610	4790	2210	565	399
5	549	710	971	573	623	1600	3750	5940	4560	2050	535	393
6	542	663	991	639	637	1630	3710	6410	4470	1970	496	400
7	542	687	975	780	615	1640	3710	5900	5310	1840	483	409
8	541	676	967	1660	635	1890	3720	5240	5140	1710	455	404
9	520	783	963	1430	760	1880	3630	4660	5220	1610	445	403
10	483	1030	908	1390	1750	2220	3440	4220	6260	1510	432	408
11	479	961	826	1220	2430	2330	3370	3850	5750	1430	415	384
12	480	975	729	1130	2000	2060	3420	3610	4950	1360	412	366
13	487	1020	739	1070	1580	1830	3350	3350	4490	1300	403	349
14	495	947	752	1080	1230	1730	3410	3150	4090	1230	379	342
15	491	893	766	1070	1010	1730	3680	2920	3870	1120	383	342
16	487	874	735	1050	952	1690	4010	2740	3660	1050	384	337
17	486	963	735	990	1030	1740	4250	2600	3790	940	394	349
18	476	956	678	907	955	2000	4320	2530	3880	832	492	354
19	470	944	688	796	845	2520	4250	2410	4030	788	524	347
20	474	923	709	723	859	3270	4280	2420	4350	748	556	364
21	509	904	690	696	846	3510	4350	2470	4450	681	615	380
22	591	868	665	769	930	3470	4300	2410	4530	633	640	372
23	606	866	675	872	996	3720	4570	2670	4630	618	612	359
24	752	902	662	792	1200	3470	4200	3180	4460	602	576	360
25	669	865	606	750	1470	3110	3910	3090	4250	719	575	334
26	637	852	582	759	1630	2840	3740	2990	4010	733	570	338
27	662	821	571	724	1640	2690	3720	2930	3590	710	583	391
28	670	767	598	675	1580	2580	4970	3360	3150	687	561	388
29	626	724	596	734	---	2540	5450	4330	3000	686	524	368
30	619	692	594	725	---	2510	5380	4800	3060	730	516	374
31	617	---	598	719	---	2560	---	5020	---	702	505	---
TOTAL	17231	24798	22870	27085	30929	70970	118310	120640	132210	39589	15939	11384
MEAN	556	827	738	874	1105	2289	3944	3892	4407	1277	514	379
MAX	752	1030	991	1660	2430	3720	5450	6410	6260	2990	682	496
MIN	470	599	571	550	615	1530	2770	2410	3000	602	379	334
AC-FT	34180	49190	45360	53720	61350	140800	234700	239300	262200	78520	31620	22580

CAL YR 1989 TOTAL 814923 MEAN 2233 MAX 10100 MIN 413 AC-FT 1616000
WTR YR 1990 TOTAL 631955 MEAN 1731 MAX 6410 MIN 334 AC-FT 1253000

GRANDE RONDE RIVER BASIN

93

13333000 GRANDE RONDE RIVER AT TROY, OR

LOCATION.--Lat 45°56'47", long 117°26'54", in NE 1/4 NW 1/4 sec.4, T.5 N., R.43 E., Wallowa County, Hydrologic Unit 17060106, on left bank 500 ft downstream from bridge at Troy, 600 ft downstream from Wenaha River, and at mile 45.2.

DRAINAGE AREA.--3,275 mi².

PERIOD OF RECORD.--August 1944 to current year. Monthly discharge only August 1944, published in WSP 1317.

REVISED RECORDS.--WSP 1397: 1946(M), 1948-50.

GAGE.--Water-stage recorder. Datum of gage is 1,585.98 ft above National Geodetic Vertical Datum of 1929. Aug. 17, 1944, to Sept. 30, 1949, nonrecording gage at site 500 ft upstream at datum 10.85 ft lower. Oct. 1, 1949, to Sept. 5, 1963, water-stage recorder at site 500 ft upstream at datum 1.15 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are poor. Flow slightly regulated by Wallowa Lake (station 13326000) and small reservoirs. Diversions for irrigation upstream from station, chiefly in vicinity of La Grande, Enterprise, and Wallowa; one transbasin diversion from Big Sheep Creek and tributaries in Imnaha River basin for irrigation in Wallowa Valley.

AVERAGE DISCHARGE.--46 years, 3,059 ft³/s, 2,216,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,200 ft³/s Dec. 23, 1964, gage height, 11.25 ft; minimum discharge, 344 ft³/s Aug. 19-21, 23, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0930	*8,570	*6.18				
Minimum discharge, 482 ft ³ /s Sept. 26.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	694	798	944	841	e1000	e2200	e4000	7250	6030	3520	916	665
2	712	801	913	867	e990	e2200	e5000	7480	5820	3330	866	640
3	713	827	945	813	e970	e2250	e5700	7770	5630	3160	826	594
4	710	891	1050	810	e950	e2300	e5800	7760	5730	2730	782	573
5	703	953	1430	799	e910	e2300	e5800	7930	5500	2480	752	552
6	700	900	1530	847	e900	e2300	e5300	8280	5310	2380	710	562
7	689	948	1420	1110	e900	e2400	e5100	7670	6010	2270	682	566
8	694	920	1390	2730	e930	e2700	e5100	6880	5970	2120	661	571
9	684	943	1400	e2200	e1050	e2700	e5500	6150	5940	2000	637	570
10	659	1250	1330	e2000	e1700	e3000	e4800	5630	6730	1870	631	566
11	638	1220	1240	e1800	e3200	e3200	e4700	5200	6620	1770	616	562
12	638	1230	1110	e1700	e3000	e2900	e4800	4900	5840	1670	602	530
13	656	1340	1050	e1600	e2500	e2700	e4700	4560	5540	1610	598	518
14	658	1270	1060	e1550	e2000	e2450	e4800	4310	5150	1530	581	508
15	663	1190	1070	e1550	e1500	e2400	e5100	4060	4860	1420	572	502
16	657	1140	1060	e1500	e1400	e2400	e5600	3810	4580	1330	571	501
17	653	1180	1020	e1450	e1450	e2450	e6000	3600	4600	1230	576	506
18	649	1250	993	e1300	e1400	e2800	e6000	3490	4670	1110	639	517
19	638	1210	926	e1250	e1300	e3300	5940	3340	4730	1050	735	512
20	643	1190	983	e1100	e1200	e5000	5850	3320	4980	1010	736	514
21	709	1170	961	e1000	e1250	e5400	5830	3450	5070	943	800	532
22	767	1130	931	e1050	e1300	e5500	5740	3340	5100	885	866	535
23	838	1110	920	e1150	e1500	e5600	6080	3540	5190	849	842	521
24	890	1180	937	e1170	e1800	e5200	5800	4160	5090	849	779	512
25	927	1160	882	e1100	e2100	e4500	5350	4180	4880	899	774	508
26	843	1140	815	e1100	e2150	e4100	5280	3990	4690	997	768	492
27	850	1110	826	e1100	e2300	e3800	5060	3860	4280	957	768	521
28	897	1070	834	e1050	e2200	e3650	6800	4180	3780	924	757	550
29	845	1000	849	e1000	---	e3600	7210	5130	3570	902	714	531
30	808	960	804	e1050	---	e3550	7480	5700	3560	929	686	520
31	814	---	855	e1050	---	e3600	---	5920	---	971	671	---
TOTAL	22639	32481	32478	39637	43850	102450	166220	160840	155450	49695	22114	16251
MEAN	730	1083	1048	1279	1566	3305	5541	5188	5182	1603	713	542
MAX	927	1340	1530	2730	3200	5600	7480	8280	6730	3520	916	665
MIN	638	798	804	799	900	2200	4000	3320	3560	849	571	492
AC-FT	44900	64430	64420	78620	86980	203200	329700	319000	308300	98570	43860	32230

CAL YR 1989 TOTAL 1032086 MEAN 2828 MAX 13200 MIN 523 AC-FT 2047000
WTR YR 1990 TOTAL 844105 MEAN 2313 MAX 8280 MIN 492 AC-FT 1674000

e Estimated

LOCATION.--Lat 46°14'53", long 118°52'43", in NE 1/4 SE 1/4 sec.24, T.9 N., R.31 E., Walla Walla County, Hydrologic Unit 17060110, in powerhouse forebay pier P-1 on south side of Bay 1 at Ice Harbor Dam, 8.0 mi northeast of Burbank, and at mile 9.7.

PERIOD OF RECORD.--October 1907 to March 1917 (gage heights only October 1907 to August 1909), March 1962 to September 1990 (discontinued). Published as "at Burbank" prior to 1911 and as "near Burbank" 1912-17.

GAGE.--Watt-hour meters on each turbine in Ice Harbor Dam powerhouse. Elevations are National Geodetic Vertical Datum of 1929. Oct. 2, 1907, to Mar. 31, 1917, nonrecording gage at site approximately 2 mi downstream at datum 300 ft higher. Mar. 23, 1962, to Sept. 30, 1968, water-stage recorder 1.0 mi downstream at National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records computed from power output, flow over spillway, flow through fish ladder, and lockage records at Ice Harbor Dam. Diversions upstream from station for irrigation of over 4,090,000 acres. Flow regulated by Lake Sacajawea and many upstream storage reservoirs and powerplants. Chemical analyses October 1965 to September 1969, October 1971 to September 1972. For records collected at site 7.5 mi downstream see station 13353200.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 312,000 ft³/s June 19, 1974; no flow momentarily Aug. 27, 1965 (result of testing at Ice Harbor Dam).

EXTREMES FOR CURRENT YEAR.--Maximum hourly discharge, 153,000 ft³/s May 30; maximum forebay elevation, 440.00 ft Oct. 10; minimum hourly discharge, 300 ft³/s Dec. 7; minimum forebay elevation, 437.07 ft May 11.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19100	24500	19800	18900	28100	37100	28700	57300	79400	37100	20200	21400
2	18400	29800	22200	20000	25400	32200	38300	63100	108000	39000	15000	22100
3	25400	22700	18800	23300	21300	30800	36700	61800	95200	41300	20200	19200
4	18100	13900	24200	23800	14900	30000	52400	65700	98500	36400	20500	25500
5	19200	13400	24900	25200	25800	37000	56400	57300	100000	38700	19100	33700
6	21800	22000	35800	24800	28900	41500	57800	62900	99300	30600	24500	26900
7	18600	26500	27700	18100	26400	38300	42600	77300	95000	36100	19800	24700
8	15700	23700	23600	22700	24500	36500	45200	81100	90900	23900	20500	34500
9	15400	26400	20000	35700	26300	35000	48600	88100	83100	36600	17800	23900
10	19000	28900	19900	33300	16900	38300	49400	89700	79400	29700	15800	25700
11	19200	21100	26500	28600	37000	43400	48600	88300	89400	37800	11800	33400
12	20700	21200	29400	28000	38800	49600	38000	81900	101000	16800	11800	28500
13	16400	21000	34800	24100	37100	44900	47800	89000	87200	27400	14600	30600
14	17600	31800	29800	21000	46300	37000	44600	79800	86600	23600	13900	31200
15	19300	28300	16400	26200	51700	42600	51700	79000	76200	14900	15200	26200
16	20800	25300	21800	26600	27800	40700	65100	53500	70400	19800	11700	19100
17	21200	25300	21100	25500	36700	32500	65500	41900	66400	19300	11600	28400
18	19600	21900	22300	31700	28000	27100	65500	46900	65100	18200	13900	27100
19	20300	19400	28200	29400	36200	35500	65300	46600	66200	19800	11700	24200
20	22100	24800	26000	25400	33300	44700	65300	41600	65000	22800	11400	24600
21	21900	24100	23600	30100	28200	49000	65600	44200	75000	16300	21900	24500
22	19800	22900	25200	24900	32400	53400	67000	41300	57900	20100	17600	25600
23	27700	27200	25200	28300	32300	46600	74300	41800	71100	15300	18100	25800
24	23600	21800	18500	30300	35400	45700	73500	52800	62300	18300	24000	30300
25	21000	18600	17100	30300	30600	38200	76800	75200	66300	23800	20300	24800
26	23200	19400	21400	23200	36800	44200	63300	70400	62200	20500	13800	18800
27	22100	20200	17800	26100	36400	40100	63100	64800	52700	23200	23600	21400
28	27100	20700	28900	20700	34600	37500	53400	73200	61100	20500	24300	26400
29	23500	24400	22500	23400	---	41600	76100	80200	56000	16700	27500	23800
30	20400	24100	21300	23800	---	42900	58500	118000	39200	18700	19100	24100
31	28800	---	21200	27700	---	37300	---	125000	---	19300	24300	---
TOTAL	647000	695300	735900	801100	878100	1231200	1685100	2139700	2306100	782500	555500	776400
MEAN	20870	23180	23740	25840	31360	39720	56170	69020	76870	25240	17920	25880
MAX	28800	31800	35800	35700	51700	53400	76800	125000	108000	41300	27500	34500
MIN	15400	13400	16400	18100	14900	27100	28700	41300	39200	14900	11400	18800
AC-FT	1283000	1379000	1460000	1589000	1742000	2442000	3342000	4244000	4574000	1552000	1102000	1540000
CAL YR 1989	TOTAL 15382700		MEAN 42140	MAX 120000		MIN 11600	AC-FT 30510000					
WTR YR 1990	TOTAL 13233900		MEAN 36260	MAX 125000		MIN 11400	AC-FT 26250000					

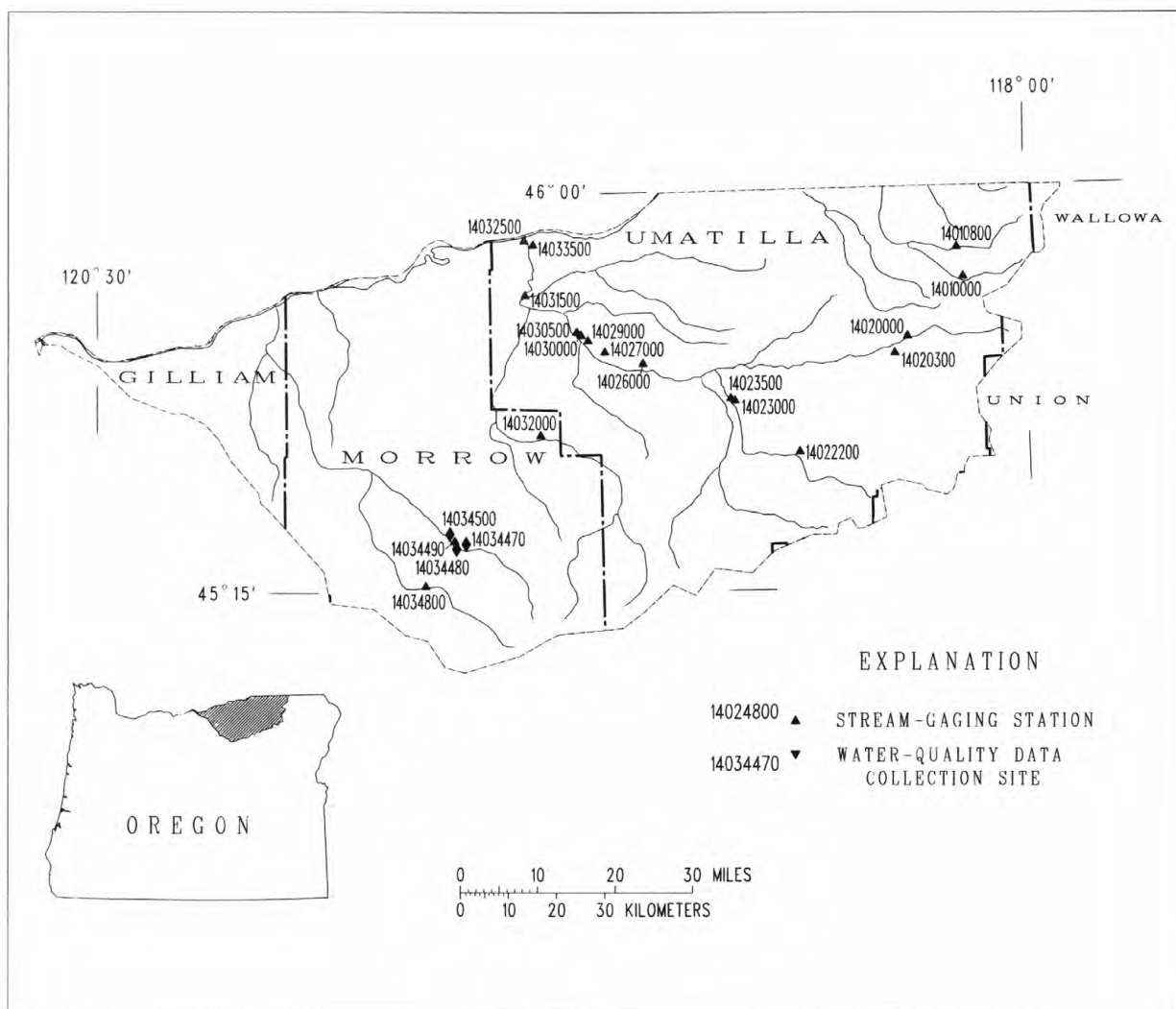


Figure 5.--Location of surface-water and water-quality stations in the Walla Walla River, Umatilla River, and Willow Creek basins.

WALLA WALLA RIVER BASIN

14010000 SOUTH FORK WALLA WALLA RIVER NEAR MILTON-FREEWATER, OR

LOCATION.--Lat 45°49'48", long 118°10'08", in NE 1/4 NE 1/4 sec.15, T.4 N., R.37 E., Umatilla County, Hydrologic Unit 17070102, on right bank 1.0 mi downstream from Elbow Creek, 13 mi southeast of Milton-Freewater, and at mile 59.1.

DRAINAGE AREA.--63 mi², approximately.

PERIOD OF RECORD.--February to October 1903, August 1906 to November 1917, May 1931 to current year. Monthly discharge only for some periods, published in WSP 1318. Published as "12 mi above Milton" 1903, as "above Pacific Power & Light Co.'s intake near Milton" 1907-10, and as "near Milton" 1911-17, 1931-85.

REVISED RECORDS.--WSP 964: Drainage area. WSP 1398: 1912, 1940, drainage area at former site.

GAGE.--Water-stage recorder. Elevation of gage is 2,050 ft from river-profile map. Prior to Mar. 23, 1934, water-stage recorder or nonrecording gage at several sites within 1.5 mi of present site at various datums.

REMARKS.--No estimated daily discharges. Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--69 years (water years 1908-17, 1932-90), 176 ft³/s, 37.94 in/yr, 127,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,530 ft³/s Jan. 29, 1965, gage height, 5.60 ft; minimum discharge, 72 ft³/s Feb. 14, 1932.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage about 6 ft Mar. 31, 1931, present site and datum.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 3	2200	*541	*2.23				
Minimum discharge, 74 ft ³ /s Oct. 6-20.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80	76	89	89	96	162	212	360	304	136	110	105
2	77	76	89	88	94	160	245	440	264	136	110	105
3	76	77	89	87	94	164	252	468	241	129	110	100
4	76	100	99	88	94	161	241	502	231	121	110	100
5	76	94	160	89	94	161	240	483	216	119	109	100
6	75	91	130	97	94	157	240	421	218	119	109	99
7	75	95	119	171	94	157	251	335	221	118	110	99
8	74	91	118	296	94	177	255	280	214	118	111	100
9	74	112	116	209	107	172	233	252	210	117	112	99
10	75	110	112	234	199	205	223	236	211	117	112	98
11	75	97	104	202	244	207	224	226	203	117	111	96
12	75	114	102	179	201	184	228	214	195	115	111	96
13	75	119	101	169	166	169	226	205	213	114	112	96
14	75	107	100	163	141	160	241	200	200	114	111	96
15	74	100	100	153	133	152	263	193	193	114	111	96
16	74	97	99	143	125	148	283	185	183	114	111	94
17	74	106	96	132	118	155	280	183	182	113	111	94
18	74	102	94	124	111	182	269	181	176	113	112	94
19	74	99	94	116	105	222	250	176	169	113	111	94
20	74	97	91	110	107	260	238	191	165	112	110	94
21	81	96	91	106	114	245	225	188	160	111	109	93
22	82	95	91	105	131	233	220	188	158	110	114	98
23	81	95	93	103	156	225	242	203	156	110	108	103
24	80	97	92	100	179	202	219	237	152	113	106	103
25	77	95	91	99	207	186	230	227	145	114	107	104
26	77	95	91	99	205	177	219	215	143	114	106	103
27	85	92	91	95	181	175	262	205	139	113	106	101
28	83	91	91	95	167	173	421	212	138	111	105	101
29	79	91	89	95	---	174	378	271	136	111	106	101
30	78	90	89	97	---	177	355	269	136	111	106	101
31	77	---	89	97	---	186	---	314	---	112	105	---
TOTAL	2382	2897	3100	4030	3851	5668	7665	8260	5672	3599	3392	2963
MEAN	76.8	96.6	100	130	138	183	255	266	189	116	109	98.8
MAX	85	119	160	296	244	260	421	502	304	136	114	105
MIN	74	76	89	87	94	148	212	176	136	110	105	93
AC-FT	4720	5750	6150	7990	7640	11240	15200	16380	11250	7140	6730	5880
CFSM	1.22	1.53	1.59	2.06	2.18	2.90	4.06	4.23	3.00	1.84	1.74	1.57
IN.	1.41	1.71	1.83	2.38	2.27	3.35	4.53	4.88	3.35	2.13	2.00	1.75

CAL YR 1989	TOTAL 55503.0	MEAN 152	MAX 549	MIN 74	AC-FT 110100	CFSM 2.41	IN. 32.77
WTR YR 1990	TOTAL 53479	MEAN 147	MAX 502	MIN 74	AC-FT 106100	CFSM 2.33	IN. 31.58

WALLA WALLA RIVER BASIN

97

14010800 NORTH FORK WALLA WALLA RIVER NEAR MILTON-FREEWATER, OR

LOCATION.--Lat 45°53'06", long 118°11'06", in SE 1/4 NW 1/4 sec.28, T.5 N., R.37 E., Umatilla County, Hydrologic Unit 17070102, on right bank 2.8 mi downstream from Little Meadow Canyon, 8.9 mi southeast of Milton-Freewater, and at mile 5.6.

DRAINAGE AREA.--34.4 mi².

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,940 ft, from topographic map.

REMARKS.--No estimated daily discharges. Records good. No regulation; one diversion upstream from station.

AVERAGE DISCHARGE.--21 years, 50.6 ft³/s, 19.98 in/yr, 36,660 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,240 ft³/s Feb. 23, 1986, gage height, 7.02 ft; minimum discharge, 3.3 ft³/s Aug. 26-28, 1986.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	0100	*400	*5.22	May 29	0930	313	4.93

Minimum discharge, 4.6 ft³/s Oct. 26, Nov. 1-3, Sept. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.9	4.7	9.1	9.8	18	45	79	222	220	16	8.1	6.1
2	5.6	4.6	8.9	9.5	17	41	99	259	176	16	8.0	5.9
3	5.4	4.7	9.0	9.4	17	41	106	266	136	16	8.0	5.8
4	5.3	6.5	12	9.7	17	40	102	255	111	14	7.9	5.8
5	5.2	8.0	40	11	16	40	96	231	89	13	7.9	5.8
6	5.2	7.3	30	14	16	38	91	200	80	13	7.4	5.7
7	5.2	8.3	24	34	15	38	91	160	75	12	6.7	5.7
8	5.2	7.7	22	78	16	48	87	125	61	11	6.9	5.8
9	5.2	11	21	66	22	48	73	98	56	10	7.0	5.6
10	5.4	11	18	107	84	83	64	80	56	10	7.1	5.4
11	5.7	9.2	17	95	122	96	61	68	49	9.9	7.0	5.4
12	5.8	15	16	82	86	74	59	58	45	9.7	6.8	5.4
13	5.9	19	15	73	49	57	56	52	56	9.5	6.7	5.4
14	5.9	15	15	63	35	50	56	49	49	9.1	6.1	5.4
15	5.9	12	14	52	30	45	56	47	46	8.9	5.6	5.4
16	5.9	11	14	46	27	42	57	42	43	8.8	5.6	5.4
17	5.9	13	13	40	24	43	56	39	42	8.7	5.6	5.2
18	5.8	13	12	36	20	55	52	37	39	8.6	5.5	5.2
19	5.9	12	12	33	18	75	46	36	35	8.4	5.5	5.2
20	5.8	11	11	29	18	98	42	41	33	8.3	5.6	5.1
21	7.1	11	11	26	26	99	37	40	31	8.2	6.1	5.1
22	7.7	10	10	24	48	96	35	37	29	8.2	7.9	5.1
23	7.0	10	11	23	68	92	44	44	28	8.3	6.7	5.1
24	5.7	10	11	20	79	78	39	83	25	8.5	6.6	4.8
25	4.8	9.9	11	19	92	66	53	82	23	9.1	6.7	4.8
26	4.6	10	11	19	87	58	47	72	21	9.0	6.6	4.9
27	5.7	9.8	10	18	68	56	118	63	20	8.7	6.4	4.9
28	6.3	9.7	11	18	54	55	314	72	19	8.4	6.3	4.9
29	5.5	9.5	10	18	---	56	270	271	18	8.2	6.3	4.8
30	5.0	9.4	9.8	18	---	58	243	225	17	8.2	6.3	4.8
31	4.9	---	9.8	18	---	63	---	250	---	8.2	6.2	---
TOTAL	176.4	303.3	448.6	1118.4	1189	1874	2629	3604	1728	313.9	207.1	159.9
MEAN	5.69	10.1	14.5	36.1	42.5	60.5	87.6	116	57.6	10.1	6.68	5.33
MAX	7.7	19	40	107	122	99	314	271	220	16	8.1	6.1
MIN	4.6	4.6	8.9	9.4	15	38	35	36	17	8.2	5.5	4.8
AC-FT	350	602	890	2220	2360	3720	5210	7150	3430	623	411	317
CFSM	.17	.29	.42	1.05	1.23	1.76	2.55	3.38	1.67	.29	.19	.15
IN.	.19	.33	.49	1.21	1.29	2.03	2.84	3.90	1.87	.34	.22	.17

CAL YR 1989	TOTAL 16523.0	MEAN 45.3	MAX 244	MIN 4.5	AC-FT 32770	CFSM 1.32	IN. 17.87
WTR YR 1990	TOTAL 13751.6	MEAN 37.7	MAX 314	MIN 4.6	AC-FT 27280	CFSM 1.10	IN. 14.87

UMATILLA RIVER BASIN

14020000 UMATILLA RIVER ABOVE MEACHAM CREEK, NEAR GIBBON, OR

LOCATION.--Lat 45°43'11", long 118°19'20", in SE 1/4 SW 1/4 sec.21, T.3 N., R.36 E., Umatilla County, Hydrologic Unit 17070103, Umatilla Indian Reservation, on right bank 0.8 mi downstream from Ryan Creek, 2.2 mi upstream from Meacham Creek, 2.5 mi northeast of Gibbon, and at mile 83.1.

DRAINAGE AREA.--131 mi².

PERIOD OF RECORD.--April 1933 to current year.

REVISED RECORDS.--WSP 1935: 1946-48(M), 1950(M), 1953(M), 1956-59(M), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,854.81 ft above National Geodetic Vertical Datum of 1929. Prior to June 27, 1939, at site 1 mi downstream at datum 43.94 ft lower.

REMARKS.--Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--57 years, 225 ft³/s, 23.32 in/yr, 163,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,930 ft³/s Jan. 25, 1975, gage height, 9.18 ft, from rating curve extended above 3,500 ft³/s; maximum gage height, 9.50 ft Jan. 29, 1965; minimum discharge, 16 ft³/s Nov. 9, 1965, momentary regulation from unknown source.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	0100	*1,350	*5.18				
Minimum discharge, 33 ft ³ /s Aug. 14.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	45	57	55	98	279	e361	e764	684	82	41	39
2	43	45	55	56	96	267	e456	e956	551	81	41	38
3	43	45	54	54	93	274	e482	e948	448	80	41	38
4	43	47	59	56	96	269	e453	e833	388	76	40	38
5	42	48	92	56	93	286	e429	e705	333	74	39	38
6	41	49	96	81	93	291	e418	e568	312	72	37	37
7	41	53	88	167	87	285	e428	e450	341	70	37	38
8	41	51	88	428	93	331	e425	e382	317	67	37	39
9	41	49	96	333	110	333	e375	e332	299	65	37	38
10	41	50	99	384	549	423	e339	e303	288	63	38	37
11	41	50	94	337	639	446	e338	e277	263	60	37	37
12	41	62	89	277	440	360	e349	e255	256	59	37	37
13	41	70	84	244	318	293	e336	e237	266	58	36	37
14	42	64	79	230	236	258	e342	e225	253	55	35	37
15	41	58	77	216	202	231	e359	e214	241	54	35	38
16	42	56	73	196	182	222	e368	e199	222	53	35	38
17	42	68	71	174	162	237	e360	194	213	52	35	38
18	42	68	68	155	142	312	e338	183	197	51	37	38
19	42	64	66	139	130	454	e308	174	176	50	38	38
20	42	60	65	124	129	e558	e285	193	161	50	38	38
21	48	58	62	115	154	e522	e260	190	148	48	40	37
22	52	56	61	113	233	e485	e248	181	138	46	43	37
23	48	58	60	111	331	e446	e278	199	130	46	39	37
24	47	70	59	101	414	e372	e247	300	120	46	37	37
25	46	68	58	97	450	e316	e254	323	112	47	38	37
26	46	69	57	100	437	e282	e264	291	104	47	38	38
27	55	66	56	95	362	e266	e442	264	98	46	37	38
28	55	64	57	95	307	e260	e1050	276	94	45	36	38
29	49	61	55	101	---	e261	e897	759	90	43	37	38
30	47	59	54	104	---	e271	e815	582	86	42	39	38
31	46	---	54	101	---	e296	---	646	---	42	39	---
TOTAL	1375	1731	2183	4895	6676	10186	12304	12403	7329	1770	1174	1131
MEAN	44.4	57.7	70.4	158	238	329	410	400	244	57.1	37.9	37.7
MAX	55	70	99	428	639	558	1050	956	684	82	43	39
MIN	41	45	54	54	87	222	247	174	86	42	35	37
AC-FT	2730	3430	4330	9710	13240	20200	24400	24600	14540	3510	2330	2240
CFSM	.34	.44	.54	1.21	1.82	2.51	3.13	3.05	1.86	.44	.29	.29
IN.	.39	.49	.62	1.39	1.90	2.89	3.49	3.52	2.08	.50	.33	.32

CAL YR 1989	TOTAL 88301	MEAN 242	MAX 1790	MIN 41	AC-FT 175100	CFSM 1.85	IN. 25.07
WTR YR 1990	TOTAL 63157	MEAN 173	MAX 1050	MIN 35	AC-FT 125300	CFSM 1.32	IN. 17.93

e Estimated

UMATILLA RIVER BASIN

99

14020300 MEACHAM CREEK AT GIBBON, OR

LOCATION.--Lat 45°41'20", long 118°21'20", in SE 1/4 SE 1/4 sec.31, T.3. N., R.36 E., Umatilla County, Hydrologic Unit 17070103, on left bank 250 ft downstream from Union Pacific railroad bridge, 0.9 mi southeast of Gibbon, and at mile 1.4.

DRAINAGE AREA.--176 mi².

PERIOD OF RECORD.--August 1975 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,803.05 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--15 years, 194 ft³/s, 14.97 in/yr, 140,600 acre-ft.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,750 ft³/s Feb. 20, 1982, gage height, 6.60 ft, from floodmark, from rating curve extended above 2,600 ft³/s; minimum discharge, 6.6 ft³/s Aug. 29, 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 25, 1975, reached a stage of 7.21 ft, from floodmark, discharge, about 8,200 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	2400	*1,150	*4.25				
Minimum discharge, 8.1 ft ³ /s Sept. 11, 17, 24.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	14	22	21	70	312	367	900	676	48	14	11
2	13	14	21	21	68	289	438	1070	600	49	14	11
3	11	14	21	20	65	303	452	1010	455	48	13	11
4	12	14	21	22	65	304	410	783	374	43	13	11
5	11	14	24	22	63	322	368	563	307	41	12	11
6	10	14	24	29	63	328	340	405	273	38	12	10
7	11	16	30	42	61	322	323	320	279	36	12	10
8	11	15	34	192	66	387	314	267	256	34	11	11
9	11	15	39	249	75	397	278	231	240	31	11	10
10	10	15	41	268	204	468	241	205	224	29	11	12
11	10	15	40	258	491	509	225	185	208	27	11	9.8
12	11	19	38	222	441	415	224	169	194	26	11	10
13	13	20	35	205	321	326	212	154	197	25	10	10
14	11	19	33	200	232	277	204	142	187	24	11	10
15	11	18	31	188	194	243	208	132	178	22	10	9.9
16	11	18	30	170	169	228	207	121	163	21	9.9	10
17	11	23	29	150	148	254	201	113	159	21	10	9.7
18	11	21	27	131	130	380	185	107	149	20	10	10
19	11	20	26	115	113	651	171	101	133	19	11	10
20	11	20	25	101	112	880	161	105	121	19	11	10
21	13	20	24	91	120	766	145	109	108	18	13	9.9
22	13	20	24	85	155	678	137	103	99	17	13	9.6
23	13	21	23	83	241	630	141	110	92	17	12	9.5
24	12	22	23	75	435	502	131	157	84	16	12	9.2
25	12	21	22	68	565	415	129	183	76	17	12	9.0
26	12	22	22	69	578	364	137	178	69	16	12	10
27	15	22	22	67	455	339	184	167	64	16	12	9.6
28	15	22	22	66	360	325	535	187	60	15	12	8.8
29	14	22	22	71	---	316	648	493	55	15	12	9.0
30	14	22	21	74	---	317	796	509	51	14	12	9.3
31	14	---	21	72	---	327	---	541	---	14	11	---
TOTAL	370	552	837	3447	6060	12574	8512	9820	6131	796	360.9	301.3
MEAN	11.9	18.4	27.0	111	216	406	284	317	204	25.7	11.6	10.0
MAX	15	23	41	268	578	880	796	1070	676	49	14	12
MIN	10	14	21	20	61	228	129	101	51	14	9.9	8.8
AC-FT	734	1090	1660	6840	12020	24940	16880	19480	12160	1580	716	598
CFSM	.07	.10	.15	.63	1.23	2.30	1.61	1.80	1.16	.15	.07	.06
IN.	.08	.12	.18	.73	1.28	2.66	1.80	2.08	1.30	.17	.08	.06

CAL YR 1989	TOTAL	64934	MEAN 178	MAX 1770	MIN 10	AC-FT 128800	CFSM 1.01	IN. 13.72
WTR YR 1990	TOTAL	49761.2	MEAN 136	MAX 1070	MIN 8.8	AC-FT 98700	CFSM .77	IN. 10.52

UMATILLA RIVER BASIN

14022200 NORTH FORK MCKAY CREEK NEAR PILOT ROCK, OR

LOCATION.--Lat 45°30'24", long 118°36'57", in NE 1/4 SE 1/4 sec.1, T.1 S., R.33 E., Umatilla County, Hydrologic Unit 17070103, Umatilla Indian Reservation, on left bank 10 mi northeast of Pilot Rock and at mile 0.5.

DRAINAGE AREA.--48.6 mi².

PERIOD OF RECORD.--May 1973 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,870 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records fair. No regulation. Minor diversion upstream from station.

AVERAGE DISCHARGE.--17 years, 42.8 ft³/s, 31,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,980 ft³/s Jan. 25, 1975, gage height, 8.48 ft, from floodmark, from rating curve extended above 150 ft³/s on basis of slope-area measurement of peak flow; minimum discharge, 0.22 ft³/s June 26, 1985 (result of temporary construction upstream).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 290 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 27	2300	*524	*3.85	May 29	0630	331	3.04

Minimum discharge, 0.74 ft³/s several days in September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	2.7	5.1	3.6	15	43	23	194	218	7.0	1.1	.89
2	2.0	2.7	5.1	3.8	15	38	22	147	157	6.8	1.1	.89
3	1.5	2.8	5.1	3.7	16	39	20	108	118	7.0	1.1	.88
4	1.6	3.1	5.2	4.0	17	40	17	79	91	6.2	1.0	.84
5	1.6	3.0	7.4	5.2	16	53	16	61	67	5.8	1.0	.82
6	1.6	3.0	7.4	11	16	56	14	47	78	5.4	.98	.81
7	1.6	3.0	7.2	19	15	56	13	40	118	5.0	.95	.82
8	1.6	3.0	7.4	38	17	67	12	34	87	4.6	.92	.86
9	1.6	3.1	7.7	34	28	71	11	29	68	4.5	.94	.84
10	1.5	2.9	7.6	61	161	197	9.6	25	62	4.0	.95	.80
11	1.5	2.9	7.2	57	159	194	9.0	21	50	3.7	.93	.79
12	1.6	4.0	6.8	50	104	139	8.3	19	47	3.6	.90	.79
13	1.6	5.3	6.5	43	69	109	7.8	17	42	3.2	.85	.81
14	1.9	4.9	6.3	46	54	95	7.3	16	36	2.8	.82	.81
15	2.0	4.5	6.0	48	43	83	6.8	15	30	2.6	.85	.81
16	2.0	4.5	5.8	43	37	73	6.4	13	26	2.4	.88	.83
17	2.1	7.4	5.4	36	33	70	6.0	13	23	2.1	.94	.83
18	2.1	7.5	5.3	30	28	75	5.6	11	21	1.9	.99	.81
19	2.0	6.5	5.1	25	23	80	5.2	11	18	1.8	.96	.80
20	2.2	6.0	4.9	21	24	80	5.0	14	16	1.7	1.0	.81
21	2.4	5.6	4.8	19	44	71	4.7	15	15	1.5	1.4	.80
22	2.5	5.3	4.6	18	82	62	4.6	13	14	1.4	1.4	.80
23	2.3	5.3	4.5	17	91	58	5.8	14	13	1.3	1.1	.78
24	2.0	5.9	4.3	15	89	50	5.3	22	12	1.3	.97	.77
25	2.3	6.1	4.3	14	83	44	6.4	20	11	2.0	.95	.78
26	2.7	6.1	4.0	14	73	39	7.2	18	10	1.8	.96	.80
27	3.9	5.8	3.7	13	59	35	97	17	9.5	1.5	.93	.83
28	4.2	5.6	e3.6	13	50	31	306	44	8.9	1.3	.91	.81
29	3.4	5.4	e3.5	14	---	28	283	259	8.3	1.2	.89	.84
30	3.1	5.3	3.5	15	---	26	264	212	7.4	1.5	.87	.86
31	2.9	---	3.4	15	---	24	---	253	---	1.2	.90	---
TOTAL	67.3	139.2	168.7	749.3	1461	2126	1209.0	1801	1482.1	98.1	30.44	24.61
MEAN	2.17	4.64	5.44	24.2	52.2	68.6	40.3	58.1	49.4	3.16	.98	.82
MAX	4.2	7.5	7.7	61	161	197	306	259	218	7.0	1.4	.89
MIN	1.5	2.7	3.4	3.6	15	24	4.6	11	7.4	1.2	.82	.77
AC-FT	133	276	335	1490	2900	4220	2400	3570	2940	195	60	49

CAL YR 1989 TOTAL 17325.56 MEAN 47.5 MAX 487 MIN .91 AC-FT 34370
WTR YR 1990 TOTAL 9356.75 MEAN 25.6 MAX 306 MIN .77 AC-FT 18560

e Estimated

UMATILLA RIVER BASIN

101

14023000 MCKAY RESERVOIR NEAR PENDLETON, OR

LOCATION.--Lat 45°36'28", long 118°47'30", in SE 1/4 sec.34, T.2 N., R.32 E., Umatilla County, Hydrologic Unit 17070103, on Bureau of Reclamation land, near right end of McKay Dam on McKay Creek, 4.0 mi south of Pendleton, and at mile 4.9.

DRAINAGE AREA.--186 mi².

PERIOD OF RECORD.--December 1927 to current year. Prior to Oct. 1, 1982, monthend contents and change in contents only.

REVISED RECORDS.--WSP 1154: Drainage area. WDR OR-79-1: 1978.

GAGE.--Water-stage recorder. Datum of gage is 0.16 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 6, 1973, nonrecording gage at same site and datum.

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 ft, 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 land along McKay Creek and Umatilla River. U. S. Bureau of Reclamation satellite telemeter at station.

COOPERATION.--Capacity tables furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 73,840 acre-ft June 9, 1950, gage height, 1,322.0 ft; no usable contents Sept. 7, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 51,340 acre-ft June 20, gage height, 1,301.62 ft; minimum contents, 1,920 acre-ft Sept. 29, 30, gage height, 1,232.16 ft.

Capacity table (gage height, in feet, and contents, in acre-feet)

1,182	6	1,210	1,610	1,260	20,880
1,185	24	1,220	3,720	1,280	33,540
1,190	117	1,230	7,120	1,300	49,840
1,200	565	1,240	11,060	1,322	73,840

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	1239.73	---	1243.47	1249.71	1259.73	1276.99	1285.40	1295.96	1297.28	1274.43	1248.98
2	1250.06	1239.76	---	1243.53	1249.85	1260.07	1277.28	1286.42	1296.69	1296.67	1273.60	1247.96
3	1249.90	1239.80	---	1243.57	1250.00	1260.42	1277.57	1287.27	1297.27	1296.10	1272.76	1246.94
4	1249.32	1239.82	---	1243.64	1250.13	1260.77	1277.84	1287.94	1297.74	1295.55	1271.94	1245.92
5	1248.83	1239.85	---	1243.70	1250.27	1261.21	1278.08	---	1298.12	1295.00	1271.12	1244.89
6	1248.22	1239.88	---	---	1250.41	1261.69	1278.32	---	1298.55	1294.43	1270.30	1243.85
7	1247.76	1239.90	1241.94	1243.90	1250.55	1262.17	1278.52	---	1299.01	1293.90	1269.46	1242.81
8	1247.25	1239.82	1242.02	1244.06	1250.68	1262.71	1278.67	1289.53	1299.39	1293.37	1268.53	1241.72
9	1246.72	1239.88	1242.08	1244.28	1250.85	1263.32	1278.86	1289.78	1299.70	1292.82	1267.63	1240.58
10	1246.24	1239.91	1242.16	1244.59	1251.39	1264.04	1279.00	1289.97	1299.98	1292.19	1266.70	---
11	1245.71	1239.94	1242.24	1244.98	1252.27	---	1279.12	1290.17	1300.23	1291.42	1265.77	1238.25
12	1245.22	1240.01	1242.32	1245.35	1252.95	---	1279.24	1290.34	1300.44	1290.65	1264.84	1237.11
13	1244.81	1240.07	1242.41	1245.70	1253.48	1267.17	1279.36	1290.46	1300.69	1289.88	1263.87	1235.95
14	1244.27	1240.09	1242.48	1246.05	1253.92	1267.91	1279.47	1290.60	1300.89	1289.12	1262.86	1234.77
15	1243.69	1240.25	1242.55	1246.39	1254.28	1268.54	1279.57	1290.74	1301.08	1288.34	1261.82	1234.16
16	1243.17	1240.34	1242.62	1246.71	1254.61	---	1279.63	1290.84	1301.21	1287.57	1260.85	1233.73
17	1242.77	1240.48	1242.68	1247.06	1254.92	---	1279.68	1290.94	1301.34	1286.79	1259.88	1233.26
18	1242.33	1240.56	1242.75	1247.35	1255.21	---	1279.70	1291.01	1301.46	1286.01	1258.90	1232.91
19	1241.87	1240.64	1242.82	1247.60	1255.46	1271.01	1279.75	1291.11	1301.59	1285.14	1257.91	1232.59
20	---	1240.74	1242.88	1247.81	1255.70	1271.70	1279.79	1291.22	1301.59	1284.27	1257.00	1232.33
21	---	1240.79	1242.93	1248.04	1255.94	1272.35	1279.82	1291.35	1301.44	1283.46	1256.44	1232.27
22	---	1240.85	1242.97	1248.21	1256.39	1272.97	1279.84	1291.44	1301.21	1282.64	1256.10	1232.29
23	1239.83	1240.94	1243.03	1248.40	1256.89	1273.58	1279.87	1291.57	1300.96	1281.84	1255.74	1232.28
24	1239.56	1241.00	1243.07	1248.57	1257.42	1274.09	1279.90	1291.67	1300.67	1281.07	1255.37	1232.28
25	1239.58	1241.08	1243.11	1248.73	1257.97	1274.56	1279.93	1291.82	1300.35	1280.27	1255.02	1232.24
26	1239.61	1241.14	1243.16	1248.87	1258.49	1274.99	1279.98	1291.94	1299.96	1279.49	1254.56	1232.23
27	1239.63	1241.20	1243.19	1249.02	1258.94	1275.37	1280.24	1292.07	1299.51	1278.64	1253.67	1232.23
28	1239.66	1241.26	1243.27	1249.17	1259.37	1275.72	1281.51	1292.30	1299.01	1277.80	1252.79	1232.22
29	1239.67	---	1243.33	1249.29	---	1276.06	1282.83	1293.18	1298.47	1276.98	1251.91	1232.21
30	1239.71	---	1243.36	1249.44	---	1276.39	1284.22	1294.05	1297.89	1276.11	1251.02	1232.19
31	1239.70	---	1243.42	1249.58	---	1276.68	---	1295.04	---	1275.29	1250.02	---
MAX	---	---	---	---	1259.37	---	1284.22	---	1301.59	1297.28	1274.43	---
MIN	---	---	---	---	1249.71	---	1276.99	---	1295.96	1275.29	1250.02	---
(†)	10920	111650	12520	15400	20500	31240	36600	45370	47910	30290	15620	7940
(‡)	-5130	+730	+870	+2880	+5100	+10740	+5360	+8770	+2540	-17620	-14670	-7680

CAL YR 1989 AC-FT† -1320
WTR YR 1990 AC-FT‡ -8110

a Interpolated.

† Contents, in acre-feet, at 2400, on last day of month.

‡ Change in contents, in acre-feet.

UMATILLA RIVER BASIN

102

14023500 MCKAY CREEK NEAR PENDLETON, OR

LOCATION.--Lat 45°36'34", long 118°47'55", in SE 1/4 NW 1/4 sec.34, T.2 N., R.32 E., Umatilla County, Hydrologic Unit 17070103, on right bank 35 ft upstream from diversion dam, 0.2 mi downstream from McKay Dam, 4.5 mi south of Pendleton, and at mile 4.7.

DRAINAGE AREA.--186 mi².

PERIOD OF RECORD.--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 current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 1154: Drainage area. WSP 1398: 1923.

GAGE.--Water-stage recorder. Concrete control since Mar. 23, 1928. Datum of gage is above 1,163.71 ft above National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). See WSP 1318 or 1738 for history of changes prior to Nov. 16, 1948.

REMARKS.--Records good except for daily discharges below 2.0 ft³/s, which are poor. Flow completely regulated since 1927 by McKay Reservoir (station 14023000). Many diversions for irrigation upstream from station. From 1932 to 1970, records excluded flow in Elder ditch, which diverts water between the gage and the control. Since 1971, records include flow in Elder ditch. During the irrigation season, from 1953 to 1982, Elder ditch diverted a maximum of 1.5 ft³/s; since 1982, diversion has been less than 1.0 ft³/s.

AVERAGE DISCHARGE.--53 years (water years 1933-43, 1949-90), 97.4 ft³/s, 70,570 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 3,250 ft³/s Feb. 10, 1921, gage height, 4.4 ft, site and datum then in use, from rating curve extended above 1,200 ft³/s; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 317 ft³/s July 19, 20, gage height, 1.50 ft, minimum daily discharge, 0.07 ft³/s Dec. 15-20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e58	e.30	e.10	e.10	e.10	e.40	e.40	e.40	e.40	240	260	233
2	e.40	e.30	e.10	e.10	e.10	e.40	e.40	e.40	e.40	238	259	224
3	e86	e.30	e.10	e.10	e.10	e.40	e.40	e.40	e.40	234	259	223
4	104	e.30	e.10	e.10	e.10	e.40	e.40	e.40	e.40	224	251	219
5	111	e.30	e.10	e.10	e.10	e.40	e.40	e.40	e.40	224	248	216
6	117	e.30	e.10	e.10	e.10	e.40	e.40	e.40	e.40	224	247	216
7	112	e.30	e.10	e.10	e.10	e.40	e.40	e.40	e.40	211	251	214
8	105	e.30	e.10	e.10	e.10	e.40	e.40	e.40	e.40	201	267	218
9	103	e.30	e.10	e.10	e.10	e.40	e.40	e.40	e.40	214	268	230
10	103	e.30	e.10	e.10	e.10	e.40	e.40	e.40	e.40	246	267	224
11	103	e.30	e.10	e.10	e.15	e.40	e.40	e.40	e.40	286	266	221
12	103	e.30	e.10	e.10	e.15	e.40	e.40	e.40	e.40	293	264	223
13	103	e.30	e.10	e.10	e.15	e.40	e.40	e.40	e.40	292	269	223
14	103	e.30	e.10	e.10	e.20	e.40	e.40	e.40	e.40	290	272	223
15	103	e.30	e.07	e.10	e.20	e.40	e.40	e.40	e.40	290	269	114
16	e36	e.25	e.07	e.10	e.25	e.40	e.40	e.40	e.40	282	262	66
17	e.30	e.25	e.07	e.10	e.25	e.40	e.40	e.40	e.40	273	250	65
18	e.30	e.25	e.07	e.10	e.30	e.40	e.40	e.40	e.40	272	254	58
19	e.30	e.25	e.07	e.10	e.30	e.40	e.40	e.40	e.40	298	256	52
20	e.30	e.25	e.07	e.10	e.35	e.40	e.40	e.40	e29	311	233	e43
21	e.30	e.25	e.10	e.10	e.35	e.40	e.40	e.40	87	280	141	e.10
22	e.30	e.25	e.10	e.10	e.35	e.40	e.40	e.40	114	270	76	e.10
23	e.30	e.25	e.10	e.10	e.35	e.40	e.40	e.40	127	266	76	e.10
24	e.30	e.25	e.10	e.10	e.40	e.40	e.40	e.40	128	257	76	e.10
25	e.30	e.25	e.10	e.10	e.40	e.40	e.40	e.40	144	269	76	e.10
26	e.30	e.25	e.10	e.10	e.40	e.40	e.40	e.40	167	287	107	e.10
27	e.30	e.25	e.10	e.10	e.40	e.40	e.40	e.40	194	285	209	e.10
28	e.30	e.25	e.10	e.10	e.40	e.40	e.40	e.40	212	284	207	e.10
29	e.30	e.20	e.10	e.10	---	e.40	e.40	e.40	227	279	197	e.10
30	e.30	e.20	e.10	e.10	---	e.40	e.40	e.40	240	272	205	e.10
31	e.30	---	e.10	e.10	---	e.40	---	e.40	---	262	224	---
TOTAL	1454.90	8.15	2.92	3.10	6.35	12.40	12.00	12.40	1676.60	8154	6766	3506.00
MEAN	46.9	.27	.094	.10	.23	.40	.40	.40	55.9	263	218	117
MAX	117	.30	.10	.10	.40	.40	.40	.40	240	311	272	233
MIN	.30	.20	.07	.10	.10	.40	.40	.40	.40	201	76	.10
AC-FT	2890	16	5.8	6.1	13	25	24	25	3330	16170	13420	6950

CAL YR 1989 TOTAL 47995.72 MEAN 131 MAX 716 MIN .07 AC-FT 95200
WTR YR 1990 TOTAL 21614.82 MEAN 59.2 MAX 311 MIN .07 AC-FT 42870

e Estimated

UMATILLA RIVER BASIN

103

14026000 UMATILLA RIVER AT YOAKUM, OR

LOCATION.--Lat 45°40'38", long 119°02'09", in SW 1/4 SW 1/4 sec.2, T.2 N., R.30 E., Umatilla County, Hydrologic Unit 17070103, at left bank on downstream side of highway bridge, 0.5 mi northeast of Yoakum, 2.5 mi downstream from abandoned Furnish Reservoir, 12.0 mi downstream from Birch Creek, and at mile 37.7.

DRAINAGE AREA.--1,280 mi², approximately.

PERIOD OF RECORD.--May 1903 to current year. Records published as "above Furnish Reservoir, near Yoakum" October 1916 to September 1934 are equivalent.

REVISED RECORDS.--WSP 794: 1906(M). WSP 1398: 1904-6, 1908-9, 1922-23, 1926, 1936.

GAGE.--Water-stage recorder. Datum of gage is 768.21 ft above National Geodetic Vertical Datum of 1929. See WSP 1318 or 1738 for history of changes prior to Oct. 21, 1948.

REMARKS.--No estimated daily discharges. Records good. Slight regulation by Furnish Reservoir, capacity 3,900 acre-ft, beginning in 1910 and continuing until 1934 when reservoir filled with silt. Flow regulated to some extent since 1927 by McKay Reservoir (station 14023000). Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--87 years, 676 ft³/s, 489,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft³/s May 30, 1906, gage height, about 15.0 ft, site and datum then in use, from floodmarks, from rating curve extended about 6,600 ft³/s; minimum discharge, 12 ft³/s Aug. 10-12, 1908, Aug. 4, 1910.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 3	0830	*2,200	*4.56				
Minimum discharge, 37 ft ³ /s Sept. 24, 25, 30.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	174	72	101	101	236	789	821	1820	1600	345	297	261
2	63	73	99	101	232	725	983	1960	1490	340	297	250
3	61	76	99	101	224	718	1090	2090	1240	345	296	247
4	160	75	100	101	225	737	1050	1850	1080	333	286	244
5	168	75	110	104	224	774	976	1560	924	323	276	244
6	173	75	136	106	224	843	902	1290	837	319	272	245
7	171	75	141	144	219	828	869	1040	882	316	271	242
8	159	80	142	445	214	903	866	884	818	301	286	241
9	156	80	147	767	234	1000	798	750	754	299	288	252
10	156	77	157	730	477	1220	707	665	701	311	288	248
11	156	76	160	807	1370	1540	655	585	676	342	294	241
12	156	90	159	683	1170	1270	646	531	599	345	292	237
13	156	106	153	611	926	1040	637	484	597	341	288	237
14	158	105	147	570	706	893	615	448	571	334	299	241
15	157	99	141	560	588	788	627	414	531	332	297	198
16	158	94	137	525	521	714	629	379	483	324	301	106
17	161	120	134	469	461	696	625	345	437	318	280	106
18	161	119	130	415	408	787	587	325	424	319	282	105
19	162	113	125	370	357	1100	545	317	368	326	298	95
20	161	107	121	330	331	1540	498	315	332	341	290	95
21	167	102	120	295	347	1550	463	346	371	325	257	92
22	173	91	116	276	546	1430	431	320	367	314	148	90
23	172	95	113	263	733	1390	435	336	372	310	138	90
24	165	99	112	254	987	1230	445	408	346	303	129	72
25	80	107	111	237	1160	1040	399	546	332	308	124	38
26	76	108	108	234	1180	897	447	534	337	318	123	39
27	77	107	106	226	1060	803	481	493	344	312	223	39
28	80	106	106	220	900	768	1560	513	354	310	244	40
29	81	104	107	231	---	743	1730	1270	347	306	233	40
30	77	104	102	241	---	733	1920	1540	356	305	237	39
31	75	---	101	244	---	751	---	1440	---	301	248	---
TOTAL	4250	2810	3841	10761	16260	30240	23437	25798	18870	9966	7882	4714
MEAN	137	93.7	124	347	581	975	781	832	629	321	254	157
MAX	174	120	160	807	1370	1550	1920	2090	1600	345	301	261
MIN	61	72	99	101	214	696	399	315	332	299	123	38
AC-FT	8430	5570	7620	21340	32250	59980	46490	51170	37430	19770	15630	9350

CAL YR 1989 TOTAL 291410 MEAN 798 MAX 5210 MIN 61 AC-FT 578000
WTR YR 1990 TOTAL 158829 MEAN 435 MAX 2090 MIN 38 AC-FT 315000

UMATILLA RIVER BASIN

14033500 UMATILLA RIVER NEAR UMATILLA, OR

LOCATION.--Lat 45°54'11", long 119°19'33", in SW 1/4 NW 1/4 sec.21, T.5 N., R.28 E., Umatilla County, Hydrologic Unit 17070103, on left bank 1.6 mi downstream from West Division main canal of Umatilla project, 1.2 mi southeast of Umatilla, and at mile 2.1.

DRAINAGE AREA.--2,290 mi², approximately.

PERIOD OF RECORD.--October 1903 to current year.

REVISED RECORDS.--WSP 794: Drainage area. WSP 1398: 1909, 1911, 1914, 1928, 1935.

GAGE.--Water-stage recorder. Datum of gage is 330.47 ft above National Geodetic Vertical Datum of 1929. Oct. 21, 1903, to Jan. 25, 1931, nonrecording gage.

REMARKS.--Records fair. Some regulation since 1927 by McKay Reservoir (station 14023000). Many diversions upstream from station for irrigation of lands upstream and downstream from station; Brownell Canal diverts downstream from station. Diversions since 1908 to Cold Springs Reservoir, an off-channel reservoir, capacity, 52,380 acre-ft. U.S. Bureau of Reclamation radio telemeter at station.

AVERAGE DISCHARGE.--63 years (water years 1928-90), 460 ft³/s, 333,300 acre-ft/yr. Water years prior to 1928 not included in computation of average discharge owing to increased regulation and diversion since 1927.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,800 ft³/s Jan. 30, 1965, gage height, 10.75 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 3	1000	*2,090	*4.68				

Minimum discharge, 1.1 ft³/s Sept. 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	164	102	97	109	689	279	1790	1280	2.4	3.0	1.3
2	64	164	102	97	102	623	384	1810	1280	3.1	1.8	9.1
3	60	163	101	97	99	553	541	1880	1010	4.5	1.8	5.8
4	54	163	103	97	98	594	527	1660	816	6.3	2.8	1.4
5	153	162	111	96	96	608	462	1320	609	6.0	2.1	1.4
6	189	162	106	97	101	662	375	1010	442	3.9	1.8	1.3
7	203	159	113	98	92	676	353	715	606	3.9	2.0	1.3
8	203	160	119	109	97	693	301	495	458	4.8	2.8	1.4
9	199	163	118	619	93	832	302	e400	411	3.3	2.1	1.3
10	191	162	122	613	107	884	208	e370	341	3.6	2.0	1.4
11	185	162	115	715	969	1470	100	254	314	3.8	2.5	1.3
12	190	176	108	652	1210	1260	81	209	296	2.0	2.4	1.3
13	214	189	108	571	964	1080	101	171	250	2.8	1.9	5.5
14	225	193	111	517	755	872	84	135	216	2.7	1.9	15
15	226	188	101	471	627	752	65	e85	144	6.6	2.5	17
16	230	184	104	442	540	654	73	e100	117	11	2.1	21
17	249	201	103	393	490	517	71	e40	88	2.8	2.1	21
18	225	219	102	346	417	549	49	e35	61	4.4	2.1	22
19	254	210	102	273	373	757	24	e30	39	2.1	2.7	21
20	252	193	101	247	310	1180	21	e30	43	3.8	10	23
21	261	132	100	214	211	1400	26	e50	18	3.9	20	22
22	264	122	100	181	267	1210	33	e30	2.6	2.4	46	22
23	260	123	99	138	454	1190	63	e35	2.5	2.5	2.1	23
24	269	122	99	138	693	1080	72	e35	5.4	16	1.8	24
25	250	116	97	112	939	894	102	e35	3.9	17	1.7	24
26	181	110	98	109	1060	686	89	e300	2.8	2.4	1.9	23
27	175	107	97	100	1040	531	144	e260	3.0	2.2	2.7	23
28	169	106	98	105	841	428	771	e110	2.3	2.6	2.3	22
29	173	102	97	92	---	345	1730	e260	2.6	2.1	2.2	21
30	171	102	99	120	---	273	1840	e1500	2.3	2.0	6.8	20
31	169	---	98	110	---	257	---	e1100	---	2.1	1.5	---
TOTAL	5955	4679	3234	8066	13154	24199	9271	16254	8866.4	139.0	141.4	397.8
MEAN	192	156	104	260	470	781	309	524	296	4.48	4.56	13.3
MAX	269	219	122	715	1210	1470	1840	1880	1280	17	46	24
MIN	47	102	97	92	92	257	21	30	2.3	2.0	1.5	1.3
AC-FT	11810	9280	6410	16000	26090	48000	18390	32240	17590	276	280	789

CAL YR 1989 TOTAL 242010.6 MEAN 663 MAX 5460 MIN 1.4 AC-FT 480000
WTR YR 1990 TOTAL 94356.6 MEAN 259 MAX 1880 MIN 1.3 AC-FT 187200

e Estimated

WILLOW CREEK BASIN

105

14034470 WILLOW CREEK ABOVE WILLOW CREEK LAKE, NEAR HEPPNER, OR

LOCATION.--Lat 45°20'27", long 119°30'53", in NE 1/4 NE 1/4 sec.1, T.3 S., R.26 E., Morrow County, Hydrologic Unit 17070104, on right bank 1.5 mi southeast of Heppner, 1.7 mi upstream from Willow Creek dam, and at mile 54.1.

DRAINAGE AREA--67.6 mi².

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 2,085.41 ft above National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers).

REMARKS.--Records poor. Many diversions for irrigation upstream from station. Part of flow of Ditch Creek (John Day River basin) is diverted to Willow Creek upstream from station.

AVERAGE DISCHARGE.--8 years, 22.5 ft³/s, 16,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 445 ft³/s Mar. 4, 1983, gage height, 6.93 ft; minimum discharge, 0.01 ft³/s July 31 to Sept. 14, 1988, but may have been less during period of no gage-height record July 31 to Sept. 14, 1988.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 140 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	0100	*200	*6.95	No other peak greater than base discharge.			
Minimum daily discharge, 0.02 ft ³ /s Aug. 11-20, Sept. 13.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	9.2	4.0	4.5	6.2	11	23	62	18	2.1	.33	.29
2	1.9	8.1	4.5	4.1	6.1	11	25	64	16	2.6	.29	.29
3	1.9	8.1	5.4	4.0	6.0	13	23	64	16	3.2	.23	.33
4	1.9	8.0	5.3	3.9	6.2	14	16	57	16	3.3	.17	.31
5	1.8	8.3	9.3	4.2	5.7	18	16	50	15	2.4	.13	.30
6	1.7	8.1	7.6	4.9	7.0	18	15	43	14	3.2	.09	.20
7	1.7	7.9	6.5	6.9	4.6	20	10	40	16	3.3	.07	.15
8	2.1	7.5	6.2	10	6.6	24	11	38	15	2.2	.04	.15
9	2.3	7.3	6.1	9.6	7.5	23	10	33	14	1.6	.04	.11
10	2.5	7.0	5.9	8.7	7.6	31	12	28	15	1.4	.03	.09
11	2.9	6.5	4.1	8.0	e6.2	33	9.5	22	15	1.2	.02	.09
12	3.2	9.3	3.5	7.3	e5.6	29	10	16	15	1.3	.02	.06
13	2.7	13	4.6	8.4	e5.0	26	9.7	15	16	.84	.02	.02
14	1.2	9.8	5.1	9.6	e4.3	26	9.7	16	15	.85	.02	.06
15	1.9	8.4	4.7	10	e4.5	22	9.5	15	14	.67	.02	.14
16	2.3	7.7	3.3	8.3	e4.2	21	11	13	13	.56	.02	.18
17	2.6	14	2.5	7.7	e4.8	21	10	13	14	.51	.02	.16
18	2.6	13	3.9	5.3	e4.7	23	6.6	13	12	.38	.02	.14
19	2.1	10	4.1	5.1	e4.2	27	4.3	12	10	.27	.02	.12
20	3.1	8.5	4.4	5.0	11	33	4.4	12	8.8	.15	.02	.19
21	4.4	7.8	4.4	5.8	12	35	4.8	12	8.3	.13	.16	.21
22	9.5	7.3	3.9	6.9	13	32	5.5	12	e7.5	.08	.13	.23
23	9.3	7.0	4.0	7.5	14	33	7.2	14	e6.5	.08	.07	.30
24	12	6.7	4.0	5.1	16	30	6.3	15	e5.5	.07	.08	.29
25	12	6.6	3.5	6.8	15	27	6.9	11	e4.5	.10	.10	.26
26	10	6.3	2.6	6.2	14	25	8.3	8.9	3.5	.16	.10	e.28
27	11	6.1	2.8	5.7	14	24	34	8.5	3.6	.15	.14	.30
28	12	5.4	5.2	6.9	15	24	121	12	3.7	.14	.18	.21
29	11	4.9	3.0	7.0	---	22	82	20	2.2	.07	.17	.10
30	11	4.3	3.9	7.2	---	21	68	18	2.0	.39	.24	.09
31	9.7	---	4.3	6.6	---	22	---	19	---	.49	.28	---
TOTAL	155.9	242.1	142.6	207.2	231.0	739	589.7	776.4	335.1	33.89	3.27	5.65
MEAN	5.03	8.07	4.60	6.68	8.25	23.8	19.7	25.0	11.2	1.09	.11	.19
MAX	12	14	9.3	10	16	35	121	64	18	3.3	.33	.33
MIN	1.2	4.3	2.5	3.9	4.2	11	4.3	8.5	2.0	.07	.02	.02
AC-FT	309	480	283	411	458	1470	1170	1540	665	67	6.5	11

CAL YR 1989 TOTAL 8574.41 MEAN 23.5 MAX 164 MIN .26 AC-FT 17010
WTR YR 1990 TOTAL 3461.81 MEAN 9.48 MAX 121 MIN .02 AC-FT 6870

e Estimated

WILLOW CREEK BASIN

14034480 BALM FORK NEAR HEPPNER, OR

LOCATION.--Lat 45°19'56", long 119°32'24", in NW 1/4 SE 1/4 sec.2, T.3 S., R.26 E., Morrow County, Hydrologic Unit 17070104, on right bank, 0.7 mi upstream from bridge on Willow Creek Road, 1.0 mi southeast of Heppner, 1.2 mi upstream from Willow Creek dam, and at mile 1.1.

DRAINAGE AREA.--26.3 mi².

PERIOD OF RECORD.--May 1982 to current year.

REVISED RECORDS.--WDR OR-83-1: Drainage area. WDR OR-88-1: 1987(M).

GAGE.--Water-stage recorder. Concrete control since Aug. 24, 1982. Datum of gage is 2,101.52 ft above National Geodetic Vertical Datum of 1929 (Corps of Engineers bench mark).

REMARKS.--Records fair. Diversion for irrigation of about 170 acres upstream from station.

AVERAGE DISCHARGE.--8 years, 2.94 ft³/s, 2,130 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 190 ft³/s Mar. 4, 1983, gage height, 4.90 ft, from rating curve extended above 82 ft³/s on basis of slope-area measurement of peak flow; no flow for part of each day Sept. 8, 9, 1982.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, about 36,000 ft³/s June 14, 1903, result of slope-area measurement (see WSP 96).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 60 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 11	1445	*1.8	3.01	May 15	0830	---	*3.05

Minimum discharge, 0.01 ft³/s several days in October and September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.08	.24	.68	.63	.72	.56	.38	.50	.59	.27	.09	.09
2	.08	.27	.69	.59	.73	.58	.36	.47	.61	.28	.07	.07
3	.08	.27	.57	.58	.73	.64	.32	.47	.68	.29	.08	.06
4	.09	.25	.70	.58	.74	.68	.29	.47	.66	.28	.09	.05
5	.08	.26	.89	.57	.74	.68	.29	.51	.62	.28	.08	.04
6	.09	.28	.78	.55	.73	.65	.29	.50	.66	.29	.08	.04
7	.10	.30	.77	.56	.74	.64	.30	.46	.71	.26	.07	.04
8	.08	.33	.76	.59	.73	.64	.30	.48	.64	.24	.06	.04
9	.08	.33	.74	.60	.73	.64	.30	.47	.62	.23	.06	.03
10	.01	.32	.75	.59	.70	.71	.29	.50	.62	.21	.06	.03
11	.01	.48	.73	.61	.70	.65	.28	.48	.62	.19	.05	.03
12	.02	.59	.73	.63	.71	.60	.27	.90	.61	.19	.04	.03
13	.01	.48	.83	.65	.73	.58	.27	1.0	.60	.19	.04	.03
14	.01	.48	.94	.67	.71	.63	.26	1.2	.59	.18	.04	.02
15	.02	.50	.88	.63	.81	.64	.29	.96	.48	.17	.04	.02
16	.02	.54	.86	.65	.85	.66	.31	.53	.39	.16	.03	.02
17	.02	.69	.82	.66	.82	.67	.31	.46	.33	.15	.04	.02
18	.03	.59	.81	.67	e.76	.69	.31	.36	.30	.15	.04	.02
19	.04	.57	.77	.63	e.69	.69	.34	.32	.27	.15	.04	.02
20	.05	.57	.73	.63	e.63	.67	.40	.43	.26	.14	.04	.02
21	.06	.58	.72	.64	e.54	.65	.38	.44	.29	.13	.07	.02
22	.07	.59	.70	.66	e.46	.52	.41	.35	.28	.12	.05	.02
23	.07	.62	.70	.67	e.41	.50	.45	.42	.29	.11	.04	.01
24	.08	.66	.67	.64	.36	.49	.38	.45	.29	.11	.03	.01
25	.08	.66	.66	.63	.44	.47	.37	.46	.34	.11	.04	.02
26	.10	.66	.66	.61	.49	.46	.39	.36	.35	.10	.04	.02
27	.09	.66	.65	.63	.51	.48	.62	.33	.33	.09	.03	.02
28	.10	.69	.67	.67	.54	.42	.68	.37	.29	.09	.03	.02
29	.23	.69	.63	.70	---	.40	.60	.45	.28	.08	.04	.02
30	.18	.69	.63	.73	---	.39	.56	.50	.28	.07	.07	.01
31	.22	---	.63	.71	---	.41	---	.55	---	.11	.08	---
TOTAL	2.28	14.84	22.75	19.56	18.45	18.09	11.00	16.15	13.88	5.42	1.66	0.89
MEAN	.074	.49	.73	.63	.66	.58	.37	.52	.46	.17	.054	.030
MAX	.23	.69	.94	.73	.85	.71	.68	1.2	.71	.29	.09	.09
MIN	.01	.24	.57	.55	.36	.39	.26	.32	.26	.07	.03	.01
AC-FT	4.5	29	45	39	37	36	22	32	28	11	3.3	1.8

CAL YR 1989 TOTAL 748.57 MEAN 2.05 MAX 15 MIN .01 AC-FT 1480
WTR YR 1990 TOTAL 144.97 MEAN .40 MAX 1.2 MIN .01 AC-FT 288

e Estimated

WILLOW CREEK BASIN

107

14034490 WILLOW CREEK LAKE AT HEPPNER, OR

LOCATION.--Lat 45°20'50", long 119°32'37", in NW 1/4 SE 1/4 sec.35, T.2 S., R.26 E., Morrow County, Hydrologic Unit 17070104, U.S. Corps of Engineers land, on top left side of spillway on dam on Willow Creek, 2,000 ft upstream from Court Street bridge and at mile 52.4.

DRAINAGE AREA.--96.6 mi².

PERIOD OF RECORD.--February 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to Dec. 22, 1983, nonrecording gage at nearby site at present datum.

REMARKS.--Lake is formed behind roller-compacted, concrete dam; storage began Feb. 16, 1983. Capacity, 14,020 acre-ft between elevations 2,000.0 ft, sill of outlet gates, and 2,113.5 ft, crest of spillway. Average minimum lake elevation 2,047.0 ft, storing 2,540 acre-ft. Dead storage, 73 acre-ft below elevation 2,000.0 ft. Reservoir used for flood control. Figures given herein represent total contents.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 6,200 acre-ft June 11-13, 1988, elevation, 2,076.16 ft; no usable contents at times.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 4,520 acre-ft May 4, 6, elevation, 2,064.48 ft; minimum contents, 3,500 acre-ft Sept. 30, elevation, 2,056.21 ft.

Capacity table (elevation, in feet, and total contents, in acre-feet)

2,050	2,840	2,060	3,950	2,070	5,280	2,080	6,820
2,055	3,370	2,065	4,590	2,075	6,020		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2057.76	2057.58	2058.97	2060.16	2061.26	2060.86	2063.14	2064.37	2063.13	2062.35	2060.52	2058.36
2	2057.73	2057.60	2059.00	2060.18	2061.22	2060.90	2063.23	2064.38	2063.20	2062.30	2060.45	2058.29
3	2057.67	2057.61	2059.08	2060.24	2061.15	2060.97	2063.32	2064.46	2063.27	2062.28	2060.38	2058.21
4	2057.65	2057.68	2059.14	2060.27	2061.11	2061.06	2063.31	2064.47	2063.31	2062.25	2060.29	2058.14
5	2057.60	2057.69	2059.22	2060.33	2061.05	2061.17	2063.25	2064.38	2063.27	2062.21	2060.23	2058.06
6	2057.56	2057.71	2059.29	2060.44	2061.00	2061.31	2063.13	2064.38	2063.27	2062.18	2060.16	2057.99
7	2057.54	2057.73	2059.37	2060.47	2060.92	2061.46	2062.91	2064.19	2063.26	2062.17	2060.08	2057.91
8	2057.50	2057.75	2059.38	2060.57	2060.88	2061.62	2062.71	2063.95	2063.24	2062.15	2060.01	2057.84
9	2057.48	2057.76	2059.47	2060.64	2060.85	2061.76	2062.57	2063.74	2063.19	2062.10	2059.94	2057.78
10	2057.46	2057.78	2059.48	2060.67	2060.81	2062.09	2062.54	2063.57	2063.17	2062.05	2059.86	2057.71
11	2057.44	2057.83	2059.56	2060.68	2060.79	2062.38	2062.47	2063.39	2063.11	2061.99	2059.80	2057.61
12	2057.43	2057.91	2059.57	2060.76	2060.78	2062.69	2062.46	2063.18	2063.05	2061.94	2059.71	2057.52
13	2057.40	2058.01	2059.58	2060.78	2060.77	2062.93	2062.51	2062.90	2063.01	2061.86	2059.62	2057.45
14	2057.36	2058.08	2059.65	2060.87	2060.71	2063.16	2062.57	2062.80	2062.94	2061.81	2059.56	2057.40
15	2057.31	2058.14	2059.68	2060.92	2060.70	2063.33	2062.65	2062.75	2062.86	2061.74	2059.47	2057.31
16	2057.29	2058.16	2059.68	2060.98	2060.71	2063.46	2062.71	2062.69	2062.76	2061.67	2059.40	2057.23
17	2057.27	2058.29	2059.71	2061.05	2060.70	2063.50	2062.77	2062.60	2062.66	2061.60	2059.35	2057.15
18	2057.25	2058.38	2059.74	2061.07	2060.66	2063.54	2062.81	2062.58	2062.61	2061.54	2059.29	2057.09
19	2057.22	2058.48	2059.77	2061.08	2060.62	2063.58	2062.74	2062.59	2062.48	2061.47	2059.24	2057.01
20	2057.22	2058.54	2059.78	2061.12	2060.62	2063.52	2062.70	2062.61	2062.44	2061.39	2059.20	2056.92
21	2057.23	2058.60	2059.86	2061.14	2060.62	2063.47	2062.71	2062.64	2062.46	2061.33	2059.18	2056.85
22	2057.26	2058.64	2059.86	2061.18	2060.64	2063.40	2062.72	2062.64	2062.52	2061.26	2059.10	2056.77
23	2057.27	2058.70	2059.88	2061.25	2060.66	2063.35	2062.74	2062.71	2062.56	2061.16	2059.02	2056.70
24	2057.29	2058.77	2059.90	2061.27	2060.67	2063.23	2062.73	2062.75	2062.58	2061.07	2058.94	2056.63
25	2057.31	2058.80	2059.93	2061.30	2060.76	2063.07	2062.73	2062.75	2062.57	2061.00	2058.87	2056.56
26	2057.35	2058.82	2059.95	2061.32	2060.77	2062.94	2062.74	2062.73	2062.54	2060.94	2058.79	2056.49
27	2057.37	2058.89	2059.96	2061.33	2060.80	2062.91	2063.07	2062.70	2062.53	2060.87	2058.71	2056.42
28	2057.44	2058.91	2060.03	2061.37	2060.84	2062.89	2063.96	2062.71	2062.51	2060.82	2058.64	2056.34
29	2057.47	2058.94	2060.07	2061.36	---	2062.91	2064.25	2062.83	2062.46	2060.75	2058.57	2056.29
30	2057.51	2058.96	2060.08	2061.34	---	2062.97	2064.34	2062.94	2062.41	2060.67	2058.50	2056.21
31	2057.56	---	2060.12	2061.30	---	2063.06	---	2063.06	---	2060.60	2058.43	---
MAX	2057.76	2058.96	2060.12	2061.37	2061.26	2063.58	2064.34	2064.47	2063.31	2062.35	2060.52	2058.36
MIN	2057.22	2057.58	2058.97	2060.16	2060.62	2060.86	2062.46	2062.58	2062.41	2060.60	2058.43	2056.21
(†)	3660	3830	3970	4110	4060	4330	4500	4330	4250	4020	3760	3500
(‡)	-30	+170	+140	+140	-50	+270	+170	-170	-80	-230	-260	-260

CAL YR 1989 MAX 2064.93 MIN 2057.22 AC-FT† -40

WTR YR 1990 MAX 2064.47 MIN 2056.21 AC-FT† -190

† Contents, in acre-feet, at 2400, on last day of month.

‡ Change in contents, in acre-feet.

WILLOW CREEK BASIN

14034500 WILLOW CREEK AT HEPPNER, OR

LOCATION.--Lat 45°21'02", long 119°32'56", in SE 1/4 NW 1/4 sec.35, T.2 S., R.26 E., Morrow County, Hydrologic Unit 17070104, on right bank at Heppner, 100 ft upstream from Court Street bridge, 800 ft southeast of Morrow County courthouse, 0.2 mi downstream from Willow Creek Dam and at mile 52.2.

DRAINAGE AREA.--96.8 mi².

PERIOD OF RECORD.--May 1951 to current year.

REVISED RECORDS.--WDR OR-83-1: Drainage area.

GAGE.--Water-stage recorder. Concrete control since September 1985. Datum of gage is 1,952.73 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good except those below 1.0 ft³/s, which are fair. Flow regulated by Willow Creek Lake, 0.2 mi upstream, since Feb. 16, 1983. Many diversions for irrigation upstream from station. Part of flow of Ditch Creek (John Day River basin) is diverted to Willow Creek upstream from station.

AVERAGE DISCHARGE.--31 years (water years 1951-82), 19.1 ft³/s, 13,840 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 812 ft³/s May 10, 1957, gage height, 6.15 ft, from rating curve extended above 230 ft³/s; maximum gage height, 6.46 ft May 25, 1971, backwater from Shobe Canyon; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, about 36,000 ft³/s June 14, 1903, result of slope-area measurement (see WSP 96). Discharge for flood of Feb. 22, 1949, was 1,700 ft³/s, result of slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 52 ft³/s Apr. 29 to May 1, gage height, 3.75 ft; minimum discharge, 0.56 ft³/s May 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	2.7	2.6	2.5	8.3	7.9	15	49	11	3.9	3.8	3.6
2	2.9	2.7	2.6	2.5	8.3	7.9	15	42	11	3.9	3.5	3.6
3	3.0	2.7	2.6	2.5	8.3	8.1	15	42	11	3.9	3.5	3.6
4	2.9	2.7	2.6	2.6	8.3	8.1	15	41	14	3.8	3.5	3.6
5	2.9	2.7	2.6	2.6	8.3	8.1	18	41	16	3.8	3.5	3.6
6	2.8	2.7	2.7	2.3	8.3	8.1	20	30	16	3.9	3.3	3.6
7	2.8	2.6	2.7	2.3	8.3	8.1	21	41	16	3.6	3.2	3.6
8	2.7	2.6	2.7	2.8	8.3	8.1	21	41	16	3.6	3.3	3.6
9	2.7	2.7	2.7	4.8	8.3	8.1	17	38	16	3.6	3.4	3.6
10	2.7	2.7	2.7	5.6	8.3	8.1	12	32	16	3.6	3.4	3.6
11	2.7	2.6	2.7	5.7	8.3	8.1	10	30	16	3.6	3.4	3.6
12	2.7	2.7	2.8	5.8	8.0	8.4	8.1	30	16	3.6	3.4	3.6
13	2.7	2.6	2.7	5.6	7.9	8.8	3.9	30	16	3.6	3.4	3.6
14	2.7	2.6	2.7	5.4	7.9	8.8	3.8	21	16	3.6	3.4	3.6
15	2.7	2.6	2.7	5.3	7.9	8.8	3.7	17	16	3.5	3.7	3.6
16	3.0	2.6	2.8	5.6	7.9	14	3.9	17	16	3.5	3.0	3.6
17	2.7	2.6	2.8	5.3	7.9	19	3.6	18	16	3.5	2.7	3.6
18	2.7	2.6	2.8	5.1	7.9	20	5.7	13	12	3.8	2.7	3.6
19	2.7	2.6	2.8	5.1	7.9	28	9.0	11	16	3.4	2.8	3.6
20	2.7	2.6	2.8	4.8	7.8	37	6.8	11	10	3.3	2.7	3.9
21	2.7	2.6	2.8	4.8	7.9	37	3.4	11	4.0	3.4	3.3	3.6
22	2.7	2.6	2.8	4.7	7.9	37	3.4	11	4.0	3.4	3.5	3.6
23	2.7	2.6	2.8	4.8	7.9	37	4.5	11	3.9	3.5	3.6	3.6
24	2.7	2.6	2.8	4.8	7.9	37	6.1	11	3.9	3.5	3.6	3.6
25	2.7	2.6	2.8	4.8	7.9	37	6.2	11	3.9	3.5	3.6	3.6
26	2.7	2.6	2.8	4.8	7.9	32	6.2	11	3.9	3.5	3.6	3.6
27	2.7	2.6	2.8	4.9	7.9	24	8.2	11	3.9	3.5	3.6	3.5
28	2.7	2.6	2.8	5.0	7.9	22	20	11	3.9	3.5	3.6	3.6
29	2.7	2.6	2.8	7.0	---	18	45	11	3.9	3.5	3.6	4.3
30	2.7	2.6	2.8	8.3	---	15	52	11	3.9	3.5	3.6	4.4
31	2.7	---	2.6	8.3	---	15	---	11	---	3.5	3.6	---
TOTAL	85.3	78.9	84.7	146.4	225.6	552.5	382.5	716	332.2	111.3	104.8	109.7
MEAN	2.75	2.63	2.73	4.72	8.06	17.8	12.7	23.1	11.1	3.59	3.38	3.66
MAX	3.0	2.7	2.8	8.3	8.3	37	52	49	16	3.9	3.8	4.4
MIN	2.7	2.6	2.6	2.3	7.8	7.9	3.4	11	3.9	3.3	2.7	3.5
AC-FT	169	156	168	290	447	1100	759	1420	659	221	208	218

CAL YR 1989 TOTAL 8086.5 MEAN 22.2 MAX 125 MIN 2.6 AC-FT 16040
WTR YR 1990 TOTAL 2929.9 MEAN 8.03 MAX 52 MIN 2.3 AC-FT 5810

WILLOW CREEK BASIN

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14034800 RHEA CREEK NEAR HEPPNER, OR

LOCATION.--Lat 45°15'46", long 119°36'51", in NW 1/4 SW 1/4 sec.32, T.3 S., R.26 E., Morrow County, Hydrologic Unit 17070104, on left bank 150 ft downstream from road bridge, 0.8 mi downstream from Sanford Canyon, 8 mi southwest of Heppner, and at mile 25.6. Prior to Nov. 4, at site 1,000 ft downstream.

DRAINAGE AREA.--120 mi², approximately.

PERIOD OF RECORD.--August 1960 to current year.

REVISED RECORD.--WDR OR-84-1: 1983.

GAGE.--Water-stage recorder. Elevation of gage is 2,320 ft, from topographic map. Prior to May 28, 1976, at site 0.6 mi downstream at different datum and May 28, 1976 to Nov. 3, 1982, at site 1,000 ft downstream at datum 10.5 ft lower.

REMARKS.--Records good except for estimated daily discharges, and those below 2.0 ft³/s, which are fair. No regulation. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--30 years, 22.6 ft³/s, 16,370 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,280 ft³/s June 10, 1969, gage height, 7.05 ft, site and datum then in use, from rating curve extended above 130 ft³/s on basis of slope-area measurement at gage height 6.72 ft; maximum gage height, 7.41 ft Dec. 22, 1964, site and datum then in use; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 230 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 14	1030	(a)	*2.33	Mar. 10	2200	*38	2.15

Minimum discharge, 0.16 ft³/s Aug. 8, 13.

(a) Backwater from ice.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	6.0	4.9	4.0	5.6	13	19	20	19	7.6	.27	4.4
2	3.6	6.2	6.4	3.7	6.0	13	18	19	18	8.3	.25	3.5
3	3.5	6.4	7.4	3.6	5.6	15	17	18	19	9.8	.25	2.7
4	3.3	6.6	6.2	3.6	5.5	16	17	17	20	8.8	.25	2.2
5	3.3	6.6	9.0	3.7	4.9	22	16	16	18	8.5	.25	2.2
6	3.4	6.6	7.6	5.2	6.3	24	15	15	19	9.3	.22	2.5
7	3.4	6.4	6.9	9.1	4.6	23	14	15	21	8.5	.21	2.1
8	3.3	6.3	6.3	17	6.8	25	14	15	19	7.3	.20	2.4
9	3.3	5.9	6.3	15	6.4	24	14	14	18	6.7	.20	2.3
10	3.4	5.7	5.9	15	8.4	33	14	14	19	5.9	.21	1.9
11	3.5	5.5	3.7	12	9.7	34	13	13	18	5.1	.22	.79
12	3.5	7.7	4.6	11	6.0	31	13	12	18	5.2	.20	.40
13	3.5	11	5.2	13	e5.5	29	12	12	18	5.4	.19	1.3
14	3.7	9.1	5.4	13	e5.0	29	11	11	17	4.1	.19	1.9
15	3.6	8.0	5.9	12	e5.2	27	10	11	16	3.6	.22	2.5
16	3.7	8.1	4.7	11	e5.2	25	9.5	9.9	15	3.3	.25	3.4
17	4.0	14	e4.7	11	e5.7	25	9.2	10	14	2.7	.55	3.1
18	4.1	12	e5.0	6.6	e5.8	26	8.6	10	14	2.2	6.4	1.7
19	4.2	10	5.1	8.0	e5.0	26	8.6	9.9	13	1.8	8.5	1.6
20	4.5	9.1	5.3	6.7	e6.5	26	9.2	11	12	1.8	8.0	1.3
21	7.7	8.6	5.5	8.1	8.3	27	9.2	11	11	.82	11	.44
22	8.9	7.9	4.8	9.5	11	27	9.0	11	12	.36	12	.63
23	8.8	7.8	5.2	9.3	13	29	8.6	17	12	.28	5.7	.23
24	9.1	7.9	5.2	5.8	15	28	7.2	17	11	.29	4.6	.22
25	7.3	7.6	4.2	9.4	16	27	7.6	13	10	1.5	4.1	.21
26	6.7	7.4	4.8	8.0	15	26	8.7	12	9.5	2.4	3.4	.25
27	7.4	7.1	e5.0	6.3	14	24	15	12	9.2	1.3	4.3	.37
28	8.2	6.1	e4.2	8.4	13	23	27	18	9.4	.51	4.4	1.3
29	6.9	5.3	3.3	7.8	---	21	22	22	8.6	.34	4.4	1.6
30	6.7	5.6	3.8	7.3	---	20	21	18	8.0	.27	5.1	1.1
31	6.5	---	4.1	5.7	---	19	---	20	---	.36	4.9	---
TOTAL	156.4	228.5	166.6	269.8	225.0	757	397.4	443.8	445.7	124.33	90.93	50.54
MEAN	5.05	7.62	5.37	8.70	8.04	24.4	13.2	14.3	14.9	4.01	2.93	1.68
MAX	9.1	14	9.0	17	16	34	27	22	21	9.8	12	4.4
MIN	3.3	5.3	3.3	3.6	4.6	13	7.2	9.9	8.0	.27	.19	.21
AC-FT	310	453	330	535	446	1500	788	880	884	247	180	100

CAL YR 1989 TOTAL 8683.8 MEAN 23.8 MAX 186 MIN 1.4 AC-FT 17220
WTR YR 1990 TOTAL 3356.00 MEAN 9.19 MAX 34 MIN .19 AC-FT 6660

e Estimated

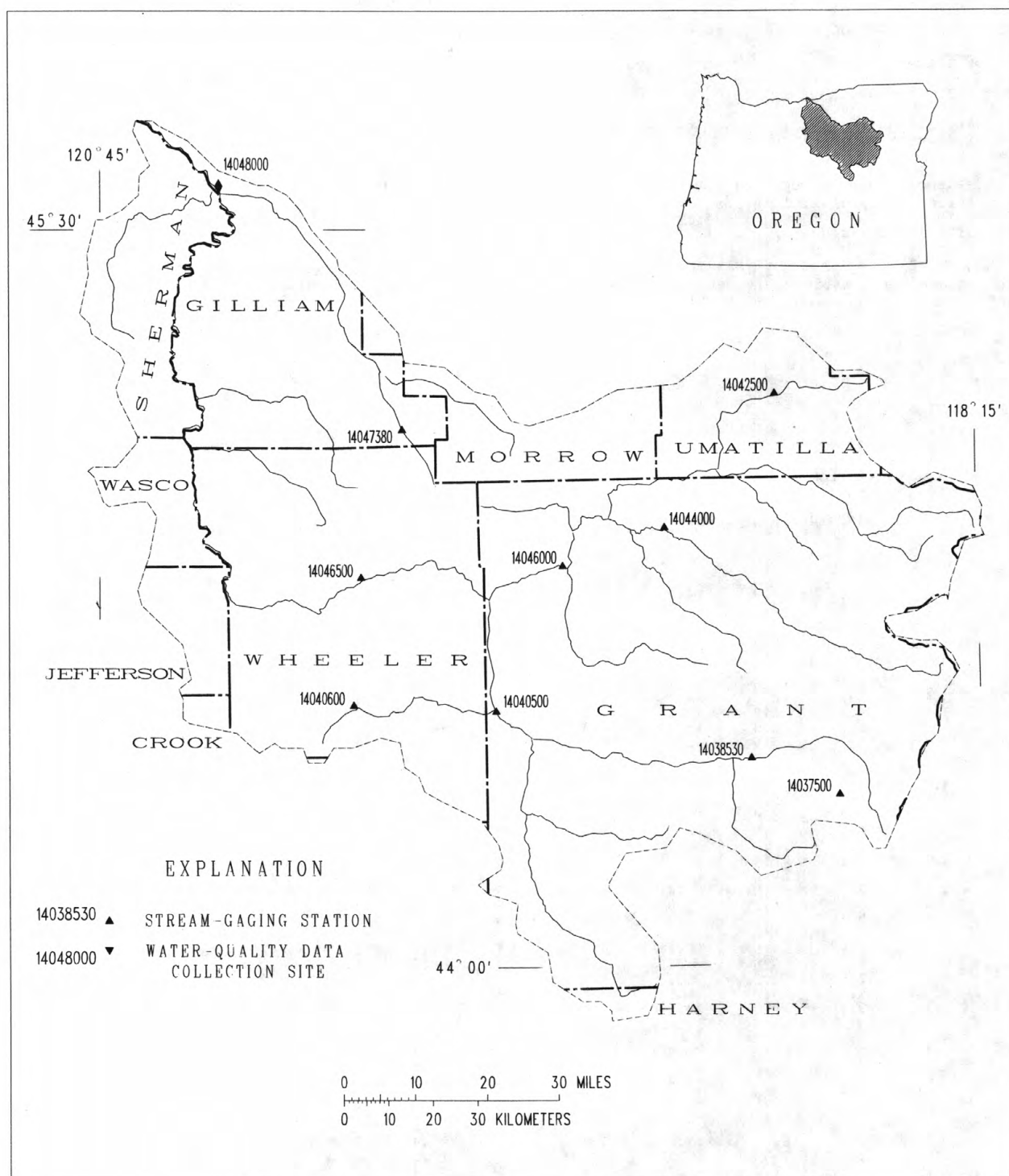


Figure 6.--Location of surface-water and water-quality stations in the John Day River basin.

JOHN DAY RIVER BASIN

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14037500 STRAWBERRY CREEK ABOVE SLIDE CREEK, NEAR PRAIRIE CITY, OR

LOCATION.--Lat 44°20'30", long 118°39'20", in SE 1/4 NW 1/4 sec.20, T.14 S., R.34 E., Grant County, Hydrologic Unit 17070201, on left bank 100 ft upstream from Slide Creek, 8.5 mi south of Prairie City, and at mile 9.0.

DRAINAGE AREA.--7.00 mi².

PERIOD OF RECORD.--October 1930 to current year. Prior to October 1944, published as "above South Fork, near Prairie City."

REVISED RECORDS.--WSP 1488: 1932-33. WSP 1738: Drainage area.

GAGE.--Water-stage recorder and log control. Datum of gage is 4,909.57 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. Flow affected by natural storage in Strawberry Lake. No diversion upstream from station.

AVERAGE DISCHARGE.--60 years, 12.8 ft³/s, 24.83 in/yr, 9,270 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 354 ft³/s May 31, 1983, gage height, 2.45 ft, from rating curve extended above 190 ft³/s; maximum gage height, 3.23 ft May 24, 1956 (backwater from logs); minimum discharge, 1.0 ft³/s Mar. 20, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 36 ft³/s several days in May and June, gage height, 1.51 ft; minimum discharge, 1.7 ft³/s Mar. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	2.9	3.2	2.4	2.1	2.1	4.1	23	35	22	6.8	3.2
2	3.2	2.7	3.2	2.4	2.1	2.1	5.0	23	35	21	6.5	3.1
3	3.2	2.7	3.2	2.4	2.2	2.1	6.1	23	35	20	6.3	2.9
4	3.0	2.9	3.5	2.4	2.2	2.1	7.0	23	34	19	6.3	2.9
5	2.9	2.9	3.7	2.4	2.2	2.1	7.3	23	34	19	5.9	e2.9
6	2.9	2.9	3.5	2.4	2.4	2.1	7.6	25	34	18	5.9	e2.9
7	2.9	2.8	3.5	2.8	2.4	2.2	7.9	24	35	17	5.6	2.9
8	2.9	2.7	3.5	2.8	2.2	2.2	8.1	24	34	16	5.4	2.9
9	2.9	3.0	3.4	2.7	2.1	2.1	8.5	24	33	16	5.2	2.9
10	2.7	2.9	3.2	2.7	2.1	2.2	8.5	23	34	15	5.0	2.9
11	2.7	2.9	3.5	2.7	2.1	1.9	8.7	24	34	14	5.0	2.8
12	2.7	2.9	3.5	2.6	2.1	1.9	9.1	23	34	14	5.0	2.7
13	2.8	3.0	3.5	2.4	e2.0	e1.9	9.8	23	33	14	4.6	2.7
14	2.9	3.2	3.4	2.4	e2.0	1.9	10	23	33	14	4.6	2.7
15	2.7	3.3	3.2	2.4	e2.3	1.9	11	23	31	13	4.6	2.7
16	2.7	3.2	3.2	2.4	e2.6	1.8	13	23	30	12	4.5	2.6
17	2.7	3.3	3.2	2.4	2.7	1.9	14	23	28	12	4.4	2.4
18	2.7	3.2	3.2	2.4	3.0	2.2	15	23	28	11	4.3	2.4
19	2.7	3.2	3.2	2.4	3.2	2.5	15	23	27	11	4.4	2.4
20	2.6	3.2	3.1	2.6	3.2	2.9	17	22	27	10	4.5	2.4
21	2.9	3.2	2.9	2.5	2.5	3.1	17	22	28	10	4.6	2.4
22	2.9	3.2	2.9	2.4	2.1	3.4	18	23	29	10	4.2	2.4
23	2.9	3.3	2.9	2.4	2.1	3.9	19	23	30	9.8	4.2	2.4
24	2.7	3.2	2.7	2.4	2.1	3.9	18	23	29	9.4	4.1	2.4
25	2.6	3.2	2.7	2.4	2.1	3.9	19	23	28	9.0	4.0	2.4
26	2.5	3.2	2.7	2.4	2.1	3.8	18	23	27	8.5	3.9	2.5
27	2.5	3.2	2.7	2.4	2.1	3.5	20	23	25	8.5	3.9	2.4
28	2.5	3.2	2.7	2.4	2.1	3.5	23	25	24	8.3	3.9	2.4
29	2.6	3.4	2.4	2.1	---	3.5	23	33	24	7.9	3.8	2.3
30	2.9	3.4	2.4	2.1	---	3.5	23	34	23	7.6	3.6	2.1
31	2.9	---	2.4	2.1	---	3.6	---	34	---	7.1	3.3	---
TOTAL	86.9	92.3	96.3	75.7	64.4	81.7	390.7	751	915	404.1	148.3	79.0
MEAN	2.80	3.08	3.11	2.44	2.30	2.64	13.0	24.2	30.5	13.0	4.78	2.63
MAX	3.2	3.4	3.7	2.8	3.2	3.9	23	34	35	22	6.8	3.2
MIN	2.5	2.7	2.4	2.1	2.0	1.8	4.1	22	23	7.1	3.3	2.1
AC-FT	172	183	191	150	128	162	775	1490	1810	802	294	157
CFSM	.40	.44	.44	.35	.33	.38	1.86	3.46	4.36	1.86	.68	.38
IN.	.46	.49	.51	.40	.34	.43	2.08	3.99	4.86	2.15	.79	.42

CAL YR 1989 TOTAL 3824.4 MEAN 10.5 MAX 82 MIN 1.5 AC-FT 7590 CFSM 1.50 IN. 20.32
WTR YR 1990 TOTAL 3185.4 MEAN 8.73 MAX 35 MIN 1.8 AC-FT 6320 CFSM 1.25 IN. 16.93

e Estimated

JOHN DAY RIVER BASIN

14038530 JOHN DAY RIVER NEAR JOHN DAY, OR

LOCATION.--Lat 44°25'07", long 118°54'19", in SW 1/4 SE 1/4 sec.19, T.13 S., R.32 E., Grant County, Hydrologic Unit 17070201, on left bank 1,200 ft downstream from Dog Creek, 2.5 mi east of John Day, and at mile 250.8.

DRAINAGE AREA.--386 mi².

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,130.56 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation upstream. Many diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--22 years, 209 ft³/s, 151,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,830 ft³/s June 9, 1969, gage height, 10.80 ft, from floodmark; minimum discharge, 3.5 ft³/s Aug. 26-28, 1969.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	0300	*853	*5.69	No other peak greater than base discharge.			
Minimum discharge, 13 ft ³ /s Sept. 12-14.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	101	101	104	97	97	143	181	324	378	54	28	41
2	97	101	107	99	96	143	196	314	311	53	24	40
3	94	103	109	98	95	153	209	307	285	61	22	35
4	93	105	121	98	95	164	215	289	272	65	20	31
5	92	105	136	100	88	171	215	274	245	64	20	26
6	91	104	129	103	97	152	208	274	246	59	16	20
7	77	106	124	148	89	147	205	270	375	56	14	16
8	77	103	122	179	97	171	207	251	271	55	16	17
9	78	105	120	147	99	160	202	210	248	51	17	17
10	83	108	116	138	113	240	191	173	243	51	19	17
11	84	108	106	133	117	247	186	148	234	46	18	15
12	90	109	e100	126	112	199	181	141	221	47	19	14
13	92	112	e105	127	97	174	169	133	256	44	19	13
14	94	113	e108	126	e80	170	168	134	210	42	18	14
15	92	108	108	121	e74	157	175	120	218	42	18	16
16	92	109	107	117	e90	150	206	105	189	39	18	17
17	92	120	106	114	e80	152	226	96	189	34	19	19
18	92	118	107	104	e76	179	226	80	173	27	28	19
19	95	114	105	e100	e76	203	206	80	144	27	36	21
20	94	112	106	e103	e80	221	205	100	127	29	44	22
21	94	112	102	109	e98	219	204	116	107	27	62	20
22	100	110	100	105	127	217	239	110	95	25	70	24
23	103	111	100	103	132	237	304	140	90	22	56	28
24	108	114	99	96	148	221	269	167	85	22	49	31
25	104	113	100	e90	153	202	243	140	77	25	48	30
26	102	114	e100	e94	161	193	224	131	71	35	52	32
27	121	112	e98	94	156	185	351	132	65	31	52	32
28	116	108	98	97	148	179	617	196	66	25	50	33
29	107	106	97	98	---	176	417	279	65	27	45	34
30	105	106	100	99	---	174	355	329	60	30	41	33
31	105	---	99	97	---	175	---	487	---	28	41	---
TOTAL	2965	3270	3339	3460	2971	5674	7200	6050	5616	1243	999	727
MEAN	95.6	109	108	112	106	183	240	195	187	40.1	32.2	24.2
MAX	121	120	136	179	161	247	617	487	378	65	70	41
MIN	77	101	97	90	74	143	168	80	60	22	14	13
AC-FT	5880	6490	6620	6860	5890	11250	14280	12000	11140	2470	1980	1440

CAL YR 1989 TOTAL 80503 MEAN 221 MAX 1850 MIN 25 AC-FT 159700
WTR YR 1990 TOTAL 43514 MEAN 119 MAX 617 MIN 13 AC-FT 86310

e Estimated

JOHN DAY RIVER BASIN

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14040500 JOHN DAY RIVER AT PICTURE GORGE, NEAR DAYVILLE, OR

LOCATION.--Lat 44°31'15", long 119°37'30", in SW 1/4 sec.17, T.12 S., R.26 E., Grant County, Hydrologic Unit 17070201, on right bank 0.7 mi upstream from Rock Creek, 5.5 mi northwest of Dayville, and at mile 205.1.

DRAINAGE AREA.--1,680 mi², approximately.

PERIOD OF RECORD.--April 1926 to current year. Monthly discharge only April 1926, published in WSP 1318.

REVISED RECORDS.--WSP 1218: 1950. WSP 1348: Drainage area. WSP 1448: 1926, 1928, 1932(M), 1936.

GAGE.--Water-stage recorder. Datum of gage is 2,229.84 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 11, 1926, nonrecording gage and Oct. 11, 1926, to Sept. 30, 1930, water-stage recorder at same site at datum 2.50 ft higher. Oct. 1, 1930, to Aug. 28, 1970, at datum 2.00 ft higher.

REMARKS.--No estimated daily discharges. Records good except those between 15 and 100 ft³/s, which are fair. No regulation. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--64 years, 496 ft³/s, 359,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,170 ft³/s Dec. 22, 1964, gage height, 14.97 ft; minimum discharge, 1.0 ft³/s for several days in August and September 1930, Aug. 8, 9, 1936, Sept. 9, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	1230	*1,170	*6.51				
Minimum discharge, 5.5 ft ³ /s Aug. 4.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	157	198	198	178	212	328	489	689	707	76	11	19
2	159	194	201	183	210	324	514	638	569	75	11	18
3	159	195	204	175	208	334	519	615	509	64	11	19
4	156	198	208	177	207	407	539	568	476	63	6.2	18
5	159	200	224	181	196	399	527	504	433	64	6.4	17
6	158	200	238	183	202	375	519	459	405	48	5.9	18
7	155	199	230	212	199	355	504	449	509	47	6.3	18
8	148	200	225	335	204	391	485	449	495	44	6.5	18
9	149	201	223	352	213	405	471	408	426	41	6.6	17
10	151	201	220	315	214	485	447	364	404	40	6.7	17
11	150	202	204	297	234	656	399	314	413	37	7.6	18
12	155	204	191	281	240	509	397	290	360	34	7.2	21
13	163	208	199	273	220	453	378	278	380	32	6.9	21
14	173	209	214	285	195	438	344	272	369	31	7.0	22
15	171	209	211	276	185	411	327	263	352	28	7.1	23
16	174	207	203	263	220	389	328	232	333	24	7.2	22
17	177	213	191	254	205	386	353	199	310	23	8.1	22
18	178	223	193	239	201	489	354	174	300	25	9.1	25
19	177	219	198	216	189	617	340	158	269	30	9.9	24
20	179	214	204	208	206	671	343	165	224	26	9.9	24
21	181	210	196	212	220	671	361	194	201	25	11	19
22	186	208	197	233	238	651	360	202	182	24	13	17
23	193	207	181	229	247	686	443	228	156	22	15	18
24	197	210	182	213	275	685	469	270	138	21	20	20
25	197	212	182	211	317	616	436	263	120	21	23	20
26	195	212	182	219	357	569	421	254	108	19	23	22
27	206	210	183	211	358	548	441	257	103	17	31	23
28	221	205	178	208	339	524	948	274	90	18	25	22
29	211	195	179	215	---	505	883	403	74	17	19	22
30	204	196	175	219	---	492	769	484	78	17	18	22
31	201	---	178	215	---	483	---	579	---	13	20	---
TOTAL	5440	6159	6192	7268	6511	15252	14108	10896	9493	1066	375.6	606
MEAN	175	205	200	234	233	492	470	351	316	34.4	12.1	20.2
MAX	221	223	238	352	358	686	948	689	707	76	31	25
MIN	148	194	175	175	185	324	327	158	74	13	5.9	17
AC-FT	10790	12220	12280	14420	12910	30250	27980	21610	18830	2110	745	1200

CAL YR 1989 TOTAL 230291 MEAN 631 MAX 4260 MIN 18 AC-FT 456800
WTR YR 1990 TOTAL 83366.6 MEAN 228 MAX 948 MIN 5.9 AC-FT 165400

JOHN DAY RIVER BASIN

14040600 MOUNTAIN CREEK NEAR MITCHELL, OR

LOCATION.--Lat 44°32'06", long 120°01'45", in NW 1/4 NE 1/4 sec.13, T.12 S., R.22 E., Wheeler County, Hydrologic Unit 17070201, on left bank about 1.5 mi southwest of Highway 26, and about 7 mi southeast of Mitchell.

DRAINAGE AREA.--20.0 mi².

PERIOD OF RECORD.--October 1985 to current year. May 1966 to September 1985 available from Oregon Water Resources Department.

GAGE.--Water-stage recorder.

REMARKS.--Records good except those for November, which are fair and Dec. 1 to Mar. 17, which are poor. Several diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--24 years (1966-90), 11.2 ft³/s, 8,110 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 538 ft³/s June 9, 1969, gage height, 2.46 ft; maximum gage height, 3.57 ft Feb. 14, 1981, backwater from ice; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 82 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 7	2130	unknown	*a2.40				
Minimum discharge, 0.01 ft ³ /s Aug. 9.							
a Backwater from ice.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	e2.4	e2.5	3.6	e6.0	e7.2	13	7.4	9.5	1.3	.08	.32
2	1.1	e2.4	e2.7	e3.3	e5.5	7.2	13	6.9	7.3	1.4	.07	.27
3	1.0	2.3	3.0	e3.1	e4.5	7.4	13	6.4	7.4	1.9	.08	.27
4	1.0	2.3	3.5	e3.1	e4.3	7.1	11	5.4	7.1	1.4	.07	.27
5	1.0	2.2	5.1	e3.5	e4.3	7.1	9.8	4.7	5.9	1.1	.06	.25
6	.99	2.1	3.1	e4	e3.7	6.0	8.6	3.8	6.6	1.0	.04	.20
7	.91	2.1	2.6	e8.0	e2.1	6.7	9.6	3.7	7.1	1.0	.04	.20
8	.90	2.0	2.5	e20	e2.5	7.5	9.1	4.7	5.4	.86	.02	.20
9	.86	2.2	2.2	e13	e4.0	7.3	8.2	4.2	5.2	.66	.02	.20
10	.86	2.1	e1.9	9.8	e5.4	12	7.7	3.5	4.9	.44	.03	.17
11	.86	1.9	e1.6	7.8	e5.6	10	7.8	2.8	4.6	.49	.05	.13
12	.86	1.9	1.5	6.6	e5.4	8.2	7.5	2.6	4.0	.85	.05	.11
13	.86	2.0	2.3	7.6	e4.5	e10	6.3	2.7	4.4	.76	.03	.10
14	.89	1.9	3.1	6.6	e4.0	7.1	6.1	2.6	4.1	.55	.02	.12
15	.93	2.2	2.8	5.5	e3.8	6.5	5.4	2.6	3.5	.48	.02	.13
16	.93	2.8	e2.5	4.9	e5.0	6.0	5.8	2.5	3.3	.42	.05	.18
17	.97	4.9	e2.4	4.4	e4.2	7.2	5.8	2.0	2.9	.32	.09	.19
18	1.1	3.2	e2.3	e4.1	e3.8	15	5.8	2.0	2.7	.31	.23	.18
19	1.1	2.6	e2.3	e4.5	e3.4	19	5.3	2.0	2.4	.25	.27	.17
20	1.2	2.4	2.4	e5.2	e3.8	19	5.5	2.6	2.3	.22	.31	.16
21	2.4	2.3	3.8	e6.0	e4.7	18	4.8	2.7	2.2	.21	.43	.15
22	2.2	2.5	e5.0	e6.8	e5.4	18	4.9	3.4	2.4	.14	.37	.14
23	2.6	2.6	e4.3	e5.4	e5.8	21	7.3	7.5	2.3	.11	.24	.14
24	2.1	2.7	e3.5	e5.6	7.2	17	5.6	5.6	1.9	.08	.21	.17
25	2.1	2.5	e3.2	e6.4	8.2	13	4.7	4.4	1.9	.13	.25	.55
26	3.1	e2.4	3.0	e6.2	7.6	13	4.4	3.8	1.6	.22	.27	.39
27	3.5	e2.3	3.7	e5.8	e7.2	12	10	4.2	1.6	.19	.27	.31
28	2.9	e2.1	2.5	e6.0	e7.2	12	18	11	1.6	.11	.25	.18
29	e2.7	e2.0	2.0	e6.0	---	11	11	13	1.6	.08	.28	.13
30	e2.6	e2.0	3.2	e6.0	---	11	8.9	9.8	1.4	.08	.35	.13
31	2.5	---	3.5	e6.0	---	12	---	9.5	---	.09	.35	---
TOTAL	48.12	71.3	90.0	194.8	139.1	341.5	243.9	150.0	119.1	17.15	4.90	6.11
MEAN	1.55	2.38	2.90	6.28	4.97	11.0	8.13	4.84	3.97	.55	.16	.20
MAX	3.5	4.9	5.1	20	8.2	21	18	13	9.5	1.9	.43	.55
MIN	.86	1.9	1.5	3.1	2.1	6.0	4.4	2.0	1.4	.08	.02	.10
AC-FT	95	141	179	386	276	677	484	298	236	34	9.7	12

CAL YR 1989 TOTAL 4992.58 MEAN 13.7 MAX 118 MIN .68 AC-FT 9900
WTR YR 1990 TOTAL 1425.98 MEAN 3.91 MAX 21 MIN .02 AC-FT 2830

e Estimated

JOHN DAY RIVER BASIN

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14042500 CAMAS CREEK NEAR UKIAH, OR

LOCATION.--Lat 45°09'25", long 118°49'10", in SE 1/4 SE 1/4 sec.3, T.5 S., R.32 E., Umatilla County, Hydrologic Unit 17070202, on right bank 1.2 mi upstream from Cable Creek, 5.8 mi east of Ukiah, and at mile 18.7.

DRAINAGE AREA.--121 mi².

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

REVISED RECORDS.--WSP 1448: 1916, 1920, 1922(M), 1924.

GAGE.--Water-stage recorder. Datum of gage is 3,588.61 ft above National Geodetic Vertical Datum of 1929 (levels by State Highway Department). May 1, 1914, to June 30, 1924, nonrecording gage and Mar. 1, 1932, to July 2, 1940, water-stage recorder at site 1.2 mi downstream at different datum.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--54 years (water years 1915-17, 1922-23, 1942-90), 95.6 ft³/s, 69,260 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,840 ft³/s Jan. 30, 1965, gage height, 5.21 ft; maximum gage height, 5.92 ft Jan. 24, 1982 (ice jam); minimum discharge recorded, 1.0 ft³/s Aug. 9, 1932, June 24 to July 2, 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 550 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 23	1600	(a)	*2.47	Apr. 28	0230	*485	2.33

Minimum discharge, 2.9 ft³/s Aug. 14, 15.

(a) Backwater from ice.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.4	8.5	e8.0	e9.4	e19	e74	214	402	182	22	5.7	4.5
2	6.5	8.7	e9.4	e10	e20	e80	246	420	165	23	5.4	4.4
3	6.1	7.8	e11	e11	e20	86	255	398	157	24	5.3	4.3
4	5.9	8.5	e14	e12	e19	90	240	352	150	21	5.0	4.3
5	5.9	9.4	22	e13	e18	108	217	309	131	19	4.7	4.1
6	5.9	8.8	21	e16	e20	110	200	268	136	18	4.6	3.9
7	5.6	8.6	e19	e18	e19	121	196	223	152	17	4.1	4.4
8	5.6	8.2	e17	e16	e18	178	201	193	131	16	4.1	5.2
9	5.6	8.6	e16	e19	e19	153	181	161	120	14	4.0	5.0
10	5.6	9.0	e15	e20	e24	209	163	135	127	13	4.0	4.4
11	5.6	8.4	e13	e19	e22	171	160	120	120	12	3.9	3.7
12	5.6	11	e10	e17	e19	135	161	106	118	12	3.7	3.7
13	5.6	14	e8.0	e18	e16	114	153	96	119	11	3.8	3.7
14	5.9	12	e7.4	e19	e14	113	150	89	110	10	3.1	3.7
15	5.4	10	e9.6	e19	e12	109	153	81	100	9.8	3.3	3.7
16	5.5	10	e11	e19	e15	111	159	73	92	9.1	3.6	3.8
17	5.9	16	e9.7	e20	e15	150	157	66	100	8.3	4.1	4.0
18	5.6	15	e9.9	e20	e13	253	141	60	93	8.4	5.9	4.0
19	6.1	13	e10	e17	e12	332	125	57	80	8.2	7.9	4.0
20	6.3	12	e10	e14	e14	399	115	66	71	7.9	8.7	3.9
21	7.1	12	e10	e17	e25	362	104	67	64	7.6	9.5	3.9
22	8.8	11	e10	e19	e35	343	97	61	58	7.6	10	4.0
23	8.6	11	e10	e23	e42	351	125	72	51	7.1	7.4	3.8
24	8.4	11	e10	e25	e46	287	118	80	46	6.9	6.1	4.0
25	8.6	11	e10	e19	e51	240	114	68	40	7.6	5.7	4.1
26	8.3	11	e9.5	e20	e55	217	113	63	35	7.6	6.1	5.5
27	10	10	e8.9	e21	e60	200	174	62	32	7.0	5.5	5.8
28	10	e12	e9.2	e20	e66	189	435	82	30	6.3	4.6	5.1
29	9.9	e9.2	e9.1	e20	---	181	379	142	27	6.0	4.5	4.6
30	8.5	e7.3	e9.1	e21	---	181	374	152	25	6.6	4.8	4.5
31	8.2	---	e9.1	e20	---	190	---	169	---	6.1	4.6	---
TOTAL	213.0	313.0	355.9	551.4	728	5837	5620	4693	2862	360.1	163.7	128.0
MEAN	6.87	10.4	11.5	17.8	26.0	188	187	151	95.4	11.6	5.28	4.27
MAX	10	16	22	25	66	399	435	420	182	24	10	5.8
MIN	5.4	7.3	7.4	9.4	12	74	97	57	25	6.0	3.1	3.7
AC-FT	422	621	706	1090	1440	11580	11150	9310	5680	714	325	254

CAL YR 1989 TOTAL 38603.8 MEAN 106 MAX 1360 MIN 3.2 AC-FT 76570
WTR YR 1990 TOTAL 21825.1 MEAN 59.8 MAX 435 MIN 3.1 AC-FT 43290

e Estimated

JOHN DAY RIVER BASIN

14044000 MIDDLE FORK JOHN DAY RIVER AT RITTER, OR

LOCATION.--Lat 44°53'20", long 119°08'25", in SW 1/4 NW 1/4 sec.8, T.8 S., R.30 E., Grant County, Hydrologic Unit 17070203, on left bank 0.2 mi south of Ritter, 0.8 mi downstream from Twelvemile Creek, and at mile 14.9.

DRAINAGE AREA.--515 mi².

PERIOD OF RECORD.--October 1929 to current year.

REVISED RECORDS.--WSP 739: 1931. WSP 1218: 1950. WSP 1448: 1930-32, 1937, drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,544.56 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--61 years, 253 ft³/s, 183,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,730 ft³/s Jan. 30, 1965, gage height, 8.39 ft, from rating curve extended above 2,200 ft³/s; maximum gage height, 9.13 ft Feb. 1, 1963, ice jam; minimum discharge, 0.90 ft³/s Aug. 19, 20, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	0600	*1,540	*5.63	No other peak greater than base discharge.			
Minimum discharge recorded, 13 ft ³ /s Dec. 13, but may have been lower during period of no gage-height record.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	52	59	e51	65	167	391	744	449	79	31	30
2	45	47	58	e53	67	167	446	706	406	76	30	30
3	45	51	63	e56	63	187	493	714	377	82	29	29
4	44	54	71	e57	64	227	494	677	353	77	28	28
5	44	60	86	57	48	224	474	645	319	72	27	29
6	44	59	91	65	56	242	450	626	309	68	26	28
7	43	58	85	76	62	235	437	557	367	66	26	27
8	43	57	79	99	69	345	452	507	323	64	25	30
9	42	56	77	146	69	290	419	455	299	60	24	32
10	42	61	73	125	83	358	380	416	294	58	24	29
11	41	61	52	124	111	374	376	385	283	56	24	27
12	41	60	26	111	112	278	397	358	261	54	23	26
13	41	70	e30	105	89	233	379	332	299	54	23	26
14	41	69	56	111	e79	237	382	313	280	48	22	26
15	41	63	62	107	e74	220	407	294	256	43	23	25
16	41	60	e54	97	e78	209	453	272	232	42	23	25
17	42	71	e52	90	72	245	483	258	232	40	25	26
18	42	94	e51	74	e65	432	467	249	224	38	28	27
19	42	77	e50	56	e61	587	436	235	199	37	34	26
20	42	71	e50	53	e58	632	425	244	182	37	45	27
21	43	67	e54	61	82	577	399	256	167	36	49	28
22	51	65	e58	72	93	558	382	232	153	34	57	27
23	58	63	e59	93	146	667	430	261	141	34	50	27
24	59	68	e58	62	184	608	434	288	126	33	39	27
25	56	65	e56	64	197	494	369	257	117	34	35	27
26	55	63	e54	72	213	439	359	226	107	36	34	28
27	60	63	e52	67	199	402	424	220	100	36	36	32
28	69	54	e50	67	176	378	1320	257	97	34	34	33
29	60	31	e49	70	---	363	982	360	90	32	32	30
30	53	57	e48	68	---	355	802	384	83	33	31	28
31	54	---	e49	66	---	358	---	405	---	33	30	---
TOTAL	1468	1847	1812	2475	2735	11088	14542	12133	7125	1526	967	840
MEAN	47.4	61.6	58.5	79.8	97.7	358	485	391	237	49.2	31.2	28.0
MAX	69	94	91	146	213	667	1320	744	449	82	57	33
MIN	41	31	26	51	48	167	359	220	83	32	22	25
AC-FT	2910	3660	3590	4910	5420	21990	28840	24070	14130	3030	1920	1670

CAL YR 1989 TOTAL 125045 MEAN 343 MAX 2880 MIN 26 AC-FT 248000
WTR YR 1990 TOTAL 58558 MEAN 160 MAX 1320 MIN 22 AC-FT 116100

e Estimated

JOHN DAY RIVER BASIN

117

14046000 NORTH FORK JOHN DAY RIVER AT MONUMENT, OR

LOCATION.--Lat 44°48'50", long 119°25'50", in SE 1/4 sec.2, T.9 S., R.27 E., Grant County, Hydrologic Unit 17070202, on right bank just downstream from entrance to canyon, 0.7 mi downstream from Cottonwood Creek, 0.8 mi west of Monument, and at mile 15.3.

DRAINAGE AREA.--2,520 mi², approximately.

PERIOD OF RECORD.--March 1925 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 754: 1932(M). WSP 1448: 1927, 1931(M), 1949.

GAGE.--Water-stage recorder. Datum of gage is 1,959.64 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 24, 1925, nonrecording 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.

REMARKS.--Records good. Very slight regulation by small reservoirs upstream. Many small diversions for irrigation upstream from station. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--65 years, 1,282 ft³/s, 928,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,400 ft³/s Jan. 30, 1965, gage height, 18.45 ft, from rating curve extended above 17,000 ft³/s; minimum discharge, 6 ft³/s sometime during period Nov. 2-13, 1936 (result of freezeup); minimum daily, 17 ft³/s Dec. 12, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	1100	*6,230	*8.20	No other peak greater than base discharge.			
Minimum discharge, 51 ft ³ /s Dec. 14.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	152	199	166	178	274	798	e2150	3790	2290	466	141	119
2	153	178	187	216	269	795	e2550	3890	2090	441	134	116
3	159	164	232	219	267	882	e2870	4200	1940	447	124	114
4	156	195	290	213	258	1080	e2900	4110	1890	450	118	109
5	154	211	344	216	233	1120	e2790	3900	1720	406	114	108
6	153	243	458	226	221	1170	2660	3730	1610	375	109	108
7	151	229	409	283	231	1110	2570	3250	1970	353	105	106
8	147	217	361	401	253	1360	2680	2910	1800	341	103	103
9	146	209	341	560	271	1410	2540	2590	1640	317	101	111
10	145	213	322	580	291	2170	2280	2260	1580	303	96	112
11	143	259	259	551	398	2390	2210	2030	1670	309	94	102
12	142	250	185	512	507	1660	2300	1860	1450	294	93	96
13	141	261	104	485	445	1370	2260	1710	1600	275	90	92
14	141	303	88	521	346	1290	2220	1590	1510	261	86	88
15	141	277	154	542	325	1230	2320	1500	1370	237	84	87
16	141	237	251	495	360	1140	2550	1370	1270	216	86	87
17	141	256	186	447	334	1170	2710	1270	1220	202	92	89
18	143	361	168	381	292	1820	2600	1200	1290	191	103	90
19	145	360	160	258	259	2770	2410	1150	1170	182	117	91
20	147	307	159	196	266	3310	2270	1150	1080	174	159	90
21	155	282	183	194	371	3220	2130	1300	1010	169	241	89
22	162	272	196	306	402	3090	1970	1210	947	160	232	92
23	186	253	234	433	476	3340	2170	1260	895	154	238	92
24	218	249	255	316	657	e3030	2350	1440	818	151	197	89
25	227	282	197	286	836	e2520	1960	1360	744	151	160	88
26	213	250	172	309	953	e2300	1930	1210	678	156	148	93
27	213	255	153	284	912	e2100	1890	1160	618	160	147	100
28	233	229	178	286	828	e2000	4860	1270	580	153	148	108
29	238	169	177	292	---	e1920	4460	1860	545	144	136	110
30	205	111	164	288	---	e1890	3850	2050	504	135	129	103
31	177	---	162	273	---	e1930	---	2090	---	146	122	---
TOTAL	5168	7281	6895	10747	11535	57385	77410	65670	39499	7919	4047	2982
MEAN	167	243	222	347	412	1851	2580	2118	1317	255	131	99.4
MAX	238	361	458	580	953	3340	4860	4200	2290	466	241	119
MIN	141	111	88	178	221	795	1890	1150	504	135	84	87
AC-FT	10250	14440	13680	21320	22880	113800	153500	130300	78350	15710	8030	5910

CAL YR 1989 TOTAL 629462 MEAN 1725 MAX 14500 MIN 88 AC-FT 1249000
WTR YR 1990 TOTAL 296538 MEAN 812 MAX 4860 MIN 84 AC-FT 588200

e Estimated

JOHN DAY RIVER BASIN

14046500 JOHN DAY RIVER AT SERVICE CREEK, OR

LOCATION.--Lat 44°47'38", long 120°00'20", in NW 1/4 NE 1/4 sec.18, T.9 S., R.23 E., Wheeler County, Hydrologic Unit 17070204, on left bank 0.2 mi downstream from bridge on State Highway 207, 0.8 mi downstream from Service Creek, 0.5 mi southwest of town of Service Creek, and at mile 156.7.

DRAINAGE AREA.--5,090 mi², approximately.

PERIOD OF RECORD.--March 1925 to September 1926, October 1929 to current year. 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 National Geodetic Vertical Datum of 1929. See WSP 1738 for history of changes prior to Feb. 24, 1957.

REMARKS.--No estimated daily discharges. Records good. Slight regulation by several small reservoirs upstream from station. Many small diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--62 years, 1,919 ft³/s, 1,390,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,200 ft³/s Dec. 23, 1964, gage height, 17.85 ft, from rating curve extended above 14,000 ft³/s on basis of slope-area measurement of peak flow; minimum discharge, 6.0 ft³/s Aug. 23, 24, 1973.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 7,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	2030	*6,980	*7.63				
Minimum discharge, 54 ft ³ /s Aug. 11, 15.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	332	438	381	415	519	1150	2610	4600	3050	615	139	131
2	337	458	422	446	516	1120	3000	4570	2950	583	134	130
3	344	433	470	489	511	1160	3420	4850	2700	571	129	130
4	355	422	526	475	506	1380	3610	4820	2580	573	121	129
5	354	457	592	459	493	1520	3490	4590	2430	554	109	123
6	354	479	679	482	462	1590	3330	4330	2250	512	96	120
7	350	508	764	502	463	1510	3180	3960	2370	465	86	112
8	342	490	703	652	465	1540	3170	3540	2660	437	83	115
9	328	481	657	964	502	1960	3190	3220	2310	415	81	112
10	326	475	640	1010	518	1900	2890	2840	2160	388	80	110
11	325	485	610	965	552	3520	2670	2540	2230	366	74	117
12	322	525	494	913	698	2560	2680	2330	2050	373	69	107
13	329	523	401	844	752	2000	2720	2160	1970	356	65	91
14	340	539	365	842	623	1740	2580	1990	2100	321	62	88
15	347	573	364	884	534	1740	2610	1890	1900	306	57	84
16	347	542	446	862	558	1580	2740	1760	1760	272	56	87
17	350	518	496	783	581	1530	3030	1590	1630	244	64	90
18	355	545	423	729	545	1900	3010	1470	1630	219	75	92
19	359	667	430	618	497	3140	2830	1390	1600	205	99	99
20	361	628	409	495	478	3900	2630	1340	1430	201	124	103
21	379	584	425	434	537	4100	2560	1470	1310	193	217	101
22	390	565	457	472	642	3920	2360	1520	1220	182	326	100
23	407	555	471	601	706	4000	2390	1500	1150	167	289	97
24	442	538	491	657	803	4100	2830	1690	1050	161	291	95
25	475	547	496	537	1050	3490	2550	1830	949	161	245	97
26	485	565	445	542	1250	3080	2320	1610	862	161	211	98
27	475	538	417	555	1320	2840	2330	1510	795	165	192	100
28	489	542	413	523	1230	2690	4340	1550	747	166	188	102
29	517	504	430	534	---	2560	5830	1980	707	158	182	111
30	506	433	452	545	---	2490	4930	2640	657	145	163	120
31	468	---	409	535	---	2480	---	2760	---	136	145	---
TOTAL	11890	15557	15178	19764	18311	74190	91830	79840	53207	9771	4252	3191
MEAN	384	519	490	638	654	2393	3061	2575	1774	315	137	106
MAX	517	667	764	1010	1320	4100	5830	4850	3050	615	326	131
MIN	322	422	364	415	462	1120	2320	1340	657	136	56	84
AC-FT	23580	30860	30110	39200	36320	147200	182100	158400	105500	19380	8430	6330
CAL YR 1989	TOTAL 903893	MEAN 2476	MAX 17800	MIN 110	AC-FT 1793000							
WTR YR 1990	TOTAL 396981	MEAN 1088	MAX 5830	MIN 56	AC-FT 787400							

JOHN DAY RIVER BASIN

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14047380 LONE ROCK CREEK NEAR LONEROCK, OR

LOCATION.--Lat 45°05'30", long 119°53'10", in SE 1/4 NE 1/4 sec.36, T.5 S., R.23 E., Gilliam County, Hydrologic Unit 17070204, on left bank about 800 ft downstream from road bridge in Lonerock.

DRAINAGE AREA.--69 mi², approximately.

PERIOD OF RECORD.--January 1966 to September 1974, October 1975 to current year. Prior to October 1985, in reports of Oregon Water Resources Department.

GAGE.--Water-stage recorder. Elevation of gage is 2,810 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Sept. 9, 1975, at datum approximately 0.5 ft higher.

REMARKS.--Records poor.

AVERAGE DISCHARGE.--23 years (1966-74, 1975-90), 18.7 ft³/s, 3.68 in/yr, 13,550 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded discharge, 1,210 ft³/s Jan. 23, 1970, gage height, 5.78 ft, datum then in use; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 10	0730	*173	*3.22				

Minimum discharge, 0.02 ft³/s many days July to September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.15	e.45	.59	1.1	4.5	31	13	6.1	3.8	.26	.02	.03
2	.17	e.41	1.2	1.1	4.6	31	12	5.5	3.2	.33	.02	.03
3	.15	e.41	1.2	1.2	4.5	58	10	5.1	3.9	1.0	.02	.03
4	.18	e.42	1.6	1.2	4.2	63	8.4	4.8	5.0	.42	.02	.03
5	.19	e.44	2.3	1.3	4.3	66	7.3	4.4	3.6	.59	.03	.03
6	.19	e.41	1.9	1.6	4.3	49	6.5	4.2	3.6	.85	.03	.03
7	.21	e.40	1.7	3.0	3.9	50	6.1	4.3	6.4	.07	.03	.03
8	.21	e.38	1.8	8.7	4.6	63	5.9	4.4	4.5	.07	.03	.03
9	.19	e.37	1.7	4.7	4.5	44	5.7	4.3	3.7	.05	.03	.02
10	.18	e.36	1.4	6.4	8.2	117	5.4	4.0	3.3	.06	.03	.02
11	.21	e.35	.82	4.5	16	63	5.0	3.8	3.2	.05	.02	.02
12	.23	e.64	1.1	3.6	14	40	4.5	3.7	3.1	.04	.02	.02
13	1.9	e.97	1.1	5.2	13	29	4.0	3.7	3.8	.04	.02	.02
14	.95	e.95	1.1	6.7	8.9	26	4.0	3.6	3.5	.03	.02	.02
15	.63	e.80	1.1	4.9	6.8	22	4.2	3.4	3.1	.03	.02	.02
16	.58	e.74	.93	3.7	6.6	22	4.1	3.4	2.5	.03	.02	.02
17	.54	e1.0	.74	2.9	6.7	36	4.2	3.1	2.4	.02	.02	.02
18	.62	e1.2	.69	2.1	5.6	78	3.9	3.0	2.2	.02	.02	.02
19	.96	e1.1	.73	2.0	6.9	85	3.8	3.0	1.8	.02	.02	.02
20	.74	e.95	.84	2.0	6.4	76	4.1	3.1	1.5	.02	.02	.02
21	1.0	e.82	.95	2.2	9.5	63	4.0	3.0	1.3	.02	.51	.02
22	.58	e.68	.94	2.2	27	55	4.0	3.1	1.4	.02	1.7	.02
23	.84	e.92	1.1	2.0	36	56	4.3	3.8	1.3	.02	.34	.02
24	.89	e1.1	1.1	1.8	45	43	4.2	3.7	.81	.02	.07	.02
25	e.70	e1.2	.82	2.0	51	33	4.2	3.2	1.2	.02	.04	.02
26	e.60	e1.3	.87	2.0	51	30	4.2	2.9	.49	.02	.03	.03
27	e.80	e1.1	.78	2.5	44	25	12	2.9	.60	.02	.03	.02
28	e.70	e.97	.90	3.9	36	20	30	3.4	.52	.02	.03	.02
29	e.58	.89	.88	e5.5	---	17	15	6.1	.56	.02	.03	.03
30	e.58	.63	.87	4.8	---	15	8.7	3.7	.42	.02	.03	.03
31	e.48	---	1.0	4.5	---	14	---	4.1	---	.02	.03	---
TOTAL	16.93	22.36	34.75	101.3	438.0	1420	212.7	120.8	76.70	4.22	3.30	0.71
MEAN	.55	.75	1.12	3.27	15.6	45.8	7.09	3.90	2.56	.14	.11	.024
MAX	1.9	1.3	2.3	8.7	51	117	30	6.1	6.4	1.0	1.7	.03
MIN	.15	.35	.59	1.1	3.9	14	3.8	2.9	.42	.02	.02	.02
AC-FT	34	44	69	201	869	2820	422	240	152	8.4	6.5	1.4
CFSM	.01	.01	.02	.05	.23	.66	.10	.06	.04	.00	.00	.00
IN.	.01	.01	.02	.05	.24	.77	.11	.07	.04	.00	.00	.00

CAL YR 1989 TOTAL 7333.03 MEAN 20.1 MAX 280 MIN .02 AC-FT 14550 CFSM .29 IN. 3.95
WTR YR 1990 TOTAL 2451.77 MEAN 6.72 MAX 117 MIN .02 AC-FT 4860 CFSM .10 IN. 1.32

e Estimated

JOHN DAY RIVER BASIN

14048000 JOHN DAY RIVER AT MCDONALD FERRY, OR
(National stream quality accounting network station)

LOCATION.--Lat 45°35'16", long 120°24'30", in NE 1/4 NW 1/4 sec.11, T.1 N., R.19 E., Sherman County, Hydrologic Unit 17070204, on left bank at McDonald Ferry, 0.8 mi downstream from Rock Creek, 10 mi east of Klondike, and at mile 20.9.

GAGE AREA.--7,580 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1904 to current year. Prior to Oct. 1, 1930, published as "at McDonald."

REVISED RECORDS.--WSP 1094: 1894(M), 1932(M). WSP 1448: 1908-9, 1912, 1916, 1920(M), 1922, 1932.

GAGE.--Water-stage recorder. Datum of gage is 392.27 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 30, 1930, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Water-discharge records good. No regulation. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--85 years (water years 1906-90), 2,086 ft³/s, 1,511,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,800 ft³/s Dec. 24, 1964, gage height, 13.59 ft, from floodmark, from rating curve extended above 11,000 ft³/s on basis of slope-area measurement of peak flow; no flow for part of Sept. 2, 1966, Aug. 15 to Sept. 16, 1973, Aug. 13, 14, 19-25, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1894 reached a stage of 12.8 ft, from floodmarks, discharge, 39,100 ft³/s, from rating curve extended above 22,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,900 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 29	1930	*6,860	*6.16	No other peak greater than base discharge.			
Minimum discharge, 39 ft ³ /s Aug. 20.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	368	511	538	454	678	1450	2710	5040	2640	638	139	184
2	354	487	494	470	659	1360	2780	4630	2830	595	136	174
3	348	455	448	465	641	1310	3100	4460	2940	573	135	151
4	355	456	440	480	638	1340	3560	4670	2700	543	122	144
5	357	455	495	492	627	1440	3810	4680	2530	527	120	129
6	362	432	543	530	619	1760	3740	4450	2460	537	110	121
7	369	447	604	524	600	1800	3590	4200	2260	552	104	120
8	367	474	692	561	574	1830	3440	3920	2180	493	100	122
9	372	504	775	585	559	1790	3370	3510	2610	451	97	116
10	370	501	726	742	565	2080	3460	3220	2330	412	86	116
11	354	491	685	1050	588	2280	3190	2860	2130	389	71	101
12	355	508	663	1090	612	3550	2930	2570	2080	369	62	99
13	356	492	640	1070	650	3070	2890	2330	2100	354	54	102
14	352	522	569	1030	808	2430	2960	2170	1880	349	45	100
15	348	525	475	987	854	2130	2840	2020	2020	329	45	97
16	354	534	416	1000	756	2030	2830	1900	1910	300	44	92
17	359	581	415	1030	660	1920	2920	1810	1770	275	52	90
18	364	562	424	997	663	1820	3210	1660	1640	268	52	82
19	367	539	507	928	689	1920	3270	1530	1550	245	46	84
20	374	541	460	870	665	3060	3100	1450	1580	221	40	81
21	385	655	458	775	619	4050	2910	1380	1460	197	212	83
22	399	643	459	658	581	4410	2820	1400	1320	178	115	80
23	410	614	443	594	631	4230	2660	1600	1240	169	98	81
24	403	583	475	578	773	4230	2540	1550	1140	159	141	89
25	410	568	505	719	865	4420	2930	1580	1050	155	253	95
26	435	564	508	799	1020	3850	2840	1780	955	156	244	96
27	470	555	555	680	1280	3380	2580	1710	860	140	249	94
28	486	576	482	668	1460	3140	2610	1600	789	140	230	92
29	480	558	449	700	---	2960	4120	1550	737	147	207	93
30	480	557	459	671	---	2820	5940	1710	690	155	202	102
31	504	---	439	667	---	2730	---	2460	---	143	183	---
TOTAL	12067	15890	16241	22864	20334	80590	95650	81400	54381	10159	3794	3210
MEAN	389	530	524	738	726	2600	3188	2626	1813	328	122	107
MAX	504	655	775	1090	1460	4420	5940	5040	2940	638	253	184
MIN	348	432	415	454	559	1310	2540	1380	690	140	40	80
AC-FT	23930	31520	32210	45350	40330	159900	189700	161500	107900	20150	7530	6370

CAL YR 1989 TOTAL 977284 MEAN 2677 MAX 18600 MIN 134 AC-FT 1938000
WTR YR 1990 TOTAL 416580 MEAN 1141 MAX 5940 MIN 40 AC-FT 826300

JOHN DAY RIVER BASIN

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14048000 JOHN DAY RIVER AT MCDONALD FERRY, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1911-12, 1960-68, 1975 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 1975 to September 1981.

WATER TEMPERATURE: October 1962 to September 1968, October 1975 to September 1981.

SEDIMENT CONCENTRATION: October 1962 to September 1968.

SEDIMENT DISCHARGE: October 1962 to September 1968.

REMARKS.--Some samples were analyzed by different methods and may have data with different levels of detection.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED SATUR- ATION	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB (MG/L AS CACO3)
NOV 15...	1255	523	259	8.6	7.5	0.5	12.5	104	26	K120	110	0
FEB 21...	1220	646	210	8.2	5.5	2.0	12.8	102	K9	K14	83	0
MAY 03...	1300	4310	110	8.0	16.0	25	10.0	102	48	89	44	0
AUG 15...	1120	47	266	8.9	21.0	1.5	10.0	115	K12	1000	88	0
DATE		CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY, DIS IT FIELD (MG/L AS CACO3)	BICAR- BONATE, DIS IT FIELD (MG/L AS HCO3)	CAR- BONATE, DIS IT FIELD (MG/L AS CO3)	SULFATE, DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
NOV 15...	24	11	15	23	0.6	1.9	131	153	3	11	2.7	0.1
FEB 21...	19	8.6	12	24	0.6	1.6	103	126	0	8.0	2.7	<0.1
MAY 03...	10	4.6	5.4	21	0.4	1.2	52	63	0	2.6	0.5	0.2
AUG 15...	17	11	21	33	1	3.0	126	139	7	9.7	5.8	<0.1
DATE		SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
NOV 15...	24	154	168	0.21	217	<0.01	<0.10	0.02	<0.01	0.2	<0.01	<0.01
FEB 21...	26	145	140	0.20	253	<0.01	<0.10	<0.01	<0.01	0.3	0.01	<0.01
MAY 03...	29	79	85	0.11	919	<0.01	<0.10	0.03	<0.01	<0.2	0.08	0.02
AUG 15...	29	173	172	0.24	22.0	<0.01	<0.10	--	--	0.6	0.06	<0.01

K - Results based on colony count outside acceptable range (non-ideal colony count).

JOHN DAY RIVER BASIN

14048000 JOHN DAY RIVER AT MCDONALD FERRY, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC, DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM, DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM, DIS- SOLVED (UG/L AS LI)
NOV 15...	<0.01	<10	<1	10	<0.5	<1	<1	<3	1	12	<1	5
FEB 21...	<0.01	10	<1	11	<0.5	<1	<5	<3	3	15	1	<4
MAY 03...	0.03	110	<1	7	<0.5	<1	<1	<3	2	110	<1	<4
AUG 15...	<0.01	10	1	8	<0.5	<1	<1	<3	3	8	<1	<4
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY, DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	
NOV 15...	2	<0.1	<10	<1	<1	<1	110	9	7	1	1.4	
FEB 21...	2	<0.1	10	<1	<1	1	88	<6	3	5	8.7	
MAY 03...	4	<0.1	<10	1	<1	<1	47	<6	<3	58	675	
AUG 15...	2	<0.1	<10	1	<1	<1	100	10	<3	2	0.25	

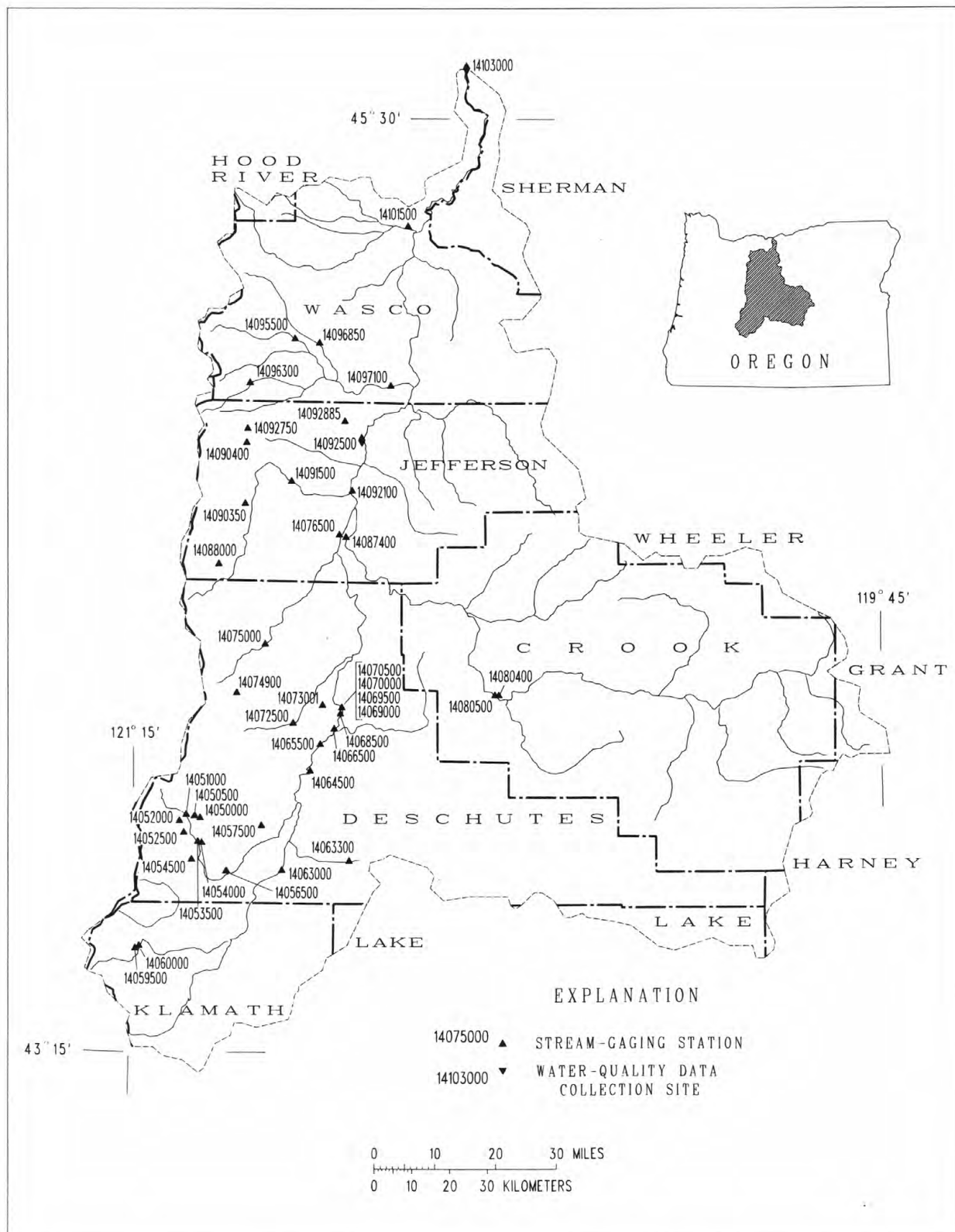


Figure 7.--Location of surface-water and water-quality stations in the Deschutes River basin.

DESCHUTES RIVER BASIN

14050000 DESCHUTES RIVER BELOW SNOW CREEK, NEAR LA PINE, OR

LOCATION.--Lat 43°48'51", long 121°46'33", in NW 1/4 sec.28, T.20 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, in Deschutes National Forest, on left bank at flow line of Crane Prairie Reservoir, 20 ft downstream from Snow Creek, 200 ft upstream from highway bridge, and 17 mi northwest of La Pine.

DRAINAGE AREA.--132 mi², including Sparks, Elk, and Mud Lake basins, which have no surface outflow to Deschutes River; hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only October 1937, published in WSP 1318. Published as "near Lapine" 1937-64.

REVISED RECORDS.--WSP 1248: 1951.

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

REMARKS.--Records excellent Oct. 1 to Jan. 7; good thereafter. 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.

AVERAGE DISCHARGE.--53 years, 148 ft³/s, 107,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 480 ft³/s Aug. 19, 1974, gage height, 3.17 ft; maximum gage height, 4.12 ft Jan. 21, 1943 (ice jam); minimum discharge, 40 ft³/s sometime during period Dec. 22, 1959, to Mar. 2, 1960, result of freezeup; minimum daily, 55 ft³/s for many days April to June 1941.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 182 ft³/s Oct. 1-3; maximum gage height, 1.41 ft Oct. 1; minimum discharge, 74 ft³/s Mar. 12-17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	182	145	119	95	92	78	79	86	108	100	111	123
2	182	145	117	95	90	79	80	86	107	102	111	123
3	180	145	117	95	88	80	80	85	108	101	112	124
4	178	144	120	95	88	79	80	84	105	102	112	124
5	176	142	122	95	88	78	79	84	103	101	113	123
6	176	141	118	96	88	78	80	84	106	103	113	123
7	173	142	117	111	87	78	80	84	108	102	114	123
8	172	140	119	120	88	78	80	86	105	103	114	123
9	170	138	116	113	87	78	80	86	104	103	114	121
10	170	137	113	110	86	79	81	88	103	103	114	121
11	170	135	112	109	84	77	82	90	103	103	115	121
12	170	138	112	106	84	75	82	92	104	103	115	123
13	168	135	112	105	84	74	82	93	104	103	116	122
14	166	134	110	101	e84	75	83	95	103	103	116	121
15	163	134	109	100	85	74	83	95	103	103	117	120
16	162	132	107	99	83	74	83	97	100	104	117	120
17	160	133	106	96	82	75	84	98	101	103	121	120
18	159	131	106	92	82	77	83	98	100	104	120	119
19	157	128	106	91	e82	77	84	98	100	105	120	118
20	158	127	106	90	83	77	84	102	99	105	121	119
21	164	126	103	90	82	77	84	103	98	106	121	120
22	160	123	103	90	82	79	85	108	100	106	121	119
23	160	127	103	91	80	79	89	112	100	106	120	117
24	157	127	101	89	79	78	86	106	100	106	120	117
25	157	127	100	89	79	79	86	103	99	108	120	119
26	159	128	99	90	79	80	87	104	100	109	123	119
27	157	124	98	89	78	79	107	109	100	109	123	117
28	155	123	98	90	78	78	108	108	100	110	123	116
29	152	121	98	90	---	79	88	106	101	111	124	114
30	149	120	95	90	---	79	86	107	101	111	123	114
31	148	---	95	90	---	80	---	109	---	112	123	---
TOTAL	5110	3992	3357	3002	2352	2407	2535	2986	3073	3250	3647	3603
MEAN	165	133	108	96.8	84.0	77.6	84.5	96.3	102	105	118	120
MAX	182	145	122	120	92	80	108	112	108	112	124	124
MIN	148	120	95	89	78	74	79	84	98	100	111	114
AC-FT	10140	7920	6660	5950	4670	4770	5030	5920	6100	6450	7230	7150

CAL YR 1989 TOTAL 44450 MEAN 122 MAX 222 MIN 64 AC-FT 88170
WTR YR 1990 TOTAL 39314 MEAN 108 MAX 182 MIN 74 AC-FT 77980

e Estimated

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LOCATION.--Lat 43°49'06", long 121°47'40", near line between secs.20 and 29, T.20 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, Deschutes National Forest, on left bank at highway culvert, 2 mi upstream from Cultus Creek, and 18 mi northwest of La Pine.

PERIOD OF RECORD.--October 1922 to September 1925, October 1937 to current year. Monthly discharge only October 1937, published in WSP 1318. Prior to Oct. 1, 1964, published as "near Lapine."

GAGE.--Water-stage recorder and cement bag control. Elevation of gage is 4,450 ft, by barometer. Oct 1, 1922, to Sept. 30, 1925, nonrecording gage at site 0.5 mi upstream at different datum.

AVERAGE DISCHARGE.--56 years, 62.6 ft³/s, 45,350 acre-ft/vr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 178 ft³/s May 31, 1956, gage height, 1.04 ft; maximum gage height, 1.32 ft May 16, 1972 (backwater from Crane Prairie Reservoir); minimum discharge, 26 ft³/s May 26-31, Nov. 23 to Dec. 4, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 68 ft³/s Oct. 1-13, 20, 21, Apr. 28; maximum gage height, 0.78 ft Oct. 1-13, 20-24, 26, 27; minimum discharge, 39 ft³/s Mar. 6-22.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	64	56	54	46	43	41	54	58	62	58	59
2	68	63	58	52	46	42	41	53	58	61	59	59
3	68	62	58	52	46	41	43	52	58	60	59	59
4	68	62	58	52	46	41	43	52	58	60	60	58
5	68	62	58	50	46	41	43	52	58	60	59	58
6	68	62	58	50	45	39	43	52	59	60	58	58
7	68	62	58	52	44	39	43	52	60	60	58	58
8	67	62	58	52	44	39	44	52	60	59	58	58
9	67	62	60	52	44	39	44	51	60	58	58	58
10	67	62	60	52	44	39	44	51	60	59	58	58
11	67	62	60	52	44	39	44	52	60	59	58	58
12	66	64	60	52	44	39	44	52	61	60	58	58
13	66	64	58	52	44	39	44	52	62	60	58	58
14	66	64	58	52	44	39	44	52	62	60	58	58
15	66	64	59	52	44	39	44	52	62	60	58	57
16	66	64	60	51	44	39	44	52	62	60	59	56
17	66	64	60	50	44	39	44	52	62	60	60	56
18	66	64	59	50	44	39	44	52	62	60	60	56
19	66	66	58	50	43	39	45	54	62	59	60	56
20	66	66	58	50	43	39	46	54	62	58	60	56
21	66	66	58	50	43	39	46	54	62	58	60	56
22	65	64	58	50	43	40	46	54	62	58	60	56
23	66	64	58	50	43	41	49	54	64	58	59	56
24	65	64	58	50	43	41	49	54	64	58	59	56
25	64	65	58	50	43	41	48	54	64	58	60	56
26	65	60	58	50	43	41	50	55	64	58	60	54
27	65	57	58	50	43	41	54	56	62	59	59	54
28	64	56	56	49	43	41	67	56	62	60	58	54
29	64	56	56	48	---	41	61	56	62	58	58	54
30	64	56	56	46	---	41	55	56	62	58	58	54
31	64	---	56	46	---	41	---	58	---	58	59	---
TOTAL	2050	1873	1802	1568	1233	1241	1397	1652	1834	1836	1824	1702
MEAN	66.1	62.4	58.1	50.6	44.0	40.0	46.6	53.3	61.1	59.2	58.8	56.7
MAX	68	66	60	54	46	43	67	58	64	62	60	59
MIN	64	56	56	46	43	39	41	51	58	58	58	54
AC-FT	4070	3720	3570	3110	2450	2460	2770	3280	3640	3640	3620	3380
CAL YR 1989	TOTAL 21533		MEAN 59.0	MAX 79	MIN 34	AC-FT 42710						
WTR YR 1990	TOTAL 20012		MEAN 54.8	MAX 68	MIN 39	AC-FT 39690						

DESCHUTES RIVER BASIN

14051000 CULTUS CREEK ABOVE CRANE PRAIRIE RESERVOIR, NEAR LA PINE, OR

LOCATION.--Lat 43°49'17", long 121°49'22", in SW 1/4 sec.19, T.20 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, on left bank 1,000 ft upstream from highway bridge, 1.0 mi downstream from Cultus Lake, and 19 mi northwest of La Pine.

DRAINAGE AREA.--33.2 mi², hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--March to September 1924 (published as "above Crane Prairie, near Lapine"), October 1937 to current year. 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. Published as "near Lapine" 1937-64.

REVISED RECORDS.--WSP 1568: 1957. WRD Oreg. 1973: 1972. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Elevation of gage is 4,545 ft, by barometer. Mar. 1 to Sept. 30, 1924, nonrecording gage at site 100 ft upstream at different datum.

REMARKS.--Records good except for estimated daily discharges, which are poor. Some regulation by fish screens at Cultus Lake since 1962. No diversion upstream from station.

AVERAGE DISCHARGE.--53 years (water years 1938-90), 22.2 ft³/s, 16,080 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 336 ft³/s Dec. 25, 1964, gage height, 4.15 ft, from floodmark, from rating curve extended above 90 ft³/s; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 267 ft³/s Apr. 28, gage height, 3.89 ft; no flow Sept. 14, 15, 18-24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	.10	.02	e.01	e10	11	6.7	215	38	15	1.5	.03
2	.80	.10	.02	e.01	e12	10	6.7	186	37	14	1.1	.04
3	.76	.10	.02	e.03	e13	11	6.5	164	36	13	.77	.03
4	.58	.10	.05	e.10	e13	11	6.9	148	36	12	.46	.03
5	.50	.08	.11	e.60	e12	10	7.3	135	35	12	.30	.02
6	.50	.06	.09	e2.0	e11	10	7.6	121	35	12	.27	.02
7	.50	.06	.11	e5.0	e11	9.6	8.3	112	36	11	.23	.02
8	.50	.06	.25	12	e11	9.4	8.2	104	37	11	.18	.02
9	.50	.05	.13	1.8	e14	9.2	8.3	97	36	10	.16	.02
10	.46	.04	.09	1.8	e18	9.5	9.4	92	35	10	.11	.02
11	.31	.04	e.08	2.9	e17	9.2	11	86	35	9.8	.09	.01
12	.27	.07	e.07	4.0	e16	9.2	12	80	33	9.4	.08	.01
13	.27	.04	e.06	5.0	e11	9.0	13	75	32	9.0	.08	.01
14	.27	.04	e.05	5.0	e9.0	9.2	15	70	31	8.7	.06	.00
15	.18	.03	e.04	4.2	e4.5	8.8	16	65	30	8.4	.04	.00
16	.18	.03	e.04	4.7	e4.0	8.4	18	60	29	8.0	.03	.02
17	.18	.03	e.04	5.2	e5.0	8.3	20	57	27	7.2	.05	.01
18	.18	.03	e.03	e5.2	e5.5	8.0	22	52	26	6.6	.04	.00
19	.12	.03	e.03	e5.2	e6.0	7.9	24	50	25	6.2	.04	.00
20	.13	.02	e.02	e5.2	e6.0	7.6	27	48	24	6.0	.03	.00
21	.22	.02	e.02	e5.2	e7.5	7.5	27	45	23	5.7	.03	.00
22	.18	.02	e.02	5.6	e10	7.7	27	45	23	5.2	.02	.00
23	.18	.04	e.02	6.7	14	7.9	34	46	22	4.7	.02	.00
24	.14	.03	e.02	7.1	14	7.9	37	45	21	4.1	.02	.00
25	.12	.03	e.01	7.2	13	7.7	39	43	20	3.6	.02	.02
26	.15	.02	e.01	8.3	12	7.9	41	42	19	3.2	.02	.03
27	.14	.02	e.01	9.3	12	7.9	98	42	18	2.8	.02	.02
28	.12	.02	e.01	11	11	7.9	240	42	17	2.4	.02	.02
29	.12	.02	e.01	18	---	7.5	255	41	16	2.3	.02	.01
30	.11	.02	e.01	13	---	7.4	243	40	15	2.1	.03	.01
31	.10	---	e.01	e11	---	6.7	---	40	---	1.9	.03	---
TOTAL	9.57	1.35	1.50	172.35	302.5	270.3	1294.9	2488	847	237.3	5.87	0.42
MEAN	.31	.045	.048	5.56	10.8	8.72	43.2	80.3	28.2	7.65	.19	.014
MAX	.80	.10	.25	18	18	11	255	215	38	15	1.5	.04
MIN	.10	.02	.01	.01	4.0	6.7	6.5	40	15	1.9	.02	.00
AC-FT	19	2.7	3.0	342	600	536	2570	4930	1680	471	12	.8

CAL YR 1989 TOTAL 7513.10 MEAN 20.6 MAX 135 MIN .01 AC-FT 14900
WTR YR 1990 TOTAL 5631.06 MEAN 15.4 MAX 255 MIN .00 AC-FT 11170

e Estimated

DESCHUTES RIVER BASIN

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14052000 DEER CREEK ABOVE CRANE PRAIRIE RESERVOIR, NEAR LA PINE, OR

LOCATION.--Lat 43°48'48", long 121°50'18", in SE 1/4 SW 1/4 sec.25, T.20 S., R.7 E., Deschutes County, Hydrologic Unit 17070301, on right bank 150 ft downstream from highway bridge, 1.2 mi downstream from Little Cultus Lake, and 19 mi northwest of La Pine.

DRAINAGE AREA.--21.5 mi², hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--February to September 1924 (published as "above Crane Prairie, near Lapine"). October 1937 to current year. 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 be unreliable and should not be used. Published as "near Lapine" 1937-64.

REVISED RECORDS.--See PERIOD OF RECORD.

GAGE.--Water-stage recorder and weir control. Elevation of gage is 4,520 ft, by barometer. Feb. 1 to Sept. 30, 1924, nonrecording gage at site 75 ft upstream at various datums. Oct. 1, 1937, to Sept. 30, 1938, water-stage recorder at bridge 150 ft upstream at different datum. Oct. 1, 1938, to Aug. 13, 1968, water-stage recorder and wooden weir control at present site and datum 0.60 ft higher.

REMARKS.--Records good except those for Apr. 27 to May 1, which are fair, and discharges below 1.0 ft³/s and estimated daily discharges, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--53 years (water years 1938-90), 7.34 ft³/s, 5,320 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 200 ft³/s, estimated, Dec. 25, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 88 ft³/s Apr. 28, gage height, 3.17 ft; minimum discharge, 0.01 ft³/s Nov. 2, Sept. 24, 28-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.09	.05	e.20	e.65	e2.1	1.7	5.3	51	6.9	.89	.08	.09
2	.09	.04	e.25	e.60	e2.2	1.6	5.9	41	6.4	.76	.07	.10
3	.09	.04	e.40	.54	e2.3	1.9	6.6	34	6.2	.63	.07	.11
4	.07	.08	.78	.56	e2.3	1.9	7.5	30	5.8	.57	.07	.10
5	.06	.09	1.4	.62	e2.1	1.9	8.5	27	5.2	.58	.07	.07
6	.06	.09	1.5	.80	e2.0	1.8	9.5	24	5.5	.61	.07	.08
7	.06	.11	1.5	4.7	e2.0	1.7	11	22	6.8	.56	.06	.08
8	.06	.09	1.9	e7.5	e2.2	1.7	12	20	6.4	.53	.07	.08
9	.05	.08	e1.6	5.5	e2.3	1.6	12	19	5.8	.50	.08	.08
10	.06	.09	e1.4	5.1	e2.3	1.9	13	17	5.2	.43	.08	.06
11	.06	.09	e1.3	4.6	e2.3	1.9	13	16	4.6	.39	.08	.03
12	.05	.14	e1.2	4.2	e2.1	1.8	13	14	4.3	.36	.07	.03
13	.06	.07	e1.1	4.3	e1.9	e1.4	14	13	4.3	.32	.07	.03
14	.06	.06	e1.0	4.1	e1.6	e1.5	15	12	4.0	.28	.06	.03
15	.06	.06	e.93	3.8	e1.5	1.7	15	11	3.7	.24	.06	.03
16	.05	.06	e.84	3.6	e1.5	1.6	16	10	3.4	.20	.06	.03
17	.03	.09	e.78	3.2	e1.5	1.6	17	9.1	3.0	.17	.12	.04
18	.03	.09	e.70	2.9	e1.5	1.6	18	8.0	2.7	.13	.09	.03
19	.03	.09	e.66	e2.5	e1.6	1.6	19	7.2	2.5	.13	.09	.04
20	.04	.09	e.61	e2.3	e1.7	1.7	20	7.3	2.3	.13	.06	.04
21	.11	.09	e.58	e2.0	e1.9	1.8	20	7.0	2.3	.13	.06	.05
22	.06	.08	e.56	e1.9	e2.0	2.2	20	8.3	2.2	.13	.06	.06
23	.08	.15	.53	e1.9	e2.0	2.7	23	10	2.2	.11	.06	.06
24	.08	.23	.50	e1.9	e2.0	2.7	25	9.7	2.1	.07	.06	.04
25	.06	.27	e.60	e1.9	e2.0	2.8	25	8.5	1.8	.08	.06	.05
26	.10	.48	e.70	e2.1	2.0	3.3	26	8.1	1.6	.06	.06	.05
27	.09	.56	e.78	e2.2	1.8	3.5	44	8.6	1.4	.06	.06	.03
28	.07	e.40	e.68	e2.3	1.7	3.7	81	8.2	1.2	.05	.06	.03
29	.06	e.20	e.66	e2.3	---	4.0	73	7.4	1.1	.08	.07	.02
30	.05	e.20	e.75	e2.2	---	4.2	63	7.3	1.0	.08	.09	---
31	.06	---	e.80	e2.1	---	4.7	---	7.4	---	.08	.09	---
TOTAL	1.98	4.26	27.19	84.87	54.4	69.7	651.3	483.1	111.9	9.34	2.21	1.59
MEAN	.064	.14	.88	2.74	1.94	2.25	21.7	15.6	3.73	.30	.071	.053
MAX	.11	.56	1.9	7.5	2.3	4.7	81	51	6.9	.89	.12	.11
MIN	.03	.04	.20	.54	1.5	1.4	5.3	7.0	1.0	.05	.06	.02
AC-FT	3.9	8.4	54	168	108	138	1290	958	222	19	4.4	3.2

CAL YR 1989 TOTAL 2370.93 MEAN 6.50 MAX 63 MIN .03 AC-FT 4700
WTR YR 1990 TOTAL 1501.84 MEAN 4.11 MAX 81 MIN .02 AC-FT 2980

e Estimated

DESCHUTES RIVER BASIN

14052500 QUINN RIVER NEAR LA PINE, OR

LOCATION.--Lat 43°47'03", long 121°50'06", in SW 1/4 NW 1/4 sec.1, T.21 S., R.7 E., Deschutes County, Hydrologic Unit 17070301, Deschutes National Forest, on left bank at flow line of Crane Prairie Reservoir, 150 ft downstream from springs at head of river, and 18 mi northwest of La Pine.

DRAINAGE AREA.--Indeterminate, normal flow is entirely from springs 150 ft upstream.

PERIOD OF RECORD.--June 1922 to September 1925, October 1937 to current year. Published as "above Crane Prairie Reservoir near Lapine" 1922-25, and as "near Lapine" 1937-64. Monthly discharge only October 1937, published in WSP 1318.

REVISED RECORDS.--WSP 1448: 1939, 1941.

GAGE.--Water-stage recorder and log control. Datum of gage is 4,442.1 ft above National Geodetic Vertical Datum of 1929, based on elevation of Crane Prairie Reservoir when slack water reached station. June 1, 1922, to Sept. 30, 1925, nonrecording gage at site 150 ft downstream at different datum.

REMARKS.--Records excellent. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--56 years, 23.8 ft³/s, 17,240 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 59 ft³/s July 4, 1949, gage height, 1.97 ft; maximum gage height, 3.92 ft June 25, 1943 (backwater from Crane Prairie Reservoir); practically no flow Nov. 14, 1941.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 27 ft³/s June 3 to July 2, gage height 1.75 ft; minimum discharge, 8.4 ft³/s Jan. 26, 27, 29-31, Feb. 1, 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	18	15	11	8.8	11	13	17	26	27	22	18
2	20	18	15	9.6	9.1	11	13	18	26	26	22	17
3	20	18	15	9.1	10	11	13	18	27	26	21	17
4	20	18	15	9.1	9.4	11	13	18	27	26	21	17
5	20	18	14	9.3	9.9	11	13	19	27	26	21	17
6	20	18	14	9.5	9.9	11	13	19	27	26	21	17
7	20	18	14	9.8	9.9	11	14	19	27	26	21	17
8	20	18	e14	9.5	9.8	9.8	14	19	27	25	21	17
9	20	18	e14	9.9	9.8	10	14	20	27	24	21	17
10	20	18	e13	9.5	9.9	10	14	20	27	24	21	17
11	20	18	e13	9.9	9.9	9.9	14	20	27	24	20	17
12	20	18	e13	10	10	9.9	14	20	27	24	20	17
13	19	17	e13	9.8	9.4	10	14	20	27	24	20	17
14	19	17	e13	9.1	9.5	10	14	21	27	24	20	17
15	19	17	e13	9.7	e9.5	10	15	21	27	24	20	17
16	19	17	12	9.4	e9.5	11	15	21	27	24	19	17
17	19	17	12	9.1	9.4	11	15	21	27	24	19	16
18	19	17	12	9.7	9.3	10	15	22	27	24	19	16
19	19	17	12	9.5	9.9	11	15	22	27	24	19	16
20	19	17	12	9.3	9.9	10	15	22	27	24	19	16
21	19	16	12	e9.3	9.9	11	15	22	27	24	19	16
22	19	16	12	9.3	10	11	15	22	27	24	19	15
23	19	16	12	9.1	9.9	11	15	23	27	23	19	15
24	19	16	11	9.1	10	11	15	23	27	23	18	15
25	19	16	11	9.3	11	11	15	23	27	23	18	15
26	19	15	11	8.9	11	11	15	23	27	23	18	14
27	19	15	11	9.1	11	11	15	24	27	23	18	14
28	19	15	11	9.3	11	11	16	24	27	23	18	14
29	19	15	11	9.2	---	11	16	24	27	22	18	14
30	19	15	11	9.2	---	12	16	25	27	22	17	14
31	18	---	11	9.1	---	13	---	26	---	22	17	---
TOTAL	601	507	392	292.7	276.6	333.6	433	656	808	748	606	483
MEAN	19.4	16.9	12.6	9.44	9.88	10.8	14.4	21.2	26.9	24.1	19.5	16.1
MAX	21	18	15	11	11	13	16	26	27	27	22	18
MIN	18	15	11	8.9	8.8	9.8	13	17	26	22	17	14
AC-FT	1190	1010	778	581	549	662	859	1300	1600	1480	1200	958

CAL YR 1989 TOTAL 6909.3 MEAN 18.9 MAX 33 MIN 7.1 AC-FT 13700
WTR YR 1990 TOTAL 6136.9 MEAN 16.8 MAX 27 MIN 8.8 AC-FT 12170

e Estimated

DESCHUTES RIVER BASIN

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14053500 CRANE PRAIRIE RESERVOIR NEAR LA PINE, OR

LOCATION.--Lat 43°45'20", long 121°47'00", in SW 1/4 NW 1/4 sec.16, T.21 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, in Deschutes National Forest, on control structure at Crane Prairie Dam on Deschutes River, 15.0 mi northwest of La Pine, and at mile 238.3.

DRAINAGE AREA.--254 mi², hydrologic drainage boundary uncertain owing to ground-water exchange.

PERIOD OF RECORD.--November 1922 to November 1935, April to December 1936, April 1937 to current year. Prior to Oct. 1, 1964, published as "near Lapine."

REVISED RECORDS.--WSP 1218: Drainage area. WSP 1318: 1925, 1940-41, 1950. WSP 1448: 1925(M,m), 1940(m), 1950(m).

GAGE.--Water-stage recorder. Datum of gage is 4,400.0 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation); gage readings have been reduced to elevations NGVD. Prior to July 13, 1940, nonrecording gage, at site 150 ft upstream at same datum. July 13, 1940, to Sept. 15, 1966, nonrecording gage, at present site and datum.

REMARKS.--Reservoir originally formed by earthfill dam completed in 1922, reconstructed as rock-faced, earthfill dam in 1940. Capacity, 55,340 acre-ft between elevation 4,424.0 ft 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. Crater Creek Canal diverts water to Tumalo Creek basin from tributaries of Soda Creek upstream from station. Released water diverted from Deschutes River near Bend for irrigation near Bend and Redmond.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 60,500 acre-ft June 5-7, 1943, elevation, 4,446.0 ft; no usable contents at times.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 43,360 acre-ft May 7, elevation, 4,442.47 ft; minimum contents, 17,140 acre-ft Sept. 23-25, elevation, 4,435.90 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30.....	4,437.97	24,620	-
Oct. 31.....	4,438.16	25,350	+730
Nov. 30.....	4,437.96	24,580	-770
Dec. 31.....	4,437.67	23,500	-1,080
CAL YR 1989.....	-	-	+1,890
Jan. 31.....	4,438.83	27,950	+4,450
Feb. 28.....	4,439.44	30,390	+2,440
Mar. 31.....	4,440.90	36,440	+6,050
Apr. 30.....	4,442.06	41,500	+5,060
May 31.....	4,441.92	40,880	-620
June 30.....	4,441.02	36,950	-3,930
July 31.....	4,438.41	26,320	-10,630
Aug. 31.....	4,436.14	17,970	-8,350
Sept.30.....	4,435.93	17,240	-730
WTR YR 1990.....	-	-	-7,380

DESCHUTES RIVER BASIN

14054000 DESCHUTES RIVER BELOW CRANE PRAIRIE RESERVOIR, NEAR LA PINE, OR

LOCATION.--Lat 43°45'13", long 121°46'57", in SW 1/4 NW 1/4 sec.16, T.21 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, Deschutes National Forest, on left bank 0.1 mi downstream from Crane Prairie Dam, 15 mi northwest of La Pine, and at mile 238.2.

DRAINAGE AREA.--254 mi², hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--August 1907 to November 1908 and August 1912 to September 1913 (fragmentary), October 1913 to September 1917, February 1922 to current year. Monthly discharge only for some periods, published in WSP 1318. Prior to October 1949, published as "at Crane Prairie, near Lapine." Published as "near Lapine" 1949-64.

REVISED RECORDS.--WSP 1218: Drainage area. WSP 1318: 1929(M).

GAGE.--Water-stage recorder. Datum of gage is 4,419.78 ft above National Geodetic Vertical Datum of 1929 (Pacific Power & Light Co. bench mark). Aug. 15, 1907, to Sept. 30, 1917, and Feb. 23 to June 8, 1922, nonrecording gage at site 0.5 mi upstream at different datums. June 9, 1922, to May 9, 1932, nonrecording gage or water-stage recorder at present site and datum.

REMARKS.--Records good except for those below 200 ft³/s, which are fair. Flows regulated by Crane Prairie Reservoir.

AVERAGE DISCHARGE.--72 years, 213 ft³/s, 154,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft³/s July 28, 1947, gage height, 3.34 ft; no flow Nov. 15, 1978, when gates in Crane Prairie Dam were closed.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 626 ft³/s July 5, gage height, 2.23 ft; minimum discharge, 19 ft³/s Mar. 2, result of regulation at Crane Prairie Reservoir.

REVISIONS.--Revised figures of discharge for the water year 1989, superseding those published in the report for 1989, are given below.

EXTREMES FOR 1989 WATER YEAR.--Maximum discharge, 326 ft³/s July 2-5, gage height, 1.70 ft; minimum discharge, 6.3 ft³/s Nov. 1, result of regulation at Crane Prairie Reservoir.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	169	136	143	143	40	126	126	192	250	322	295	291
2	169	143	143	143	40	126	126	192	250	322	295	291
3	169	145	143	143	40	126	126	192	250	326	295	287
4	169	145	143	143	40	126	126	192	250	326	295	287
5	169	145	143	143	40	126	126	192	250	321	295	287
6	169	145	143	e92	40	126	126	192	250	317	295	287
7	169	145	143	e27	40	126	126	192	250	317	294	287
8	169	145	143	e27	40	126	126	192	250	313	293	287
9	169	145	143	e28	40	126	126	192	250	313	295	287
10	169	145	143	e29	40	126	126	192	250	313	295	287
11	169	145	143	e30	40	126	126	192	250	313	295	287
12	169	145	143	e31	40	126	126	192	250	313	294	287
13	169	145	143	e32	40	126	126	192	250	313	291	287
14	169	145	143	e32	40	126	129	192	250	313	291	287
15	169	145	143	e33	40	126	129	192	250	313	291	287
16	169	145	143	e33	40	126	129	192	250	313	291	283
17	169	145	143	e34	40	126	129	192	250	313	291	282
18	169	145	143	e34	40	126	129	192	250	313	291	282
19	169	145	143	e35	40	126	129	195	250	311	291	282
20	169	145	143	e35	40	126	157	196	250	308	291	282
21	166	145	143	e36	40	126	192	199	250	307	291	282
22	166	145	143	e36	76	126	192	199	251	304	291	282
23	166	145	143	e37	126	126	192	199	254	303	291	282
24	166	144	143	e37	126	126	192	199	254	300	291	279
25	166	143	143	e38	126	126	192	199	253	300	291	278
26	166	143	143	e39	126	126	192	199	250	300	291	278
27	156	143	143	e39	126	126	192	199	250	300	291	278
28	148	143	143	e40	126	126	192	199	250	300	291	278
29	148	143	143	e41	---	126	192	199	250	298	291	278
30	148	143	143	e41	---	126	192	199	290	295	291	278
31	148	---	143	e42	---	126	---	229	---	295	291	---
TOTAL	5124	4326	4433	1673	1672	3906	4489	6066	7552	9615	9065	8517
MEAN	165	144	143	54.0	59.7	126	150	196	252	310	292	284
MAX	169	145	143	143	126	126	192	229	290	326	295	291
MIN	148	136	143	27	40	126	126	192	250	295	291	278
AC-FT	10160	8580	8790	3320	3320	7750	8900	12030	14980	19070	17980	16890

CAL YR 1988 TOTAL 55838 MEAN 153 MAX 182 MIN 86 AC-FT 110800
WTR YR 1989 TOTAL 66438 MEAN 182 MAX 326 MIN 27 AC-FT 131800

e Estimated

DESCHUTES RIVER BASIN

131

14054000 DESCHUTES RIVER BELOW CRANE PRAIRIE RESERVOIR, NEAR LA PINE, OR--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	278	220	220	119	121	99	30	129	209	226	355	195
2	257	220	220	119	121	41	30	129	209	239	355	195
3	223	220	220	119	121	21	30	129	209	242	355	195
4	223	220	220	119	121	21	30	129	209	242	355	200
5	223	220	220	119	121	21	29	129	209	306	355	202
6	223	220	220	119	121	21	29	129	209	374	355	202
7	223	220	220	119	121	21	29	173	209	374	355	202
8	223	220	220	119	121	21	29	242	209	373	354	202
9	223	220	220	119	121	21	29	242	209	369	336	202
10	223	220	220	119	121	21	29	242	209	369	331	202
11	223	220	220	119	121	21	29	242	209	369	322	202
12	223	220	220	119	121	21	30	242	209	366	317	202
13	223	220	220	119	121	25	30	242	209	362	306	202
14	223	220	220	119	121	30	32	242	209	309	325	202
15	223	220	220	119	121	31	32	242	209	217	380	202
16	222	220	220	e119	121	32	68	242	209	194	421	202
17	220	220	220	e121	121	32	125	242	209	269	421	202
18	220	220	220	121	121	32	124	242	209	350	421	202
19	220	220	220	121	121	32	124	242	209	352	421	202
20	220	220	220	121	121	32	124	242	209	355	421	202
21	220	220	215	121	121	32	124	196	209	355	421	201
22	220	220	205	121	121	31	124	180	209	355	419	199
23	220	220	205	121	121	30	124	209	209	355	408	199
24	220	220	205	121	121	30	126	209	212	355	282	199
25	220	220	205	121	121	30	126	209	213	355	199	199
26	220	220	167	121	121	30	126	209	213	355	199	198
27	220	220	119	121	121	30	127	209	214	355	199	195
28	220	220	119	121	121	30	129	209	216	355	198	195
29	220	220	119	121	---	30	129	209	216	355	196	195
30	220	220	119	121	---	30	129	209	217	355	195	192
31	220	---	119	121	---	30	---	209	---	355	195	---
TOTAL	6956	6600	6197	3719	3388	929	2276	6350	6308	10162	10172	5989
MEAN	224	220	200	120	121	30.0	75.9	205	210	328	328	200
MAX	278	220	220	121	121	99	129	242	217	374	421	202
MIN	220	220	119	119	121	21	29	129	209	194	195	192
AC-FT	13800	13090	12290	7380	6720	1840	4510	12600	12510	20160	20180	11880
CAL YR 1989	TOTAL 72308	MEAN 198	MAX 326	MIN 27	AC-FT 143400							
WTR YR 1990	TOTAL 69046	MEAN 189	MAX 421	MIN 21	AC-FT 137000							

e Estimated

DESCHUTES RIVER BASIN

14054500 BROWN CREEK NEAR LA PINE, OR

LOCATION.--Lat 43°42'57", long 121°48'10", in NE 1/4 SW 1/4 sec.29, T.21 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, in Deschutes National Forest, on right bank at highway crossing and 15 mi northwest of La Pine.

DRAINAGE AREA.--21 mi², approximately, hydrologic drainage boundary uncertain owing to ground-water exchange.

PERIOD OF RECORD.--May 1922 to September 1925, July 1938 to current year. Monthly discharge only July 1938 to September 1949, published in WSP 1318. Prior to Oct. 1, 1964, published as "near Lapine."

REVISED RECORDS.--WSP 1448: 1922-24. WDF OR-78-1: 1977.

GAGE.--Water-stage recorder. Elevation of gage is 4,370 ft, from topographic map. May 24, 1922, to Sept. 30, 1925, nonrecording gage, and July 1, 1938, to Nov. 1, 1945, water-stage recorder at site 0.4 mi downstream at different datums. Nov. 2, 1945, to Aug. 25, 1971, water-stage recorder at site 0.8 mi upstream at datum of 4,372.94 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. No regulation. No diversion upstream from station.

AVERAGE DISCHARGE.--55 years, 38.3 ft³/s, 27,750 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 104 ft³/s Aug. 4, 1956, gage height, 1.64 ft; maximum gage height, 3.50 ft Jan. 30, 1980, backwater from ice; minimum discharge, 16 ft³/s July 22-25, 1941, and at times December 1941 to March 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 48 ft³/s Jan. 7, gage height, 0.71 ft; maximum gage height, 1.20 ft Feb. 14, backwater from ice; minimum discharge, 27 ft³/s Apr. 12-27, May 1-21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	35	33	32	30	30	30	27	28	30	31	35
2	36	35	33	32	30	30	30	27	28	30	31	35
3	36	35	33	32	30	30	29	27	28	30	31	35
4	36	35	34	32	30	30	29	27	28	30	31	35
5	36	35	35	32	30	30	29	27	28	30	31	34
6	36	35	34	32	30	30	28	27	28	30	31	34
7	36	35	34	37	30	30	29	27	29	30	31	33
8	36	35	34	37	30	30	28	27	28	30	31	33
9	36	35	34	33	30	29	28	27	28	30	31	32
10	36	34	33	32	30	30	28	27	28	30	31	32
11	36	34	33	32	30	29	28	27	28	30	31	32
12	36	35	33	31	30	29	28	27	28	30	31	32
13	36	35	33	31	29	29	27	27	28	30	32	32
14	36	34	32	31	e30	29	27	27	28	31	32	32
15	36	34	32	31	30	29	27	27	29	31	32	32
16	36	34	32	31	29	29	27	27	28	31	32	32
17	36	34	32	31	29	30	28	27	29	31	32	32
18	36	34	32	31	28	31	27	27	29	31	33	32
19	35	34	32	30	e30	32	27	27	29	31	32	32
20	36	34	32	30	29	33	27	28	29	31	32	32
21	36	34	32	30	29	33	27	27	29	31	32	31
22	36	33	32	30	29	32	27	29	29	31	32	31
23	36	34	32	30	29	32	29	29	29	31	31	31
24	36	34	32	30	30	31	28	28	30	31	32	32
25	35	34	32	31	29	31	27	28	30	31	32	32
26	36	34	32	31	29	32	27	28	30	31	32	32
27	36	34	32	30	29	31	31	28	30	31	32	31
28	35	33	32	30	30	30	33	28	30	31	32	31
29	35	33	32	30	---	30	29	28	30	31	33	31
30	35	33	32	30	---	30	28	28	30	31	33	31
31	35	---	32	30	---	30	---	28	---	31	34	---
TOTAL	1110	1027	1012	972	828	941	847	850	863	948	984	971
MEAN	35.8	34.2	32.6	31.4	29.6	30.4	28.2	27.4	28.8	30.6	31.7	32.4
MAX	36	35	35	37	30	33	33	29	30	31	34	35
MIN	35	33	32	30	28	29	27	27	28	30	31	31
AC-FT	2200	2040	2010	1930	1640	1870	1680	1690	1710	1880	1950	1930

CAL YR 1989 TOTAL 11428 MEAN 31.3 MAX 38 MIN 23 AC-FT 22670
WTR YR 1990 TOTAL 11353 MEAN 31.1 MAX 37 MIN 27 AC-FT 22520

e Estimated

DESCHUTES RIVER BASIN

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14056500 DESCHUTES RIVER BELOW WICKIUP RESERVOIR, NEAR LA PINE, OR

LOCATION.--Lat 43°41'10", long 121°41'13", in NW 1/4 NE 1/4 sec.7, T.22 S., R.9 E., Deschutes County, Hydrologic Unit 17070301, on left bank 1,000 ft downstream from Wickiup Dam, 9 mi west of La Pine, and at mile 226.4.

DRAINAGE AREA.--483 mi², hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--June 1938 to current year. Monthly discharge only June 1938, published in WSP 1318. Published as "near Lapine" 1938-64.

REVISED RECORDS.--WSP 1448: 1944(m), 1947-51(m).

GAGE.--Water-stage recorder. Datum of gage is 4,257.41 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation).

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Crane Prairie Reservoir (station 14053500), and since 1942 by Wickiup Reservoir (station 14056000). Some leakage from Crane Prairie and Wickiup Reservoirs does not pass station. Some spill bypassed station in 1955. Crater Creek canal diverts water upstream from station to Tumalo Creek basin. U.S. Bureau of Reclamation satellite telemeter at station.

AVERAGE DISCHARGE.--52 years, 736 ft³/s, 533,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,280 ft³/s July 28 to Aug. 1, 1956, July 31, Aug. 1, 2, 1962; minimum, 1.9 ft³/s Nov. 10, 1973; minimum daily, 10 ft³/s Jan. 17, 1952.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,860 ft³/s July 18, gage height, 6.51 ft; maximum gage height, 6.52 ft July 20; minimum discharge, 15 ft³/s Oct. 21-31, Nov. 7, 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	914	16	22	24	27	33	35	805	618	1550	1460	890
2	849	16	22	24	28	30	36	790	605	1510	1420	891
3	775	16	22	24	28	31	36	740	608	1440	1430	891
4	729	16	22	25	28	31	37	826	704	1420	1420	893
5	718	16	22	25	27	31	37	992	914	1420	1420	912
6	720	16	22	25	27	30	37	1090	992	1390	1420	1030
7	722	16	22	26	28	32	137	1160	902	1290	1420	1080
8	724	16	22	25	28	33	870	1210	978	1300	1420	1080
9	749	18	22	25	29	33	895	1360	1040	1290	1420	1080
10	776	18	22	26	30	31	892	1460	1090	1410	1420	1110
11	892	19	22	27	28	32	899	1540	1270	1490	1420	1160
12	986	19	23	26	28	32	903	1570	1330	1580	1440	1160
13	961	19	23	24	28	34	902	1560	1350	1700	1440	1160
14	288	19	22	25	28	33	900	1500	1450	1750	1430	1150
15	49	19	21	25	28	33	899	1460	1560	1730	1440	1130
16	79	19	22	26	29	33	1110	1410	1650	1750	1440	1130
17	152	20	22	26	29	33	1190	1380	1690	1820	1420	1110
18	149	20	21	26	28	33	1190	1380	1680	1840	1330	1070
19	65	20	21	26	28	33	1190	1380	1680	1850	1320	1060
20	16	20	21	26	28	33	1160	1370	1680	1840	1110	1060
21	16	20	21	26	29	33	1140	1370	1690	1840	937	1010
22	15	20	21	26	30	33	1140	1200	1670	1820	903	976
23	15	20	21	26	31	33	1060	873	1640	1760	845	975
24	15	20	22	26	30	34	974	771	1610	1730	840	974
25	15	21	23	26	30	34	950	772	1600	1680	854	973
26	15	21	23	26	30	34	871	772	1550	1640	857	974
27	16	21	23	26	31	34	813	774	1510	1600	858	945
28	16	21	23	27	32	34	814	773	1510	1590	881	926
29	15	22	23	27	---	34	814	737	1530	1580	906	925
30	16	22	24	27	---	34	810	700	1560	1550	889	923
31	16	---	24	27	---	35	---	650	---	1530	889	---
TOTAL	11483	566	686	796	805	1016	22741	34375	39661	49690	37699	30648
MEAN	370	18.9	22.1	25.7	28.7	32.8	758	1109	1322	1603	1216	1022
MAX	986	22	24	27	32	35	1190	1570	1690	1850	1460	1160
MIN	15	16	21	24	27	30	35	650	605	1290	840	890
AC-FT	22780	1120	1360	1580	1600	2020	45110	68180	78670	98560	74780	60790

CAL YR 1989 TOTAL 228076 MEAN 625 MAX 1760 MIN 15 AC-FT 452400
WTR YR 1990 TOTAL 230166 MEAN 631 MAX 1850 MIN 15 AC-FT 456500

DESCHUTES RIVER BASIN

14057500 FALL RIVER NEAR LA PINE, OR

LOCATION.--Lat 43°47'48", long 121°34'18", in NW 1/4 SE 1/4 sec.31, T.20 S., R.10 E., Deschutes County, Hydrologic Unit 17070301, on left bank 50 ft downstream from pond spillway at State fish hatchery, 9 mi northwest of La Pine, and at mile 4.8.

DRAINAGE AREA.--45.1 mi², hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--July 1938 to current year. Records for May to September 1912 at site 3 mi downstream not equivalent owing to difference in drainage area. Prior to Oct. 1, 1964, published as "near Lapine."

REVISED RECORDS.--WSP 984: 1938-42 (M,m).

GAGE.--Water-stage recorder. Elevation of gage is 4,220 ft, by barometer.

REMARKS.--No estimated daily discharges. Records excellent. Diversion only to ponds at fish hatchery 50 ft upstream from station, from which water returns to river upstream from station. Stream is spring fed and momentary extremes are caused by operation of fish hatchery.

AVERAGE DISCHARGE.--52 years, 148 ft³/s, 107,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 254 ft³/s June 5, 1965, gage height, 2.02 ft; minimum discharge, 67 ft³/s sometime during period Sept. 20-30, 1969.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 147 ft³/s Nov. 12, gage height, 1.36 ft, result of regulation; minimum discharge, 92 ft³/s Apr. 16, 23, result of regulation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	109	110	112	109	109	107	107	105	107	107	107	106
2	109	111	112	109	109	107	105	105	107	108	107	106
3	109	111	112	109	109	108	105	105	107	107	107	106
4	109	112	113	109	109	107	105	105	106	107	107	106
5	109	112	112	109	109	107	105	105	107	107	107	106
6	109	112	112	109	109	107	105	105	107	107	107	105
7	109	112	112	114	109	107	105	105	107	107	107	105
8	109	112	112	111	109	107	104	105	107	107	107	105
9	108	112	111	110	109	107	104	105	107	107	107	105
10	109	112	110	109	109	107	104	105	107	107	107	105
11	108	112	110	109	109	106	104	105	107	107	107	105
12	108	113	110	109	108	105	104	105	107	107	107	105
13	108	112	110	110	109	105	104	105	107	107	107	105
14	108	112	110	109	107	105	104	105	107	107	107	105
15	109	112	110	109	109	105	105	105	107	107	107	105
16	109	112	110	109	109	105	105	105	107	107	107	105
17	109	112	110	109	108	106	105	105	107	107	107	105
18	109	112	110	109	108	105	105	105	107	107	107	105
19	109	112	110	109	108	105	105	106	107	107	107	105
20	110	112	110	109	108	105	105	106	107	107	107	105
21	111	112	110	109	108	105	105	106	107	107	107	105
22	110	112	110	109	108	106	106	107	107	107	107	105
23	111	112	109	109	108	105	106	106	107	107	106	105
24	111	112	109	109	108	105	105	105	107	107	106	105
25	112	113	109	109	108	106	105	105	107	107	106	106
26	113	112	109	109	108	106	105	106	107	107	107	105
27	112	112	109	109	107	106	108	107	107	107	107	105
28	111	112	109	109	107	106	106	107	107	107	106	105
29	111	112	108	109	---	106	105	107	107	107	107	105
30	111	112	109	109	---	107	105	107	107	107	106	105
31	110	---	109	109	---	107	---	107	---	107	106	---
TOTAL	3399	3358	3418	3388	3035	3288	3151	3272	3209	3318	3311	3156
MEAN	110	112	110	109	108	106	105	106	107	107	107	105
MAX	113	113	113	114	109	108	108	107	107	108	107	106
MIN	108	110	108	109	107	105	104	105	106	107	106	105
AC-FT	6740	6660	6780	6720	6020	6520	6250	6490	6370	6580	6570	6260

CAL YR 1989 TOTAL 39406 MEAN 108 MAX 116 MIN 98 AC-FT 78160
WTR YR 1990 TOTAL 39303 MEAN 108 MAX 114 MIN 104 AC-FT 77960

DESCHUTES RIVER BASIN

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14059500 CRESCENT LAKE NEAR CRESCENT, OR

LOCATION.--Lat 43°30'05", long 121°58'20", in SW 1/4 sec.11, T.24 S., R.6 E., Klamath County, Hydrologic Unit 17070302, Deschutes National Forest, on outlet works at dam on Crescent Creek, 0.8 mi south of town of Crescent Lake, 14.0 mi west of Crescent, and at mile 30.0.

DRAINAGE AREA.--60.7 mi², hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--August 1922 to current year.

REVISED RECORDS.--WSP 1218: Drainage area. WSP 1318: 1922-31. WSP 1448: 1923-31(M,m).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Prior to Oct. 1, 1956, nonrecording gage at nearby site at datum 4,825.16 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1956, to Sept. 12, 1966, nonrecording gage, at present site and datum.

REMARKS.--Reservoir originally formed by dam of earth and logs completed in 1922, reconstructed as earthfill dam in 1956. Capacity, 117,200 acre-ft between elevations 4,821.5 ft, sill of outlet gate and 4,853.0 ft, crest of spillway. Maximum allowable storage, 86,050 acre-ft elevation, 4,845.32 ft. Dead storage about 500,000 acre-ft, Oregon Game Commission survey. Records given herein represent total contents (previously reported as usable contents) above elevation 4,821.5 ft, water surface probably cannot be lowered below elevation 4,823.4 ft, 5,360 acre-ft, because of natural flow through reservoir.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 93,010 acre-ft June 6, 1975, elevation, 4,847.09 ft; minimum contents observed, 9,640 acre-ft Oct. 21, 1931, elevation, 4,827.91 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 56,010 acre-ft June 25, elevation, 4,837.52 ft; minimum contents, 24,820 acre-ft Sept. 30, elevation, 4,829.03 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30.....	4,832.81	38,470	-
Oct. 31.....	a4,833.14	39,680	+1,210
Nov. 30.....	a4,833.48	40,930	+1,250
Dec. 31.....	a4,833.68	41,660	+730
CAL YR 1989.....	-	-	+4,370
Jan. 31.....	4,834.36	44,170	+2,510
Feb. 28.....	4,834.80	45,810	+1,640
Mar. 31.....	4,834.88	46,110	+300
Apr. 30.....	4,836.36	51,630	+5,520
May 31.....	4,837.05	54,220	+2,590
June 30.....	4,837.48	55,850	+1,630
July 31.....	4,835.71	49,210	-6,640
Aug. 31.....	4,832.13	35,970	-13,240
Sept.30.....	4,829.03	24,820	-11,150
WTR YR 1990.....	-	-	-13,650

a Provided by U.S. Bureau of Reclamation.

DESCHUTES RIVER BASIN

14060000 CRESCENT CREEK AT CRESCENT LAKE, NEAR CRESCENT, OR

LOCATION.--Lat 43°30'11", long 121°58'20", in SE 1/4 SW 1/4 sec.11, T.24 S., R.6 E., Klamath County, Hydrologic Unit 17070302, Deschutes National Forest, on left bank 400 ft downstream from Crescent Lake Dam, 0.5 mi south of town of Crescent Lake, 14 mi west of Crescent, and at mile 29.9.

DRAINAGE AREA.--60.7 mi², hydrologic drainage boundary uncertain owing to ground-water exchange.

PERIOD OF RECORD.--January to September 1911 (gage heights and discharge measurements only), January 1912 to July 1915, July to September 1927, May 1928 to current year. 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.

REVISED RECORDS.--WSP 1218: Drainage area.

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 4,819.96 ft above National Geodetic Vertical Datum of 1929. See WSP 1935 for history of changes prior to Sept. 11, 1956.

REMARKS.--No estimated daily discharges. Records good above 10 ft³/s, fair below. Flow regulated since 1922 by Crescent Lake (station 14059500). No diversion upstream from station.

AVERAGE DISCHARGE.--64 years (water years 1913-14, 1929-90), 57.6 ft³/s, 41,730 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 313 ft³/s July 9, 1929, Aug. 9, 1936; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 247 ft³/s Aug. 16, 17, gage height, 2.76 ft; minimum daily discharge, 2.1 ft³/s Oct. 22-25, Nov. 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	2.7	8.1	8.1	9.0	9.4	9.0	10	10	55	90	225
2	4.1	2.6	8.1	8.1	9.1	9.4	9.0	10	10	98	90	223
3	4.0	2.1	8.1	8.1	9.0	9.4	9.0	10	10	98	131	221
4	3.3	2.4	8.1	8.1	9.0	9.4	9.0	10	11	97	167	219
5	3.3	2.4	8.3	8.1	8.7	9.4	9.1	10	11	97	165	219
6	3.3	2.4	8.5	8.4	8.5	9.4	9.3	10	11	97	164	220
7	3.3	2.4	8.5	8.5	8.5	9.4	9.4	10	11	97	162	218
8	3.4	2.4	8.5	8.5	8.5	9.4	9.4	10	11	96	161	216
9	3.7	2.4	8.5	8.5	8.5	9.4	9.4	10	11	96	160	216
10	3.9	2.4	8.5	8.5	8.5	9.4	9.4	10	11	96	191	214
11	3.5	2.4	8.5	8.5	8.5	9.4	9.4	10	11	96	222	213
12	3.3	2.4	8.5	8.5	8.5	9.4	9.4	10	11	96	219	213
13	3.0	5.3	8.5	8.5	8.5	9.4	9.4	10	11	96	216	212
14	2.9	11	8.5	8.5	8.5	9.4	9.4	10	11	95	216	210
15	2.7	11	8.5	8.5	8.5	9.4	9.4	10	11	96	217	207
16	2.7	11	8.5	8.5	8.5	9.4	9.4	10	11	96	233	207
17	2.6	11	8.5	8.5	8.5	9.4	9.4	10	11	96	245	205
18	2.4	11	8.5	8.5	8.5	9.4	9.4	10	11	96	243	204
19	2.4	11	8.5	8.5	8.5	9.4	9.4	10	11	95	242	205
20	2.4	11	8.3	8.5	8.5	9.4	9.4	10	11	95	241	203
21	2.3	11	7.7	8.5	8.5	9.4	9.4	10	11	95	240	200
22	2.1	11	8.1	8.5	8.5	9.4	9.4	10	11	95	238	198
23	2.1	11	8.1	8.5	8.5	9.4	9.5	10	11	94	238	196
24	2.1	11	8.1	8.5	8.5	9.4	9.8	10	11	92	237	193
25	2.1	11	8.1	8.5	8.5	9.4	9.8	10	11	92	235	194
26	2.3	11	8.1	8.5	8.5	9.4	9.8	10	11	91	233	195
27	2.4	11	8.1	8.5	8.5	9.4	9.8	10	11	91	233	192
28	2.7	9.9	8.1	8.5	9.1	9.4	9.8	10	11	91	231	189
29	2.7	8.1	8.1	8.9	---	9.2	10	10	11	91	230	186
30	2.7	8.1	8.1	9.0	---	9.3	10	10	11	91	229	182
31	2.7	---	8.1	9.0	---	9.0	---	10	---	90	227	---
TOTAL	90.3	214.4	256.7	262.8	240.9	290.7	283.3	310	327	2897	6346	6195
MEAN	2.91	7.15	8.28	8.48	8.60	9.38	9.44	10.0	10.9	93.5	205	206
MAX	4.1	11	8.5	9.0	9.1	9.4	10	10	11	98	245	225
MIN	2.1	2.1	7.7	8.1	8.5	9.0	9.0	10	10	55	90	182
AC-FT	179	425	509	521	478	577	562	615	649	5750	12590	12290

CAL YR 1989 TOTAL 12670.6 MEAN 34.7 MAX 147 MIN 2.1 AC-FT 25130
WTR YR 1990 TOTAL 17714.1 MEAN 48.5 MAX 245 MIN 2.1 AC-FT 35140

DESCHUTES RIVER BASIN

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14063000 LITTLE DESCHUTES RIVER NEAR LA PINE, OR

LOCATION.--Lat 43°41'21", long 121°30'06", in SW 1/4 SW 1/4 sec.2, T.22 S., R.10 E., Deschutes County, Hydrologic Unit 17070302, on right bank 10 ft downstream from highway bridge, 1.1 mi north of La Pine, and at mile 26.8.

DRAINAGE AREA.--859 mi², hydrologic drainage boundary uncertain owing to ground-water exchange.

PERIOD OF RECORD.--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 current year. Monthly discharge only for some periods, published in WSP 1318. Published as Deschutes River near Lapine 1910-12, as East Fork Deschutes River near Lapine 1913-20, and as Little Deschutes River near Lapine 1924-64.

REVISED RECORDS.--WSP 1218: 1950.

GAGE.--Water-stage recorder. Datum of gage is 4,192.81 ft above National Geodetic Vertical Datum of 1929. Sept. 1, 1910, to Aug. 31, 1911, nonrecording gage at present site at different datum. Mar. 1 to Sept. 30, 1912, nonrecording gage at site 1.2 mi downstream at different datum. June 1, 1913, to Sept. 28, 1928, nonrecording gage and Sept. 29, 1928, to Sept. 30, 1931, water-stage recorder at present site at different datums.

REMARKS.--Records good except those for May 16 to Sept. 30, which are fair, and Jan. 11 to May 15, which are poor. Flow regulated since 1922 by Crescent Lake (station 14059500). Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--66 years (water years 1925-90), 205 ft³/s, 148,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,660 ft³/s Dec. 25, 1964, gage height, 8.18 ft; minimum discharge, 8 ft³/s Sept. 2, 3, 1931.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 395 ft³/s Jan. 11, gage height, 4.98 ft; minimum discharge, 34 ft³/s Oct. 19, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60	67	68	64	e78	86	189	344	155	49	89	224
2	59	65	78	58	e70	89	199	344	151	48	86	221
3	56	62	83	57	64	106	207	312	143	87	84	216
4	54	62	79	65	73	113	214	269	144	107	84	212
5	51	62	90	61	72	110	219	234	142	114	135	210
6	49	62	130	60	80	105	220	215	138	120	148	211
7	48	62	140	80	81	109	221	196	140	121	143	213
8	47	62	131	185	77	109	236	186	148	120	138	214
9	46	63	125	266	68	107	236	183	146	124	154	211
10	45	63	123	316	66	107	232	176	136	126	158	210
11	43	58	99	377	82	111	225	167	124	126	157	211
12	42	56	86	285	96	106	218	160	116	129	190	208
13	41	63	82	180	104	97	215	149	112	128	202	208
14	40	76	86	161	82	94	214	139	109	123	202	206
15	39	81	92	125	e60	100	211	133	107	119	201	205
16	39	78	86	116	e60	104	211	129	103	115	201	208
17	38	75	80	103	e66	107	220	122	101	110	204	214
18	36	74	67	94	e66	117	248	112	98	107	226	213
19	34	74	63	87	e66	134	266	110	92	107	241	212
20	35	72	61	79	e65	155	273	115	87	109	250	213
21	42	71	60	89	e72	178	275	124	80	109	252	211
22	47	69	62	84	90	188	252	135	76	105	253	207
23	55	71	66	86	97	193	240	161	70	103	246	205
24	58	75	65	92	102	187	261	189	68	100	239	205
25	85	89	65	86	102	181	273	182	64	101	234	211
26	101	91	61	83	94	184	270	160	60	112	230	225
27	89	82	57	75	91	208	252	145	57	110	229	228
28	91	76	60	75	88	205	261	149	55	106	227	220
29	86	60	50	78	---	192	332	153	52	102	224	212
30	77	70	54	67	---	186	340	150	51	96	227	208
31	69	---	58	68	---	185	---	153	---	92	229	---
TOTAL	1702	2091	2507	3702	2212	4253	7230	5496	3125	3325	5883	6372
MEAN	54.9	69.7	80.9	119	79.0	137	241	177	104	107	190	212
MAX	101	91	140	377	104	208	340	344	155	129	253	228
MIN	34	56	50	57	60	86	189	110	51	48	84	205
AC-FT	3380	4150	4970	7340	4390	8440	14340	10900	6200	6600	11670	12640

CAL YR 1989 TOTAL 62061 MEAN 170 MAX 660 MIN 34 AC-FT 123100
WTR YR 1990 TOTAL 47898 MEAN 131 MAX 377 MIN 34 AC-FT 95010

e Estimated

DESCHUTES RIVER BASIN

14064500 DESCHUTES RIVER AT BENHAM FALLS, NEAR BEND, OR

LOCATION.--Lat 43°55'49", long 121°24'39", in SW 1/4 NE 1/4 sec.16, T.19 S., R.11 E., Deschutes County, Hydrologic Unit 17070301, Deschutes National Forest, on right bank 0.5 mi upstream from Benham Falls, 10 mi southwest of Bend, and at mile 181.4.

DRAINAGE AREA.--1,759 mi².

PERIOD OF RECORD.--April 1906 to September 1913, April to September 1914, August to December 1920, April to September 1921, February 1924 to current year. 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.

REVISED RECORDS.--See PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 4,142.10 ft above National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). See WSP 1738 for history of changes prior to Nov. 20, 1958.

REMARKS.--Records excellent. Flow regulated by Crane Prairie Reservoir, Crescent Lake, and Wickiup Reservoir (see elsewhere in this report). Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--73 years (water years 1907-13, 1925-90), 1,408 ft³/s, 1,020,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,000 ft³/s, estimated, Nov. 27, 1909 (gage height not determined); minimum discharge, 363 ft³/s Jan. 20, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,310 ft³/s July 21-23, gage height, 5.77 ft; minimum discharge, 450 ft³/s Feb. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1580	518	506	498	506	567	662	1590	1210	2030	2060	1600
2	1420	509	514	501	523	564	663	1590	1180	2030	2020	1600
3	1350	508	525	495	537	583	671	1580	1170	2010	1980	1590
4	1280	506	545	501	518	597	679	1530	1160	1980	1960	1590
5	1230	504	550	502	518	604	686	1570	1240	1970	1960	1580
6	1210	504	554	510	527	593	693	1660	1430	1980	1960	1590
7	1210	507	577	542	519	589	696	1720	1490	1950	1980	1670
8	1210	504	602	605	517	590	779	1760	1430	1890	1980	1700
9	1210	504	601	606	537	587	1460	1800	1500	1870	1980	1710
10	1220	505	584	661	556	586	1550	1900	1560	1870	1980	1700
11	1240	506	550	704	542	581	1560	1980	1600	1930	1980	1720
12	1320	510	525	739	533	582	1560	2050	1720	2000	1980	1750
13	1420	508	534	781	521	574	1560	2090	1780	2050	2000	1750
14	1400	506	530	690	490	564	1560	2080	1810	2140	2010	1750
15	959	514	525	654	533	554	1560	2020	1880	2190	2010	1750
16	576	520	523	619	539	562	1570	1960	1980	2200	2020	1730
17	538	528	513	600	531	568	1730	1920	2050	2210	2030	1730
18	619	525	510	572	527	576	1800	1880	2110	2240	2030	1720
19	648	521	510	539	519	583	1830	1860	2120	2270	1980	1690
20	624	521	507	522	524	595	1840	1850	2130	2290	1950	1670
21	536	518	500	536	533	614	1830	1840	2140	2310	1830	1670
22	511	518	499	558	541	637	1820	e1840	2160	2310	1710	1640
23	505	521	502	553	548	658	1820	e1730	2150	2310	1660	1610
24	504	523	502	524	562	662	1730	e1460	2120	2280	1610	1600
25	505	528	499	547	578	662	1670	e1380	2090	2250	1580	1600
26	517	540	498	552	585	671	1660	e1380	2080	2220	1590	1620
27	548	545	494	545	577	667	1610	e1360	2050	2190	1590	1610
28	539	532	500	532	571	676	1570	e1360	2010	2170	1580	1590
29	535	505	497	516	---	682	1540	e1340	2010	2140	1600	1560
30	534	502	490	550	---	673	1570	e1300	2020	2130	1620	1560
31	525	---	493	531	---	665	---	e1260	---	2100	1600	---
TOTAL	28023	15460	16259	17785	15012	18866	41929	52640	53380	65510	57820	49650
MEAN	904	515	524	574	536	609	1398	1698	1779	2113	1865	1655
MAX	1580	545	602	781	585	682	1840	2090	2160	2310	2060	1750
MIN	504	502	490	495	490	554	662	1260	1160	1870	1580	1560
AC-FT	55580	30660	32250	35280	29780	37420	83170	104400	105900	129900	114700	98480

CAL YR 1989 TOTAL 443400 MEAN 1215 MAX 2310 MIN 460 AC-FT 879500
WTR YR 1990 TOTAL 432334 MEAN 1184 MAX 2310 MIN 490 AC-FT 857500

e Estimated

DESCHUTES RIVER BASIN

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DIVERSIONS FROM DESCHUTES RIVER NEAR BEND, OR

The following six canals, all in Deschutes County, Hydrologic Unit 17070301, are the only diversions from Deschutes River between gaging stations at Benham Falls (station 14064500) and below Bend (station 14070500).

14065500 ARNOLD CANAL NEAR BEND diverts at mile 174.5 from right bank at head of Lava Island, in SW 1/4 sec.27, T.18 S., R.11 E., water used for irrigation southeast of Bend. Records available, October 1912 to current year.

14065500 CENTRAL OREGON CANAL ABOVE PILOT BUTTE CANAL, NEAR BEND diverts at mile 169.5 from left bank in SE 1/4 NE 1/4 sec.11, T.18 S., R.11 E., water used for irrigation east of Bend. Records available, October 1932 to current year.

14068500 DESCHUTES COUNTY MUNICIPAL IMPROVEMENT DISTRICT CANAL AT BEND diverts at mile 165.8 from left bank in SW 1/4 SE 1/4 sec.29, 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. Records available, May 1923 to current year.

14069000 NORTH UNIT MAIN CANAL NEAR BEND diverts at mile 164.8 from right bank in NE 1/4 sec.29, T.17 S., R.12 E., water used for irrigation near Madras. Records available, October 1945 to current year.

14069500 NORTH CANAL NEAR BEND diverts at mile 164.8 from right bank in NE 1/4 sec.29, T.17 S., R.12 E., water used for irrigation north of Bend, mostly near Redmond. Records available, June 1913 to current year.

14070000 SWALLEY CANAL NEAR BEND diverts at mile 164.8 from right bank in NE 1/4 sec.29, T.17 S., R.12 E., water used for irrigation north of Bend. Records available, 1913 to current year.

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

DIVERSIONS, IN ACRE-FEET, WATER YEAR OCTOBER 1989 to SEPTEMBER 1990

MONTH	DESCHUTES COUNTY						TOTAL
	ARNOLD CANAL	CENTRAL OREGON CANAL	MUNICIPAL IMPROVEMENT DISTRICT CANAL	NORTH UNIT MAIN CANAL	NORTH CANAL	SWALLEY CANAL	
OCTOBER.....	1,920	9,150	49	16,290	8,440	3,580	39,430
NOVEMBER.....	334	2,160	475	0	1,690	173	4,930
DECEMBER.....	132	1,980	2.3	0	1,190	438	3,740
JANUARY.....	305	2,060	0	0	1,510	292	4,170
FEBRUARY.....	97	2.1	0	0	1,110	468	1,680
MARCH.....	196	2,000	0	0	532	0	2,730
APRIL.....	2,150	15,450	604	32,980	15,440	3,550	70,170
MAY.....	5,540	27,830	1,840	28,810	26,330	5,990	96,340
JUNE.....	5,700	27,370	3,210	27,180	27,770	6,620	97,850
JULY.....	6,820	32,040	7,170	35,220	32,110	7,300	120,660
AUGUST.....	6,960	30,650	8,910	21,590	30,970	7,130	106,210
SEPTEMBER.....	5,440	26,220	6,610	20,040	25,960	5,560	89,830
WTR YR 1990.....	35,590	176,900	28,970	182,100	173,100	41,100	637,800

DESCHUTES RIVER BASIN

14070500 DESCHUTES RIVER BELOW BEND, OR

LOCATION.--Lat 44°04'59", long 121°18'24", in SE 1/4 SE 1/4 sec.20, T.17 S., R.12 E., Deschutes County, Hydrologic Unit 17070301, on right bank 0.4 mi downstream from North Canal, at city limits of town of Bend, and at mile 164.4.

DRAINAGE AREA.--1,899 mi².

PERIOD OF RECORD.--October 1914 to current year.

REVISED RECORDS.--WSP 1318: 1916-18(M), 1926(M), 1931(M).

GAGE.--Water-stage recorder. Datum of gage is 3,503.96 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1931, water-stage recorder at site 200 ft downstream at datum 1.00 ft higher.

REMARKS.--Records good except for discharges below 40 ft³/s, which are fair. Flow regulated by powerplant at Bend, Crescent Lake, Crane Prairie Reservoir, and Wickiup Reservoir (see elsewhere in this report). Six large canals and several small ditches divert water upstream from station for irrigation.

AVERAGE DISCHARGE.--76 years, 491 ft³/s, 355,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,820 ft³/s Dec. 27, 1964, gage height, 4.90 ft; maximum gage height, 5.38 ft Dec. 15, 1932 (backwater from ice); minimum discharge, 1.0 ft³/s Aug. 25, 1930.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge near this site since 1905, 4,820 ft³/s Nov. 27, 1909.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 866 ft³/s Jan. 13, gage height, 3.38 ft; minimum discharge, 17 ft³/s Oct. 5, Aug. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	447	373	414	436	259	513	40	78	32	27	41
2	44	440	403	417	427	367	203	40	59	32	27	42
3	101	442	436	415	451	444	98	43	39	33	28	41
4	90	436	458	414	441	452	103	40	34	31	29	41
5	57	432	468	419	431	377	110	40	36	32	29	39
6	36	431	468	423	442	252	82	40	35	32	26	33
7	42	435	478	483	437	241	41	40	33	32	29	48
8	42	433	518	518	434	240	49	40	35	32	30	33
9	42	431	518	494	446	360	157	40	81	32	30	33
10	43	433	501	504	470	482	45	41	43	32	29	32
11	43	434	361	548	463	477	46	41	32	31	29	33
12	43	436	187	592	449	476	45	40	33	34	30	34
13	43	409	188	700	441	472	45	40	40	32	30	33
14	44	335	199	625	414	465	44	40	33	32	30	31
15	99	160	290	490	428	451	44	39	31	33	30	32
16	80	154	317	376	449	456	44	38	32	34	31	33
17	34	159	241	297	446	461	e44	38	32	33	31	44
18	29	189	249	291	439	470	e44	37	33	36	32	36
19	30	453	350	347	429	470	e44	37	32	35	33	34
20	347	325	420	427	427	479	e44	36	32	33	32	33
21	440	243	417	442	438	497	44	36	44	32	31	34
22	370	234	413	336	448	518	44	36	37	31	110	34
23	376	237	414	194	416	542	44	49	33	32	111	34
24	375	345	416	216	405	544	44	67	33	31	58	34
25	377	444	416	201	421	545	44	37	31	29	39	34
26	384	453	412	301	283	558	43	37	32	30	33	34
27	408	462	410	404	235	554	159	37	31	28	34	34
28	407	458	367	414	277	560	102	36	31	27	42	35
29	401	404	363	440	---	565	43	40	31	27	43	35
30	401	368	378	452	---	566	43	71	32	26	44	35
31	427	---	409	448	---	554	---	112	---	27	47	---
TOTAL	5695	11062	11838	13042	11723	14154	2455	1348	1138	973	1184	1069
MEAN	184	369	382	421	419	457	81.8	43.5	37.9	31.4	38.2	35.6
MAX	440	462	518	700	470	566	513	112	81	36	111	48
MIN	29	154	187	194	235	240	41	36	31	26	26	31
AC-FT	11300	21940	23480	25870	23250	28070	4870	2670	2260	1930	2350	2120

CAL YR 1989 TOTAL 79936 MEAN 219 MAX 703 MIN 27 AC-FT 158600
WTR YR 1990 TOTAL 75681 MEAN 207 MAX 700 MIN 26 AC-FT 150100

e Estimated

DESCHUTES RIVER BASIN

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14074900 SNOW CREEK NEAR SISTERS, OR

LOCATION.--Lat 44°06'59", long 121°39'34", in NE 1/4 SW 1/4 sec.9, T.17 S., R.9 E., Deschutes County, Hydrologic Unit 17070301, on left bank about 250 ft upstream from diversion dam, and 13 mi southwest of Sisters.

DRAINAGE AREA.--1.65 mi².

PERIOD OF RECORD.--October 1985 to current year. November 1970 to September 1985 available from Oregon Water Resources Department.

GAGE.--Water-stage recorder. Prior to Oct 14, 1975, on right bank at different datum.

REMARKS.--Records excellent Oct. 1-23, May 1 to Sept. 30; good Apr. 1-30; poor Oct. 24 to Mar. 31. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--19 years (1971-90), 6.69 ft³/s, 55.06 in/yr, 4,850 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 341 ft³/s Dec. 10, 1987, gage height 2.68 ft; maximum gage height, 5.73 ft (backwater from ice), discharge not determined, Jan. 18, 1971; minimum discharge, 0.82 ft³/s Mar. 24, 25, 31, 1988.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 25 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 8	0345	(a)	*2.22				

Minimum recorded discharge, 1.7 ft³/s Jan. 4, but may have been lower during periods of estimated discharge.

(a) Backwater from ice.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	4.2	e3.3	3.3	e3.1	e2.4	3.0	5.0	6.0	9.1	6.5	5.6
2	5.0	4.0	3.7	3.2	e2.9	e2.3	3.0	5.3	6.6	8.8	6.3	5.6
3	5.8	4.0	5.6	3.2	e2.9	e2.2	3.1	5.8	9.7	8.1	6.3	5.6
4	5.3	4.3	11	2.8	e2.9	e2.2	3.2	6.3	7.8	8.0	6.3	5.6
5	4.7	4.6	5.9	3.5	e2.9	e2.2	3.2	7.6	7.4	8.5	6.3	5.4
6	4.5	5.4	5.1	3.3	e2.8	e2.2	3.4	7.1	12	8.4	6.3	5.3
7	4.4	4.2	4.4	6.3	e2.8	e2.2	3.5	6.0	11	8.0	6.2	5.3
8	4.4	4.8	4.5	e23	e2.8	e2.2	3.4	5.8	11	7.9	6.1	5.3
9	4.4	4.6	e4.0	11	e2.8	e2.2	3.2	5.9	11	8.2	6.2	5.3
10	4.4	4.2	e3.7	4.3	e3.0	e2.2	3.4	6.1	10	8.4	6.0	5.3
11	4.4	4.0	e3.7	4.0	e3.0	e2.2	3.6	5.9	8.8	8.5	6.0	5.1
12	4.4	4.4	e3.2	3.9	e2.8	e2.2	3.5	5.7	8.0	8.7	6.0	5.0
13	4.4	8.8	e3.5	3.7	e2.6	e2.2	3.9	5.4	7.1	8.5	6.0	5.0
14	4.4	e19	3.9	3.7	e2.5	e2.2	4.4	5.5	7.1	8.2	6.0	5.0
15	4.9	e6.0	3.9	3.7	e2.4	e2.2	4.7	5.5	7.0	8.0	6.0	5.0
16	4.8	4.2	4.3	3.7	e2.4	e2.2	4.7	5.7	7.2	8.0	6.0	5.0
17	4.3	4.3	3.7	3.7	e2.4	e2.2	4.6	6.0	7.3	7.7	6.5	5.0
18	4.2	e4.0	e3.3	3.7	e2.4	e2.2	4.5	5.8	7.5	7.5	6.1	5.0
19	4.2	e3.7	e3.0	3.5	e2.4	e2.2	4.6	5.6	8.2	7.3	6.3	5.0
20	4.5	e3.4	3.7	3.4	e2.4	e2.2	4.6	5.3	8.9	7.3	6.0	4.9
21	4.9	e3.3	3.7	3.4	e2.4	e2.2	4.8	5.6	9.3	7.3	6.1	4.7
22	4.6	e3.3	3.6	3.4	e2.4	e2.2	4.7	7.8	10	7.3	6.0	4.7
23	4.8	e3.7	3.5	e3.4	e2.4	e2.2	4.5	6.0	10	7.2	6.0	4.7
24	5.2	e3.6	3.4	e3.4	e2.4	e2.2	4.2	5.5	10	7.1	6.0	4.7
25	7.4	e3.4	3.4	3.4	e2.4	e2.2	4.4	5.4	10	7.1	6.0	4.8
26	5.1	e3.2	3.4	3.5	e2.4	e2.2	4.2	6.3	9.6	6.9	6.0	4.8
27	8.1	e3.0	3.4	3.5	e2.4	e2.2	9.1	11	9.2	6.7	6.0	4.7
28	9.6	e3.0	3.4	e3.5	e2.4	e2.3	7.8	9.1	9.0	6.7	5.7	4.7
29	11	e3.0	3.4	e3.6	---	e2.4	5.6	8.3	9.0	6.7	5.9	4.7
30	4.7	e3.0	3.2	3.5	---	e2.6	5.0	7.5	9.2	6.7	5.6	4.7
31	4.2	---	3.2	3.3	---	2.8	---	6.3	---	6.6	5.6	---
TOTAL	162.0	138.6	125.0	138.8	73.4	69.8	129.8	196.1	264.9	239.4	188.3	151.5
MEAN	5.23	4.62	4.03	4.48	2.62	2.25	4.33	6.33	8.83	7.72	6.07	5.05
MAX	11	19	11	23	3.1	2.8	9.1	11	12	9.1	6.5	5.6
MIN	4.2	3.0	3.0	2.8	2.4	2.2	3.0	5.0	6.0	6.6	5.6	4.7
AC-FT	321	275	248	275	146	138	257	389	525	475	373	301
CFSM	3.17	2.80	2.44	2.71	1.59	1.36	2.62	3.83	5.35	4.68	3.68	3.06
IN.	3.65	3.12	2.82	3.13	1.65	1.57	2.93	4.42	5.97	5.40	4.25	3.42

CAL YR 1989 TOTAL 2876.4 MEAN 7.88 MAX 87 MIN 1.4 AC-FT 5710 CFSM 4.78 IN. 64.85
WTR YR 1990 TOTAL 1877.6 MEAN 5.14 MAX 23 MIN 2.2 AC-FT 3720 CFSM 3.12 IN. 42.33

e Estimated

DESCHUTES RIVER BASIN

14075000 SQUAW CREEK NEAR SISTERS, OR

LOCATION.--Lat 44°14'02", long 121°33'57", in SE 1/4 SW 1/4 sec.29, T.15 S., R.10 E., Deschutes County, Hydrologic Unit 17070301, on right bank 800 ft upstream from intake of McAllister ditch, 4 mi south of Sisters, and at mile 26.8.

DRAINAGE AREA.--45.2 mi², not including 12.6 mi² of Pole Creek. See REMARKS.

PERIOD OF RECORD.--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 current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WDR OR-83-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,490 ft, by barometer. July 1, 1906, to May 29, 1913, nonrecording gage at site 1,000 ft downstream at different datum, below intake of McAllister ditch (records include flow in McAllister ditch). May 30, 1913, to Sept. 2, 1915, nonrecording gage and Mar. 24, 1916, to Oct. 5, 1928, water-stage recorder at site 300 ft downstream at different datum. Oct. 6, 1928, to Nov. 7, 1967, water-stage recorder at site 200 ft downstream at datum 2.64 ft lower.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation. A canal near mouth of Pole Creek has diverted the entire flow of that creek since 1885. Prior to Oct. 1, 1982, drainage area of 57.8 mi² included that of Pole Creek. Water is diverted from Snow Creek, a tributary upstream from station, for irrigation in Three Creek basin.

AVERAGE DISCHARGE.--78 years (water years 1907-18, 1920, 1926-90), 105 ft³/s, 76,070 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge since 1909, 2,000 ft³/s Dec. 25, 1980, from rating curve extended above 690 ft³/s on basis of slope-area measurement of peak flow; a maximum gage height of 9.2 ft from water-borne ice was observed on Jan. 11, 1979, and probably occurred on Jan. 10, 1979; previous maximum gage height, about 8.75 ft, over top of gage Nov. 22, 1909, site and datum then in use (discharge not determined); minimum discharge, 14 ft³/s Mar. 2, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 470 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 27	2100	*774	*3.63	No other peak greater than base discharge.			
Minimum discharge, 36 ft ³ /s Mar. 12, 13, but may have been lower during periods of ice effect.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	53	49	46	52	45	54	139	101	165	98	74
2	64	53	48	44	52	44	57	136	101	155	94	72
3	62	53	62	e42	51	44	59	136	134	131	93	70
4	61	62	157	e47	57	43	60	138	129	125	92	71
5	61	55	166	49	59	43	62	155	113	133	95	72
6	61	53	85	53	49	42	65	169	162	152	102	71
7	60	52	72	97	51	43	68	137	191	133	97	72
8	62	52	74	173	47	42	68	121	180	128	96	73
9	62	66	63	129	51	42	63	116	187	132	107	72
10	61	62	e58	104	56	44	64	117	181	142	97	73
11	61	55	e50	84	51	43	71	113	143	148	96	74
12	58	74	e52	75	49	42	72	107	130	153	96	69
13	58	58	e52	71	45	45	75	103	118	162	96	67
14	58	52	e54	66	43	43	87	100	110	146	93	66
15	57	54	64	63	e45	41	95	97	111	133	92	63
16	56	53	57	62	e45	41	103	98	115	133	88	62
17	56	60	e54	59	e45	42	103	101	120	125	95	61
18	56	55	e50	57	e46	46	99	100	123	118	88	61
19	57	53	e55	58	e50	47	101	97	139	111	81	62
20	57	52	e60	63	e52	47	103	97	156	109	78	60
21	68	51	50	65	56	47	101	93	162	111	77	59
22	64	50	50	55	50	49	107	130	177	115	84	60
23	69	e50	49	53	46	51	124	118	186	115	79	60
24	59	50	48	60	46	49	99	100	189	106	75	60
25	57	49	e48	54	46	47	110	94	185	100	72	64
26	57	49	e48	54	45	47	107	98	175	97	73	65
27	56	e49	e48	57	45	47	340	151	160	98	70	63
28	53	e48	47	52	45	48	392	148	154	97	73	61
29	53	e48	e47	49	---	48	206	136	157	96	80	59
30	54	e48	e46	53	---	49	157	132	170	100	81	58
31	55	---	46	54	---	51	---	113	---	102	73	---
TOTAL	1839	1619	1909	2048	1375	1402	3272	3690	4459	3871	2711	1974
MEAN	59.3	54.0	61.6	66.1	49.1	45.2	109	119	149	125	87.5	65.8
MAX	69	74	166	173	59	51	392	169	191	165	107	74
MIN	53	48	46	42	43	41	54	93	101	96	70	58
AC-FT	3650	3210	3790	4060	2730	2780	6490	7320	8840	7680	5380	3920

CAL YR 1989 TOTAL 35104 MEAN 96.2 MAX 339 MIN 22 AC-FT 69630
WTR YR 1990 TOTAL 30169 MEAN 82.7 MAX 392 MIN 41 AC-FT 59840

e Estimated

LOCATION.--Lat 44°29'56", long 121°19'12", in NW 1/4 SE 1/4 sec.29, T.12 S., R.12 E., Jefferson County, Hydrologic Unit 17070301, on right bank 2.5 mi downstream from Squaw Creek, 6.0 mi southwest of Culver, and at mile 120.6.

GAGE.--Water-stage recorder. Elevation of gage is 1,980 ft above National Geodetic Vertical Datum of 1929 (river-profile survey). July 14, 1952, to Sept. 30, 1961, at site 4.1 mi downstream at different datum.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,680 ft³/s Dec. 24, 1964, gage height, 10.00 ft, from rating curve extended above 2,200 ft³/s on basis of slope-area measurement of peak flow; minimum discharge, 418 ft³/s July 7, 8, 1964.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	580	1030	974	989	1070	871	1120	684	606	515	506	540
2	582	1030	978	988	1040	859	1060	612	577	517	505	529
3	583	1030	1030	981	1050	1040	714	600	562	516	501	525
4	624	1040	1110	990	1060	1060	649	583	550	516	498	525
5	620	1030	1310	993	1040	1080	625	566	550	516	501	522
6	600	1020	1170	1000	1050	908	611	579	522	515	501	522
7	572	1030	1110	1040	1040	854	600	566	545	512	509	520
8	580	1030	1130	1200	1040	839	548	538	592	512	508	521
9	578	1030	1150	1190	1040	839	542	529	584	512	503	529
10	575	1050	1120	1130	1070	1040	660	521	627	509	500	519
11	577	1040	1040	1130	1090	1080	550	523	596	514	500	515
12	579	1040	876	1150	1070	1090	550	523	548	520	501	517
13	579	1010	809	1260	1060	1070	541	521	538	512	502	518
14	581	945	754	1330	1020	1070	539	522	523	515	500	519
15	581	813	759	1230	1000	1050	540	521	520	512	500	518
16	627	663	893	1120	1050	1050	547	519	514	510	502	515
17	617	658	809	942	1040	1070	550	516	515	510	508	518
18	583	686	827	924	1050	1080	596	517	515	510	513	525
19	573	810	849	909	1030	1100	554	519	513	511	522	522
20	585	1010	1010	999	1040	1100	554	518	515	511	523	518
21	945	863	1010	1060	988	1110	543	516	523	511	520	515
22	995	834	993	1080	974	1130	542	521	526	511	561	514
23	951	833	1000	887	978	1100	540	532	561	514	652	513
24	966	840	1020	800	933	1110	550	533	555	513	599	516
25	954	996	1020	827	935	1110	540	553	536	513	558	524
26	976	1050	1020	804	990	1110	534	535	532	513	525	524
27	996	1050	1020	958	819	1110	560	524	527	512	524	526
28	1010	1060	1010	1030	847	1110	1070	526	517	513	516	525
29	1000	1050	964	1060	---	1120	862	534	517	509	524	537
30	1010	991	962	1050	---	1120	739	536	514	508	527	563
31	1010	---	992	1080	---	1120	---	556	---	507	528	---
TOTAL	22589	28562	30719	32131	28414	32400	19130	16843	16320	15889	16137	15694
MEAN	729	952	991	1036	1015	1045	638	543	544	513	521	523
MAX	1010	1060	1310	1330	1090	1130	1120	684	627	520	652	563
MIN	572	658	754	800	819	839	534	516	513	507	498	513
AC-FT	44810	56650	60930	63730	56360	64270	37940	33410	32370	31520	32010	31130
CAL YR 1989	TOTAL 281809		MEAN 772	MAX 1310	MIN 515	AC-FT 559000						
WTR YR 1990	TOTAL 274828		MEAN 753	MAX 1330	MIN 498	AC-FT 545100						

DESCHUTES RIVER BASIN

14080400 PRINEVILLE RESERVOIR NEAR PRINEVILLE, OR

LOCATION.--Lat 44°06'50", long 120°46'50", in SW 1/4 NW 1/4 sec.11, T.17 S., R.16 E., Crook County, Hydrologic Unit 17070304, at right end of Prineville Dam on Crooked River, 13.8 mi south of Prineville, and at mile 72.5.

DRAINAGE AREA.--2,700 mi², approximately, of which 500 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Prior to Aug. 13, 1969, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill dam with ungated concrete spillway and concrete outlet tunnel controlled by two 4-ft by 6-ft regulating gates. Storage began in December 1960. Total capacity at elevation 3,234.80 ft, crest of spillway, is 154,700 acre-ft, of which 152,800 acre-ft is active storage above 3,114.00 ft, proposed minimum pool. Reservoir used for flood control, irrigation, and recreation. Figures given herein represent active storage.

COOPERATION.--Gage inspected, and elevations and capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 178,100 acre-ft Apr. 20, 1984, elevation, 3,242.75 ft; minimum contents observed, 37,400 acre-ft Oct. 31, Nov. 1, 1977, elevation, 3,177.40 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 127,200 acre-ft Apr. 16, 17, elevation, 3,225.80 ft; minimum contents, 58,530 acre-ft Sept. 30, elevation, 3,192.45 ft, but may have been lower during period of no record, Sept. 1-30.

Capacity table (elevation, in feet, and usable contents, in acre-feet)

3,175	34,560	3,210	90,380
3,180	40,600	3,215	101,100
3,185	47,390	3,220	112,600
3,190	54,740	3,230	138,700
3,195	62,640	3,235	153,400
3,200	71,190	3,240	169,100
3,205	80,430	3,243	178,900

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3211.95	3210.88	3211.25	3212.01	3214.23	3215.44	3223.73	3224.45	3219.73	3215.03	3208.10	---
2	3211.86	3210.88	3211.26	3212.01	3214.26	3215.54	3224.09	3224.39	3219.69	3214.83	3207.84	---
3	3211.78	3210.87	3211.26	3212.02	3214.31	3215.77	3224.36	3224.31	3219.61	3214.60	3207.60	---
4	3211.69	3210.88	3211.30	3212.02	3214.36	3216.02	3224.60	3224.23	3219.53	3214.40	3207.33	---
5	3211.62	3210.88	3211.33	3212.09	3214.38	3216.32	3224.79	3224.12	3219.40	3214.19	3207.09	---
6	3211.55	3210.88	3211.44	3212.12	3214.40	3216.53	3224.99	3223.93	3219.37	3213.99	3206.82	---
7	3211.48	3210.89	3211.47	3212.20	3214.47	3216.69	3225.17	3223.75	3219.29	3213.78	3206.56	---
8	3211.44	3210.89	3211.61	3212.33	3214.47	3216.81	3225.26	3223.64	3219.19	3213.60	3206.29	---
9	3211.39	3211.02	3211.62	3212.63	3214.57	3216.98	3225.38	3223.42	3219.05	3213.39	3206.02	---
10	3211.31	3211.02	3211.63	3212.77	3214.57	3217.12	3225.49	3223.27	3218.90	3213.19	3205.76	---
11	3211.27	3211.02	3211.66	3212.98	3214.58	3217.49	3225.53	3223.07	3218.75	3212.97	3205.51	---
12	3211.22	3211.02	3211.66	3213.11	3214.65	3217.78	3225.58	3222.87	3218.59	3212.79	3205.24	---
13	3211.12	3211.00	3211.74	3213.24	3214.65	3217.89	3225.66	3222.68	3218.41	3212.59	3204.96	---
14	3211.11	3211.00	3211.75	3213.38	3214.65	3218.05	3225.68	3222.49	3218.25	3212.37	3204.69	---
15	3211.09	3211.00	3211.77	3213.54	3214.65	3218.17	3225.74	3222.28	3218.06	3212.16	3204.38	---
16	3211.06	3211.00	3211.78	3213.62	3214.68	3218.31	3225.80	3222.10	3217.93	3211.91	3204.10	---
17	3211.03	3211.03	3211.78	3213.68	3214.68	3218.44	3225.80	3221.89	3217.75	3211.68	3203.83	---
18	3211.03	3211.03	3211.79	3213.75	3214.68	3218.78	3225.69	3221.67	3217.58	3211.46	3203.58	---
19	3211.02	3211.04	3211.80	3213.76	3214.68	3219.30	3225.57	3221.47	3217.45	3211.24	3203.31	---
20	3210.97	3211.04	3211.82	3213.78	3214.68	3219.77	3225.46	3221.27	3217.22	3211.00	3203.07	---
21	3210.96	3211.04	3211.83	3213.84	3214.69	3220.19	3225.35	3221.08	3217.05	3210.80	3202.81	---
22	3210.93	3211.05	3211.87	3213.93	3214.70	3220.67	3225.24	3220.88	3216.86	3210.58	3202.57	---
23	3210.92	3211.06	3211.88	3213.95	3214.80	3221.17	3225.15	3220.73	3216.68	3210.29	3202.29	---
24	3210.92	3211.15	3211.91	3213.98	3214.85	3221.54	3225.02	3220.52	3216.54	3210.02	3202.00	---
25	3210.92	3211.15	3211.93	3213.99	3214.92	3221.92	3224.85	3220.40	3216.33	3209.78	3201.72	---
26	3210.92	3211.16	3211.93	3214.08	3215.02	3222.22	3224.74	3220.23	3216.12	3209.58	3201.46	---
27	3210.89	3211.16	3211.94	3214.08	3215.18	3222.50	3224.62	3220.09	3215.87	3209.33	3201.19	---
28	3210.89	3211.17	3211.94	3214.10	3215.34	3222.73	3224.50	3219.93	3215.67	3209.12	3200.94	---
29	3210.89	3211.17	3211.94	3214.13	---	3222.96	3224.51	3219.87	3215.48	3208.90	3200.66	---
30	3210.89	3211.25	3211.95	3214.16	---	3223.21	3224.50	3219.82	3215.25	3208.66	3200.38	---
31	3210.88	---	3212.00	3214.23	---	3223.43	---	3219.74	---	3208.38	3200.21	---
MAX	3211.95	3211.25	3212.00	3214.23	3215.34	3223.43	3225.80	3224.45	3219.73	3215.03	3208.10	---
MIN	3210.88	3210.87	3211.25	3212.01	3214.23	3215.44	3223.73	3219.74	3215.25	3208.38	3200.21	---
(†)	92200	92980	94560	99370	101800	121100	123800	112000	101600	87080	71570	a58530
(‡)	-2460	+780	+1580	+4810	+2430	+19300	+2700	-11800	-10400	-14520	-15510	-13040

CAL YR 1989 MAX 3237.20 MIN 3209.14 AC-FT† +6110
WTR YR 1990 MAX 3225.80 MIN -- AC-FT† -36130

† Contents, in acre-feet, at 2400, on last day of month.

‡ Change in contents, in acre-feet.

a Interpolated.

DESCHUTES RIVER BASIN

145

14080500 CROOKED RIVER NEAR PRINEVILLE, OR

LOCATION.--Lat 44°06'50", long 120°47'40", in SW 1/4 NE 1/4 sec.10, T.17 S., R.16 E., Crook County, Hydrologic Unit 17070304, on right bank 0.4 mi downstream from Prineville Dam, 13.6 mi south of Prineville, and at mile 72.1.

DRAINAGE AREA.--2,700 mi², approximately, of which 500 mi² is probably noncontributing.

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

REVISED RECORDS.--WSP 1448: 1909-13, 1914(M), drainage area (at sites prior to Apr. 24, 1961). See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 3,070.85 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Prior to September 1914, nonrecording gage at several sites from 9 mi to 23 mi downstream at various datums. Mar. 26, 1941, to Apr. 23, 1961, water-stage recorder at site 5.5 mi downstream at different datum.

REMARKS.--No estimated daily discharges. Records excellent above 300 ft³/s, good below. Flow completely regulated since December 1960 by Prineville Reservoir (station 14080400). Diversions for irrigation upstream from station. Discharge not adjusted for storage or release from Prineville Reservoir as evaporation from reservoir at times exceeds natural flow.

AVERAGE DISCHARGE.--24 years (water years 1910-14, 1942-60), 378 ft³/s, 273,900 acre-ft/yr; 30 years (water years 1961-90), 361 ft³/s, 261,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,410 ft³/s Mar. 26, 1952, gage height, 8.2 ft, from floodmark, site and datum then in use; no flow Aug. 13-21, 1959, Jan. 3-5, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 253 ft³/s many days in May, gage height, 3.53 ft; minimum discharge, 4.5 ft³/s Nov. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	124	71	58	57	58	74	75	216	200	224	243	236
2	124	71	58	57	58	74	75	216	200	224	243	236
3	124	64	58	57	58	74	75	216	200	224	243	236
4	124	58	59	57	58	74	75	216	200	223	243	236
5	124	58	59	57	58	74	75	216	199	223	241	236
6	108	58	49	57	58	74	75	216	199	224	241	236
7	98	58	31	57	58	74	75	216	199	222	241	236
8	98	58	46	57	58	74	76	238	214	222	240	236
9	99	58	56	57	59	74	76	253	224	222	240	236
10	99	78	56	57	58	74	76	253	224	222	240	236
11	99	91	56	57	58	74	76	253	224	223	240	236
12	99	91	56	57	68	74	76	253	225	222	240	236
13	82	72	56	57	75	74	76	253	224	222	240	236
14	71	58	56	57	75	74	76	253	224	222	240	236
15	71	57	56	57	75	74	76	253	224	222	240	236
16	71	57	56	57	75	74	124	253	224	222	238	236
17	71	53	56	57	75	74	216	253	224	222	239	235
18	71	57	56	57	75	74	216	253	224	222	239	234
19	71	57	56	57	75	74	216	253	224	222	238	234
20	71	57	56	57	75	74	216	253	224	222	238	234
21	71	57	56	57	75	74	216	253	224	222	238	234
22	71	57	56	57	75	74	216	253	224	222	238	232
23	71	58	56	57	74	75	216	253	224	222	237	232
24	71	58	56	57	74	75	216	253	224	222	236	232
25	71	58	56	57	74	75	216	253	224	222	236	232
26	71	58	57	58	74	75	216	253	224	222	236	232
27	71	58	57	58	74	75	216	253	224	222	236	232
28	71	58	57	58	74	75	216	253	224	222	236	215
29	71	58	57	58	---	75	216	253	224	221	236	203
30	71	58	57	58	---	75	216	253	224	221	236	201
31	71	---	57	58	---	75	---	225	---	232	236	---
TOTAL	2680	1860	1712	1773	1901	2303	4281	7541	6540	6901	7408	6958
MEAN	86.5	62.0	55.2	57.2	67.9	74.3	143	243	218	223	239	232
MAX	124	91	59	58	75	75	216	253	225	232	243	236
MIN	71	53	31	57	58	74	75	216	199	221	236	201
AC-FT	5320	3690	3400	3520	3770	4570	8490	14960	12970	13690	14690	13800

CAL YR 1989 TOTAL 157674.5 MEAN 432 MAX 3080 MIN 7.6 AC-FT 312700
WTR YR 1990 TOTAL 51858 MEAN 142 MAX 253 MIN 31 AC-FT 102900

DESCHUTES RIVER BASIN

14087400 CROOKED RIVER BELOW OPAL SPRINGS, NEAR CULVER, OR

LOCATION.--Lat 44°29'33", long 121°17'50", in NW 1/4 NE 1/4 sec.33, T.12 S., R.12 E., Jefferson County, Hydrologic Unit 17070305, on right bank 0.2 mi downstream from Opal Springs, 4.8 mi southwest of Culver, and at mile 6.7.

DRAINAGE AREA.--4,300 mi², approximately, of which 500 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,953.60 ft above National Geodetic Vertical Datum of 1929 (Portland General Electric Co. bench mark).

REMARKS.--No estimated daily discharges. Records good. Flow regulated since December 1960 by Prineville Reservoir (station 14080400) and Ochoco Reservoir, capacity, 47,500 acre-ft. Dam and powerplant 500 ft upstream, completed in 1985, causes brief fluctuations in flow. Many diversions for irrigation upstream from station. Practically all of the summer flow comes from Opal Springs and other springs within 15 mi upstream from station. Simultaneous records (1961-63) at former gaging station 5.6 mi downstream indicated over 15 percent increase to summer flow from springs downstream from this station.

AVERAGE DISCHARGE.--29 years, 1,584 ft³/s, 1,148,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,660 ft³/s Dec. 24, 1964, gage height, 9.36 ft; minimum daily discharge, 1,090 ft³/s May 11, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,580 ft³/s Sept. 7, gage height, 4.70 ft, due to powerplant operation; maximum daily discharge, 1,460 ft³/s Oct. 3; minimum discharge, 656 ft³/s on many days, due to powerplant operation; minimum daily, 1,160 ft³/s many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1420	1360	1290	1270	1260	1300	1270	1250	1370	1170	1160	1250
2	1410	1360	1290	1270	1260	1300	1260	1240	1320	1180	1160	1240
3	1460	1360	1290	1260	1260	1290	1280	1240	1310	1180	1170	1250
4	1410	1360	1290	1260	1260	1290	1260	1200	1300	1180	1160	1250
5	1400	1340	1290	1270	1260	1280	1260	1170	1260	1170	1170	1230
6	1380	1340	1290	1270	1260	1280	1260	1160	1210	1170	1170	1210
7	1370	1340	1290	1280	1260	1280	1260	1170	1210	1180	1170	1220
8	1360	1330	1290	1290	1260	1290	1250	1160	1200	1170	1170	1220
9	1370	1330	1260	1290	1250	1300	1250	1160	1180	1170	1160	1210
10	1360	1320	1270	1280	1250	1300	1190	1170	1190	1160	1170	1210
11	1360	1320	1280	1280	1250	1290	1200	1170	1190	1160	1170	1200
12	1360	1350	1280	1280	1260	1280	1200	1160	1180	1180	1170	1190
13	1370	1350	1280	1280	1260	1280	1200	1160	1170	1180	1170	1200
14	1370	1340	1290	1280	1270	1280	1190	1170	1170	1170	1170	1190
15	1360	1320	1310	1280	1270	1280	1180	1170	1160	1170	1170	1190
16	1360	1310	1310	1280	1280	1280	1190	1170	1160	1160	1170	1190
17	1370	1310	1290	1290	1270	1280	1190	1160	1160	1160	1180	1200
18	1360	1320	1300	1310	1270	1280	1240	1160	1170	1170	1190	1210
19	1340	1320	1300	1310	1270	1280	1230	1170	1170	1160	1210	1200
20	1350	1320	1290	1290	1270	1290	1240	1170	1170	1170	1270	1200
21	1360	1300	1270	1270	1270	1290	1230	1180	1170	1170	1450	1210
22	1370	1300	1270	1270	1270	1290	1190	1180	1170	1170	1430	1200
23	1370	1300	1270	1260	1270	1280	1190	1200	1200	1160	1320	1210
24	1400	1310	1270	1260	1270	1280	1200	1360	1200	1160	1330	1220
25	1390	1310	1270	1290	1270	1280	1170	1350	1190	1170	1340	1230
26	1370	1300	1270	1290	1270	1280	1160	1350	1190	1160	1330	1230
27	1370	1290	1270	1300	1280	1280	1180	1350	1180	1160	1320	1230
28	1370	1290	1260	1270	1290	1280	1200	1400	1170	1160	1290	1230
29	1360	1290	1280	1270	---	1270	1270	1420	1170	1170	1240	1230
30	1360	1290	1270	1270	---	1270	1260	1430	1170	1170	1240	1280
31	1360	---	1270	1260	---	1270	---	1400	---	1170	1270	---
TOTAL	42620	39680	39750	39630	35440	39800	36650	38200	36060	36230	38090	36530
MEAN	1375	1323	1282	1278	1266	1284	1222	1232	1202	1169	1229	1218
MAX	1460	1360	1310	1310	1290	1300	1280	1430	1370	1180	1450	1280
MIN	1340	1290	1260	1260	1250	1270	1160	1160	1160	1160	1160	1190
AC-FT	84540	78710	78840	78610	70300	78940	72700	75770	71520	71860	75550	72460

CAL YR 1989 TOTAL 581330 MEAN 1593 MAX 4310 MIN 1140 AC-FT 1153000
WTR YR 1990 TOTAL 458680 MEAN 1257 MAX 1460 MIN 1160 AC-FT 909800

DESCHUTES RIVER BASIN

147

14088000 LAKE CREEK NEAR SISTERS, OR

LOCATION.--Lat 44°25'35", long 121°43'30", in NE 1/4 SW 1/4 sec.24, T.13 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, on left bank 300 ft downstream from Suttle Lake and 13 mi northwest of Sisters.

DRAINAGE AREA.--22.2 mi².

PERIOD OF RECORD.--June to November 1911, March to September 1912, May to October 1913, April 1915 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 1124: 1943, 1947. WSP 1218: Drainage area. WSP 1448: 1916(M), 1925. WDR OR-81-1: 1974(M), 1978(M).

GAGE.--Water-stage recorder. Datum of gage is 3,431.68 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 1, 1916, nonrecording gage at two sites 400 ft upstream at different datums. Apr. 1, 1916, to Oct. 12, 1928, nonrecording gage or water-stage recorder at site 640 ft downstream at different datum. Oct. 13, 1928, to Aug. 13, 1967, water-stage recorder at site 600 ft downstream at datum 1.61 ft lower.

REMARKS.--Records good. Flow occasionally regulated by Suttle Lake 150 ft upstream from station.

AVERAGE DISCHARGE.--75 years (water years 1916-90), 52.1 ft³/s, 37,750 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded discharge, 446 ft³/s Dec. 15, 1977, gage height, 4.78 ft, but may have been higher during period of no gage-height record Dec. 23, 1964; minimum discharge, 1.0 ft³/s Nov. 4, 5, 1940; minimum daily, 8 ft³/s Nov. 5, 1940, Oct. 6, 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 209 ft³/s Apr. 29, gage height, 3.66 ft; minimum discharge, 18 ft³/s Nov. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	25	22	29	51	37	51	148	42	30	25	27
2	27	25	25	29	47	38	52	119	42	28	24	26
3	23	25	26	27	44	40	54	110	44	28	25	25
4	24	23	29	28	43	41	56	103	44	29	26	25
5	23	19	31	29	e43	40	62	92	42	30	27	25
6	25	25	29	33	e44	38	66	85	48	31	26	25
7	24	28	29	48	e45	39	66	76	48	29	26	25
8	25	27	33	58	47	40	66	73	46	29	26	25
9	24	26	31	63	43	38	67	69	47	30	26	25
10	26	25	30	82	47	46	68	63	48	29	26	25
11	25	25	30	93	42	42	69	61	47	29	26	26
12	25	29	30	91	e40	41	69	59	46	28	27	24
13	25	30	30	86	e37	40	69	57	44	28	26	25
14	24	27	30	81	e36	43	69	56	43	27	24	26
15	25	25	29	74	e36	40	70	52	43	27	24	25
16	23	25	29	67	e37	39	72	51	41	26	23	25
17	25	27	29	59	e37	39	74	50	39	25	25	25
18	23	25	29	56	e37	39	75	48	39	25	26	25
19	24	25	29	53	38	39	76	46	38	26	28	26
20	25	24	27	50	39	39	76	50	38	26	27	26
21	29	22	27	48	41	40	75	48	37	26	27	24
22	29	24	27	53	38	41	74	49	37	26	26	26
23	25	30	27	49	37	43	79	51	36	24	25	23
24	25	30	27	45	37	44	76	49	34	24	25	27
25	25	31	27	45	36	46	82	46	33	23	25	26
26	25	31	27	47	37	47	80	46	32	23	25	28
27	28	26	27	48	37	48	110	49	31	25	25	29
28	27	25	27	53	37	48	150	49	31	26	25	29
29	24	24	27	53	---	49	197	45	32	26	25	24
30	24	24	27	48	---	49	192	45	31	27	29	26
31	23	---	27	47	---	50	---	46	---	26	27	---
TOTAL	774	777	874	1672	1133	1303	2442	1991	1203	836	797	768
MEAN	25.0	25.9	28.2	53.9	40.5	42.0	81.4	64.2	40.1	27.0	25.7	25.6
MAX	29	31	33	93	51	50	197	148	48	31	29	29
MIN	23	19	22	27	36	37	51	45	31	23	23	23
AC-FT	1540	1540	1730	3320	2250	2580	4840	3950	2390	1660	1580	1520

CAL YR 1989 TOTAL 15441 MEAN 42.3 MAX 129 MIN 19 AC-FT 30630
WTR YR 1990 TOTAL 14570 MEAN 39.9 MAX 197 MIN 19 AC-FT 28900

e Estimated

DESCHUTES RIVER BASIN

14090350 JEFFERSON CREEK NEAR CAMP SHERMAN, OR

LOCATION.--Lat 44°34'18", long 121°38'17", in SW 1/4 SE 1/4 sec.34, T.11 S., R.9 E., Jefferson County, Hydrologic Unit 17070301, Warm Springs Indian Reservation, on left bank 100 ft upstream from bridge, 7.6 mi north of Camp Sherman, and at mile 1.3.

DRAINAGE AREA.--27.8 mi².

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,780 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--7 years, 90.6 ft³/s, 44.26 in/yr, 65,640 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 428 ft³/s Feb. 23, 1986, gage height, 3.21 ft; minimum daily discharge, 37 ft³/s Feb. 8-10, 1989.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 4	2300	340	2.91	Apr. 27	2130	*391	*3.09
Jan. 8	0130	334	2.89				

Minimum daily discharge, 38 ft³/s Feb. 15, 16, but minimum discharge could have been lower during period of ice effect Feb. 14-21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75	65	59	55	62	59	69	107	97	103	85	74
2	74	65	59	54	62	59	72	111	96	101	84	73
3	73	65	72	55	62	58	73	114	110	96	83	73
4	73	72	141	56	60	58	72	118	116	94	83	73
5	72	67	142	59	61	58	73	126	102	96	83	73
6	72	66	84	68	60	57	76	128	139	102	84	72
7	71	69	74	131	60	58	78	109	154	95	83	72
8	71	68	87	180	59	57	79	102	124	94	83	72
9	72	115	74	143	62	57	74	100	120	93	85	72
10	71	87	68	146	70	58	74	102	120	94	85	71
11	71	73	66	98	67	57	78	101	104	94	85	71
12	70	106	66	87	64	56	80	98	104	95	83	70
13	70	78	65	85	61	56	80	95	100	96	83	69
14	70	71	64	81	e50	56	90	93	97	92	82	69
15	69	68	63	76	e38	55	98	93	97	91	82	68
16	69	67	62	74	e38	56	105	94	100	92	80	68
17	69	78	61	72	e39	56	103	97	102	90	80	67
18	69	71	59	70	e41	59	96	96	101	89	79	68
19	69	69	60	69	e46	60	93	95	107	88	78	67
20	67	67	60	69	e52	60	93	96	109	88	78	67
21	76	65	59	69	e60	61	93	93	108	88	78	66
22	71	64	59	68	62	62	97	100	111	89	80	66
23	72	67	60	67	60	63	117	101	113	88	77	67
24	69	65	59	66	60	62	93	95	111	88	76	67
25	68	63	58	66	60	60	108	92	108	87	75	67
26	71	62	58	65	60	60	101	94	104	87	74	67
27	69	62	57	64	59	60	209	111	101	87	74	67
28	66	61	56	65	59	61	208	117	101	86	75	66
29	66	60	55	63	---	62	129	112	102	85	76	66
30	66	60	55	64	---	63	113	112	106	85	77	65
31	66	---	56	63	---	65	---	104	---	85	74	---
TOTAL	2177	2116	2118	2448	1594	1829	2924	3206	3264	2838	2484	2073
MEAN	70.2	70.5	68.3	79.0	56.9	59.0	97.5	103	109	91.5	80.1	69.1
MAX	76	115	142	180	70	65	209	128	154	103	85	74
MIN	66	60	55	54	38	55	69	92	96	85	74	65
AC-FT	4320	4200	4200	4860	3160	3630	5800	6360	6470	5630	4930	4110
CFSM	2.53	2.54	2.46	2.84	2.05	2.12	3.51	3.72	3.91	3.29	2.88	2.49
IN.	2.91	2.83	2.83	3.28	2.13	2.45	3.91	4.29	4.37	3.80	3.32	2.77

CAL YR 1989	TOTAL 31965	MEAN 87.6	MAX 166	MIN 37	AC-FT 63400	CFSM 3.15	IN. 42.77
WTR YR 1990	TOTAL 29071	MEAN 79.6	MAX 209	MIN 38	AC-FT 57660	CFSM 2.86	IN. 38.90

e Estimated

DESCHUTES RIVER BASIN

149

14090400 WHITEWATER RIVER NEAR CAMP SHERMAN, OR

LOCATION.--Lat 44°43'04", long 121°38'07", in SE 1/4 NE 1/4 sec.11, T.10 S., R.9 E., Jefferson County, Hydrologic Unit 17070301, Warm Springs Indian Reservation, on left bank 0.2 mi downstream from Lionshead Creek, 18 mi north of Camp Sherman, and at mile 7.1.

DRAINAGE AREA.--22.9 mi².

PERIOD OF RECORD.--July 1982 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 3,230 ft above National Geodetic Datum of 1929, from topographic map.

REMARKS.--Records good except those for Jan. 14-17, Apr. 11 to June 12, 23-26, June 30 to July 1, which are fair, and Feb. 12-21, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--8 years, 82.3 ft³/s, 48.80 in/yr, 59,630 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 613 ft³/s Dec. 10, 1987, from rating curve extended above 170 ft³/s, gage height, 3.24 ft; minimum daily discharge, 30 ft³/s Feb. 15, 1990, but could be less because of ice effect.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 4	2200	359	2.64	Apr. 27	1930	352	2.63
Jan. 7	2400	*363	*2.65				

Minimum daily discharge, 30 ft³/s Feb. 15, but could be less because of ice effect.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	35	34	36	48	48	67	154	89	121	79	60
2	43	35	34	36	48	49	77	154	83	106	76	59
3	40	35	50	36	46	50	86	145	99	87	75	59
4	40	40	174	40	45	51	87	132	122	82	77	63
5	40	37	136	42	45	51	89	135	100	90	80	66
6	40	37	75	63	45	50	89	159	111	114	83	65
7	40	41	54	155	44	50	86	143	163	103	80	66
8	43	38	71	205	44	50	86	131	138	95	82	65
9	44	92	54	166	45	50	85	119	132	94	88	66
10	43	75	49	168	51	53	83	122	133	108	85	70
11	43	49	46	121	50	50	84	112	95	115	83	72
12	38	98	45	106	e47	48	87	109	100	116	85	62
13	38	54	44	101	e43	47	89	105	87	117	86	58
14	38	44	44	91	e32	47	101	99	80	96	79	59
15	36	42	44	90	e30	47	109	90	79	93	79	53
16	35	40	43	83	e32	46	122	83	82	95	70	51
17	36	53	42	77	e33	47	117	85	86	89	72	50
18	37	45	41	63	e37	51	104	83	87	83	66	52
19	38	42	40	61	e40	53	100	83	108	80	62	51
20	39	40	40	59	e42	55	105	86	118	81	60	49
21	45	38	40	58	e43	56	98	70	117	83	68	50
22	40	37	40	59	44	58	104	85	133	89	77	54
23	45	43	39	58	44	58	119	86	152	87	66	57
24	38	40	39	55	44	59	102	79	148	81	58	57
25	37	39	38	55	47	58	111	73	138	77	53	62
26	42	38	37	54	48	57	106	71	121	80	52	60
27	39	33	37	52	48	56	198	101	104	79	56	59
28	37	33	37	54	48	56	204	110	103	76	61	56
29	35	34	37	53	---	57	160	114	112	77	67	55
30	35	34	36	52	---	58	148	113	133	81	72	51
31	35	---	36	49	---	61	---	96	---	85	59	---
TOTAL	1225	1341	1576	2398	1213	1627	3203	3327	3353	2860	2236	1757
MEAN	39.5	44.7	50.8	77.4	43.3	52.5	107	107	112	92.3	72.1	58.6
MAX	46	98	174	205	51	61	204	159	163	121	88	72
MIN	35	33	34	36	30	46	67	70	79	76	52	49
AC-FT	2430	2660	3130	4760	2410	3230	6350	6600	6650	5670	4440	3490
CFSM	1.73	1.95	2.22	3.38	1.89	2.29	4.66	4.69	4.88	4.03	3.15	2.56
IN.	1.99	2.18	2.56	3.90	1.97	2.64	5.20	5.40	5.45	4.65	3.63	2.85

CAL YR 1989	TOTAL 28019	MEAN 76.8	MAX 201	MIN 33	AC-FT 55580	CFSM 3.35	IN. 45.52
WTR YR 1990	TOTAL 26116	MEAN 71.6	MAX 205	MIN 30	AC-FT 51800	CFSM 3.12	IN. 42.42

e Estimated

DESCHUTES RIVER BASIN

14091500 METOLIUS RIVER NEAR GRANDVIEW, OR

LOCATION.--Lat 44°37'33", long 121°28'55", in SE 1/4 SW 1/4 sec.12, T.11 S., R.10 E., Jefferson County, Hydrologic Unit 17070301, Deschutes National Forest, on right bank 1.0 mi upstream from maximum controlled pool of Lake Billy Chinook, 15.0 mi northwest of Culver, and at mile 13.6.

DRAINAGE AREA.--316 mi², at cableway 1.0 mi downstream, where all discharge measurements are made. Hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--April 1910 to February 1912 (gage heights and discharge measurements only), March 1912 to December 1913, October 1921 to current year. Published as "at Hubbard's ranch, near Sisters" 1910, and as "at Hubbard's ranch, near Grandview" 1910-13.

REVISED RECORDS.--WSP 1448: 1913.

GAGE.--Water-stage recorder. Datum of gage is 1,974.36 ft above National Geodetic Vertical Datum of 1929 (levels by Portland General Electric Co.). Prior to Dec. 31, 1913, nonrecording gage at site 2.3 mi upstream at different datum. Oct. 1, 1921, to May 3, 1949, nonrecording gage and May 4, 1949, to June 18, 1963, water-stage recorder at site 2.7 mi downstream at datum 64 ft lower.

REMARKS.--No estimated daily discharges. Records excellent. No regulation. Many small diversions for irrigation upstream from station. Stream is spring fed. Records herein are for measuring site.

AVERAGE DISCHARGE.--70 years (water years 1913, 1922-90), 1,491 ft³/s, 1,080,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,530 ft³/s Dec. 24, 1964, gage height, 6.81 ft; minimum discharge, 1,080 ft³/s Feb. 17, 1932, Oct. 2-31, Nov. 6, 7, 10-14, 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,570 ft³/s Apr. 28, gage height, 2.85 ft; minimum discharge, 1,210 ft³/s Dec. 28, Jan. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1270	1240	1230	1220	1320	1290	1340	1690	1440	1430	1330	1280
2	1270	1240	1230	1220	1300	1290	1350	1650	1430	1420	1320	1280
3	1260	1240	1250	1220	1300	1300	1360	1630	1450	1390	1320	1280
4	1260	1260	1380	1230	1290	1310	1360	1610	1490	1380	1320	1280
5	1260	1240	1520	1230	1290	1300	1370	1610	1450	1390	1320	1280
6	1260	1240	1330	1260	1290	1300	1390	1620	1510	1430	1330	1280
7	1260	1260	1290	1470	1290	1300	1400	1550	1640	1390	1320	1280
8	1260	1250	1320	1820	1290	1300	1400	1520	1550	1380	1320	1280
9	1260	1330	1290	1680	1300	1300	1380	1500	1530	1380	1340	1280
10	1260	1310	1270	1700	1360	1320	1380	1490	1540	1390	1330	1280
11	1260	1270	1260	1570	1350	1310	1390	1480	1480	1400	1330	1280
12	1250	1340	1260	1490	1330	1300	1400	1460	1460	1400	1320	1270
13	1250	1290	1250	1460	1310	1290	1400	1450	1460	1400	1320	1260
14	1250	1270	1250	1440	1270	1300	1420	1440	1440	1380	1310	1270
15	1250	1250	1250	1410	1310	1290	1440	1430	1430	1370	1310	1260
16	1250	1250	1240	1390	1300	1290	1470	1420	1430	1370	1300	1260
17	1250	1280	1240	1370	1290	1290	1480	1430	1430	1360	1300	1260
18	1250	1260	1230	1350	1280	1310	1470	1420	1430	1350	1300	1260
19	1250	1250	1240	1340	1260	1310	1460	1420	1450	1350	1310	1260
20	1250	1240	1230	1330	1280	1320	1460	1430	1470	1350	1300	1260
21	1280	1240	1230	1320	1300	1320	1450	1420	1460	1350	1310	1250
22	1270	1240	1230	1330	1290	1330	1460	1450	1470	1350	1320	1260
23	1270	1260	1230	1330	1290	1340	1540	1480	1490	1350	1300	1260
24	1260	1260	1230	1310	1290	1330	1480	1440	1470	1340	1290	1260
25	1250	1260	1220	1310	1300	1330	1500	1420	1460	1340	1280	1260
26	1270	1250	1220	1300	1300	1330	1530	1420	1440	1340	1280	1260
27	1260	1240	1220	1300	1290	1330	1830	1490	1430	1340	1280	1260
28	1250	1240	1220	1330	1290	1330	2260	1550	1420	1330	1290	1260
29	1250	1230	1220	1330	---	1330	1890	1500	1420	1330	1290	1250
30	1250	1230	1220	1320	---	1330	1780	1500	1440	1330	1310	1250
31	1250	---	1220	1310	---	1330	---	1480	---	1340	1290	---
TOTAL	38990	37760	39020	42690	36360	40650	44840	46400	44010	42450	40590	38010
MEAN	1258	1259	1259	1377	1299	1311	1495	1497	1467	1369	1309	1267
MAX	1280	1340	1520	1820	1360	1340	2260	1690	1640	1430	1340	1280
MIN	1250	1230	1220	1220	1260	1290	1340	1420	1420	1330	1280	1250
AC-FT	77340	74900	77400	84680	72120	80630	88940	92030	87290	84200	80510	75390

CAL YR 1989 TOTAL 502620 MEAN 1377 MAX 1740 MIN 1220 AC-FT 996900
WTR YR 1990 TOTAL 491770 MEAN 1347 MAX 2260 MIN 1220 AC-FT 975400

DESCHUTES RIVER BASIN

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14092100 LAKE BILLY CHINOOK NEAR METOLIUS, OR

LOCATION.--Lat 44°36'14", long 121°16'40", in SW 1/4 NE 1/4 sec.22, T.11 S., R.12 E., Jefferson County, Hydrologic Unit 17070301, Warm Springs Indian Reservation, near left end of Round Butte Dam on Deschutes River, 5.0 mi west of Metolius, and at mile 110.6.

DRAINAGE AREA.--7,490 mi², approximately.

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Portland General Electric Co.).

REMARKS.--Reservoir is formed by rock fill dam completed in June 1964 by Portland General Electric Co.; storage began Jan. 2, 1964. Total capacity is 534,700 acre-ft at elevation 1,945.0 ft proposed upper limit of operation, and usable capacity is 273,900 acre-ft between elevations 1,860.0 ft, proposed lower limit of operation, and 1,945.0 ft. Reservoir used for power generation under FERC license 2030. Figures given herein represent total contents.

COOPERATION.--Gage readings and capacity tables furnished by Portland General Electric Co.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 538,700 acre-ft July 15, 16, 1972, elevation, 1,946.00 ft; minimum contents observed since first filling, 431,100 acre-ft Feb. 13, 1972, elevation, 1,917.13 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 535,700 acre-ft Aug. 8, elevation, 1,945.23 ft; minimum contents observed, 489,800 acre-ft Mar. 8, elevation, 1,933.32 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30.....	1,941.47	520,900	--
Oct. 31.....	1,943.42	528,500	+7,600
Nov. 30.....	1,943.20	527,600	-900
Dec. 31.....	1,942.90	526,500	-1,100
CAL YR 1989.....	--	--	+12,600
Jan. 31.....	1,941.32	520,300	-6,200
Feb. 28.....	1,934.92	495,900	-24,400
Mar. 31.....	1,941.40	520,600	+24,700
Apr. 30.....	1,944.16	531,400	+10,800
May 31.....	1,944.63	533,300	+1,900
June 30.....	1,944.64	533,300	0
July 31.....	1,944.69	533,500	+200
Aug. 31.....	1,944.31	532,000	-1,500
Sept.30.....	1,941.31	520,300	-11,700
WTR YR 1990.....	--	--	-600

DESCHUTES RIVER BASIN

14092110 DESCHUTES RIVER BELOW ROUND BUTTE DAM, NEAR MADRAS, OR

LOCATION.--Lat 44°37'23", long 121°16'54", in NE 1/4 NW 1/4 sec.15, T.11 S., R.12 E., Jefferson County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on right bank, 1.5 mi downstream from Round Butte Dam, and at mile 109.1.

DRAINAGE AREA.--7,500 mi², approximately.

PERIOD OF RECORD.--October 1988 to current year.

GAGE.--Acoustic velocity meter (AVM) with water-stage and velocity-index recorder. Datum of gage is 1,580 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records poor. Flow regulated by Round Butte Dam.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge recorded, 6,720 ft³/s Sept. 17; maximum gage height recorded, 10.30 ft Apr. 28; no flow many days.

REVISION.--The maximum daily discharge for water year 1989 has been revised to 6,590 ft³/s Mar. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2310	3960	4010	3780	3390	4200	3510	e3860	4340	---	---	4190
2	3190	4100	4040	4460	3710	4140	4090	e3940	3910	---	---	4460
3	1880	4550	3720	3550	4960	4530	3320	e3990	4010	---	---	3890
4	1240	4150	4080	e2990	4480	3900	2460	e4170	4680	---	---	---
5	1760	4130	3970	e3910	4820	4710	3990	e4940	3520	---	---	---
6	1770	4110	4150	4130	5110	4310	3230	e4200	e3570	---	---	---
7	1560	3460	4770	3650	4650	4570	3830	5470	e3520	---	---	---
8	1580	4580	4670	4720	5210	4150	3480	3530	3690	---	---	---
9	1870	4160	4870	4920	4520	2760	3290	4400	2670	---	---	---
10	1810	4560	4770	4610	4840	4090	3020	4010	2960	---	---	---
11	1150	4180	5110	5210	4500	3580	3530	3600	4000	---	---	---
12	1680	4670	3900	5000	3920	4330	4140	4180	2920	---	---	---
13	1280	4300	4030	4600	4400	3010	3160	3760	2330	---	---	---
14	1290	3820	4250	4280	6440	3540	3790	5550	4320	---	---	---
15	1330	4170	4310	4530	4690	3810	3470	3920	3590	---	---	---
16	2010	4270	3960	4740	5400	2780	2460	4520	2260	---	3770	6690
17	2140	4360	4030	4750	3690	3520	3720	4610	3530	---	4050	6720
18	2620	3990	3640	4420	3760	2960	3350	3420	---	---	3680	6640
19	2730	3790	3620	4640	4040	4270	3530	---	---	---	4340	6430
20	2210	4290	3730	3790	3900	3680	3430	---	---	---	4000	---
21	1830	3960	---	3700	2730	3330	3800	---	---	---	3570	---
22	1670	3940	---	4710	3480	3240	2970	---	---	---	3970	---
23	---	3600	3930	4050	3800	3340	3110	---	---	---	3960	---
24	---	3770	4290	3840	3990	2700	3980	---	---	---	4340	---
25	3660	3610	3790	4110	4260	2710	4280	---	---	---	3790	---
26	4260	3720	e3630	4730	3700	3550	4640	---	---	---	4150	---
27	3770	3570	4230	4440	3890	3280	4210	---	---	---	3260	3820
28	4100	3840	4030	4460	6260	3220	3520	---	---	---	4170	4000
29	4140	3620	4170	4210	---	3110	e3700	---	---	---	3300	3970
30	3670	3550	4350	3910	---	3350	e4290	---	---	---	3450	3710
31	4140	---	4380	4830	---	2860	---	---	---	---	3730	---
TOTAL	---	120780	---	133670	122540	111530	107300	---	---	---	---	---
MEAN	---	4026	---	4312	4376	3598	3577	---	---	---	---	---
MAX	---	4670	---	5210	6440	4710	4640	---	---	---	---	---
MIN	---	3460	---	2990	2730	2700	2460	---	---	---	---	---
AC-FT	---	239600	---	265100	243100	221200	212800	---	---	---	---	---

e Estimated

DESCHUTES RIVER BASIN

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14092150 SEEKSEEQUA CREEK NEAR WARM SPRINGS, OR

LOCATION.--Lat 44°40'28", long 121°17'28" (revised), in SW 1/4 NW 1/4 sec.27, T.10 S., R.12 E., Jefferson County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on right bank 75 ft upstream from culvert, 8.3 mi east of Madras, and at mile 2.5.

DRAINAGE AREA.--93.3 mi².

PERIOD OF RECORD.--May 1987 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,860 ft, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 100 ft³/s Mar. 10, 1989, gage height, 5.57 ft; minimum discharge, 0.57 ft³/s Aug. 10, 1990.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12 ft³/s Jan. 8, gage height, 4.29 ft; minimum discharge, 0.57 ft³/s Aug. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	2.6	3.0	3.1	3.7	5.1	3.9	2.5	3.4	1.2	.91	1.9
2	2.3	2.6	3.0	2.6	3.3	5.1	3.0	2.8	3.1	1.3	.94	1.8
3	2.2	2.6	3.1	2.8	3.2	6.4	3.4	2.4	2.6	1.5	.89	1.9
4	2.1	2.6	3.2	2.6	3.2	6.5	3.6	2.2	2.1	1.5	1.0	1.7
5	2.1	2.6	3.5	2.9	3.2	6.1	3.5	2.3	2.0	1.5	1.2	1.8
6	2.1	2.6	3.3	3.2	3.1	7.2	3.5	2.6	2.3	1.6	1.1	1.8
7	2.1	2.9	3.2	4.9	3.3	7.7	3.7	2.2	2.4	1.6	1.1	1.7
8	2.1	2.6	3.2	8.4	3.4	7.1	2.9	1.8	2.3	1.5	1.3	1.3
9	2.1	2.7	3.0	6.9	3.7	6.1	3.1	2.0	2.1	1.5	1.7	1.6
10	2.1	2.9	2.9	6.7	3.8	5.9	3.4	2.1	2.1	1.4	1.3	1.9
11	2.1	3.0	2.6	7.5	3.8	7.2	3.4	2.1	2.0	1.4	1.3	1.6
12	2.2	3.0	2.6	7.0	3.3	7.0	3.4	2.1	2.0	1.6	1.5	1.6
13	2.3	2.6	2.7	6.0	2.9	6.2	3.6	2.1	2.0	1.1	1.4	1.4
14	2.3	2.5	2.9	5.5	2.9	5.9	3.6	2.1	2.0	1.1	1.1	1.6
15	2.3	2.4	2.9	5.9	3.3	5.2	3.1	2.3	1.9	1.0	1.4	e1.5
16	2.3	2.5	2.8	4.9	3.3	5.0	2.6	2.3	1.7	.98	1.4	e1.4
17	2.3	2.8	2.9	5.1	3.5	5.1	2.8	2.3	1.7	1.0	e1.4	e1.4
18	2.3	2.6	3.0	4.7	3.1	5.3	3.0	2.2	1.6	.99	e1.4	e1.3
19	2.3	2.6	2.9	5.5	2.5	7.3	2.7	2.2	1.5	.95	e1.5	1.9
20	2.3	2.7	2.9	4.7	2.5	6.8	2.8	2.1	1.6	1.0	e1.5	1.8
21	2.4	2.8	2.8	4.3	2.4	6.4	3.0	2.0	1.4	.95	1.4	1.8
22	2.6	3.0	2.9	4.7	2.5	6.2	2.7	2.6	1.4	.98	1.7	1.3
23	2.6	3.1	3.1	4.8	2.1	7.0	2.8	4.1	1.6	1.0	2.0	1.7
24	2.6	3.2	3.1	4.8	2.1	6.1	2.7	3.1	1.4	.95	1.9	1.2
25	2.7	3.2	3.1	4.9	2.4	5.8	2.8	2.4	1.5	.98	1.8	1.1
26	2.9	3.4	2.9	5.0	3.6	4.7	2.8	2.4	1.3	1.0	1.7	1.5
27	3.0	3.2	2.8	4.6	4.7	4.4	3.7	3.1	1.3	.93	1.7	e1.5
28	2.6	3.0	3.0	3.2	4.8	5.0	4.4	3.7	1.3	.91	1.5	e1.5
29	2.6	2.9	3.0	4.0	---	4.0	3.7	2.7	1.3	.89	1.6	e1.6
30	2.6	3.0	3.1	3.6	---	4.7	2.7	3.0	1.2	.93	2.0	e1.6
31	2.6	---	4.0	3.6	---	4.4	---	3.8	---	.98	2.7	---
TOTAL	73.5	84.2	93.4	148.4	89.6	182.9	96.3	77.6	56.1	36.22	45.34	47.7
MEAN	2.37	2.81	3.01	4.79	3.20	5.90	3.21	2.50	1.87	1.17	1.46	1.59
MAX	3.0	3.4	4.0	8.4	4.8	7.7	4.4	4.1	3.4	1.6	2.7	1.9
MIN	2.1	2.4	2.6	2.6	2.1	4.0	2.6	1.8	1.2	.89	.89	1.1
AC-FT	146	167	185	294	178	363	191	154	111	72	90	95
CFSM	.03	.03	.03	.05	.03	.06	.03	.03	.02	.01	.02	.02
IN.	.03	.03	.04	.06	.04	.07	.04	.03	.02	.01	.02	.02

CAL YR 1989 TOTAL 2856.78 MEAN 7.83 MAX 81 MIN .70 AC-FT 5670 CFSM .08 IN. 1.14
WTR YR 1990 TOTAL 1031.26 MEAN 2.83 MAX 8.4 MIN .89 AC-FT 2050 CFSM .03 IN. .41

e Estimated

LOCATION.--Lat 44°43'34", long 121°14'45", in SE 1/4 SW 1/4 sec.1, T.10 S., R.12 E., Jefferson County, Hydrologic Unit 17070306, on right bank 400 ft downstream from reregulating dam, 2.7 mi downstream from Pelton Dam, 8.5 mi northwest of Madras, and at mile 100.1.

PERIOD OF RECORD.--October 1923 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,390.25 ft above National Geodetic Vertical Datum of 1929 (levels by Portland General Electric Co.). See WSP 1738 for history of changes prior to Nov. 23, 1957.

AVERAGE DISCHARGE.--67 years, 4,541 ft³/s, 3,290,000 acre-ft/yr.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,250 ft³/s Jan. 9, gage height, 3.63 ft; minimum daily discharge, 3,460 ft³/s Aug. 6.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4400	4170	4190	4240	4290	5570	3770	4610	4160	3840	4240	3880
2	4430	4190	4240	4200	4290	4560	3740	4160	4430	3900	3920	4030
3	4440	4450	4270	4100	4290	4650	3730	4630	4440	3840	3670	4030
4	4400	4450	4270	4080	4340	4570	3730	4640	4460	3840	3470	3770
5	4220	4470	4310	4090	5390	4550	3740	4640	4410	3860	3470	3580
6	4010	4470	4610	4070	5470	4530	3750	4670	4020	3850	3460	3580
7	4040	4490	4840	4090	5490	4550	3720	4650	3990	3710	3480	3580
8	4030	4720	4860	4580	5480	4470	3750	4630	3680	3760	3790	3570
9	3990	4990	4870	5400	5400	3930	3730	4210	3700	3740	4020	3570
10	3710	5030	4850	5610	4520	3750	3720	4040	3700	3710	4030	3580
11	3700	4910	4930	5170	4540	3750	3730	4030	3700	3820	4050	3570
12	3710	4490	4450	5160	4590	3750	3710	4020	3690	3730	4060	3580
13	3710	4460	4440	5180	5480	3770	3680	4010	3690	3700	4030	3600
14	3700	4470	4450	4990	5470	3770	3680	4020	3720	3710	3760	3790
15	3700	4460	4450	4890	5450	3780	3630	3980	3940	3720	3630	3840
16	3700	4450	3960	4910	5390	3770	3630	3660	3770	3710	3610	4450
17	3720	4160	3930	4890	4520	3770	3650	3700	3770	3690	3590	4550
18	3740	4160	3940	4820	4520	3770	3670	3700	3790	3600	3590	4530
19	3730	4170	3950	4290	4490	3750	3710	3700	3800	3690	3600	4490
20	3730	4150	3970	4270	4490	3750	3710	3700	3840	3900	3610	3980
21	3730	4050	3960	4290	4460	3730	3760	3710	4040	3710	3820	3670
22	3720	4020	3940	4330	4360	3770	3770	3700	3940	3670	4230	3670
23	3740	3950	3960	4500	4350	3770	3810	3720	3940	3600	4270	3680
24	4160	3950	3970	4530	4330	3770	4230	3730	3940	3620	4460	3740
25	4160	3940	3970	4740	4290	3760	4290	3650	3940	3610	4010	4020
26	4170	3940	3990	4710	4520	3760	4250	3610	3930	3600	4010	4210
27	4170	3930	4090	4480	5570	3740	4220	3580	3830	3600	4010	4220
28	4150	3960	4480	4480	5640	3740	3890	3620	3820	3610	4000	4220
29	4150	4040	4490	4500	---	3740	3930	3690	3810	3700	3610	4710
30	4150	4050	4510	4450	---	3730	4640	3720	3810	3840	3590	4760
31	4170	---	4520	4290	---	3750	---	4090	---	4260	3690	---
TOTAL	123280	129140	133660	142330	135420	124020	114970	124220	117700	116140	118780	118460
MEAN	3977	4305	4312	4591	4836	4001	3832	4007	3923	3746	3832	3949
MAX	4440	5030	4930	5610	5640	5570	4640	4670	4460	4260		

DESCHUTES RIVER BASIN

155

14092750 SHITIKE CREEK AT PETERS PASTURE, NEAR WARM SPRINGS, OR

LOCATION.--Lat 44°45'02", long 121°37'56", in NW 1/4 NE 1/4 sec.35, T.9 S., R.9 E., Jefferson County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on left bank 0.5 mi downstream from Peters Pasture, and 18 mi west of town of Warm Springs.

DRAINAGE AREA.--22.9 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,580 ft, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--8 years, 75.5 ft³/s, 44.77 in/yr, 54,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft³/s Feb. 23, 1986, gage height, 3.65 ft, from rating curve extended above 170 ft³/s; minimum discharge, 19 ft³/s several days in October 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft³/s and maximum (*) from rating curve extended above 170 ft³/s:

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 8	0400	688	2.95	Apr. 27	2400	*768	*3.08
Jan. 10	0230	456	2.55				

Minimum discharge, 24 ft³/s Sept. 25-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	28	31	28	42	50	75	146	87	85	48	34
2	31	27	30	28	42	50	83	137	78	85	47	33
3	31	27	39	27	42	50	90	142	88	76	45	31
4	30	31	125	29	41	50	93	141	123	70	45	31
5	30	32	179	29	40	50	95	149	95	72	44	31
6	29	31	93	43	40	50	99	160	119	88	43	31
7	28	33	72	146	40	50	106	127	193	75	43	31
8	28	31	88	436	39	50	109	109	149	71	42	30
9	28	55	76	335	38	49	100	98	136	71	42	30
10	27	62	62	334	44	50	93	93	133	73	42	29
11	27	44	55	193	e46	48	92	90	104	74	41	29
12	27	88	50	137	e44	46	98	86	92	73	41	28
13	27	59	48	114	e37	44	100	81	89	71	40	27
14	27	45	45	99	e28	44	112	78	83	65	39	27
15	27	40	42	87	e25	44	130	73	82	62	38	27
16	27	37	40	79	e25	44	146	70	88	63	37	27
17	27	47	38	71	e26	45	150	72	89	61	37	27
18	27	43	36	65	e30	48	139	72	85	57	38	27
19	27	39	35	60	e34	52	128	70	94	55	41	26
20	27	37	34	56	e40	58	121	71	100	54	42	26
21	30	34	33	54	e42	63	117	69	99	54	40	26
22	37	33	32	54	e43	68	117	77	105	54	39	25
23	38	37	32	52	e44	73	147	85	107	53	37	25
24	38	38	31	50	e45	75	123	79	101	53	36	25
25	34	35	31	50	e46	71	132	72	95	53	36	24
26	34	34	31	48	e48	68	142	68	89	52	35	24
27	36	32	30	47	e50	65	294	87	82	52	35	24
28	33	32	30	46	50	64	458	120	79	50	35	24
29	31	31	29	45	---	64	249	113	80	49	34	24
30	31	31	28	43	---	64	178	110	88	49	36	24
31	31	---	28	42	---	67	---	100	---	51	35	---
TOTAL	936	1173	1553	2927	1111	1714	4116	3045	3032	1971	1233	827
MEAN	30.2	39.1	50.1	94.4	39.7	55.3	137	98.2	101	63.6	39.8	27.6
MAX	38	88	179	436	50	75	458	160	193	88	48	34
MIN	27	27	28	27	25	44	75	68	78	49	34	24
AC-FT	1860	2330	3080	5810	2200	3400	8160	6040	6010	3910	2450	1640
CFSM	1.32	1.71	2.19	4.12	1.73	2.41	5.99	4.29	4.41	2.78	1.74	1.20
IN.	1.52	1.91	2.52	4.75	1.80	2.78	6.69	4.95	4.93	3.20	2.00	1.34

CAL YR 1989 TOTAL 23238 MEAN 63.7 MAX 251 MIN 27 AC-FT 46090 CFSM 2.78 IN. 37.75
WTR YR 1990 TOTAL 23638 MEAN 64.8 MAX 458 MIN 24 AC-FT 46890 CFSM 2.83 IN. 38.40

e Estimated

DESCHUTES RIVER BASIN

14092750 SHITIKE CREEK AT PETERS PASTURE, NEAR WARM SPRINGS, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February to September 1990.

WATER QUALITY DATA, FEBRUARY TO SEPTEMBER 1990

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, DIS- CHARGE, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) *
FEB 1990					
27...	1500	3.0	50	0	0.0
APR					
18...	1700	7.0	136	3	1.1
JUN					
06...	1500	--	106	2	0.57
JUL					
30...	1710	11.0	48	2	0.26
SEP					
27...	1310	10.0	24	4	0.26

* Sediment discharges shown are estimated instantaneous values. The values were calculated by multiplying the water discharge times the sediment concentration times the coefficient of 0.0027 to get sediment discharge for the given date.

DESCHUTES RIVER BASIN

157

14092885 SHITIKE CREEK BELOW WOLFORD CANYON, NEAR WARM SPRINGS, OR

LOCATION.--Lat 44°46'20", long 121°18'15", in NW 1/4 SE 1/4 sec.21, T.9 S., R.12 E., Jefferson County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on left bank at bridge crossing 2.3 mi upstream from Tenino Creek, and 2.1 mi northwest of Warm Springs.

DRAINAGE AREA.--75.8 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to current year. Records for June 1911 to October 1916, April 1923 to September 1928, and October 1972 to September 1974 (see sta 14093000) at sites downstream not equivalent owing to difference in drainage areas.

GAGE.--Water-stage recorder. Elevation of gage is 1,600 ft, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, and those above 1,000 ft³/s, which are poor. No regulation. Some diversion for irrigation and Warm Springs water supply.

AVERAGE DISCHARGE.--16 years, 96.1 ft³/s, 17.22 in/yr, 69,620 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,980 ft³/s Feb. 23, 1986, gage height, 6.40 ft, from rating curve extended above 860 ft³/s; maximum gage height, 7.35 ft Dec. 13, 1977; minimum daily discharge, 17 ft³/s Oct. 12-15, 17-22, 24-27, Nov. 12, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 5	0530	463	4.96	Jan. 10	0700	493	5.00
Jan. 8	0800	*668	*5.24	Apr. 28	0230	618	5.17

Minimum discharge, 32 ft³/s Oct. 20, 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	40	40	54	61	70	90	181	108	125	57	47
2	42	40	39	53	61	70	98	157	99	125	55	47
3	40	39	52	53	61	70	105	157	99	113	54	46
4	39	43	175	53	59	70	107	155	135	102	53	44
5	38	50	294	55	57	70	107	161	118	112	51	43
6	37	47	150	67	58	70	112	177	116	133	51	43
7	36	51	120	144	59	70	119	147	212	108	51	43
8	36	50	123	471	55	70	123	127	167	86	49	42
9	35	61	123	386	54	70	118	115	153	91	50	43
10	35	129	106	390	61	72	111	109	147	92	51	42
11	35	78	98	253	65	70	108	107	126	88	49	41
12	35	112	93	174	63	68	113	102	110	89	48	41
13	35	131	87	137	e54	65	114	98	108	99	47	41
14	35	77	79	122	e35	65	120	94	100	93	47	41
15	34	62	73	109	e33	65	137	88	99	82	48	41
16	34	56	73	98	e34	65	158	86	104	88	51	42
17	34	63	69	89	e38	65	170	85	107	87	53	41
18	33	68	64	83	e42	70	160	86	103	81	55	41
19	33	58	68	78	e45	74	145	86	107	75	57	41
20	33	54	68	74	e54	78	137	85	118	69	62	40
21	33	48	63	70	61	85	135	85	125	66	55	41
22	47	47	61	71	61	88	132	93	139	64	53	40
23	50	46	61	70	61	95	162	108	144	64	50	39
24	57	57	61	66	62	96	145	99	140	65	48	39
25	50	51	61	65	65	93	134	91	136	64	47	40
26	49	48	57	65	68	88	172	86	129	63	47	39
27	56	45	55	63	70	86	215	98	117	61	46	39
28	48	44	63	65	70	85	501	133	110	61	47	39
29	46	42	60	65	---	83	310	129	111	59	48	39
30	45	41	58	62	---	83	225	129	121	58	52	39
31	43	---	55	61	---	85	---	123	---	63	50	---
TOTAL	1248	1778	2649	3666	1567	2354	4583	3577	3708	2626	1582	1244
MEAN	40.3	59.3	85.5	118	56.0	75.9	153	115	124	84.7	51.0	41.5
MAX	57	131	294	471	70	96	501	181	212	133	62	47
MIN	33	39	39	53	33	65	90	85	99	58	46	39
AC-FT	2480	3530	5250	7270	3110	4670	9090	7090	7350	5210	3140	2470
CFSM	.53	.78	1.13	1.56	.74	1.00	2.02	1.52	1.63	1.12	.67	.55
IN.	.61	.87	1.30	1.80	.77	1.16	2.25	1.76	1.82	1.29	.78	.61

CAL YR 1989 TOTAL 31960 MEAN 87.6 MAX 294 MIN 33 AC-FT 63390 CFSM 1.16 IN. 15.68
WTR YR 1990 TOTAL 30582 MEAN 83.8 MAX 501 MIN 33 AC-FT 60660 CFSM 1.11 IN. 15.01

e Estimated

DESCHUTES RIVER BASIN

14092885 SHITIKE CREEK BELOW WOLFORD CANYON, NEAR WARM SPRINGS, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--November 1989 to September 1990.

WATER QUALITY DATA, November 1989 to September 1990

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, DIS- CHARGE, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) *
NOV 1989					
06...	1330	7.0	46	1	0.12
FEB 1990					
06...	1300	3.5	57	2	0.31
APR					
24...	1300	10.0	140	8	3.0
JUN					
06...	1800	12.0	120	6	1.9
AUG					
01...	1500	20.0	58	3	0.47
SEP					
26...	1500	17.0	38	2	0.21

* Sediment discharges shown are estimated instantaneous values. The values were calculated by multiplying the water discharge times the sediment concentration times the coefficient of 0.0027 to get sediment discharge in tons per day. They do not reflect the actual sediment discharge for the given date.

DESCHUTES RIVER BASIN

159

14095500 WARM SPRINGS RIVER NEAR SIMNASHO, OR

LOCATION.--Lat 44°58'10", long 121°28'35", in SE 1/4 SW 1/4 sec.7, T.7 S., R.11 E., Wasco County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on right bank abutment of log bridge at Hehe Butte rodeo grounds, 3.3 mi upstream from Badger Creek, and 6.2 mi west of Simnasho.

DRAINAGE AREA.--107 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June to September 1915, August 1949 to September 1954, October 1983 to current year. Prior to October 1983, published as "at Hehe Mill near Warm Springs."

GAGE.--Water-stage recorder. Datum of gage is 2,533.78 ft above National Geodetic Vertical Datum of 1929. June to September 1915 1.0 mi downstream at different datum. August 1949 to September 1954 0.5 mi downstream at datum 7.12 ft lower.

REMARKS.--Water-discharge records excellent except for estimated daily discharges, which are fair. No regulation or diversions.

AVERAGE DISCHARGE.--12 years (water years 1950-54, 1984-90) 166 ft³/s, 21.07 in/yr, 120,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,700 ft³/s Feb. 23, 1986, gage height, 5.70 ft, from floodmark; minimum discharge observed, 97 ft³/s July 30, Sept. 5, 30, 1915.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 350 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	0330	*488	*3.98	No other peak greater than base discharge.			
Minimum daily discharge, 103 ft ³ /s Dec. 19, 20, but may have been less during period of no gage height record, Dec. 12 to Jan. 1.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	115	111	112	e114	125	140	167	243	142	120	113	110
2	114	111	112	115	122	139	173	230	139	121	113	109
3	114	111	114	112	121	143	177	221	138	121	113	109
4	114	114	120	113	120	149	179	211	141	120	113	109
5	114	112	132	113	119	150	180	203	138	120	112	109
6	114	111	124	117	119	149	182	196	140	120	112	109
7	112	112	118	155	118	152	184	190	144	119	113	109
8	112	111	124	203	119	152	186	185	138	118	111	109
9	112	113	122	203	124	150	180	179	135	118	112	108
10	112	112	118	213	147	158	176	176	134	117	114	108
11	112	111	116	179	148	151	177	172	132	117	112	108
12	112	117	e114	159	147	147	177	169	134	117	112	108
13	112	115	e110	151	140	146	176	166	134	116	111	108
14	112	114	e108	147	137	146	180	165	131	116	111	108
15	111	112	e107	142	135	144	183	160	130	116	111	108
16	110	111	e106	137	132	141	187	156	128	115	111	108
17	110	112	e105	131	128	141	190	153	127	115	115	108
18	109	112	e104	127	125	146	185	150	127	115	114	108
19	110	111	e103	126	123	149	182	148	125	115	114	108
20	111	111	e103	123	125	154	177	149	124	115	114	108
21	113	111	e104	121	135	160	173	148	124	115	114	108
22	114	109	e104	124	136	166	172	153	124	115	113	108
23	113	113	e105	133	136	173	179	162	124	116	111	108
24	113	116	e106	125	137	174	172	157	122	116	111	108
25	113	114	e106	122	139	171	173	148	122	117	111	108
26	113	118	e107	123	142	168	176	146	121	116	111	108
27	114	115	e107	121	142	164	263	157	121	116	111	108
28	112	114	e108	128	141	162	418	174	121	115	111	107
29	111	113	e110	140	---	160	310	155	121	115	110	107
30	111	112	e111	134	---	160	268	150	121	114	112	107
31	111	---	e112	128	---	162	---	147	---	115	111	---
TOTAL	3480	3379	3452	4279	3682	4767	5902	5319	3902	3621	3477	3246
MEAN	112	113	111	138	131	154	197	172	130	117	112	108
MAX	115	118	132	213	148	174	418	243	144	121	115	110
MIN	109	109	103	112	118	139	167	146	121	114	110	107
AC-FT	6900	6700	6850	8490	7300	9460	11710	10550	7740	7180	6900	6440
CFSM	1.05	1.05	1.04	1.29	1.23	1.44	1.84	1.60	1.22	1.09	1.05	1.01
IN.	1.21	1.17	1.20	1.49	1.28	1.66	2.05	1.85	1.36	1.26	1.21	1.13

CAL YR 1989 TOTAL 51969 MEAN 142 MAX 311 MIN 100 AC-FT 103100 CFSM 1.33 IN. 18.07
WTR YR 1990 TOTAL 48506 MEAN 133 MAX 418 MIN 103 AC-FT 96210 CFSM 1.24 IN. 16.86

e Estimated

DESCHUTES RIVER BASIN

14095500 WARM SPRINGS RIVER NEAR SIMNASHO, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--November 1989 to August 1990.

WATER QUALITY DATA, November 1989 to August 1990

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) *
NOV 1989					
15...	1430	6.0	111	2	0.60
FEB 1990					
26...	1550	5.5	142	2	0.77
MAY					
17...	1130	9.5	156	2	0.84
AUG					
02...	1230	12.0	116	2	0.63

* Sediment discharges shown are estimated instantaneous values. The values were calculated by multiplying the water discharge times the sediment concentration times the coefficient of 0.0027 to get sediment discharge in tons per day. They do not reflect the actual sediment discharge for the given date.

DESCHUTES RIVER BASIN

161

14096300 MILL CREEK NEAR BADGER BUTTE, NEAR WARM SPRINGS, OR

LOCATION.--Lat 44°51'42", long 121°37'35", in SW 1/4 sec.23, T.8 S., R.9 E., Wasco County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on right bank 200 ft upstream from bridge on road B241, 3.4 mi upstream from headworks of Mill Creek Canal, and 19.3 mi northwest of Warm Springs.

DRAINAGE AREA.--26.8 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 3,380 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--7 years, 63.4 ft³/s, 32.13 in/yr, 45,930 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 478 ft³/s Apr. 27, 1990; maximum gage height, 7.30 ft Feb. 23, 1986, from high-water mark on crest-stage gage; minimum discharge, 29 ft³/s Sept. 27, 29, 30, 1990.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 130 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 5	0030	139	5.57	Apr. 27	2400	*478	6.57
Jan. 8	0600	313	6.13	Apr. 27	2400	(a)	*6.92

Minimum discharge, 29 ft³/s Sept. 27, 29, 30.

(a) From crest-stage gage.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	39	43	46	71	55	63	122	80	42	37	35
2	43	38	42	47	71	55	67	106	75	45	36	35
3	43	39	46	46	69	55	71	103	72	45	36	34
4	42	45	69	49	67	60	74	99	81	43	38	33
5	42	41	129	51	63	61	74	98	82	42	36	32
6	41	41	111	71	67	57	75	98	82	45	36	31
7	40	44	89	146	67	59	76	94	97	44	36	31
8	40	41	112	279	69	58	80	87	98	42	36	31
9	39	43	100	240	72	55	77	81	90	42	38	31
10	38	43	88	231	84	61	74	76	86	41	38	32
11	39	41	79	176	81	57	72	73	82	41	36	32
12	39	58	72	138	72	55	73	72	78	41	36	32
13	39	52	67	116	68	52	75	71	77	39	34	31
14	39	49	64	103	e54	55	78	71	72	39	34	31
15	39	44	61	92	e42	54	85	68	68	38	34	31
16	39	41	58	82	e39	52	94	64	65	37	34	33
17	39	46	54	76	e36	53	101	63	61	36	37	34
18	39	43	52	68	e38	61	101	63	60	36	39	33
19	39	43	51	63	e43	63	97	63	56	36	38	32
20	38	41	50	59	e53	66	92	65	55	36	38	31
21	44	41	49	56	e65	67	91	65	53	38	38	30
22	47	39	47	60	66	69	89	72	50	36	36	30
23	47	49	47	61	63	72	108	78	49	36	35	31
24	45	54	47	58	60	70	104	77	48	38	35	30
25	43	51	46	55	61	65	108	71	47	39	36	30
26	45	48	45	55	60	65	116	69	45	38	36	31
27	48	47	45	56	59	64	222	75	45	36	35	31
28	43	46	45	61	57	61	342	87	45	36	35	31
29	41	43	45	70	---	60	203	82	43	38	35	31
30	39	43	45	71	---	59	150	81	43	36	36	30
31	39	---	45	71	---	60	---	83	---	38	35	---
TOTAL	1281	1333	1943	2853	1717	1856	3132	2477	1985	1219	1119	950
MEAN	41.3	44.4	62.7	92.0	61.3	59.9	104	79.9	66.2	39.3	36.1	31.7
MAX	48	58	129	279	84	72	342	122	98	45	39	35
MIN	38	38	42	46	36	52	63	63	43	36	34	30
AC-FT	2540	2640	3850	5660	3410	3680	6210	4910	3940	2420	2220	1880
CFSM	1.54	1.66	2.34	3.43	2.29	2.23	3.90	2.98	2.47	1.47	1.35	1.18
IN.	1.78	1.85	2.70	3.96	2.38	2.58	4.35	3.44	2.76	1.69	1.55	1.32

CAL YR 1989 TOTAL 22140 MEAN 60.7 MAX 130 MIN 36 AC-FT 43910 CFSM 2.26 IN. 30.73
WTR YR 1990 TOTAL 21865 MEAN 59.9 MAX 342 MIN 30 AC-FT 43370 CFSM 2.24 IN. 30.35

e Estimated

DESCHUTES RIVER BASIN

14096300 MILL CREEK NEAR BADGER BUTTE, NEAR WARM SPRINGS, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February to September 1990.

WATER QUALITY DATA, February to September 1990

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, DIS- CHARGE, SUS- PENDEDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDEDED (T/DAY) *
FEB 1990					
28...	1230	2.0	55	1	0.15
APR					
17...	1300	--	104	5	1.4
JUN					
04...	1230	8.0	83	2	0.45
AUG					
01...	1100	10.0	38	3	0.31
SEP					
26...	1200	9.5	33	2	0.18

* Sediment discharges shown are estimated instantaneous values. The values were calculated by multiplying the water discharge times the sediment concentration times the coefficient of 0.0027 to get sediment discharge in tons per day. They do not reflect the actual sediment discharge for the given date.

DESCHUTES RIVER BASIN

163

14096850 BEAVER CREEK BELOW QUARTZ CREEK, NEAR SIMNASHO, OR

LOCATION.--Lat 44°57'32", long 121°23'35", in NE 1/4 SW 1/4 sec.14, T.7 S., R.11 E., Wasco County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on right bank 600 ft downstream from culvert on Warm Springs Reservation Highway 9, 200 ft downstream from Quartz Creek, and 2.4 mi west of Simnasho.

DRAINAGE AREA.--145 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,260 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Water-discharge records good. No regulation or diversions upstream from station.

AVERAGE DISCHARGE.--7 years, 82.2 ft³/s, 7.70 in/yr, 59,550 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,340 ft³/s, Feb. 23, 1986, gage height, 7.96 ft; minimum discharge, 31 ft³/s Sept. 7, 1988.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	0730	*342	*3.48	No other peak greater than base discharge.			
Minimum discharge, 32 ft ³ /s Dec. 27.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	39	40	41	57	84	93	167	65	45	39	37
2	36	39	40	41	57	82	97	151	62	45	39	37
3	35	39	40	41	58	83	99	137	62	45	39	37
4	35	40	43	42	55	86	100	125	62	45	39	37
5	37	40	57	43	54	89	98	117	61	44	39	37
6	37	40	50	48	54	89	98	108	62	44	38	36
7	36	41	47	70	52	90	99	102	65	44	38	37
8	36	40	49	125	54	90	99	98	61	42	38	36
9	36	41	49	136	65	87	95	92	60	42	38	36
10	36	41	45	118	110	90	90	88	59	42	39	36
11	36	40	43	99	127	87	88	84	58	42	39	36
12	36	41	42	83	106	84	89	81	58	42	39	36
13	37	44	42	75	89	80	88	79	59	41	38	36
14	37	44	42	72	77	78	89	77	57	41	37	36
15	37	42	42	69	80	77	90	74	56	40	37	36
16	37	41	41	66	73	76	92	71	54	40	38	36
17	38	41	39	62	69	75	94	69	53	40	39	36
18	38	42	39	58	66	79	93	67	52	40	40	36
19	38	41	41	57	63	84	89	66	52	40	39	37
20	39	40	41	54	63	90	86	66	52	39	40	36
21	40	40	40	53	78	97	83	66	52	39	39	36
22	41	40	41	54	85	101	82	69	52	39	39	36
23	41	40	41	64	85	113	85	76	51	39	38	36
24	41	42	40	58	84	112	83	75	49	39	37	36
25	40	42	40	55	85	105	83	67	48	39	37	36
26	40	42	39	55	88	99	90	64	47	39	37	36
27	41	41	39	53	88	94	148	66	46	39	37	36
28	40	40	42	57	85	90	310	81	46	39	37	36
29	39	40	41	72	---	88	234	69	46	39	38	36
30	39	40	41	67	---	87	193	68	45	39	38	36
31	39	---	41	60	---	88	---	70	---	39	37	---
TOTAL	1174	1223	1317	2048	2107	2754	3257	2690	1652	1272	1186	1087
MEAN	37.9	40.8	42.5	66.1	75.2	88.8	109	86.8	55.1	41.0	38.3	36.2
MAX	41	44	57	136	127	113	310	167	65	45	40	37
MIN	35	39	39	41	52	75	82	64	45	39	37	36
AC-FT	2330	2430	2610	4060	4180	5460	6460	5340	3280	2520	2350	2160
CFSM	.26	.28	.29	.46	.52	.61	.75	.60	.38	.28	.26	.25
IN.	.30	.31	.34	.53	.54	.71	.84	.69	.42	.33	.30	.28
CAL YR 1989	TOTAL 27843	MEAN 76.3	MAX 500	MIN 35	AC-FT 55230	CFSM .53	IN. 7.14					
WTR YR 1990	TOTAL 21767	MEAN 59.6	MAX 310	MIN 35	AC-FT 43170	CFSM .41	IN. 5.58					

DESCHUTES RIVER BASIN

14096850 BEAVER CREEK BELOW QUARTZ CREEK, NEAR SIMNASHO, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1989 to September 1990.

WATER QUALITY DATA, October 1989 to September 1990

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, DIS- CHARGE, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) *
OCT 1989					
24...	1200	8.5	42	2	0.23
MAR 1990					
01...	1355	4.5	85	4	0.92
MAY					
17...	1345	12.0	68	3	0.55
AUG					
01...	1415	17.0	38	3	0.31

* Sediment discharges shown are estimated instantaneous values. The values were calculated by multiplying the water discharge times the sediment concentration times the coefficient of 0.0027 to get sediment discharge in tons per day. They do not reflect the actual sediment discharge for the given date.

DESCHUTES RIVER BASIN

165

14097100 WARM SPRINGS RIVER NEAR KAHNEETA HOT SPRINGS, OR

LOCATION.--Lat 44°51'24", long 121°08'55", in SE 1/4 SW 1/4 sec.23, T.8 S., R.13 E., Wasco County, Hydrologic Unit 17070306, Warm Springs Indian Reservation, on right bank 25 ft upstream from bridge, 2.5 mi east of Kahneeta Hot Springs, and at mile 4.6.

DRAINAGE AREA.--526 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,400 ft, from topographic map.

REMARKS.--No estimated daily discharges. Water-discharge records excellent. No regulation. Small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--18 years, 439 ft³/s, 11.33 in/yr, 318,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,240 ft³/s Feb. 23, 1986, gage height, 10.54 ft; minimum daily discharge, 160 ft³/s Jan. 1, 2, 1979.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	0900	*1,600	*3.99	No other peak greater than base discharge.			
Minimum discharge, 202 ft ³ /s Sept. 12, 13, 22-25.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	246	242	243	243	302	343	408	767	378	256	223	222
2	240	241	243	247	292	340	425	694	364	261	221	220
3	237	242	245	243	294	344	442	644	354	263	220	219
4	236	248	260	243	286	354	452	602	359	259	221	215
5	236	253	361	253	276	376	457	573	364	257	220	214
6	236	247	378	271	276	370	460	552	368	258	218	214
7	236	251	334	376	262	373	469	532	395	257	216	215
8	236	250	330	775	278	377	475	510	393	252	218	215
9	234	251	355	845	283	369	468	483	374	248	218	214
10	233	246	327	792	364	377	451	461	363	245	227	212
11	233	241	296	673	427	377	445	444	355	246	224	212
12	236	245	284	533	406	359	448	431	349	250	221	211
13	234	279	279	464	357	344	449	422	351	242	219	211
14	233	265	272	429	303	339	453	413	342	237	215	211
15	233	254	270	404	341	338	468	402	331	237	215	212
16	233	247	262	374	332	332	487	387	321	233	216	214
17	235	249	253	352	314	331	507	374	314	231	226	214
18	234	253	245	329	304	342	508	366	307	230	240	212
19	236	248	247	313	286	364	492	361	299	230	239	216
20	236	244	255	300	292	384	477	362	293	231	237	211
21	242	241	249	284	318	402	461	366	287	230	238	210
22	255	240	245	290	349	423	449	379	303	229	236	210
23	253	241	246	313	345	452	470	423	328	226	227	211
24	258	269	247	307	342	456	483	422	280	226	222	211
25	254	267	245	288	346	442	451	383	273	229	221	210
26	249	264	239	287	353	425	510	366	267	232	222	209
27	260	259	232	279	354	410	572	374	265	228	223	210
28	254	250	245	286	348	401	1440	451	264	226	222	210
29	247	244	243	343	---	394	1140	418	262	226	225	209
30	244	245	239	341	---	391	892	394	258	225	228	208
31	244	---	240	315	---	395	---	400	---	230	225	---
TOTAL	7473	7516	8409	11792	9030	11724	16109	14156	9761	7430	6943	6382
MEAN	241	251	271	380	322	378	537	457	325	240	224	213
MAX	260	279	378	845	427	456	1440	767	395	263	240	222
MIN	233	240	232	243	262	331	408	361	258	225	215	208
AC-FT	14820	14910	16680	23390	17910	23250	31950	28080	19360	14740	13770	12660
CFSM	.46	.48	.52	.72	.61	.72	1.02	.87	.62	.46	.43	.40
IN.	.53	.53	.59	.83	.64	.83	1.14	1.00	.69	.53	.49	.45

CAL YR 1989	TOTAL 140199	MEAN 384	MAX 1400	MIN 232	AC-FT 278100	CFSM .73	IN. 9.92
WTR YR 1990	TOTAL 116725	MEAN 320	MAX 1440	MIN 208	AC-FT 231500	CFSM .61	IN. 8.26

DESCHUTES RIVER BASIN

14097100 WARM SPRINGS RIVER NEAR KAHNEETA HOT SPRINGS, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--November 1989 to August 1990.

WATER QUALITY DATA, November 1989 to August 1990

DATE	TIME	TEMPER- ATURE WATER (DEG C)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) *
NOV 1989					
15...	1215	6.0	252	2	1.4
MAR 1990					
01...	1130	3.5	344	4	3.7
AUG					
01...	1645	21.0	224	4	2.4

* Sediment discharges shown are estimated instantaneous values. The values were calculated by multiplying the water discharge times the sediment concentration times the coefficient of 0.0027 to get sediment discharge in tons per day. They do not reflect the actual sediment discharge for the given date.

DESCHUTES RIVER BASIN

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14101500 WHITE RIVER BELOW TYGH VALLEY, OR

LOCATION.--Lat 45°14'30", long 121°05'38", in NE 1/4 NE 1/4 sec.7, T.4 S., R.14 E., Wasco County, Hydrologic Unit 17070306, on left bank 200 ft downstream from former Pacific Power & Light Co. powerplant at White River Falls, 3.9 mi east of town of Tygh Valley, and at mile 2.0.

DRAINAGE AREA.--417 mi².

PERIOD OF RECORD.--October 1917 to September 1990 (discontinued).

REVISED RECORDS.--WSP 1448: 1920, 1923, 1927-28, drainage area. WSP 1935: 1956.

GAGE.--Water-stage recorder. Datum of gage is 870.15 ft above National Geodetic Vertical Datum of 1929 (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.

REMARKS.--Records fair. No regulation. Diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--73 years, 423 ft³/s, 306,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,300 ft³/s Jan. 6, 1923, gage height, about 13.3 ft, site and datum then in use, from rating curve extended above 5,000 ft³/s; minimum discharge, 7.5 ft³/s Aug. 31, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	0330	*2,190	*4.99	No other peak greater than base discharge.			

Minimum daily discharge, 91 ft³/s Sept. 30, but minimum discharge could have been lower during period of missing record, Aug. 18 to Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	120	107	144	170	280	541	647	1040	435	217	131	e111
2	109	109	141	168	272	520	713	986	409	212	128	e110
3	105	111	148	161	273	515	750	920	396	209	127	e110
4	104	119	209	169	261	525	745	863	410	202	125	e110
5	105	129	529	203	251	551	754	821	389	204	125	e111
6	104	122	373	283	269	541	772	804	395	205	123	e108
7	104	167	311	516	250	546	793	721	445	199	119	e109
8	103	145	378	938	248	543	800	650	411	192	118	e110
9	103	252	384	978	269	523	717	593	398	188	118	e102
10	102	264	319	965	647	525	669	557	396	186	121	e103
11	102	176	282	748	797	487	659	517	408	180	120	e104
12	102	186	249	613	651	458	658	486	411	189	120	e105
13	101	208	235	541	561	434	636	466	541	179	120	e103
14	102	187	222	503	490	424	655	462	457	170	118	e103
15	102	166	214	460	491	415	713	431	415	168	114	e104
16	102	155	203	426	458	402	786	406	383	167	115	e125
17	101	202	196	391	419	394	819	381	358	161	116	e108
18	101	206	184	360	382	419	757	370	325	155	e133	e103
19	101	179	191	343	355	470	707	362	305	148	e120	e99
20	101	166	177	321	353	529	671	371	300	146	e115	e97
21	104	157	172	306	560	596	637	355	286	144	e130	e97
22	113	150	169	316	580	633	580	399	283	140	e145	e100
23	111	148	171	336	561	744	706	469	294	140	e130	e96
24	115	170	185	306	562	737	669	461	274	137	e112	e98
25	111	165	177	296	584	671	728	400	267	138	e111	e98
26	111	162	173	292	605	630	809	382	251	138	e110	e97
27	121	157	170	283	590	602	1010	408	243	137	e110	e97
28	117	156	170	287	564	584	1870	552	235	134	e109	e96
29	113	150	166	324	---	577	1450	483	229	134	e111	e93
30	110	147	163	313	---	579	1200	457	225	135	e135	e91
31	109	---	164	290	---	586	---	471	---	136	e120	---
TOTAL	3309	4918	6969	12606	12583	16701	24080	17044	10574	5190	3749	3098
MEAN	107	164	225	407	449	539	803	550	352	167	121	103
MAX	121	264	529	978	797	744	1870	1040	541	217	145	125
MIN	101	107	141	161	248	394	580	355	225	134	109	91
AC-FT	6560	9750	13820	25000	24960	33130	47760	33810	20970	10290	7440	6140

CAL YR 1989 TOTAL 133799 MEAN 367 MAX 1380 MIN 98 AC-FT 265400
WTR YR 1990 TOTAL 120821 MEAN 331 MAX 1870 MIN 91 AC-FT 239600

e Estimated

LOCATION.--Lat 45°37'20", long 120°54'05", in SW 1/4 SE 1/4 sec.26, T.2 N., R.15 E., Sherman County, Hydrologic Unit 17070306, on right bank at Moody, 4.0 mi southwest of Biggs, and at mile 1.4.

DRAINAGE AREA.--10,500 mi², approximately.

WATER-DISCHARGE RECORDS

REVISED RECORDS.--WSP 754: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 167.54 ft above National Geodetic Vertical Datum of 1929. Oct. 19, 1897, to Dec. 31, 1899, nonrecording gage at site 10 mi upstream at different datum. July 22, 1906, to July 18, 1930, nonrecording gage at site 300 ft downstream at datum 0.50 ft lower.

REMARKS.--No estimated daily discharges. Water-discharge records excellent. Some fluctuation caused by regulation at Lake Simtustus since 1957. Some winter and spring runoff stored in Ochoco Reservoir, capacity, 46,420 acre-ft, in Crescent Lake, Crane Prairie, and Wickiup Reservoirs, combined capacity, 323,390 acre-ft, and since 1960, in Prineville Reservoir (station 14080400), and since 1964 in Lake Billy Chinook (station 14092100). Large diversions in upper river basin for irrigation.

AVERAGE DISCHARGE.--86 years, 5,845 ft³/s, 4,235,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 75,500 ft³/s Dec. 22, 1964, gage height, 11.80 ft, from rating curve extended above 47,000 ft³/s; minimum discharge, 2,400 ft³/s Dec. 5, 1957.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,450 ft³/s Jan. 11, gage height, 3.61 ft; minimum discharge, 3,890 ft³/s Aug. 7, 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4760	4550	4480	4900	4990	6350	4740	6590	5010	4420	4640	4160
2	4780	4580	4560	4760	4950	6300	4820	6290	5060	4450	4670	4300
3	4790	4580	4630	4670	4930	5540	4890	5870	5230	4480	4420	4430
4	4790	4640	4680	4590	4930	5450	4940	6080	5260	4450	4180	4480
5	4790	4700	4820	4550	5010	5460	4960	6040	5310	4450	3970	4370
6	4730	4750	5080	4560	5740	5460	4980	5990	5240	4520	3930	4170
7	4550	4780	5230	4650	5900	5440	5000	5950	4990	4480	3910	4100
8	4500	4820	5340	5080	5910	5460	5030	5840	4980	4350	3900	4090
9	4480	4910	5450	6110	5910	5400	5030	5680	4680	4360	4120	4090
10	4460	5080	5490	7000	5870	5020	4950	5270	4630	4340	4320	4090
11	4310	5200	5470	7350	5700	4760	4860	5040	4600	4300	4380	4090
12	4200	5260	5420	6950	5710	4690	4830	4970	4590	4380	4420	4070
13	4190	5210	5210	6640	5680	4640	4810	4920	4610	4350	4440	4060
14	4160	5150	5080	6430	6050	4600	4780	4870	4630	4280	4430	4070
15	4160	5100	5020	6130	6110	4580	4790	4850	4590	4260	4260	4160
16	4160	5040	4970	5870	6150	4570	4840	4720	4710	4260	4110	4280
17	4160	5000	4690	5690	6030	4550	4940	4440	4580	4250	4040	4550
18	4160	4890	4550	5570	5300	4550	4990	4440	4530	4230	4050	4820
19	4180	4810	4480	5350	5210	4580	4960	4420	4500	4150	4080	4990
20	4190	4760	4450	4990	5150	4620	4940	4430	4510	4210	4110	4870
21	4200	4720	4440	4950	5150	4690	4860	4440	4530	4380	4140	4430
22	4210	4650	4430	4940	5280	4750	4840	4480	4680	4250	4260	4150
23	4210	4590	4420	5030	5260	4920	4860	4600	4690	4180	4530	4160
24	4210	4530	4420	5140	5250	5000	5030	4750	4670	4120	4660	4170
25	4330	4500	4420	5160	5230	4980	5290	4670	4610	4120	4790	4200
26	4420	4480	4420	5310	5230	4890	5540	4500	4590	4130	4620	4450
27	4480	4470	4420	5250	5370	4830	5570	4450	4560	4130	4520	4660
28	4510	4440	4480	5090	6070	4770	6940	4560	4470	4110	4500	4680
29	4540	4440	4720	5140	---	4740	7130	4690	4450	4100	4490	4690
30	4550	4460	4840	5190	---	4730	6480	4700	4430	4170	4300	4900
31	4550	---	4870	5140	---	4710	---	4750	---	4320	4180	---
TOTAL	136710	143090	148980	168180	154070	155030	154620	157290	141920	132980	133370	130730
MEAN	4410	4770	4806	5425	5502	5001	5154	5074	4731	4290	4302	4358
MAX	4790	5260	5490	7350	6150	6350	7130	6590	5310	4520	4790	4990
MIN	4160	4440	4420	4550	4930	4550	4740	4420	4430	4100	3900	4060
AC-FT	271200	283800	295500	333600	305600	307500	306700	312000	281500	263800	264500	259300
CAL YR 1989	TOTAL 1997420		MEAN 5472	MAX 8940	MIN 3990	AC-FT 3962000						
WTR YR 1990	TOTAL 1756970		MEAN 4814	MAX 7350	MIN 3900	AC-FT 3485000						

DESCHUTES RIVER BASIN

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14103000 DESCHUTES RIVER AT MOODY, NEAR BIGGS, OR--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1911-12, 1953-58, 1962 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1975 to September 1981.

WATER TEMPERATURE: December 1952 to February 1954, November 1954 to September 1958, June 1962 to September 1981.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	
NOV 1989													
28...	1320	4440	133	8.2	8.0	1.4	12.2	103	K1	100	42	7.9	
JAN 1990													
17...	1305	5700	137	8.2	7.0	0.7	12.4	101	K1	K6	43	8.2	
MAR													
20...	1030	4600	126	8.3	10.0	0.5	11.2	99	K3	61	41	7.7	
MAY													
16...	1430	4790	113	8.5	14.5	3.5	11.1	109	K6	K67	39	7.9	
JUL													
10...	1125	4340	116	8.2	21.5	1.0	10.2	116	K12	330	38	7.0	
SEP													
19...	1030	4980	123	8.1	16.0	2.5	7.2	73	--	--	40	7.5	
DATE		MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY DIS IT FIELD (MG/L AS CACO3)	BICAR- BONATE DIS IT FIELD (MG/L AS HCO3)	CAR- BONATE DIS IT FIELD (MG/L AS CO3)	SULFATE, DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)
NOV 1989													
28...	5.5	12	37	0.8	2.0	63	77	0	3.0	2.1	0.1	27	
JAN 1990													
17...	5.5	11	34	0.7	2.0	63	77	0	3.0	2.4	<0.1	28	
MAR													
20...	5.2	11	36	0.8	1.7	58	71	0	2.2	1.9	<0.1	29	
MAY													
16...	4.7	9.6	34	0.7	1.5	52	63	0	1.9	2.9	<0.1	29	
JUL													
10...	5.1	9.8	34	0.7	1.7	57	70	0	1.8	2.8	<0.1	25	
SEP													
19...	5.2	11	36	0.8	1.9	59	72	0	1.9	2.8	<0.1	30	
DATE		SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	
NOV 1989													
28...		88	98	0.12	1050	<0.01	<0.10	0.01	0.2	0.06	0.03	0.03	
JAN 1990													
17...		112	99	0.15	1720	<0.01	0.15	0.01	<0.2	0.04	0.03	0.04	
MAR													
20...		97	96	0.13	1200	0.02	0.50	0.02	0.7	0.04	0.04	<0.01	
MAY													
16...		82	89	0.11	1060	<0.01	<0.10	<0.01	0.3	0.07	0.04	0.05	
JUL													
10...		100	88	0.14	1170	<0.01	<0.10	0.02	0.2	0.06	0.05	0.03	
SEP													
19...		92	96	0.09	941	<0.01	<0.10	<0.01	<0.2	0.04	0.04	0.05	

K - Results based on colony count outside acceptable range (non-ideal colony count).

DESCHUTES RIVER BASIN

14103000 DESCHUTES RIVER AT MOODY, NEAR BIGGS, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC, DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM, DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM, DIS- SOLVED (UG/L AS LI)
NOV 1989 28...	<10	2	4	<0.5	1	1	<3	1	21	<1	6
JAN 1990 17...	--	--	--	--	--	--	--	--	--	--	--
MAR 20...	10	2	4	<0.5	<1	<5	<3	1	<3	<1	5
MAY 16...	<10	1	3	<0.5	<1	<1	<3	1	9	<1	5
JUL 10...	--	--	--	--	--	--	--	--	--	--	--
SEP 19...	10	1	4	<0.5	<1	<1	<3	1	8	<1	6
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY, DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
NOV 1989 28...	1	<0.1	<10	1	<1	<1	43	14	<3	7	84
JAN 1990 17...	--	--	--	--	--	--	--	--	--	9	139
MAR 20...	1	<0.1	<10	<1	<1	<1	44	12	<3	5	62
MAY 16...	2	<0.1	<10	<1	<1	<1	40	12	3	8	103
JUL 10...	--	--	--	--	--	--	--	--	--	8	94
SEP 19...	2	<0.1	<10	<1	<1	<1	41	15	<3	11	148

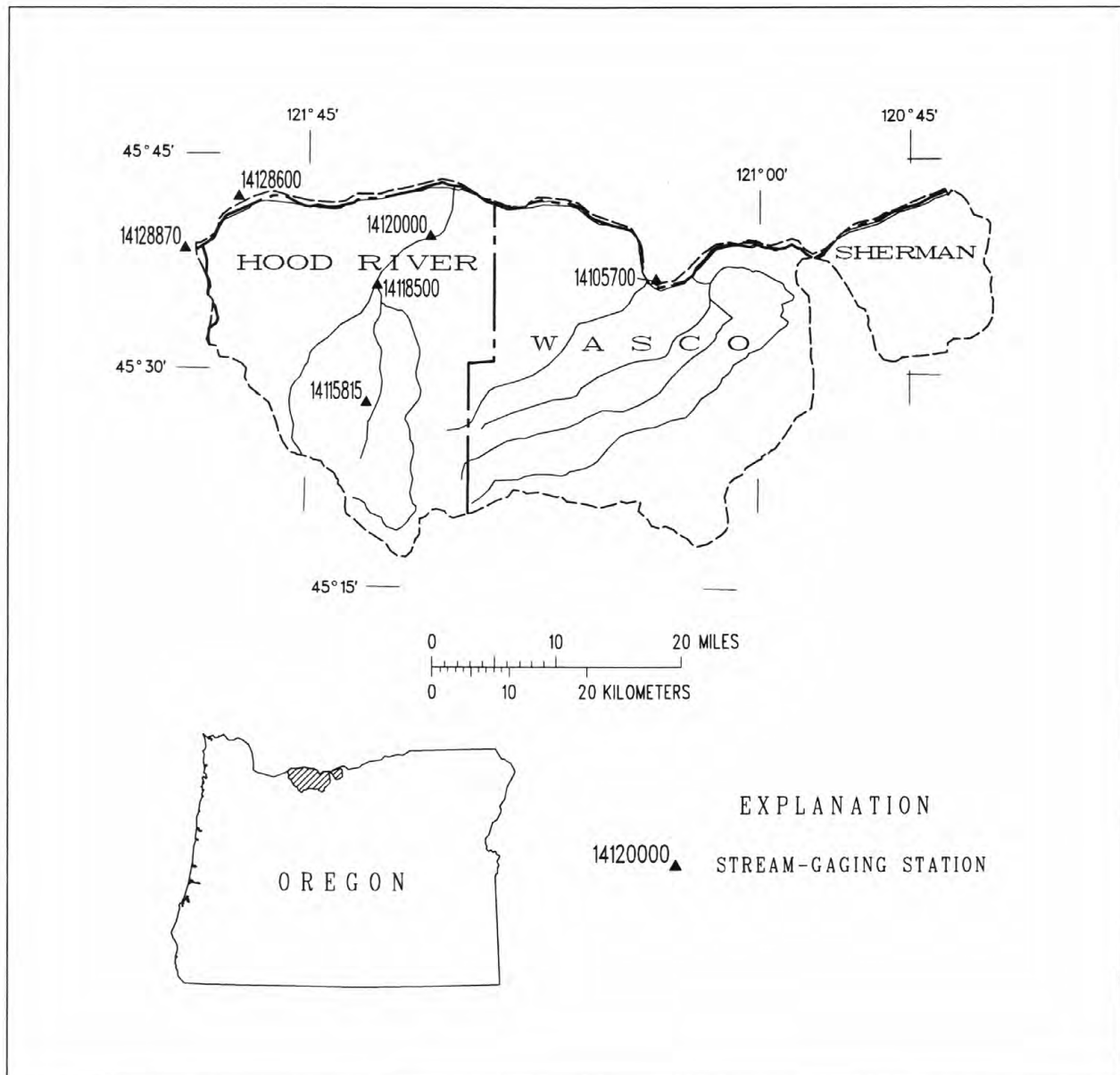


Figure 8.--Location of surface-water and water-quality stations in the Middle and Lower Columbia River area, Hood River basin.

COLUMBIA RIVER MAIN STEM

14105700 COLUMBIA RIVER AT THE DALLES, OR

LOCATION.--Lat 45°36'27", long 121°10'20", in SW 1/4 SW 1/4 sec.34, T.2 N., R.13 E., Wasco County, Hydrologic Unit 17070105, Corps of Engineers land, on left bank 0.3 mi downstream from Mill Creek, 2.6 mi downstream from The Dalles Dam, and at mile 188.9.

DRAINAGE AREA.--237,000 mi², approximately.

PERIOD OF RECORD.--October 1857 to September 1877 (annual maximum only, at Lower Cascades Landing, published in WSP 1318), June 1878 to current year. Published as "near The Dalles" 1936-56.

REVISED RECORDS.--WSP 534: 1920(m). WSP 1094: 1894. WSP 1248: 1866, 1888, 1899, 1909. WSP 1518: 1876(M).

GAGE.--Acoustic velocity meter (AVM) with water-stage and velocity-index recorder. Datum of gage is National Geodetic Vertical Datum of 1929. See WSP 1738 for history of changes prior to Mar. 16, 1957. Mar. 16, 1957, to Sept 30, 1968, water-stage recorder at site 0.4 mi upstream at same datum.

REMARKS.--Daily discharges Nov. 14 to May 11, May 30 to Aug. 11 determined from data provided by Corps of Engineers. Records good. Considerable regulation by many large reservoirs. Diurnal fluctuations caused by powerplant and gates at The Dalles Dam. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--112 years, 192,100 ft³/s, 139,200,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge (since 1858), 1,240,000 ft³/s June 6, 1894, elevation, 106.5 ft; minimum discharge (since 1878), 12,100 ft³/s Apr. 16, 1968 (due to closure of John Day dam, recorded by AVM).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 391,000 ft³/s June 9; maximum elevation, 82.6 ft June 10; minimum daily discharge, 72,300 ft³/s Sept. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	89400	137000	e133000	e122000	e200000	e180000	e162000	e216000	e313000	e252000	e161000	112000
2	124000	163000	e107000	e146000	e150000	e193000	e150000	e253000	e345000	e258000	e153000	104000
3	129000	156000	e107000	e172000	e146000	e172000	e164000	e230000	e353000	e243000	e171000	99000
4	116000	94400	e124000	e164000	e129000	e163000	e174000	e256000	e315000	e198000	e147000	102000
5	115000	85200	e116000	e172000	e154000	e182000	e149000	e227000	e302000	e249000	e142000	113000
6	94000	104000	e130000	e143000	e160000	e178000	e147000	e238000	e342000	e236000	e174000	135000
7	102000	134000	e163000	e133000	e173000	e186000	e166000	e251000	e350000	e216000	e171000	94600
8	93000	141000	e164000	e152000	e168000	e181000	e166000	e261000	e362000	e212000	e173000	113000
9	98400	135000	e146000	e139000	e196000	e179000	e201000	e266000	e391000	e234000	e147000	95000
10	99400	142000	e146000	e171000	e150000	e220000	e201000	e260000	e381000	e223000	e150000	101000
11	125000	133000	e155000	e187000	e139000	e170000	e185000	e264000	e329000	e234000	e142000	118000
12	132000	107000	e180000	e169000	e182000	e212000	e167000	219000	e327000	e219000	e112000	118000
13	143000	127000	e174000	e160000	e197000	e205000	e156000	213000	e360000	e214000	e134000	117000
14	112000	e146000	e166000	e104000	e218000	e186000	e205000	229000	e372000	e182000	e124000	137000
15	108000	e153000	e145000	e142000	e220000	e201000	e167000	237000	e352000	e157000	e128000	109000
16	109000	e174000	e142000	e176000	e220000	e146000	e204000	233000	e320000	e149000	e126000	72300
17	133000	e171000	e148000	e185000	e209000	e177000	e226000	225000	e331000	e180000	e132000	132000
18	118000	e139000	e145000	e171000	e184000	e159000	e232000	188000	e314000	e157000	127000	122000
19	122000	e122000	e138000	e176000	e207000	e176000	e238000	204000	e290000	e157000	99700	115000
20	101000	e148000	e166000	e154000	e202000	e191000	e247000	168000	e289000	e158000	137000	122000
21	109000	e136000	e171000	e148000	e201000	e194000	e233000	201000	e272000	e148000	122000	111000
22	77800	e139000	e148000	e166000	e183000	e239000	e233000	203000	e272000	e149000	134000	102000
23	94000	e106000	e153000	e157000	e197000	e239000	e213000	216000	e288000	e144000	142000	91100
24	154000	e114000	e115000	e181000	e154000	e191000	e259000	219000	e246000	e133000	161000	108000
25	164000	e98300	e107000	e165000	e165000	e184000	e252000	230000	e279000	e144000	151000	126000
26	130000	e106000	e135000	e175000	e186000	e257000	e241000	217000	e260000	e147000	155000	123000
27	94000	e144000	e135000	e146000	e181000	e222000	e254000	191000	e271000	e128000	171000	110000
28	111000	e147000	e160000	e161000	e191000	e196000	e284000	205000	e294000	e116000	152000	132000
29	123000	e165000	e163000	e172000	---	e213000	e269000	213000	e301000	e104000	137000	105000
30	143000	e195000	e122000	e165000	---	e235000	e191000	e191000	e271000	e159000	125000	106000
31	144000	---	e139000	e196000	---	e174000	---	e289000	---	e147000	131000	---
TOTAL	3607000	4061900	4443000	4970000	5062000	6001000	6136000	7090000	9492000	5647000	4431700	3345000
MEAN	116400	135400	143300	160300	180800	193600	204500	228700	316400	182200	143000	111500
MAX	164000	195000	180000	196000	220000	257000	284000	289000	391000	258000	174000	137000
MIN	77800	85200	107000	104000	129000	146000	147000	168000	246000	104000	99700	72300
AC-FT	7154000	8057000	8813000	9858000	10040000	11900000	12170000	14060000	18830000	11200000	8790000	6635000

CAL YR 1989 TOTAL 56531600 MEAN 154900 MAX 328000 MIN 71400 AC-FT .11213042E9
WTR YR 1990 TOTAL 64286600 MEAN 176100 MAX 391000 MIN 72300 AC-FT .12751246E9

e Estimated

HOOD RIVER BASIN

173

14115815 CLEAR BRANCH BELOW LAURANCE LAKE, NEAR PARKDALE, OR

LOCATION.--Lat 45°27'44", long 121°39'04", in SE 1/4 SE 1/4 sec.22, T.1 S., R.9 E., Hood River County, Hydrologic Unit 17070105, on right bank 0.3 mi downstream from Laurance Lake, and 5.0 mi southwest of Parkdale.

DRAINAGE AREA.--8.62 mi².

PERIOD OF RECORD.--May 1986 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,790 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor. Flow regulated by Laurance Lake 0.3 mi upstream. Water is diverted from Laurance Lake for irrigation.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 184 ft³/s Apr. 27, 1990, gage height, 7.03 ft; minimum discharge, 0.65 ft³/s Oct. 9, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 184 ft³/s Apr. 27, gage height, 7.03 ft; minimum discharge, 5.6 ft³/s Aug. 18-20, 31, gage height, 5.56 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	11	19	18	29	32	31	53	25	9.2	6.6	14
2	17	15	19	19	29	32	31	47	20	8.5	6.6	14
3	16	12	21	20	29	32	31	44	27	8.2	6.6	14
4	16	11	27	21	28	32	31	44	51	8.2	6.6	14
5	16	12	31	27	28	32	31	52	39	8.2	6.6	14
6	15	13	31	31	29	32	31	55	40	8.2	6.6	14
7	15	16	32	32	29	32	32	49	69	8.2	6.6	14
8	15	18	32	33	29	32	32	42	56	8.2	6.6	14
9	15	17	32	34	30	32	32	38	45	7.8	6.6	14
10	15	25	30	63	32	32	32	36	42	7.5	6.6	14
11	15	27	29	72	31	31	32	36	44	7.5	6.6	14
12	15	23	29	53	31	31	32	35	50	7.4	6.4	14
13	15	22	29	42	31	31	32	35	62	7.4	6.2	14
14	15	22	29	35	31	31	32	35	46	7.4	6.0	14
15	15	e27	29	30	31	31	32	16	40	7.4	6.0	14
16	15	e28	29	30	31	31	32	8.6	37	7.4	6.0	14
17	15	e21	29	28	31	31	32	9.5	31	7.4	6.0	14
18	15	e20	29	27	32	31	32	12	28	7.4	5.8	14
19	15	e19	25	32	32	31	32	13	27	7.4	5.6	14
20	15	e19	23	28	32	31	32	19	26	7.3	5.9	14
21	15	e18	23	27	32	31	32	20	25	7.0	6.0	14
22	15	e18	23	30	32	31	32	24	27	7.0	6.0	14
23	15	e20	23	31	32	31	34	29	25	7.0	6.0	14
24	15	e23	23	28	32	31	54	28	17	7.0	6.0	14
25	15	e22	23	29	32	31	71	23	10	7.0	6.0	14
26	15	e21	23	29	32	31	74	21	8.6	7.0	6.0	14
27	20	e21	23	29	32	31	118	22	8.2	7.0	6.0	14
28	25	e20	23	29	32	31	130	29	8.2	7.0	6.0	14
29	20	20	20	29	---	31	86	29	8.3	7.0	6.0	14
30	13	19	18	29	---	31	66	27	9.6	6.7	6.0	14
31	13	---	18	29	---	31	---	28	---	6.6	8.5	---
TOTAL	488	580	794	994	861	971	1331	959.1	951.9	232.5	195.0	420
MEAN	15.7	19.3	25.6	32.1	30.7	31.3	44.4	30.9	31.7	7.50	6.29	14.0
MAX	25	28	32	72	32	32	130	55	69	9.2	8.5	14
MIN	13	11	18	18	28	31	31	8.6	8.2	6.6	5.6	14
AC-FT	968	1150	1570	1970	1710	1930	2640	1900	1890	461	387	833

CAL YR 1989 TOTAL 8842.9 MEAN 24.2 MAX 89 MIN 5.6 AC-FT 17540
WTR YR 1990 TOTAL 8777.5 MEAN 24.0 MAX 130 MIN 5.6 AC-FT 17410

e Estimated

HOOD RIVER RIVER BASIN

14118500 WEST FORK HOOD RIVER NEAR DEE, OR

LOCATION.--Lat 45°35'55", long 121°38'05", in SE 1/4 sec.1, T.1 N., R.9 E., Hood River County, Hydrologic Unit 17070105, on left bank 0.3 mi upstream from Dead Point Creek, 0.8 mi northwest of Dee, and at mile 0.4.

DRAINAGE AREA.--95.6 mi².

PERIOD OF RECORD.--September 1913 to February 1916 (incomplete), June 1932 to current year.

REVISED RECORDS.--WDR OR-80-1: 1972(M).

GAGE.--Water-stage recorder. Datum of gage is 802.1 ft above National Geodetic Vertical Datum of 1929. Sept. 1, 1913, to Feb. 12, 1916, nonrecording gage at site 0.5 mi upstream at different datum.

REMARKS.--No estimated daily discharges. Records excellent. No regulation. Dee Irrigation District canal diverts from right bank about 6 mi upstream from station for irrigation upstream from station and in Middle Fork Basin. Diversions from Green Point Creek basin upstream from station for irrigation near Oak Grove; water from two of these diversions is carried in Hood River Irrigation District canal.

AVERAGE DISCHARGE.--59 years (water years 1914, 1933-90), 550 ft³/s, 398,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge not determined, Dec. 22, 1964, gage height, 27.0 ft, from floodmarks; maximum daily discharge, 15,000 ft³/s Dec. 23, 1964; minimum, 90 ft³/s Oct. 25, 29, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 4,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 4	2100	*6,090	*9.62	Jan. 9	0100	5,780	9.38

Minimum discharge, 99 ft³/s Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	144	126	265	321	580	584	673	821	466	264	162	127
2	124	124	248	284	590	551	741	738	434	268	154	125
3	119	122	434	257	572	544	735	674	482	262	152	123
4	115	175	2630	407	513	601	707	641	557	238	155	123
5	114	154	2190	663	505	596	704	625	482	242	154	126
6	114	314	1080	1560	475	578	718	586	561	259	156	123
7	112	551	761	3160	447	607	724	531	689	232	148	125
8	112	335	1260	4020	493	621	675	485	607	227	148	125
9	114	612	1060	3970	891	570	581	447	566	226	152	119
10	117	493	777	2520	2550	740	545	423	566	230	155	117
11	122	359	617	1420	1870	620	560	412	668	248	152	119
12	115	720	525	1000	1270	546	570	429	829	255	155	118
13	120	561	460	810	930	496	549	457	899	237	154	116
14	122	544	412	703	740	539	585	490	693	211	146	116
15	116	420	375	617	665	527	658	440	591	207	138	117
16	114	362	342	557	583	502	734	407	526	206	137	142
17	111	448	318	498	517	507	716	386	471	196	142	121
18	111	368	293	453	461	554	635	383	439	188	144	114
19	113	320	277	418	422	639	566	367	408	183	136	111
20	114	284	263	388	504	801	534	413	393	181	135	109
21	129	258	247	369	850	796	503	387	380	186	150	108
22	138	235	235	484	792	754	549	445	378	189	166	112
23	140	318	260	691	729	871	951	439	365	185	145	110
24	144	457	245	541	709	751	839	457	342	174	131	110
25	144	481	228	516	742	644	1220	424	324	172	128	110
26	184	436	219	493	725	579	994	405	304	169	125	110
27	222	401	213	505	672	547	2320	457	287	169	126	109
28	188	362	210	921	622	535	1990	534	273	163	125	107
29	152	319	201	1130	---	535	1320	489	274	169	133	105
30	137	287	196	816	---	555	990	457	272	183	162	103
31	132	---	213	651	---	609	---	475	---	175	136	---
TOTAL	4053	10946	17054	31143	21419	18899	24586	15124	14526	6494	4502	3500
MEAN	131	365	550	1005	765	610	820	488	484	209	145	117
MAX	222	720	2630	4020	2550	871	2320	821	899	268	166	142
MIN	111	122	196	257	422	496	503	367	272	163	125	103
AC-FT	8040	21710	33830	61770	42480	37490	48770	30000	28810	12880	8930	6940

CAL YR 1989 TOTAL 161141 MEAN 441 MAX 2630 MIN 111 AC-FT 319600
WTR YR 1990 TOTAL 172246 MEAN 472 MAX 4020 MIN 103 AC-FT 341600

14120000 HOOD RIVER AT TUCKER BRIDGE, NEAR HOOD RIVER, OR

LOCATION.--Lat 45°39'20", long 121°32'50", in SE 1/4 sec.15, T.2 N., R.10 E., Hood River County, Hydrologic Unit 17070105, on right bank 25 ft downstream from Tucker Bridge, 0.5 mi upstream from Odell Creek, 4.0 mi, southwest of town of Hood River, and at mile 6.1.

DRAINAGE AREA.--279 mi².

PERIOD OF RECORD.--October 1897 to December 1899, September 1913 to September 1914, August 1915 to September 1917, January 1965 to current year. Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 1318: 1899. WSP 1935: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 383.2 ft above National Geodetic Vertical Datum of 1929 (Oregon State Highway Department bench mark). Prior to July 23, 1915, nonrecording gage at bridge at various datums. July 23 to Dec. 21, 1915, water-stage recorder at site 0.8 mi upstream at different datum. January 1916 to September 1917, nonrecording gage at bridge at different datum. Jan. 16 to July 23, 1965, nonrecording gage at bridge.

REMARKS.--Records fair. Some daily fluctuation caused by diversion dam upstream from station and sawmill at Dee. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--30 years (water years 1898-99, 1914, 1916-17, 1966-90), 1,038 ft³/s, 752,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,300 ft³/s Dec. 13, 1977, gage height, 15.59 ft; minimum discharge recorded, 136 ft³/s Sept. 16, 1915, caused by temporary storage behind dam at Dee.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Dec. 22, 1964, reached a stage of 20.6 ft, present datum, discharge, 33,200 ft³/s, from rating curve extended above 1,500 ft³/s on basis of slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 4	unknown	*9,280	*a10.12	Apr. 27	2100	7,250	9.17
Jan. 9	0200	8,470	9.74				

Minimum discharge, 217 ft³/s Sept. 20.

a From crest-stage gage.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	380	281	471	543	1040	1020	1100	1490	886	594	357	272
2	307	289	452	501	1030	974	1190	1390	832	564	318	272
3	295	295	e780	472	1000	975	1200	1300	871	553	316	266
4	286	400	e3900	612	920	1040	1200	1250	1050	e500	336	275
5	281	351	e3200	877	919	1020	1170	1240	900	e510	332	290
6	276	515	e1800	1850	884	991	1200	1240	952	e540	342	280
7	276	815	e1300	4490	837	1020	1220	1100	1220	e510	305	282
8	276	560	e2050	6140	915	1040	1190	1000	1100	e500	325	286
9	336	997	e1550	6020	1270	976	1050	935	1070	e500	347	259
10	348	e760	e1150	4300	3500	1190	989	909	1060	542	361	259
11	358	e550	e900	2260	2730	1040	1040	886	1170	590	377	281
12	338	e1100	e770	1640	1830	930	1050	900	1240	649	390	268
13	336	e840	e710	1380	1460	858	1010	900	1430	606	394	243
14	342	812	e680	1210	1210	908	1080	926	1180	531	341	250
15	325	662	638	1080	1150	886	1200	841	1030	499	299	261
16	322	590	599	989	1050	853	1310	794	952	518	286	306
17	328	745	570	901	946	859	1320	771	885	473	290	273
18	335	620	539	827	867	911	1190	767	836	444	287	247
19	337	557	520	786	814	1010	1080	749	822	414	258	242
20	346	511	501	744	897	1190	1030	804	851	400	266	232
21	360	482	484	714	1380	1200	996	762	827	430	324	233
22	371	459	469	845	1300	1170	1040	836	827	450	407	262
23	399	539	496	1110	1220	1330	1550	851	836	438	339	269
24	372	715	482	912	1180	1180	1420	827	780	373	282	267
25	338	733	460	877	1220	1050	1940	785	749	347	272	295
26	355	687	447	851	1200	975	1670	762	685	337	264	293
27	403	637	436	874	1130	936	3740	856	636	372	259	283
28	364	582	430	1380	1060	915	4090	1150	594	342	275	273
29	324	532	418	1730	---	916	2340	962	590	359	295	261
30	290	497	408	1350	---	938	1720	875	601	415	365	258
31	280	---	425	1120	---	1010	---	916	---	391	290	---
TOTAL	10284	18113	28035	49385	34959	31311	43325	29774	27462	14691	9899	8038
MEAN	332	604	904	1593	1249	1010	1444	960	915	474	319	268
MAX	403	1100	3900	6140	3500	1330	4090	1490	1430	649	407	306
MIN	276	281	408	472	814	853	989	749	590	337	258	232
AC-FT	20400	35930	55610	97960	69340	62110	85940	59060	54470	29140	19630	15940

CAL YR 1989 TOTAL 294627 MEAN 807 MAX 3900 MIN 236 AC-FT 584400
WTR YR 1990 TOTAL 305276 MEAN 836 MAX 6140 MIN 232 AC-FT 605500

e Estimated

COLUMBIA RIVER MAIN STEM

14128600 COLUMBIA RIVER AT STEVENSON, WA

LOCATION.--Lat 45°41'58", long 121°52'02", in NW 1/4 SE 1/4 sec.36, T.3 N., R.7-1/2 E., Skamania County, Hydrologic Unit 17070105, on right bank 0.9 mi east of Stevenson, and at mile 151.3.

DRAINAGE AREA.--239,800 mi², approximately.

PERIOD OF RECORD.--October 1973 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Flow regulated by many reservoirs upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 79.79 ft June 20, 1974; minimum, 70.39 ft Oct. 25, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 78.38 ft June 2, 3, 10; minimum, 72.16 ft Dec. 6.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	75.84	74.21	74.68	75.86	73.74	74.70	74.72	72.65	73.28	74.65	73.01	73.77
2	75.77	73.77	74.65	76.16	73.91	75.14	73.25	72.28	72.70	74.71	73.31	74.15
3	76.37	74.03	75.19	76.15	73.25	74.23	73.89	72.77	73.28	75.45	73.09	74.34
4	76.23	75.23	75.79	74.35	73.10	73.71	74.38	72.47	73.26	75.35	72.82	73.64
5	76.24	74.69	75.29	74.33	73.37	73.65	74.42	72.35	72.95	74.37	72.78	73.44
6	75.67	74.78	75.30	74.14	72.66	73.34	74.70	72.16	73.04	75.32	73.34	74.20
7	76.10	74.95	75.42	74.78	73.18	74.18	74.76	72.75	73.53	75.51	73.47	74.57
8	75.93	74.89	75.21	75.29	72.94	74.02	74.52	72.53	73.26	75.41	73.07	73.78
9	74.87	74.11	74.44	75.33	73.30	74.26	74.50	73.07	73.64	75.10	72.89	73.70
10	74.65	73.92	74.35	75.02	73.51	74.36	74.75	73.82	74.14	74.78	73.01	73.77
11	74.66	74.00	74.33	75.02	73.87	74.51	75.10	74.02	74.51	74.91	73.16	73.72
12	75.24	73.67	74.38	75.18	74.04	74.72	75.12	72.91	74.03	73.94	72.72	73.22
13	75.63	73.96	74.53	74.75	73.57	74.03	75.12	73.19	74.24	75.46	73.73	74.35
14	75.83	74.94	75.37	74.46	73.23	73.86	75.05	73.16	74.11	75.51	73.29	73.90
15	75.67	75.20	75.41	75.20	72.90	74.17	74.60	72.96	73.56	74.32	72.59	73.35
16	75.70	74.16	74.96	75.47	74.10	74.88	74.74	74.03	74.38	74.49	72.93	73.75
17	74.40	73.42	73.94	74.75	73.29	73.83	75.13	74.25	74.56	74.64	73.25	73.81
18	74.16	72.88	73.30	74.40	72.39	73.26	75.34	73.11	73.91	74.71	73.20	73.78
19	74.31	73.38	73.91	74.58	73.98	74.21	74.48	72.45	73.54	74.53	73.31	73.90
20	73.76	72.88	73.24	74.58	72.57	73.55	75.61	72.26	73.91	74.57	73.58	74.20
21	75.15	72.93	73.98	74.44	72.53	73.36	76.20	73.78	74.73	74.30	73.84	74.06
22	74.85	74.05	74.30	75.37	72.97	73.83	75.97	74.27	75.10	74.77	73.21	73.84
23	74.39	73.50	73.94	75.75	74.79	75.26	75.44	73.66	74.52	74.76	72.43	73.39
24	75.02	72.91	73.91	75.80	74.84	75.24	75.36	73.89	74.61	76.86	74.02	75.44
25	75.79	73.26	74.63	75.22	74.73	74.88	75.24	74.08	74.57	76.72	75.48	76.07
26	75.80	74.83	75.44	74.86	73.54	73.89	75.58	73.29	74.23	76.43	74.30	75.57
27	75.30	73.94	74.64	73.71	72.28	72.86	75.66	74.12	74.58	75.75	74.12	74.94
28	75.34	73.11	74.14	73.40	72.27	72.79	74.93	72.90	73.86	76.38	74.82	75.61
29	75.55	73.97	74.66	74.60	72.39	73.23	75.79	73.33	74.25	76.74	74.48	75.86
30	75.81	74.38	75.22	74.76	72.96	73.88	75.90	73.61	74.45	76.29	73.98	74.99
31	75.72	73.70	74.93	---	---	---	75.02	73.91	74.43	76.72	73.04	74.91
MONTH	76.37	72.88	74.63	76.16	72.27	74.06	76.20	72.16	73.97	76.86	72.43	74.26

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	76.68	74.61	75.61	76.94	75.47	76.08	75.11	73.65	74.39	75.63	73.90	74.75
2	76.59	74.66	75.81	76.57	74.06	75.49	75.05	73.91	74.51	77.38	75.40	76.46
3	76.38	74.21	75.00	76.36	74.73	75.44	74.88	73.38	74.21	77.06	74.36	75.16
4	75.77	74.27	74.68	75.96	74.37	75.05	75.50	74.30	74.86	75.38	73.96	74.82
5	76.09	73.78	75.02	76.38	74.14	75.39	76.22	75.14	75.72	75.02	73.30	74.08
6	76.80	74.09	75.45	76.45	74.26	75.27	76.26	75.04	75.57	75.78	74.12	74.86
7	76.58	74.18	75.77	76.66	73.88	75.45	76.33	73.66	74.87	75.71	73.64	74.36
8	76.14	73.74	75.20	76.74	73.77	75.64	77.24	74.08	75.32	74.77	73.79	74.36
9	77.01	74.26	75.64	76.93	73.36	75.43	77.10	75.01	75.96	75.13	74.05	74.66
10	76.91	74.91	75.76	77.24	74.75	76.19	76.16	74.44	74.91	74.67	73.48	74.15
11	76.82	74.61	75.57	76.90	74.57	75.46	75.19	72.96	74.09	74.60	74.09	74.41
12	76.95	74.32	75.78	76.85	73.79	75.52	75.23	73.17	74.43	74.53	73.40	73.97
13	76.73	73.99	75.53	76.89	74.21	75.89	75.31	74.11	74.81	74.00	73.12	73.57
14	77.27	73.71	75.62	76.66	73.65	75.29	76.51	73.75	74.67	74.01	73.40	73.76
15	77.31	73.81	75.77	76.65	74.37	75.65	76.48	74.89	75.48	74.05	73.02	73.60
16	76.61	73.89	75.53	76.25	73.87	75.20	76.09	73.35	74.79	74.06	73.24	73.64
17	76.65	74.12	75.29	76.34	74.18	75.24	76.40	73.48	74.99	74.32	73.21	73.80
18	76.51	74.31	75.31	76.25	74.20	75.02	76.13	74.48	75.23	74.34	72.79	73.75
19	76.08	74.48	75.26	76.56	73.35	74.73	76.28	74.76	75.36	74.09	72.40	73.40
20	76.16	74.64	75.50	76.62	74.21	75.20	76.85	75.52	76.28	74.08	72.38	72.95
21	76.80	74.81	75.52	76.93	74.33	75.71	76.86	76.01	76.35	74.52	72.66	73.49
22	76.82	74.70	75.82	77.65	75.25	76.31	76.70	76.21	76.47	75.65	73.36	74.56
23	76.11	74.40	75.29	77.39	74.96	76.19	76.88	76.00	76.58	76.41	73.79	75.20
24	75.93	74.29	75.11	77.15	75.43	75.95	76.89	74.91	75.79	76.41	73.99	75.12
25	76.03	75.22	75.58	76.76	74.07	75.16	77.10	75.57	76.25	75.78	73.64	74.70
26	76.04	74.46	75.18	76.82	75.13	75.99	77.09	75.20	76.36	75.74	74.55	75.22
27	75.39	74.38	74.93	75.49	72.81	73.85	76.74	74.69	75.77	74.79	73.27	73.96
28	76.28	74.03	75.23	74.36	72.77	73.51	77.01	75.78	76.43	75.29	73.05	74.10
29	---	---	---	74.51	72.81	73.63	77.09	75.05	76.17	75.19	72.66	74.14
30	---	---	---	74.65	73.10	73.89	76.84	74.97	75.97	76.63	74.06	75.39
31	---	---	---	75.31	73.81	74.61	---	---	---	77.66	76.59	77.19
MONTH	77.31	73.71	75.42	77.65	72.77	75.27	77.24	72.96	75.42	77.66	72.38	74.44
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	77.89	77.02	77.47	77.24	76.04	76.64	77.85	74.57	76.42	76.62	75.30	76.03
2	78.38	77.26	77.91	77.17	76.14	76.66	77.09	74.30	75.84	76.53	75.05	75.83
3	78.38	77.83	78.08	76.79	75.45	76.06	77.40	75.35	76.52	76.18	75.13	75.57
4	77.90	77.19	77.63	75.65	73.12	74.49	76.74	74.93	75.70	75.71	74.96	75.27
5	77.79	76.55	77.33	76.37	72.89	74.49	76.20	74.77	75.23	74.95	73.74	74.16
6	78.17	77.30	77.75	76.64	75.32	76.19	76.77	73.71	75.08	75.17	72.46	73.12
7	77.98	77.22	77.65	77.14	76.01	76.63	75.62	72.50	74.03	75.29	74.68	74.92
8	77.60	76.43	77.14	76.37	75.19	75.82	77.35	73.75	75.40	75.91	74.72	75.25
9	77.89	77.32	77.66	77.15	75.07	76.12	76.42	73.25	74.79	76.27	75.22	75.61
10	78.38	77.46	77.88	77.10	74.45	75.62	76.25	73.50	74.93	75.65	74.76	75.22
11	78.21	76.28	77.35	77.18	74.42	75.74	75.34	73.24	74.25	75.89	74.16	74.97
12	78.01	77.30	77.67	77.37	74.30	75.59	75.21	74.17	74.54	76.26	74.60	75.14
13	77.62	76.75	77.19	77.31	74.54	75.67	76.56	73.86	74.76	76.50	75.17	75.60
14	76.74	75.25	76.24	76.87	75.14	76.05	76.58	74.86	75.65	76.14	74.24	75.02
15	77.57	76.03	77.06	76.78	75.58	75.96	75.61	74.21	74.94	76.83	74.44	75.58
16	77.45	76.48	77.04	76.01	74.44	75.17	75.51	74.10	74.77	76.33	74.86	75.25
17	77.73	77.17	77.48	76.83	73.75	75.15	75.27	74.27	74.84	76.44	74.34	75.32
18	77.67	76.08	76.98	76.59	74.64	75.50	75.05	73.60	74.38	76.44	74.94	75.77
19	77.32	75.98	76.37	76.41	75.04	75.65	75.08	74.08	74.51	76.34	74.74	75.57
20	77.69	77.08	77.37	76.58	74.49	75.38	75.90	73.91	74.82	76.40	74.99	75.86
21	77.69	76.71	77.10	76.38	74.04	75.01	76.00	74.18	75.21	76.03	74.62	75.47
22	77.47	75.92	76.72	75.51	73.41	74.23	75.86	73.95	74.87	75.74	74.70	75.18
23	77.67	76.37	76.86	76.42	73.51	74.62	76.44	73.90	75.05	75.77	74.76	75.23
24	77.34	75.66	76.18	76.19	74.58	75.38	76.93	74.64	75.97	76.17	74.72	75.46
25	77.75	75.72	76.69	76.08	74.29	75.02	76.90	74.83	75.87	76.74	74.74	75.78
26	77.17	75.58	76.16	75.78	73.84	74.70	77.02	74.69	76.01	76.72	74.75	75.70
27	76.84	75.54	76.24	75.38	72.85	73.50	77.03	74.83	76.10	76.64	74.45	75.05
28	77.95	76.63	77.39	74.12	73.68	73.97	76.78	74.72	75.55	76.09	74.43	75.30
29	77.89	77.19	77.44	74.40	73.94	74.20	75.89	73.83	74.81	76.06	74.68	75.04
30	77.89	76.49	77.17	77.07	73.98	75.40	76.15	74.73	75.58	75.70	74.95	75.34
31	---	---	---	77.24	74.83	76.22	76.61	74.47	75.67	---	---	---
MONTH	78.38	75.25	77.17	77.37	72.85	75.38	77.85	72.50	75.23	76.83	72.46	75.29
YEAR	78.38	72.16	75.04									

COLUMBIA RIVER MAIN STEM

14128870 COLUMBIA RIVER BELOW BONNEVILLE DAM, OR

LOCATION.--Lat 45°38'20", long 121°57'16", in sec.21, T.2 N., R.7 E., Multnomah County, Hydrologic Unit 17080001, on left bank 0.4 mi downstream from Bonneville Dam left bank powerhouse, 0.5 mi upstream from Tanner Creek, and at mile 145.0.

DRAINAGE AREA.--239,900 mi², approximately.

PERIOD OF RECORD.--May 1981 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Flow regulated by many reservoirs upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 30.40 ft June 11, 1981; minimum, 6.69 ft Oct. 10, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 27.36 ft June 9; minimum, 6.98 ft Sept. 17.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	10.49	9.65	10.04	13.13	11.20	12.17	16.24	9.50	14.09	13.62	10.83	12.13
2	11.10	9.38	10.34	15.60	11.76	13.20	10.38	9.20	9.80	15.05	11.25	13.37
3	11.00	10.24	10.59	16.94	12.77	15.23	11.67	9.27	10.07	16.05	12.93	14.38
4	10.95	10.31	10.55	12.62	9.62	10.54	16.10	9.32	12.52	17.38	14.65	15.85
5	11.35	9.91	10.78	10.42	8.48	9.61	14.62	12.74	13.96	17.00	14.17	15.41
6	10.24	8.33	9.00	10.56	8.16	9.67	15.10	10.64	12.71	14.86	13.35	14.04
7	9.40	7.88	8.85	13.30	9.59	11.74	17.15	11.43	15.12	16.30	13.57	14.74
8	10.79	7.76	9.29	13.07	11.42	12.25	17.85	14.25	15.72	18.92	16.04	17.35
9	11.44	7.68	9.80	13.26	12.26	12.72	15.94	13.18	14.46	19.64	14.99	17.78
10	10.51	7.69	9.51	14.31	11.61	13.07	15.11	12.58	14.41	20.97	16.36	18.82
11	12.58	8.92	11.31	14.36	12.00	12.88	16.40	12.22	14.60	20.22	18.47	19.28
12	13.56	8.33	11.48	13.24	10.36	11.74	18.11	13.57	15.96	18.91	15.91	17.83
13	13.85	10.19	12.36	15.11	10.57	13.18	17.16	14.55	15.71	16.80	14.22	15.63
14	12.11	10.32	11.14	15.80	10.76	13.68	17.37	13.87	15.57	16.14	12.42	14.52
15	11.50	10.47	10.85	15.30	12.70	13.85	17.69	11.99	14.55	15.88	10.56	13.69
16	13.86	8.47	11.23	17.75	13.17	15.41	14.33	10.11	12.49	17.92	14.63	16.07
17	14.89	9.02	12.09	16.57	14.45	15.74	14.38	12.38	13.37	17.26	15.80	16.76
18	12.56	9.15	11.21	15.91	12.43	13.88	15.21	12.62	13.78	16.50	15.28	15.78
19	13.94	8.61	11.45	12.42	10.29	11.54	14.75	12.25	13.33	16.64	14.48	15.65
20	12.13	9.02	10.72	14.68	12.24	13.28	14.61	12.74	13.81	15.80	13.70	14.69
21	10.34	8.27	9.33	13.37	12.47	12.93	15.36	13.87	14.61	14.92	13.33	13.98
22	9.46	8.41	8.94	13.06	10.91	12.19	14.40	13.43	13.87	16.18	12.77	14.73
23	10.86	7.80	9.76	10.85	9.49	10.29	14.16	13.35	13.74	17.10	14.13	15.39
24	14.62	8.01	12.22	12.70	9.91	11.64	13.77	10.32	11.31	15.87	13.61	14.70
25	14.89	10.21	13.78	11.38	10.22	10.77	11.35	9.87	10.40	17.24	13.93	15.79
26	13.60	9.58	12.45	13.11	10.38	11.83	11.56	10.86	11.15	17.25	15.52	16.57
27	12.65	9.86	11.16	14.70	11.27	13.63	14.26	11.01	12.84	15.72	13.66	15.03
28	11.74	8.85	10.11	14.76	11.43	13.55	15.44	13.05	14.07	17.28	13.82	15.58
29	12.66	9.06	10.47	15.50	11.62	13.51	15.09	13.46	14.24	18.19	16.57	17.24
30	14.22	10.70	12.58	17.70	15.35	16.25	14.47	11.25	12.80	18.46	16.39	17.78
31	14.64	11.10	12.66	---	---	---	13.82	11.11	12.68	18.32	16.00	17.43
MONTH	14.89	7.68	10.84	17.75	8.16	12.73	18.11	9.20	13.48	20.97	10.56	15.74

COLUMBIA RIVER MAIN STEM

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14128870 COLUMBIA RIVER BELOW BONNEVILLE DAM, OR--Continued

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	20.34	17.52	18.80	17.35	13.95	16.36	16.37	13.71	15.43	20.09	17.73	18.95
2	17.93	14.29	16.03	18.00	15.05	16.81	17.09	15.28	16.43	21.00	17.96	19.67
3	16.45	15.17	15.60	16.68	15.62	16.24	18.59	16.53	17.61	21.62	19.95	20.68
4	15.32	13.86	14.78	15.83	14.70	15.27	20.01	17.57	18.67	21.65	18.93	20.50
5	15.56	13.62	14.56	16.57	15.29	16.08	20.19	18.10	19.09	20.99	18.72	19.48
6	16.40	14.28	15.36	17.36	15.47	16.14	20.28	17.33	18.84	20.72	17.76	19.01
7	18.51	14.07	16.48	17.83	15.79	16.68	18.34	15.81	16.73	22.14	19.90	21.05
8	17.82	15.04	16.68	19.51	16.01	17.22	19.39	15.63	17.06	21.83	18.82	20.44
9	19.93	16.39	17.50	17.69	15.42	16.44	20.61	17.84	19.35	22.45	19.12	21.17
10	18.49	17.25	17.69	19.64	17.73	18.77	21.64	19.07	20.68	22.14	19.15	20.78
11	17.33	15.01	16.39	18.90	16.75	17.53	19.41	16.98	18.23	21.52	20.30	21.12
12	19.81	16.81	18.15	19.64	16.98	17.74	20.14	16.29	18.17	20.69	18.57	19.20
13	19.69	17.58	18.34	21.47	16.99	18.93	19.37	16.02	16.52	18.62	17.32	17.95
14	20.63	18.24	19.05	19.39	15.84	17.02	16.12	13.96	14.53	20.02	17.48	18.63
15	20.93	17.99	18.98	19.88	17.07	17.97	15.24	14.58	14.91	20.56	18.32	19.26
16	21.85	17.49	19.66	16.22	14.14	14.75	17.38	15.44	16.63	20.89	17.66	19.46
17	19.03	16.90	17.46	16.47	14.26	15.72	17.68	16.75	17.02	19.84	17.48	18.92
18	18.91	13.67	17.48	16.47	14.82	15.55	20.87	17.63	18.68	18.49	15.80	16.95
19	19.44	13.35	16.53	16.05	15.16	15.38	20.05	16.17	18.48	17.52	15.93	16.81
20	19.41	15.54	17.34	17.99	15.92	16.92	20.08	16.18	18.92	17.08	14.84	16.22
21	19.30	16.18	17.32	17.22	16.26	16.85	19.44	17.66	18.83	16.77	14.48	15.59
22	18.62	16.02	17.18	20.68	16.99	18.88	18.77	17.30	17.79	17.55	15.01	16.37
23	19.21	17.11	17.91	20.71	19.21	19.98	19.67	18.37	19.12	18.78	16.98	17.73
24	17.17	14.42	15.74	19.56	16.37	18.50	20.52	18.06	19.31	19.78	17.62	18.45
25	17.06	14.52	15.78	16.39	15.14	15.85	---	---	---	20.31	18.20	19.04
26	18.01	16.65	17.22	21.91	16.08	20.49	---	---	---	20.54	17.42	19.16
27	19.42	14.49	16.81	22.39	17.56	20.10	22.20	19.23	21.27	17.45	16.22	16.62
28	18.05	13.84	16.31	20.39	15.98	18.04	22.18	19.91	21.28	18.54	16.73	17.47
29	---	---	---	20.56	15.63	17.78	21.71	20.07	20.72	18.72	16.60	17.98
30	---	---	---	21.49	17.35	19.57	21.08	18.42	19.64	21.57	18.67	19.70
31	---	---	---	17.40	15.24	16.30	---	---	---	22.84	20.07	21.55
MONTH	21.85	13.35	17.04	22.39	13.95	17.29	---	---	---	22.84	14.48	18.90
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	23.95	20.92	23.12	21.10	19.75	20.06	15.28	11.66	13.84	11.86	9.24	10.24
2	25.20	22.13	24.05	20.79	19.12	20.23	15.33	12.46	13.82	10.74	9.30	9.97
3	25.77	24.56	25.08	22.42	18.77	20.38	17.00	12.87	14.71	10.22	9.06	9.69
4	25.05	22.31	24.13	19.22	17.54	18.47	14.22	13.33	13.64	11.92	8.63	10.02
5	23.91	21.75	22.79	19.24	17.28	17.95	14.08	13.19	13.75	12.69	8.99	11.26
6	26.16	22.83	24.08	20.21	17.96	19.02	15.66	13.86	14.89	12.77	10.49	11.52
7	26.18	24.84	25.58	19.37	17.66	18.57	15.73	14.13	14.64	10.50	8.43	9.75
8	26.04	25.54	25.75	18.87	17.12	17.63	15.86	13.39	14.39	11.62	7.91	10.03
9	27.36	25.75	26.74	20.74	16.81	18.34	15.17	13.28	13.76	10.67	7.91	9.37
10	27.26	25.77	26.67	19.76	18.35	18.98	14.28	13.61	13.90	11.21	8.81	9.96
11	26.73	24.31	25.28	20.09	17.34	18.59	14.06	12.28	13.18	11.93	8.91	10.41
12	25.47	23.91	24.58	19.30	17.54	18.40	12.85	9.98	11.37	11.62	8.47	10.31
13	26.77	24.55	25.69	19.57	16.45	18.28	11.39	9.87	10.72	11.97	8.97	10.91
14	26.93	25.28	26.47	17.28	15.62	16.22	12.88	10.95	12.00	12.33	9.96	11.46
15	26.04	24.14	25.18	16.67	14.48	14.96	---	---	---	11.67	9.22	10.29
16	24.48	23.53	23.86	14.77	13.54	14.26	---	---	---	10.91	8.05	8.91
17	24.29	23.60	23.99	15.32	13.74	14.91	13.18	10.39	11.91	12.30	6.98	10.57
18	24.89	23.57	24.16	15.79	13.46	14.61	12.77	10.35	11.39	12.49	10.05	11.26
19	22.98	21.29	22.18	14.65	13.43	14.14	10.50	9.52	10.01	11.76	10.50	11.20
20	22.45	21.28	21.98	15.41	13.49	14.37	12.16	8.95	11.03	12.21	8.53	10.92
21	22.71	19.81	21.65	15.10	14.09	14.44	12.13	9.71	10.97	12.24	9.73	10.68
22	22.18	21.01	21.53	14.76	13.79	14.37	12.50	11.72	12.08	11.22	7.81	9.42
23	22.17	21.40	21.85	14.59	10.92	12.38	12.47	11.83	12.20	10.39	8.51	9.09
24	22.09	20.25	21.00	14.79	10.56	12.82	15.37	11.94	13.29	11.68	8.47	9.33
25	22.60	20.19	21.02	14.98	11.89	13.27	14.46	12.37	13.14	11.74	9.86	10.85
26	22.19	20.35	21.06	15.30	12.19	13.49	14.59	12.09	13.19	11.91	10.27	10.88
27	21.36	20.19	20.91	15.43	11.42	13.32	15.48	12.55	14.20	11.90	9.01	11.14
28	23.80	19.52	21.98	11.90	9.56	10.86	15.79	12.14	14.30	11.77	8.80	10.44
29	22.72	21.46	22.25	10.15	9.11	9.68	12.36	10.92	12.07	11.76	8.91	10.37
30	22.51	21.15	21.85	13.68	9.55	11.26	11.79	10.32	11.06	9.49	8.60	9.03
31	---	---	---	14.58	11.43	12.94	12.41	10.97	11.45	---	---	---
MONTH	27.36	19.52	23.55	22.42	9.11	15.72	---	---	---	12.77	6.98	10.31

CHEMICAL QUALITY OF PRECIPITATION

SILVER LAKE BASIN

430701121040001 SILVER LAKE RANGER STATION, OR

LOCATION.--Lat 43°07'01", Long 121°04'00", in NE 1/4 SW 1/4 sec.21, T.28 S., R.14 E., Lake County, Hydrologic Unit 17120005, at Silver Lake Ranger Station, 0.5 mi south of State Highway 31, and 1 mi southwest of town of Silver Lake.

PERIOD OF RECORD.--August 1983 to current year (weekly composite).

INSTRUMENTATION.--The wet-deposition sample collector is an Aerochem Metrics Model 301* wet/dry deposition collector. The sensing circuit is activated by wet deposition, causing the motor to move the cover from the wet bucket and cover the dry bucket. When the heater in the sensor evaporates the precipitation, the cycle is reversed. The sample buckets are polyethylene and have a capacity of 13 liters (28.6 cm inside diameter, 23.2 cm deep). The opening of the collector is approximately 5 ft above ground level.

REMARKS.--Inches of precipitation obtained from an on-site recording weighing-bucket gage. Samples are collected by Silver Lake Ranger Station personnel and analyzed by the Illinois State Water Survey Central Analytical Laboratory.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	TOTAL PRECIP- ITATION FOR DEFINED PERIOD (IN)	COL- LECTOR EFFI- CIENCY WET DEPOS. PERCENT	SPEC. CONDUCT- TANCE CK.SOL.* ATM DEP WET TOT (US/CM)	SPEC. CONDUCT- TANCE FIELD ATM DEP WET TOT (US/CM)	SPEC. CONDUCT- TANCE LAB ATM DEP WET TOT (US/CM)	PH CK.SOL.* ATM DEP WET TOT (UNITS)	PH FIELD ATM DEP WET TOT (UNITS)	PH LAB ATM DEP WET TOT (UNITS)
OCT									
17-24	1535	0.45	100	21.1	3.8	2.5	4.28	5.01	5.54
OCT									
24-31	1520	0.08	100	22.7	5.3	3.4	4.29	5.00	6.05
NOV									
14-21	1624	0.02	131	--	--	3.3	--	--	5.98
NOV									
21-28	1610	0.28	87	22.5	3.9	2.2	4.29	5.13	5.75
DEC									
05-12	1620	0.21	107	22.1	5.1	2.3	4.30	4.97	5.52
DEC 26 1989-									
JAN 02 1990	1726	0.05	54	--	--	4.8	--	--	6.59
JAN									
02-09	1620	0.66	93	21.7	3.3	2.0	4.40	5.27	5.55
JAN									
09-16	1606	0.19	91	22.5	4.8	2.9	4.31	5.16	5.97
JAN									
23-30	1610	0.10	59	21.1	4.0	3.8	4.32	5.05	6.18
JAN 30-									
FEB 07	1629	0.09	27	--	--	4.1	--	--	6.12
FEB 27-									
MAR 06	1620	--	--	21.6	4.6	2.5	4.40	4.97	5.55
MAR									
06-13	1623	0.25	95	22.0	14.3	5.7	4.40	4.45	5.16
MAR									
20-27	1610	0.85	107	21.8	5.1	3.8	4.38	4.90	5.36
APR									
03-17	1520	0.38	100	21.4	11.6	7.7	4.40	4.68	5.71
MAY									
22-29	1515	1.02	106	21.8	3.3	2.1	4.37	5.33	5.61
MAY 29-									
JUN 05	1530	0.31	104	21.5	4.6	3.8	4.37	5.24	5.32
JUN									
05-12	1530	0.20	118	22.0	3.8	2.6	4.38	5.23	5.43
JUN 26-									
JUL 03	1525	0.20	107	22.3	7.8	3.7	4.39	4.88	5.92
JUL									
03-10	1455	0.19	98	25.5	6.1	3.5	4.35	5.27	5.60
JUL									
10-17	1525	0.10	96	22.1	16.1	13.6	4.34	4.77	4.87
JUL									
24-31	1600	--	--	22.1	10.9	6.7	4.37	4.70	5.13
AUG									
07-14	1600	0.20	95	21.8	17.4	15.7	4.37	4.99	5.25
AUG									
14-21	1515	0.60	103	22.5	10.1	6.0	4.40	4.78	5.04
AUG 28-									
SEP 04	1515	0.18	97	21.6	7.6	4.2	4.39	5.14	5.91
SEP									
18-25	1520	0.06	75	21.5	20.5	22.1	4.36	4.95	6.61
SEP 25-									
OCT 02	1535	0.10	110	21.9	8.7	7.5	4.37	5.14	5.97

* Measurements of low ionic strength standard solution, with theoretical values of conductance 21.8 us/cm +/- 3 us/cm, pH 4.30 +/- 0.1, made prior to the corresponding sample measurement.

CHEMICAL QUALITY OF PRECIPITATION

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SILVER LAKE BASIN

430701121040001 SILVER LAKE RANGER STATION, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	CALCIUM ATM DEP WET DIS (MG/L)	MAG- NESIUM ATM DEP WET DIS (MG/L)	SODIUM ATM DEP WET DIS (MG/L)	POTAS- SIUM ATM DEP WET DIS (MG/L)	SULFATE ATM DEP WET DIS AS SO4 (MG/L)	CHLO- RIDE ATM DEP WET DIS (MG/L)	NI- TROGEN AMMON. ATM DEP WET DIS AS NH4 (MG/L)	NI- TROGEN NITRATE ATM DEP WET DIS AS NO3 (MG/L)	PHOS- PHORUS ORTHO ATM DEP WET DIS AS PO4 (MG/L)
OCT 17-24	0.02	0.005	0.043	0.010	0.10	0.06	0.08	0.20	<0.02
OCT 24-31	0.05	0.006	0.090	0.018	0.17	0.10	0.16	0.33	<0.02
NOV 14-21	0.03	0.007	0.156	0.011	0.14	0.10	0.26	0.15	<0.02
NOV 21-28	0.14	0.008	0.073	0.014	0.11	0.07	<0.02	0.17	<0.02
DEC 05-12	0.01	0.004	0.035	0.005	0.07	0.04	0.04	0.15	<0.02
DEC 26 1989- JAN 02 1990	0.04	0.021	0.101	0.060	0.15	0.13	0.06	0.09	0.05
JAN 02-09	0.01	0.003	0.041	0.007	0.07	0.06	0.07	0.17	<0.02
JAN 09-16	0.03	0.009	0.021	0.021	0.13	0.06	0.09	0.31	<0.02
JAN 23-30	0.04	0.024	0.156	0.051	0.17	0.31	0.02	0.24	<0.02
JAN 30- FEB 07	0.07	0.014	0.101	0.014	0.22	0.23	0.10	0.49	<0.02
FEB 27- MAR 06	0.01	0.004	0.027	<0.003	0.11	0.06	0.09	0.20	<0.02
MAR 06-13	0.03	0.009	0.040	0.013	0.29	0.08	0.17	0.99	<0.02
MAR 20-27	0.05	0.008	0.036	0.012	0.25	0.07	0.13	0.42	<0.02
APR 03-17	0.22	0.039	0.155	0.041	0.72	0.11	0.26	1.35	<0.02
MAY 22-29	<0.01	<0.003	0.011	<0.003	0.08	0.04	<0.02	0.13	<0.02
MAY 29- JUN 05	0.04	0.011	0.033	0.020	0.25	0.09	0.04	0.35	<0.02
JUN 05-12	0.04	0.006	0.030	0.015	0.10	0.06	<0.02	0.15	<0.02
JUN 26- JUL 03	0.02	0.009	0.042	0.010	0.34	0.10	0.06	0.35	<0.02
JUL 03-10	<0.01	0.004	0.047	0.041	0.28	0.13	0.15	0.50	<0.02
JUL 10-17	0.38	0.088	0.277	0.096	0.93	0.33	0.10	1.83	0.03
JUL 24-31	0.05	0.013	0.069	0.076	0.58	0.15	0.08	0.91	<0.02
AUG 07-14	0.59	0.086	0.143	0.129	1.48	0.25	0.87	2.79	0.06
AUG 14-21	0.04	0.008	0.034	0.017	0.28	0.07	0.06	0.62	<0.02
AUG 28- SEP 04	0.09	0.024	0.094	0.027	0.36	0.12	0.09	0.68	<0.02
SEP 18-25	0.56	0.083	1.46	0.221	1.85	0.65	1.05	2.82	<0.02
SEP 25- OCT 02	0.14	0.028	0.296	0.048	0.63	0.14	0.33	1.57	<0.02

CHEMICAL QUALITY OF PRECIPITATION

GRANDE RONDE RIVER BASIN

451328118304100 STARKEY EXPERIMENTAL STATION, OR

LOCATION.--Lat 45°13'28", long 118°30'41", in NE 1/4 NW 1/4 sec.14, T.4 S., R.34 E., Union County, Hydrologic Unit 17060104, in the Starkey Experimental Forest, 2.5 mi north of State Highway 244, 29 mi west of LaGrande.

PERIOD OF RECORD.--March 1984 to current year (weekly composite).

INSTRUMENTATION.--The wet-deposition sample collector is an Aerochem Metrics Model 301* wet/dry deposition collector. The sensing circuit is activated by wet deposition, causing the motor to move the cover from the wet bucket and cover the dry bucket. When the heater in the sensor evaporates the precipitation, the cycle is reversed. The sample buckets are polyethylene and have a capacity of 13 liters (28.6 cm inside diameter, 23.2 cm deep). The opening of the collector is approximately 8 ft above ground level.

REMARKS.--Inches of precipitation obtained from an on-site recording weighing-bucket gage. Samples are collected by U.S. Forest Service personnel and analyzed by the Illinois State Water Survey Central Analytical Laboratory.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	TOTAL PRECIP- ITATION FOR DEFINED PERIOD (IN)	COL- LECTOR EFFI- CIENCY WET DEPOS. PERCENT	SPEC. CONDUCT- TANCE CK.SOL.* ATM DEP WET TOT (US/CM)	SPEC. CONDUCT- TANCE FIELD ATM DEP WET TOT (US/CM)	SPEC. CONDUCT- TANCE LAB ATM DEP WET TOT (US/CM)	PH CK.SOL.* ATM DEP WET TOT (UNITS)	PH FIELD ATM DEP WET TOT (UNITS)	PH LAB ATM DEP WET TOT (UNITS)
OCT 17-24	1445	0.36	88	20.8	3.2	2.5	4.30	5.28	6.06
OCT 24-31	1500	0.61	82	21.3	6.5	3.1	4.30	4.81	5.30
OCT 31- NOV 07	1535	0.25	79	20.7	9.7	2.5	--	--	5.69
NOV 07-14	1711	0.70	94	21.1	5.9	1.8	--	--	5.56
NOV 14-21	1500	0.33	88	21.2	5.2	1.6	--	--	5.79
NOV 21-28	1445	0.28	47	20.5	9.0	2.4	--	--	6.11
NOV 28- DEC 05	1545	0.32	86	21.3	6.2	1.9	--	--	5.76
DEC 05-12	1600	0.37	74	21.0	6.1	2.9	--	--	5.51
DEC 26 1989- JAN 02 1990	1640	0.23	22	21.5	11.7	4.8	4.39	4.74	6.08
JAN 02-09	1600	0.72	83	21.3	3.6	1.9	4.31	5.19	5.39
JAN 09-16	1515	0.48	79	21.2	6.8	2.6	4.33	4.81	5.52
JAN 16-23	1615	0.29	58	21.0	6.4	2.7	4.32	4.95	5.78
JAN 23-30	1610	0.65	66	--	--	2.6	--	--	5.75
JAN 30- FEB 06	1845	0.50	69	21.2	3.9	2.0	4.33	5.52	5.69
FEB 06-13	1600	1.21	66	21.3	3.0	1.8	4.36	5.58	5.65
FEB 13-20	1530	0.14	46	20.9	8.7	4.8	4.37	4.89	6.16
FEB 20-27	1520	0.11	42	21.0	28.2	6.8	4.17	4.34	5.14
FEB 27- MAR 06	1530	0.20	90	21.1	9.1	2.4	4.30	4.57	5.72
MAR 06-13	1535	1.23	82	20.4	4.3	2.9	4.30	5.12	5.42
MAR 13-20	1540	0.21	63	20.9	12.3	4.9	4.31	4.70	5.85
MAR 20-27	1645	0.30	87	19.6	12.9	4.4	4.36	4.74	5.39
APR 03-10	1435	0.09	57	20.9	45.4	21.2	4.29	4.17	5.51
APR 10-17	1415	--	--	20.8	16.8	7.4	4.36	4.46	5.97
APR 17-24	1445	--	--	--	--	2.5	--	--	5.75
APR 24- MAY 01	1415	--	--	21.5	2.9	1.8	--	--	5.66
MAY 01-08	1430	--	--	21.8	11.8	4.4	--	--	5.76
MAY 08-15	1445	--	--	21.8	12.0	5.9	4.30	4.69	5.26
MAY 15-22	1430	--	--	20.6	5.5	2.6	4.33	4.55	5.56
MAY 22-29	1425	--	--	21.4	4.9	3.2	4.38	4.51	5.27
MAY 29- JUN 05	1445	--	--	21.6	6.9	3.1	4.37	4.80	5.37
JUN 05-12	1445	0.91	98	21.4	3.2	2.6	4.35	5.02	5.39
JUN 12-19	1420	1.05	101	21.1	5.8	5.3	4.36	4.80	5.22
JUN 26- JUL 03	1520	0.10	103	21.5	8.5	4.6	4.39	4.93	6.40
JUL 03-24	1450	--	--	20.6	13.6	5.4	4.35	4.76	5.67
AUG 14-21	1425	0.53	96	21.4	10.4	6.4	4.39	4.87	5.14
AUG 21-28	1530	0.50	95	20.6	5.4	3.2	4.38	4.71	5.55
SEP 04-11	1445	0.47	92	20.9	9.6	7.8	4.39	5.15	5.82
SEP 25- OCT 02	1515	0.15	96	21.9	12.1	11.2	4.39	5.39	6.26

* Measurements of low ionic strength standard solution, with theoretical values of conductance 21.8 us/cm +/- 3 us/cm, pH 4.30 +/- 0.1, made prior to the corresponding sample measurement.

CHEMICAL QUALITY OF PRECIPITATION

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GRANDE RONDE RIVER BASIN

451328118304100 STARKEY EXPERIMENTAL STATION, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	CALCIUM ATM DEP WET DIS (MG/L)	MAG- NESIUM ATM DEP WET DIS (MG/L)	SODIUM ATM DEP WET DIS (MG/L)	POTAS- SIUM ATM DEP WET DIS (MG/L)	SULFATE ATM DEP WET DIS AS SO4 (MG/L)	CHLO- RIDE ATM DEP WET DIS (MG/L)	NI- TROGEN AMMON. ATM DEP WET DIS AS NH4 (MG/L)	NI- TROGEN NITRATE ATM DEP WET DIS AS NO3 (MG/L)	PHOS- PHORUS ORTHO ATM DEP WET DIS AS PO4 (MG/L)
OCT 17-24	0.05	0.007	0.269	0.030	0.13	0.07	0.03	0.28	<0.02
OCT 24-31	<0.01	0.005	0.045	0.015	0.14	0.07	0.04	0.29	<0.02
OCT 31- NOV 07	0.07	0.010	0.042	0.009	0.28	0.08	<0.02	0.16	<0.02
NOV 07-14	<0.01	<0.003	0.027	<0.003	0.08	0.05	<0.02	0.08	<0.02
NOV 14-21	<0.01	<0.003	0.048	<0.003	0.05	0.06	<0.02	0.06	<0.02
NOV 21-28	0.02	0.006	0.092	0.008	0.14	0.08	0.02	0.19	<0.02
NOV 28- DEC 05	<0.01	0.003	0.028	0.005	0.07	0.04	<0.02	0.15	<0.02
DEC 05-12	0.01	0.003	0.047	<0.003	0.11	0.09	0.03	0.27	<0.02
DEC 26 1989- JAN 02 1990	0.02	0.019	0.382	0.014	0.60	0.37	0.21	0.32	<0.02
JAN 02-09	0.01	0.003	0.029	0.005	0.09	0.04	<0.02	0.11	<0.02
JAN 09-16	0.03	0.008	0.029	0.005	0.13	0.05	<0.02	0.29	<0.02
JAN 16-23	0.04	0.008	0.106	0.004	0.15	0.08	<0.02	0.24	<0.02
JAN 23-30	0.04	0.013	0.082	0.010	0.15	0.14	<0.02	0.22	<0.02
JAN 30- FEB 06	0.03	0.005	0.026	<0.003	0.16	0.05	<0.02	0.19	0.03
FEB 06-13	0.02	0.004	0.024	0.004	0.11	0.04	<0.02	0.08	<0.02
FEB 13-20	0.04	0.023	0.079	0.008	0.33	0.14	0.02	0.26	<0.02
FEB 20-27	0.05	0.023	0.062	0.016	0.19	0.09	0.03	0.23	<0.02
FEB 27- MAR 06	0.01	<0.003	0.035	<0.003	0.15	0.08	0.12	0.30	<0.02
MAR 06-13	<0.01	<0.003	0.038	<0.003	0.10	0.09	0.06	0.21	<0.02
MAR 13-20	0.06	0.012	0.066	0.008	0.33	0.12	0.08	0.56	<0.02
MAR 20-27	0.09	0.012	0.040	0.013	0.26	0.11	0.19	0.61	<0.02
APR 03-10	0.57	0.097	0.330	0.159	2.77	0.28	1.21	4.08	<0.02
APR 10-17	0.16	0.026	0.091	0.033	0.76	0.13	0.30	1.16	<0.02
APR 17-24	0.08	0.012	0.024	0.007	0.16	0.07	0.09	0.33	<0.02
APR 24- MAY 01	0.02	0.005	0.023	0.004	0.12	0.06	<0.02	0.15	<0.02
MAY 01-08	0.08	0.015	0.045	0.015	0.40	0.09	0.08	0.65	<0.02
MAY 08-15	0.14	0.015	0.039	0.015	0.64	0.09	0.11	0.78	<0.02
MAY 15-22	0.03	0.004	0.016	0.010	0.20	0.06	0.03	0.20	<0.02
MAY 22-29	0.03	0.005	0.036	0.006	0.15	0.08	0.05	0.32	<0.02
MAY 29- JUN 05	0.01	0.004	0.019	0.006	0.24	0.04	0.08	0.26	<0.02
JUN 05-12	0.05	0.004	0.024	0.016	0.14	0.06	0.02	0.19	<0.02
JUN 12-19	0.08	0.012	0.033	0.041	0.37	0.08	0.15	0.63	<0.02
JUN 26- JUL 03	0.04	0.017	0.052	0.017	0.32	0.08	<0.02	0.25	<0.02
JUL 03-24-31	0.14	0.020	0.068	0.061	0.40	0.12	0.23	0.84	<0.02
AUG 14-21	0.08	0.013	0.049	0.037	0.39	0.09	0.21	0.98	<0.02
AUG 21-28	<0.01	0.003	0.039	0.020	0.24	0.06	0.13	0.41	<0.02
SEP 04-11	0.21	0.028	0.151	0.048	0.68	0.14	0.46	1.70	<0.02
SEP 25- OCT 02	0.39	0.060	0.091	0.071	1.12	0.20	0.65	2.31	0.02

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table.

Discharge measurements at miscellaneous sites during water year 1990

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Date	Discharge (ft ³ /s)
KLAMATH RIVER BASIN						
North Fork Sprague River	Sprague River	Lat 42°30'06", long 120°59'13",	---	---	2- 6-90	a12.8
		in SW 1/4 SE 1/4 sec.30, T.35 S., R.15 E., Klamath County, Hydrologic Unit 18010202, at Fred D. Ehler power plant 0.1 mi upstream from Yaden Creek and 7.6 mi northeast of Bly. Measurements made in diverted channel upstream from powerplant.	---	---	2- 6-90	b39.1
Tailwater of Fred D. Ehlers Powerplant	North Fork Sprague River	Lat 42°30'06", long 120°59'13",	---	---	2- 6-90	a26.2
		in SW 1/4 SE 1/4 sec.30, T.35 S., R.15 E., Klamath County, Hydrologic Unit 18010202, at Fred D. Ehler powerplant 0.1 mi upstream from Yaden Creek and 7.6 mi northeast of Bly. Measurement made at outlet of powerplant.	---	---	2- 6-90	c18.0
			---	---	2- 6-90	d11.7
DESCHUTES RIVER BASIN						
14054100 Deschutes River below Sheep Springs, near La Pine	Columbia River	Lat 43°43'56", long 121°47'10", in SE 1/4 SE 1/4 sec.20, T.21 S., R.8 E., Deschutes County, Hydrologic Unit 17070301, on left bank about 500 ft upstream from Sheep Bridge, and about 15 mi northwest of La Pine.	256	1938-48†e, 1950, 1952-57, 1960-89	10- 9-89 1-16-90 4-11-90 5-21-90 6-22-90 7-26-90 8-16-90 9-25-90	f585 f294 f210 f507 f590 f790 f749 f527

† Operated as a continuous-record gaging station.

a Plant producing 300 kW.

b Plant shut down.

c Plant producing 200 kW.

d Plant producing 100 kW.

e Published by State of Oregon Water Resources Department.

f Base flow from intervening springs can be obtained by subtracting flow of Deschutes River below Crane Prairie Reservoir.

DISCONTINUED GAGING STATIONS

The following continuous-record streamflow stations in Oregon have been discontinued or converted to partial-record stations. Daily streamflow records were collected and published for the period of record shown for each station.

Station number	Station name	Drainage area (mi ²)	Period of record (calendar year)
WARNER LAKES BASIN			
10366500	Deep Creek above Dismal Creek, near Warner Lake	13.0	1917-19
10367000	Dismal Creek above Big Valley, near Warner Lake	12.5	1913
10367500	Dismal Creek near Warner Lake	14.0	1919
10368000	Deep Creek below Dismal Creek, near Warner Lake	27	1913;1917-19
10368500	Deep Creek at Big Valley, near Lakeview	76	1911-15
10369000	Camas Creek near Plush	32.0	1911-12
10369500	Mud Creek near Plush	18.0	1911-12;1915;1927-30
10370000	Camas Creek near Lakeview	63.0	1912-15;1949-73
10370500	Crane Creek near Lakeview	7.00	1914
10371000	Drake Creek near Adel	67.0	1915;1923;1951;1966-73
10373000	Givan Canal near Adel	--	1915
10374500	Deep Creek at Adel	274	1909-16;1918-19;1921-22
10375000	Mud Creek Ditch at Adel	--	1915
10376500	Fish Creek near Plush	38.0	1914
10377000	Honey Creek at Chalstrand's ranch, near Plush	56.0	1910-11
10377500	Snyder Creek near Plush	--	1911
10378000	Twelvemile Creek near Plush	37.0	1911
ABERT LAKE BASIN			
10382500	Chewaucan River at Damsite, near Paisley	158	1912-16
10382550	Chewaucan River near Buck Mountain, near Paisley	157	1983-86
10382600	Chewaucan River below Coffeepot Creek, near Paisley	216	1983-86
10383500	Conn Ditch near Paisley	--	1914-20
10384100	Chewaucan River at Paisley	278	1905-07;1909-13
10384500	Smalls Canal at Paisley	--	1914-16;1917-21
10385500	Jones-Innis-Zx Ditch near Paisley	--	1914-21
10386000	Chewaucan River at Narrows, near Paisley	380	1914-21
10386500	Chewaucan River at Hotchkiss Ford, near Paisley	430	1914-20;1921
10387000	Crooked Creek near Valley Falls	--	1912-13
SUMMER LAKE BASIN			
10389000	West Fork Silver Creek near Silver Lake	27	1919-23;1925-32
10390001	Silver Creek plus Silver Lake Ir Canal, near Silver Lake	--	1965-89
10390500	Bridge Creek near Silver Lake	30	1922-23
10390800	Buck Creek above Timothy Creek, near Silver Lake	250	1922-23
10391000	Buck Creek near Silver Lake	290	1905-06;1909-11;1919-21
10392000	Duncan Creek near Silver Lake	58	1922
MALHEUR AND HARNEY LAKES BASIN			
10392500	Silvies River near Silvies	510	1903-04;1909-12;1916;1921-23
10393000	Emigrant Creek near Burns	240	1921
10394000	Poison Creek near Burns	81	1921-22
10394500	Prater Creek near Burns	20	1921-23
10395000	East Fork Silvies River near Lawen	--	1916;1973-76
10395500	West Fork Silvies River near Lawen	--	1916-17;1919;1922;1972-76
10395505	Flood Bypass Silvies River near Burns	--	1975-76
10395600	Rock Creek near Burns	--	1976
10396500	Mud Creek near Diamond	30	1911-16;1930
10397000	Bridge Creek near Frenchglen	30.0	1911-16;1930;1937-70
10397500	Krumbo Creek near Diamond	37	1911;1930
10398500	Donner und Blitzen River near Narrows	420	1915-20
10399000	Kiger Creek near Diamond	75	1911-13;1916-21;1930;1941
10399500	Cucamonga Creek near Diamond	15	1916;1930
10400000	McCoy Creek near Diamond	45	1910-11;1914;1916-21;1930;1941
10400500	Riddle Creek near Smith	60	1911
10401000	Riddle Creek near Diamond	120	1917-21
10401500	Donner Und Blitzen River near Voltage	760	1938-46;1973-77
10401800	Malheur Lake near Voltage	2,150	1972-80;1983-89
10401810	Malheur Lake on west side Cole Island dike, at Voltage	--	1983-84
10401830	Malheur Lake at break in Cole Island dike, near Voltage	2,150	1972-78
10402000	Malheur Lake Outlet at Narrows	2,150	1903-06;1909;1911-14;1916;1973-76
10402500	Mud Lake Outlet near Narrows	2,160	1916-18;1921-22
10403000	Silver Creek near Riley	228	1951-80
10403500	Silver Creek above Sutex	260	1904-06;1909-12;1914-23;1925-26
10404000	Chickahominy Creek near Sutex	90	1917;1921;1922-23
10404500	Rock Quarry Creek near Sutex	--	1921;1922
10405000	Silver Creek below Sutex	550	1912-13;1921-23
10406000	Silver Creek near Narrows	630	1917;1919-23
CATLOW VALLEY BASIN			
10406300	Home Creek near Beckley (Narrows)	38	1911-12;1915-17;1930
ALVORD LAKE BASIN			
10407000	Little Cottonwood Creek near Denio, NV	8	1911-12

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi ²)	Period of record (calendar year)
GOOSE LAKE (CLOSED BASIN)			
11338000	Dog Creek near Lakeview	27	1912-13
11339000	North Drews Canal near Lakeview	--	1975-81
11339500	Drews Creek near Lakeview	212	1909-81
11340500	Cottonwood Creek near Lakeview	32.9	1908-19; 1923-81
11341000	Thomas Creek near Lakeview	30	1912-17; 1919; 1927-31
LOST RIVER BASIN			
11483500	Miller Creek at Gerber Reservoir, near Lorella	220	1904-08; 1925-50
11484000	Miller Creek near Lorella	270	1909-20
11484500	Lost River above Olene	1,410	1915-17
11485000	Lost River at Olene	1,590	1904; 1907-12
11486000	Lost River Diversion Canal near Olene	--	1960-68
11487000	Lost River at Wilson Bridge, near Olene	1,620	1912-20
11487500	Lost River near Merrill	1,670	1904-07; 1908-09
11488000	Lost River at Merrill	1,680	1916
KLAMATH RIVER BASIN			
11491500	Williamson River near Silver Lake	220	1917-18; 1920-21
11492000	Miller Creek near Crescent	23.7	1912-14
11492500	Sand Creek near Fort Klamath	35	1917-22
11493000	Scott Creek near Fort Klamath	10	1917-20
11494000	Williamson River above Spring Creek, near Klamath Agency	1,330	1912-13; 1917-25
11494500	Williamson River at Chiloquin	1,400	1911-16; 1917
11495500	South Fork Sprague River near Bly	110	1925-26
11496500	North Fork Sprague River near Bly	45	1917-18; 1925-26
11497000	Fivemile Creek near Bly	40	1917-20
11498000	Sycan River near Silver Lake	100	1918-20
11498100	Sycan River at Sycan Marsh, near Silver Lake	220	1905
11498500	Long Creek near Silver Lake	40	1918-23; 1926-29
11499000	Sycan River near Beatty	540	1917-25
11500000	Sprague River near Yainax	1,270	1904
11502000	Sprague River at Chiloquin	1,600	1911-19; 1923; 1925
11503000	Annie Creek at Crater Lake	--	1913
11503500	Annie Creek near Fort Klamath	40	1922-27
11504000	Wood River at Fort Klamath	90.0	1911; 1913-36
11504100	Wood River near Fort Klamath	87.7	1964-67
11504200	Crooked Creek near Fort Klamath	5.68	1964-67
11505500	Fourmile Creek near Odessa	10.6	1912-17
11505600	Fourmile Creek near Rocky Point	105	1964-67
11505700	Varney Creek near Rocky Point	7.43	1964-67
11507200	A Canal at Klamath Falls	--	1960-81
11507400	Keno Canal at Klamath Falls	--	1966-83
11508500	Diversion from Klamath River to Lost River, near Olene	--	1931-68
11510000	Spencer Creek near Keno	90	1929-32
11510500	Klamath River at Spencer Bridge, near Keno	4,050	1913-31
11512920	Howard Prairie Lake Outlet near Pinehurst	--	1960-65
11514500	Keene Creek near Ashland	12.1	1917-22; 1948-65
11516100	Green Springs Powerplant Diversion near Ashland	--	1960-65
OWYHEE RIVER BASIN			
13181500	Crooked Creek near Rome	1,700	1949-52
13182000	Owyhee River above Owyhee Reservoir	10,400	1929-51
13184000	Owyhee River at Owyhee	11,300	1890-96; 1903-16; 1920-29; 1979-86
MALHEUR RIVER BASIN			
13213500	Malheur River at Jone's Ranch, near Drewsey	530	1914
13215500	South Fork Malheur River at Riverside	630	1910-14; 1919-20; 1927-29; 1938
13216000	Malheur River at Riverside	1,750	1909-15
13218000	North Fork Malheur River at Foley's Ranch, near Beulah	470	1909-14
13218500	North Fork Malheur River at Juntura	530	1919-22; 1926-32; 1935-40
13219000	Malheur River near Namorf	2,590	1913-23; 1926-31
13219500	Malheur River near Westfall	2,970	1903-05
13220000	Malheur River at Little Valley, near Hope	3,010	1949-79
13220500	Malheur River near Hope	3,030	1919-49
13221500	Malheur River near Little Valley	3,030	1914
13223500	Malheur River at McLaughlin Bridge, near Vale	3,060	1905-06
13225500	Bully Creek near Westfall	160	1912-13; 1923
13226000	Cottonwood Creek near Westfall	82	1922-23
13226500	Bully Creek at Warm Springs, near Vale	539	1903-07; 1910-17; 1922-23; 1963-86
13227000	Bully Creek near Vale	570	1933-62
13227500	Bully Creek at Vale	620	1904-05
13228000	Malheur River at Vale	3,880	1890-91; 1895-97; 1903-14; 1919
13229500	Willow Creek near Malheur	250	1912-15; 1921-29
13230500	Willow Creek below reservoir, near Malheur	290	1904-06; 1911; 1920-29
13231000	Cow Creek near Brogan	75	1912-14
13231500	Willow Creek near Brogan	420	1912-14
13232000	Willow Creek at Cole's Ranch, near Brogan	455	1904-06
13232500	Pole Creek near Brogan	14	1912
13233000	Pole Creek below Black Creek feed canal, near Brogan	14	1913
13233300	Malheur River below Nevada Dam, near Vale	3,880	1926-34; 1950-54
13233500	Malheur River at Halliday Bridge, near Ontario	4,620	1904-05
13234000	Malheur River near Ontario	4,680	1903-04

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi ²)	Period of record (calendar year)
BURNT RIVER BASIN			
13269300	North Fork Burnt River near Whitney	110	1964-80
13269500	North Fork Burnt River at Audrey	139	1915-16
13270000	Middle Fork Burnt River near Audrey	9.54	1915-16
13270500	South Fork Burnt River near Unity	30.9	1915-16
13270800	South Fork Burnt River above Barney Creek, near Unity	38.5	1963-81
13271000	South Fork Burnt River at Hardman Ranch, near Unity	44.4	1916-20; 1938-40
13271500	Fleetwood Ditch near Unity	--	1918-20
13272000	Sawmill Creek near Unity	--	1915
13274000	Burnt River at Bridgeport	600	1915-16; 1931-35
13274200	Burnt River near Bridgeport	650	1956-80
13274500	Burnt River near Durkee	700	1931-38
13275000	Burnt River at Huntington	1,093	1928-32; 1956-59; 1962-80
POWDER RIVER BASIN			
13275500	Powder River near Baker	219	1903-14; 1926-68
13276000	Old Settlers Slough at Baker	--	1913-14
13276500	Baldock Slough at Baker	--	1913-14
13277500	Pine Creek near Baker	8.8	1913-14; 1928-30
13278000	Goodrich Creek near Baker	3.1	1913
13279000	Mill Creek near Baker	3.9	1913-14; 1928-30
13279500	Marble Creek near Baker	3.9	1913-14; 1928-30
13280000	Salmon Creek near Baker	4.4	1913-14; 1928-29
13280500	Willow Creek near Haines	2.4	1913
13281000	Powder River at Haines	539	1914
13281500	Powder River near Haines	572	1946-53
13282000	North Powder River near North Powder	47.7	1912
13282500	Anthony Fork near North Powder	37	1912
13283000	North Powder River at North Powder	129	1912-14
13283500	Wolf Creek at Bauer's Ranch, near North Powder	30	1913-14
13284000	Wolf Creek near North Powder	32.9	1946-53
13284500	Powder River near North Powder	860	1913-16; 1920-25
13286000	Big Creek near Medical Springs	35.5	1913-14
13286500	Goose Creek near Keating	41.9	1913-14
13287000	Eagle Creek above West Fork, near Baker	18	1911
13287500	West Fork Eagle Creek near Baker	15	1911
13288000	Eagle Creek near Baker	42	1909-10
13288500	Eagle Creek near New Bridge	170	1910-11; 1914
13289000	Daly Creek near Richland	40.5	1913
13289500	Powder River near Robinette	1,660	1928-57
IMNAHA RIVER BASIN			
13291000	Imnaha River above Gumboat Creek	99.6	1944-53
13291500	Big Sheep Creek near Joseph	12.5	1920
GRANDE RONDE RIVER BASIN			
13318000	Meadow Creek near Starkey	140	1931-35
13318050	Meadow Creek below Smith Creek, near Starkey	33.2	1977-79
13318060	Meadow Creek above Bear Creek, near Starkey	48.2	1977-79
13318500	Grande Ronde River near Hilgard	505	1938-56
13318800	Grande Ronde River at Hilgard	555	1966-81
13319000	Grande Ronde River at La Grande	678	1903-15; 1918-23; 1925-89
13321000	Little Creek near Union	30.4	1918
13321500	Ladd Creek near Hot Lake	40	1918
13322000	Mill Creek near Cove	11.6	1918; 1920-21
13322500	Mill Creek near Summerville	--	1914-15
13323500	Grande Ronde River near Elgin	1,250	1955-81
13323600	Indian Creek near Imbler	22.0	1938-50
13324000	Grande Ronde River at Elgin	1,400	1903-12; 1918-19
13324500	Wallowa Falls powerplant tailrace near Joseph	--	1924-52; 1966-83
13325000	East Fork Wallowa River near Joseph	10.3	1924-52; 1967-83
13325500	Wallowa River above Wallowa Lake, near Joseph	43.0	1924-33; 1936-38; 1940-41
13326500	Joseph powerplant tailrace at Joseph	--	1929-41; 1950-52
13329500	Hurricane Creek near Joseph	29.6	1915; 1924-78
13329900	Wallowa River at Wallowa	--	1976-77
13330200	Lostine River at Lostine	--	1975-77
13330500	Bear Creek near Wallowa	68.0	1915; 1924-85
13331000	Wallowa River near Wallowa	520	1903-07
13332000	Wallowa River at Minam	880	1903-14
13333500	Joseph Creek at Chico	280	1931-33
13334000	Grande Ronde River at Zindel, WA	3,950	1904-12
WALLA WALLA RIVER BASIN			
14010500	South Fork Walla Walla River blw PP&L plant, near Milton	80.0	1904-06; 1930-45
14011000	North Fork Walla Walla River near Milton	43.8	1930-69
14011500	Walla Walla River near Milton	130	1905-06; 1918-29
14012000	Walla Walla River at Milton	155	1903-05
14012500	Walla Walla River below Freewater	160	1941-48
COLUMBIA RIVER BASIN			
14019200	Columbia River at McNary Dam, near Umatilla	214,000	1950-81

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi ²)	Period of record (calendar year)
UMATILLA RIVER BASIN			
14019500	North Fork Umatilla River near Gibbon	31	1912-15;1940-43
14020500	Umatilla River at Gibbon	310	1896-99;1900-01;1902-12
14020700	Umatilla River near Cayuse	384	1968-75
14021000	Umatilla River at Pendleton	637	1903-05;1934-89
14022000	Umatilla River above McKay Creek near Pendleton	700	1921-34
14022500	McKay Creek near Pilot Rock	180	1921;1926-28;1929-89
14024000	McKay Creek at mouth, near Pendleton	190	1903-04;1922-24
14024200	East Birch Creek near Pilot Rock	69.7	1968-73
14024500	Birch Creek near Pilot Rock	240	1919-26
14025000	Birch Creek at Rieth	291	1921-23;1928-76
14025500	Umatilla River near Yoakum	1,260	1915-36
14032000	Butter Creek near Pine City	291	1927-88
WILLOW CREEK BASIN			
14035000	Willow Creek near Morgan	630	1921;1928-31
14035500	Willow Creek above Eightmile Canyon, near Arlington	680	1905
14036000	Willow Creek near Arlington	850	1906;1961-79
JOHN DAY RIVER BASIN			
14038000	Strawberry Creek near Prairie City	15	1916-17;1925-30
14038500	John Day River at Prairie City	231	1916-17;1925-68
14039000	John Day River near Dayville	960	1908-14;1920-21;1925-26
14039500	South Fork John Day River near Dayville	590	1951-56
14040000	South Fork John Day at Dayville	600	1908-14;1920-21;1925-26
14040600	Mountain Creek near Mitchell	20.0	1984-89
14041000	Desolation Creek near Dale	108	1915-17;1949-58
14041500	North Fork John Day River near Dale	525	1929-58
14042000	Camas Creek near Lehman	60.7	1950-70
14043000	Cable Creek near Ukiah	39	1914-17;1919-24;1932-37
14043500	Camas Creek below Cable Creek, near Ukiah	--	1939
14043560	Snipe Creek near Ukiah	37.0	1914
14044500	Fox Creek at gorge, near Fox	90.2	1968-73
14045000	Cottonwood Creek near Monument	210	1930-58
14045500	Cottonwood Creek at Monument	232	1926-31
14047000	John Day River at Clarno	5,940	1925
14047390	Rock Creek above Whyte Park near Condon	297	1914-15;1920-21
14047500	Rock Creek at Rock Creek	500	1975-89
DESCHUTES RIVER BASIN			
14049000	Deschutes River above Snow Creek, near La Pine	109	1922-25
14049500	Snow Creek above Crane Prairie, near La Pine	23.0	1922-25
14051500	Cultus River below Cultus Creek, near La Pine	52.8	1922
14053000	Charlton Creek above Crane Prairie Reservoir, near La Pine	15.6	1938-79
14055000	Deschutes River above Davis Creek, near La Pine	290	1925-32
14055500	Odell Creek near Crescent	39.0	1911-14;1923-24;1933-76
14057000	Deschutes River at Pringle Falls, near La Pine	507	1915-17;1922-52
14058000	Deschutes River near La Pine	600	1910-17;1920;1922
14058500	Deschutes River near Lava	659	1905-07;1909-12
14059000	Little Deschutes River at Crescent	109	1905-08;1910-14
14060500	Crescent Creek below Cold Creek, near Crescent	77	1922-26;1931-32
14061000	Big Marsh Creek at Hoey Ranch, near Crescent	51.5	1912-14;1924;1928-58
14061500	Crescent Creek near Crescent	137	1912-14
14062000	Little Deschutes R above Walker Basin intake, near La Pine	307	1914-17;1919-26;1931-22
14063000	Little Deschutes River near La Pine	859	1924-89
14063300	Paulina Creek near La Pine	10.1	1982-89
14063500	Little Deschutes River at Allen's Ranch, near La Pine	1,020	1905-12;1913-15;1931-32
14065000	Deschutes River above Lava Island, near Bend	1,790	1943-44
14066000	Deschutes River below Lava Island, near Bend	1,829	1914-16;1943-50
14070700	Bridge Creek near Bend	6.58	1926-65
14071500	Tumalo Creek near Tumalo	30.9	1980-85
14074000	Deschutes River at Tumalo	1,983	1906-14
14074500	Deschutes River at Cline Falls, near Redmond	2,080	1910-12;1914-15
14077000	South Fork Beaver Creek near Paulina	95	1910-13;1928-46
14077500	North Fork Beaver Creek near Paulina	64.4	1944-53
14078000	Beaver Creek near Paulina	450	1942-54
14078500	North Fork Crooked River above Deep Creek	159	1943-75
14079000	North Fork Crooked River below Deep Creek	264	1941-54
14079500	Crooked River near Post	2,160	1946-53
14079800	Crooked River above Prineville Reservoir, near Post	2,400	1908-11;1939-60;1968-73
14080000	Bear Creek at Rickman Ranch, near Roberts	44	1976-77
14080250	Bear Creek near Prineville	205	1960-68
14081500	Crooked River at Prineville	2,820	1920-23
14082500	Marks Creek near Prineville	61.0	1976-81
14083000	Ochoco Creek above Mill Creek, near Prineville	200	1914
14083500	Mill Creek near Prineville	78.8	1916
14085000	Ochoco Creek at Elliott Ranch, near Prineville	300	1917-22;1924-28
14085500	Ochoco Creek at Prineville	358	1916-18;1920-22;1924-33
14086000	McKay Creek near Prineville	76.6	1909-10;1914-17
14086500	McKay Creek above Old Dry Creek, near Prineville	86.2	1912;1913-15
14087000	McKay Creek below Old Dry Creek, near Prineville	103	1924-32
14087300	Crooked River near Terrebonne	4,240	1918-19;1920
			1915
			1961-67;1967-73

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi ²)	Period of record (calendar year)
DESCHUTES RIVER BASIN--Continued			
14087500	Crooked River near Culver	4,330	1917-63
14088500	Metolius River at Allingham ranger station, near Sisters	81.5	1910-13;1915-17
14089000	First Creek near Sisters	12.2	1915-17;1924-28
14089500	Jack Creek near Sisters	16.0	1915-16
14090000	Canyon Creek near Sisters	32.5	1915-16
14090500	Whitewater River near Grandview	30.6	1911-13
14092000	Metolius River at Riggs Ranch, near Sisters	347	1908-12
14093000	Shitike Creek at Warm Springs	105	1911-16;1923-28;1972-74
14093500	Deschutes River at Mecca	7,940	1911-27
14094000	Trout Creek near Antelope	220	1915-17
14094500	Trout Creek near Gateway	--	1915-16
14095000	Hay Creek near Hay Creek	78	1915-16
14096000	Mill Creek at outlet of Olallie Lake	5.6	1915-16
14096500	Mill Creek near Warm Springs	28.8	1915
14097000	Warm Springs River near Warm Springs	517	1911-19
14097200	White River near Government Camp	40.7	1969-79;1980-81
14097400	Clear Creek below Clear Lake, near Govt Camp	8.32	1968-73
14097500	Clear Creek near Government Camp	9.94	1940-41;1946-53
14098000	Clear Creek above intake, near Wapinitia	17.7	1918-21;1934-35
14098100	Clear Creek Ditch near Government Camp	--	1968-73
14098600	Clear Creek near Pine Grove	38.3	1967-73
14099500	Gate Creek at Purcell Ranch, near Wamic	23.9	1920-23
14100000	Gate Creek near Wamic	28.3	1917-18
14100500	White River near Tygh Valley	221	1911-18
14102000	Deschutes River at Sherars Bridge	10,200	1923-32
FIFTEENMILE CREEK BASIN			
14104000	Fifteenmile Creek near Dufur	19.6	1918-19
14104500	Fifteenmile Creek near Wrentham	171	1946-53
14105000	Eightmile Creek near Boyd	56	1946-53
14105500	Fivemile Creek near The Dalles	32.4	1925-26;1927-28;1930-31
MILL CREEK BASIN			
14105850	South Fork Mill Creek near The Dalles	28.0	1959-75
MOSIER CREEK BASIN			
14113200	Mosier Creek near Mosier	41.5	1963-81
HOOD RIVER BASIN			
14113400	Dog River near Parkdale	4.50	1959-71
14113500	East Fork Hood River above intake, near Mount Hood	77.2	1915-22
14115000	East Fork Hood River near Mount Hood	78.8	1913-14
14115500	East Fork Hood River near Dee	108	1917
14116000	Hood River at Dee	155	1913-16;1917
14116500	Green Point Creek near Dee	10.0	1919-21
14117500	North Fork Green Point Creek near Dee	7.6	1919;1921
14118000	Green Point below North Fork, near Dee	20.0	1949-54
14119000	Hood River at Winans	259	1905-07;1910-12;1913
14121000	Hood River near Hood River	329	1913-64
SANDY RIVER BASIN			
14130000	Lost Creek near Brightwood	11.2	1913-18
14131000	Little Zigzag River at Twin Bridges, near Rhododendron	3.70	1926-36
14131500	Zigzag River at Rhododendron	31.0	1920-21;1926-30
14133500	Sandy River above Salmon River, at Brightwood	117	1910-14;1926-31
14134500	Salmon River below Linney Creek	54.0	1927-50
14135000	Salmon River at Welches	100	1913-14;1920-21;1925-36
14135500	Salmon River above Boulder Creek, near Brightwood	106	1936-52
14139500	Bull Run River below Lake Ben Morrow	74.0	1929-54
14140500	Little Sandy River near Marmot	17.9	1913-19
MIDDLE FORK WILLAMETTE RIVER BASIN			
14144900	Hills Creek above Hills Creek Reservoir, near Oakridge	52.7	1958-81
14145000	Hills Creek near Oakridge	59.0	1935-43
14146000	Salt Creek near Oakridge	113	1913-14;1933-51
14146700	Gray Creek near Oakridge	5.06	1978-86
14147000	Waldo Lake Outlet near Oakridge	30.5	1936-53;1969-82;1983-84
14150500	Fall Creek above Winberry Creek, near Lowell	127	1935-43
14150800	Winberry Creek near Lowell	43.9	1963-81
14151500	Little Fall Creek near Fall Creek	52.5	1935-48
COAST FORK WILLAMETTE RIVER BASIN			
14152500	Coast Fork Willamette River at London	72.1	1935-87
14156000	Mosby Creek near Cottage Grove	85.0	1936-46
14156500	Mosby Creek at Mouth, near Cottage Grove	95.3	1946-68;1969-81
14157000	Coast Fork Willamette River at Saginaw	529	1923-26;1927-51
UPPER WILLAMETTE RIVER BASIN			
14158000	Willamette River at Springfield	2,030	1911-13;1919-57

WATER RESOURCES DATA FOR OREGON, 1990

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi ²)	Period of record (calendar year)
MCKENZIE RIVER BASIN			
14158700	McKenzie River near Belknap Springs	146	1957-62
14158930	Budworm Creek near Belknap Springs	3.00	1978-83; 1983-86
14158955	McKenzie River above Boulder Creek, near Belknap Springs	--	1983
14159100	Horse Creek near McKenzie Bridge	149	1962-69
14159200	South Fork McKenzie River above Cougar Lake, nr Rainbow	160	1957-87
14161000	Blue River above Quentin Creek	11.5	1947-55
14162000	Blue River near Blue River	75.0	1935-64
14164000	McKenzie River near Springfield	1,066	1905-15
14165500	McKenzie River near Coburg	1,337	1944-72
MIDDLE WILLAMETTE RIVER BASIN			
14167000	Coyote Creek near Crow	95.1	1940-87
14169300	Amazon Creek at Eugene	3.35	1962-75
14169500	Amazon Creek near Eugene	21.3	1954-68; 1979-82
14170500	Rock Creek near Philomath	14.6	1945-52; 1974-79
14171000	Marys River near Philomath	159	1940-85
14171500	Muddy Creek near Corvallis	107	1963-68
14173500	Calapooia River at Albany	372	1940-81
14179000	Breitenbush River above Canyon Creek, near Detroit	106	1932-87
14185880	Packers Gulch near Cascadia	7.45	1983-86
14186000	Middle Santiam River near Foster	271	1931-47
14186500	Middle Santiam River at Mouth, near Foster	287	1950-66
14186700	South Santiam River at Foster	493	1966-73
14187100	Wiley Creek at Foster	62.3	1973-88
14188700	Crabtree Creek near Crabtree	111	1963-70
14188800	Thomas Creek near Scio	109	1962-87
14189500	Luckiamute River near Hoskins	34.3	1934-78
14190000	Luckiamute River at Pedee	115	1940-70
14190100	Little Luckiamute River at Falls City	22.7	1965-71
14190700	Rickreall Creek near Dallas	27.4	1957-78
14191500	Mill Creek at Penitentiary Annex, near Salem	104	1940-56
14192000	Mill Creek at Salem	110	1940-78
14193300	Mill Creek near Willamina	27.4	1958-73
14195000	Haskins Creek near McMinnville	6.48	1928-51
14196500	North Yamhill River near Pike	47.8	1940-51
14197000	North Yamhill River at Pike	66.8	1948-73
14198000	Willamette River at Wilsonville	8,400	1948-73
MOLALLA-PUDDING RIVER BASIN			
14199000	Molalla River near Molalla	201	1905-09; 1946-51
14200000	Molalla River near Canby	323	1928-59; 1963-78
14200300	Silver Creek at Silverton	47.9	1963-68; 1970-79
14201000	Pudding River near Mount Angel	204	1939-66
14201500	Butte Creek at Monitor	58.7	1936; 1940-52; 1966-85
14202000	Pudding River at Aurora	479	1928-64
TUALATIN RIVER BASIN			
14202500	Tualatin River near Gaston	48.5	1940-56; 1972-76; 1978-84
14202850	Scoggins Creek above Henry Hagg Lake, near Gaston	15.9	1972-76
14202920	Sain Creek near Gaston	10.3	1972-76
14203000	Scoggin Creek near Gaston	43.3	1940-74
14204000	Gales Creek near Gales Creek	33.2	1935-45; 1963-70
14204500	Gales Creek near Forest Grove	66.1	1940-56; 1970-81
14205500	East Fork Dairy Creek at Mountindale	43.0	1940-51
14205800	Dairy Creek near Cornelius	147	1973-76
14206000	McKay Creek near North Plains	27.6	1940-43; 1948-56
14206180	McKay Creek near Hillsboro	61.0	1972; 1973-76
14206500	Tualatin River at Farmington	568	1939-58; 1972; 1973-76
CLACKAMAS RIVER BASIN			
14208000	Clackamas River at Big Bottom	136	1920-70
14208300	Collawash River near Breitenbush	142	1966-68
14208500	Oak Grove Fork at Timothy Meadows	54.0	1913-14; 1915-29
14209600	Roaring River near Estacada	42.4	1966-68
14211000	Clackamas River near Clackamas	930	1962-83
LOWER COLUMBIA RIVER BASIN			
14248700	Bear Creek near Svensen	3.33	1965-75
14251500	Youngs River near Astoria	40.1	1927-58
WILSON-TRASK-NESTUCCA RIVER BASIN			
14302500	Trask River near Tillamook	145	1931-55; 1961-72
14303000	Nestucca River near McMinnville	12.0	1928-44
SILETZ RIVER BASIN			
14304850	Big Rock Creek near Valsetz	6.90	1985-89
YAQUINA RIVER BASIN			
14306036	Mill Creek near Toledo	4.18	1960-73

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi ²)	Period of record (calendar year)
ALSEA RIVER BASIN			
14306040	North Fork Beaver Creek near Seal Rock	10.0	1965-67
14306100	North Fork Alsea River at Alsea	63.0	1957-89
14306200	South Fork Alsea River near Alsea	49.5	1960-63
14306300	Fall Creek near Alsea	29.4	1960-63
14306600	Drift Creek near Salado	20.5	1958-63; 1965-70
14306700	Needle Branch near Salado	.27	1958-73
14306800	Flynn Creek near Salado	.78	1958-73
14306810	Deer Creek near Salado	1.17	1958-73
SIUSLAW RIVER BASIN			
14307000	Siuslaw River above Wildcat Creek, at Austa	267	1931-40
14307500	Lake Creek at Triangle Lake	52.5	1931-55
14307580	Lake Creek near Deadwood	174	1967-89
14307645	North Fork Siuslaw River near Minerva	41.2	1967-85
SOUTH UMPQUA RIVER BASIN			
14307700	Jackson Creek near Tiller	152	1955-86
14308700	Days Creek at Days Creek	55.3	1955-72
14310700	South Myrtle Creek near Myrtle Creek	43.9	1955-72
14311000	North Myrtle Creek near Myrtle Creek	54.2	1955-86
14311200	Olalla Creek near Tenmile	61.3	1956-73
14311300	Tenmile Creek at Tenmile	29.6	1967-73
14312200	Deer Creek near Roseburg	53.2	1955-73
NORTH UMPQUA RIVER BASIN			
14312400	Silent Creek near Diamond Lake	8.24	1971-77
14312500	Lake Creek near Diamond Lake	54.9	1922; 1923-29; 1930; 1930-32; 1933-53; 1971-84
14315500	North Umpqua River at Toketee Falls	339	1925-45; 1946-48
14317500	North Umpqua River above Rock Creek, near Glide	886	1924-45
14317600	Rock Creek near Glide	97.4	1957-73
14318000	Little River at Peel	177	1954-89
14318500	North Umpqua River near Glide	1,210	1915-18; 1927-38
14319200	Sutherlin Creek at Sutherlin	16.4	1955-67
UMPQUA RIVER BASIN			
14319900	Calapooya Creek at Nonpareil	88.6	1976-88
14322000	Elk Creek near Drain	104	1955-73; 1978-79
14322900	Umpqua River near Scottsburg	4,095	1966-69
14323100	Smith River near Gardiner	206	1965-73
14323200	Tenmile Creek near Lakeside	87.0	1957-76
COOS RIVER BASIN			
14324500	West Fork Millicoma River near Allegany	46.9	1954-81
COQUILLE RIVER BASIN			
14324600	South Fork Coquille River above Panther Creek, nr Illahe	31.2	1956-70
14324700	South Fork Coquille River near Illahe	40.6	1956-74
14324900	South Fork Coquille River near Powers	93.2	1956-70
14326500	Middle Fork Coquille River near Myrtle Point	305	1930-46
14326800	North Fork Coquille River near Fairview	73.9	1963-81
14327000	North Fork Coquille River near Myrtle Point	282	1928-46; 1963-68
SIXES RIVER BASIN			
14327150	Sixes River at Sixes	116	1967-70
14327300	Elk River near Sixes	86.1	1967-70
UPPER ROGUE RIVER BASIN			
14327500	Rogue River above Bybee Creek, near Union Creek	156	1930-52
14329500	Mill Creek near Prospect	32.0	1925-35
14330500	South Fork Rogue River above Imnaha Creek, near Prospect	52.0	1931-49
14331000	Imnaha Creek near Prospect	26.0	1931-49
14333000	Middle Fork Rogue River near Prospect	56.5	1925-55
14333500	Red Blanket Creek near Prospect	45.5	1925-32; 1933-81
14335000	Rogue River below South Fork Rogue River, near Prospect	650	1928-65
14335075	Rogue River at McLeod	697	1977-81
14339400	South Fork Little Butte Collect Canal near Pinehurst	--	1960-65
14339500	South Fork Little Butte Creek at Big Elk Ranger Station	16.6	1926-50
14340400	Dead Indian Collect Canal near Pinehurst	--	1960-65
14341500	South Fork Little Butte Creek near Lakecreek	138	1921-57; 1960-82
14342500	North Fork Little Butte Creek at Fish Lake, near Lakecreek	20.8	1914-15; 1916-89
14343000	North Fork Little Butte Creek near Lakecreek	43.8	1911-13; 1917; 1922-27; 1928-64; 1965-85
14344500	N F Little Butte Creek abv Intake Canal, near Lakecreek	60.4	1916-19; 1921-50
14347000	Little Butte Creek above Eagle Point	269	1916-26; 1928-29
14348000	Little Butte Creek below Eagle Point	293	1907-16; 1923-26; 1945-50

WATER RESOURCES DATA FOR OREGON, 1990

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi ²)	Period of record (calendar year)
MIDDLE ROGUE RIVER BASIN			
14350000	Emigrant Creek near Ashland	64.3	1920-86
14353000	West Fork Ashland Creek near Ashland	10.5	1924-33;1974-82
14353500	East Fork Ashland Creek near Ashland	8.14	1924-33;1974-82
14359500	Evans Creek near Bybee Springs, near Rogue River	116	1925-27;1940-53
APPLEGATE RIVER BASIN			
14361590	Middle Fork Applegate River near Copper	50.7	1979-87
14361600	Elliot Creek near Copper	51.8	1977-87
14361700	Carberry Creek near Copper	68.9	1978-87
14363000	Applegate River near Ruch	302	1911-14;1925-53
14368500	Powell Creek near Williams	8.17	1946-58
14370000	Slate Creek at Wonder	31.4	1943-57
LOWER ROGUE RIVER BASIN			
14371500	Grave Creek at Pease Bridge, near Placer	22.1	1940-89
14372000	Grave Creek near Placer	45.6	1913;1914;1941-50
ILLINOIS RIVER BASIN			
14373500	Althouse Creek near Holland	24.3	1946-53
14375000	Sucker Creek near Holland	76.2	1941-65
14375500	West Fork Illinois River below Rock Creek, near O'Brien	42.4	1954-85
14376500	West Fork Illinois River near O'Brien	49.7	1946-54
14377000	Illinois River at Kerby	364	1926-61
14377500	Deer Creek near Dryden	22.0	1941-56
14378000	Illinois River near Selma	665	1956-68
14378200	Illinois River near Agness	988	1960-81

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FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI).

Multiply inch-pound units	By	To obtain SI units
<i>Length</i>		
inches (in)	2.54×10^1	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^0	kilometers (km)
<i>Area</i>		
acres	4.047×10^3	square meters (m ²)
	4.047×10^{-1}	square hectometers (hm ²)
	4.047×10^{-3}	square kilometers (km ²)
square miles (mi ²)	2.590×10^0	square kilometers (km ²)
<i>Volume</i>		
gallons (gal)	3.785×10^0	liters (L)
	3.785×10^0	cubic decimeters (dm ³)
	3.785×10^{-3}	cubic meters (m ³)
million gallons	3.785×10^3	cubic meters (m ³)
	3.785×10^{-3}	cubic hectometers (hm ³)
cubic feet (ft ³)	2.832×10^1	cubic decimeters (dm ³)
	2.832×10^{-2}	cubic meters (m ³)
cfs-days	2.447×10^3	cubic meters (m ³)
	2.447×10^{-3}	cubic hectometers (hm ³)
acre-feet (acre-ft)	1.233×10^3	cubic meters (m ³)
	1.233×10^{-3}	cubic hectometers (hm ³)
	1.233×10^{-6}	cubic kilometers (km ³)
<i>Flow</i>		
cubic feet per second (ft ³ /s)	2.832×10^1	liters per second (L/s)
	2.832×10^1	cubic decimeters per second (dm ³ /s)
	2.832×10^{-2}	cubic meters per second (m ³ /s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm ³ /s)
	6.309×10^{-5}	cubic meters per second (m ³ /s)
million gallons per day	4.381×10^1	cubic decimeters per second (dm ³ /s)
	4.381×10^{-2}	cubic meters per second (m ³ /s)
<i>Mass</i>		
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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